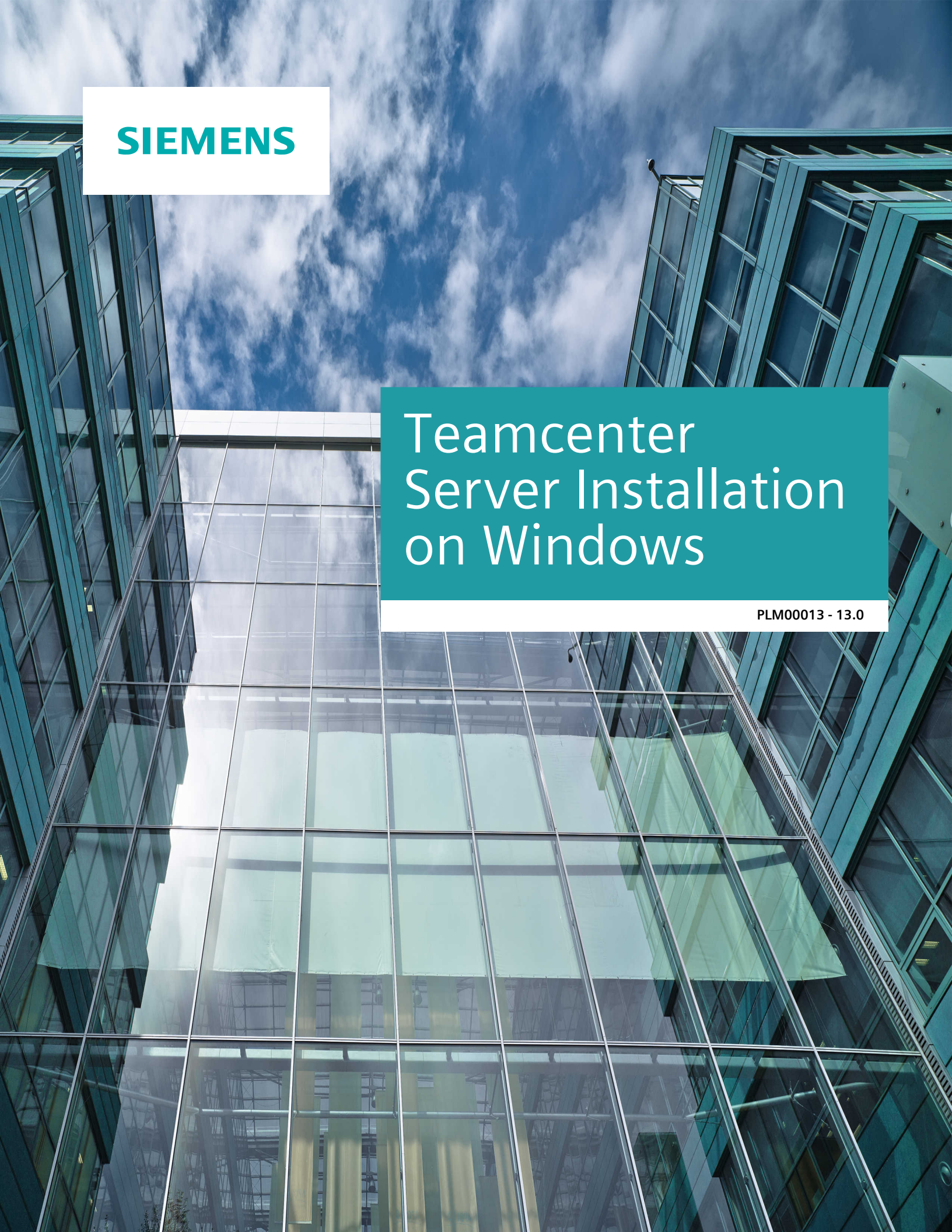

SIEMENS

Teamcenter Server Installation on Windows

PLM00013 - 13.0

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Part I: Getting started with Teamcenter server installation

This guide describes how to install Teamcenter 13.0 on Microsoft Windows servers. This includes installation of Teamcenter servers using Teamcenter Environment Manager and the Teamcenter web tier using the Web Application Manager.

This guide assumes you have a thorough working knowledge of your operating system and general knowledge of Teamcenter use.

1. Requirements and overview

System requirements

Where to find release information

Before you install Teamcenter 13.0, read the following resources for information that may affect your Teamcenter deployment.

- *What's new in Active Workspace 5.0 in Teamcenter 13*
  Contains information about new features in Teamcenter 13.0.

- Teamcenter 13.0 README file
  Contains release notes with workarounds for known problems.
  The Teamcenter 13.0 README file is available in PDF format in the software downloads area on **Support Center**:
  https://support.sw.siemens.com

- *Teamcenter Deployment Guide*
  Contains general guidelines and best practices when deploying a new Teamcenter installation or upgrading an existing Teamcenter system.
  The *Teamcenter Deployment Guide* is available on **Support Center**:
  https://support.sw.siemens.com

Where to find system requirements

For versions of system software and hardware certified for running Teamcenter on your platform, see the Hardware and Software Certifications knowledge base article on Support Center:

https://support.sw.siemens.com

This article describes where to find certified software versions for:

- Operating systems
- Databases
- C++ compilers
- Web servers
- Java
- Other third-party software

> Note:
>
> Some software requirements differ for non-English locales. When viewing the certification database, make sure you note any exceptions for your locale.

Installing, upgrading, and patching Teamcenter

Teamcenter 13 is a *major* release, a new baseline version of the Teamcenter platform.

Teamcenter general patches are cumulative and include the latest minor release.

Before you install, upgrade, or patch Teamcenter, understand the types of Teamcenter releases.

Release type:	Major release	Minor release	General patch
Contains	Baseline version of the Teamcenter platform.	Updates to the latest major release.	Minor release *plus* fixes to the major or minor release.
Usage	Install a major release or upgrade from one major release to another.	Install new, upgrade from an earlier major release, or patch a major or minor release.	Apply updates and fixes to an existing major or minor release installation.
Installing requires	Software kit for the latest major release.	Software kits for: • Latest minor release • Latest major release	Software kits for: • Patch • Corresponding major release

Upgrading requires	• Software kit for the latest major release.
	• Existing installation of earlier Teamcenter major release.
		• Software kits for:
		  • Latest minor release
		  • Latest major release
		• Existing installation of earlier Teamcenter major release.
			• Software kits for:
			  • Patch
			  • Latest major release
			• Existing installation of earlier Teamcenter major release.

Patching requires	*Not applicable.*	• Software kit for minor release. • Existing installation of earlier Teamcenter major release, with or without minor releases applied.	• Software kit for patch. • Existing installation of corresponding major or minor Teamcenter release.

Where to start

Whether your move to Teamcenter 13 requires an installation, upgrade, or patch process depends on your current and target versions of Teamcenter. Find your starting point in Teamcenter help from the following table.

<table>
<tr><th>Update path</th><th>Process</th><th>Starting point in Teamcenter help</th></tr>
<tr><td>New Teamcenter deployment
Examples:
<table><tr><th>Current</th><th>Target</th></tr><tr><td>None</td><td>→ Major</td></tr><tr><td>None</td><td>→ Major + Minor</td></tr><tr><td>None</td><td>→ Major + Gen. Patch</td></tr></table></td><td>Install</td><td>• Teamcenter Server Installation on Windows
• Teamcenter Server Installation on Linux</td></tr>
<tr><td>Change in major version
Examples:
<table><tr><th>Current</th><th>Target</th></tr><tr><td>Major 1</td><td>→ Major 2</td></tr><tr><td>Major 1 + Minor 1</td><td>→ Major 2</td></tr><tr><td>Major 1 + Minor 1</td><td>→ Major 2 + Minor 2</td></tr><tr><td>Major 1</td><td>→ Major 2 + Gen. Patch</td></tr></table></td><td>Upgrade</td><td>• Teamcenter Upgrade</td></tr>
<tr><td>Change in minor version
Examples:
<table><tr><th>Current</th><th>Target</th></tr><tr><td>Major 1</td><td>→ Major 1 + Minor 1</td></tr><tr><td>Major 1 + Minor 1</td><td>→ Major 1 + Minor 2</td></tr><tr><td>Major 1 + Minor 1</td><td>→ Major 1 + Gen. Patch</td></tr></table></td><td>Patch</td><td>• Installing Teamcenter patches (Windows)
• Installing Teamcenter patches (Linux)</td></tr>
</table>

Platforms

Determine from the following table which Teamcenter 13.0 servers and clients are supported on your operating system. Bullet characters (•) denote supported servers and clients.

Platform support for Teamcenter servers and clients

Operating system	Corporate server	Web tier	Rich client	Business Modeler IDE client	TCCS[1]
Microsoft Windows (desktop platforms)[2]			•	•	•
Microsoft Windows (server platforms)[3]	•	•		•	
SUSE Linux	•	•	•	•	•
Red Hat Linux[4]	•	•	•	•	•
CentOS Linux[5]	•	•	•	•	•

Notes about platform support

General notes

- For supported operating systems, see the Hardware and Software Certifications knowledge base article on Support Center.
- For information about tuning operating system performance for Teamcenter 13.0, see the *Teamcenter Deployment Guide* on Support Center.
- If your workstation is running Data Share Manager, close Data Share Manager (stopping its Java process) before upgrading.

Microsoft Windows

- 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.

1 Teamcenter client communication system (TCCS) is installed with the rich client. This column refers to the stand-alone TCCS application.
2 Microsoft Windows desktop platforms include Windows 10.
3 Microsoft Windows server platforms include Windows Server 2012 and Windows Server 2016.
4 Only 64-bit Red Hat Linux is supported.
5 Only 64-bit CentOS Linux is supported.

For more information, see Microsoft Windows documentation.

- Disable the Windows TCP scaling feature. Open a command prompt and enter the following command:

  ```
  netsh interface tcp set global autotuninglevel=disabled
  ```

  Siemens Digital Industries Software recommends setting this parameter before installing Teamcenter because most client network infrastructures use one or more switches or routers. By default, Windows enables TCP window scaling, but some routers do not support this feature. This can cause installation failures that are difficult to diagnose and correct.
  For more information, see Microsoft Windows documentation.

- If you use a nonnative 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.

System hardware

Hardware requirements for a Teamcenter deployment vary depending on several considerations, such as whether your deployment contains:

- A single host or multiple hosts
- Rich client, Active Workspace, or both
- Additional components such as Dispatcher Server on separate hosts

The *Teamcenter Server Hardware Overview* available on the documentation site on **Support Center** contains hardware recommendations based on these and other variables.

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.

For support database versions, see the Hardware and Software Certifications knowledge base article on Support Center. 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.

> Note:
>
> If you use Oracle, Siemens Digital Industries Software recommends setting system parameters to recommended values to ensure adequate database performance.
>
> If you use Microsoft SQL Server, keep in mind that Teamcenter servers and two-tier rich clients on Linux hosts cannot connect to Microsoft SQL Server database servers.

Java Runtime Environment

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

Before you launch TEM to install Teamcenter:

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

   For certified JRE versions, see the Hardware and Software Certifications knowledge base article on Support Center.

2. Set the **JRE_HOME** environment variable to the location of the supported JRE. 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 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 Internet Explorer, Mozilla Firefox, and Google Chrome
- Linux systems: Mozilla Firefox and Google Chrome

> Note:
>
> Teamcenter online help is also supported on Google Chrome on all supported platforms.

For supported browser versions, see the Hardware and Software Certifications knowledge base article on Support Center.

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.

For supported versions of these products, see the Hardware and Software Certifications knowledge base article on Support Center.

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

Software integrations

If you use Teamcenter integrations to other Siemens Digital Industries Software products or third-party software, install those products *before* you install Teamcenter.

Some Siemens Digital Industries Software products require separate licenses from your Siemens Digital Industries Software representative. Siemens Digital Industries Software products are licensed using the **Siemens Digital Industries Software Common Licensing Server**.[6]

Prepare Teamcenter software kits

Download Teamcenter software

From the download page on **Support Center**, download the Teamcenter software kit files for Windows:

Tc13.0_wntx64_1_of_2.zip
Tc13.0_wntx64_2_of_2.zip

Expand software kits

Expand both Teamcenter software kit ZIP files to a common directory to assemble the full software kit.

Use a commercial unzip utility such as **7-Zip** to expand files.

> Note:
>
> Contents of Teamcenter kits are described in *Teamcenter distribution media*.

Locate all required software kits

Using kits on a non-local drive

Teamcenter cannot be installed from UNC paths, for example, **\\mediaserver\tcmedia**. If the software kit is located on a remote host, map a drive to the software location using the **net use** command:

1. Open an administrator command prompt using one of the following methods:

   - From the Windows **Start** menu, right-click **All Programs→Accessories→Command Prompt** and choose **Run as administrator**.
   - In the Windows **Start Search** box, type **cmd**, and then press Ctrl+Shift+Enter. If Windows displays the **User Account Control** dialog box, click **Yes** to continue.

2. Type the **net use** command:

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

   For example:

6 Installation of the Siemens Digital Industries Software Common Licensing Server is described in the server installation guides for Windows and Linux.

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

Choose an online help source

You can access Teamcenter online help from two sources.

Online help source:	Support Center	Siemens Documentation Server
Access required	Internet access	Local network access
Benefits	• Eliminates the need to install and maintain documentation on user desktops or intranet. • Provides secure access through a generated API key specific to your site. • Requires no log on.	• Local access to help for all products and versions you use, in multiple languages. • No Internet access required.
Software to install	Secure Documentation Proxy	1. Siemens Documentation Server To enable access for multiple hosts in your network, configure multiuser mode. 2. Product documentation

To configure client access to online help:

1. Choose how you want to access online help.

2. Download and install the appropriate software from Support Center.

3. Supply the appropriate online help URL to the rich client:

   http://*domain***/en-US/product/282219420/doc/PL20200109161601697.xid1899404/html/xid1899405**

   Replace *domain* with the source from which you access online help:

   - Support Center: **docs.sw.siemens.com**
   - Siemens Documentation Server: *doc-server-host***:***doc-server-port*

Create the Teamcenter administrative user account

Before you install Teamcenter, create an operating system logon account for Teamcenter. This account must belong to the **Administrators** group and must be granted the **Log on as a service** right. Teamcenter services run on the server as this user account.

Log on using this account when you install the Teamcenter corporate server and when you perform maintenance such as upgrading or installing updates using Teamcenter Environment Manager.

Basic concepts about Teamcenter installation

Teamcenter servers

Database server

A Teamcenter network requires access to a database server to store Teamcenter data.

Before you install Teamcenter, you or your database administrator must install and configure one of the following supported database servers:

- **Oracle**
- **Microsoft SQL Server**

For configuration settings and tuning methods to optimize Teamcenter performance with Oracle or Microsoft SQL Server, see the *Teamcenter Deployment Guide* available on **Support Center**.

The *Teamcenter Deployment Guide* also provides an in-depth review of database performance issues and diagnosis, and configuration and tuning guidelines.

> Note:
>
> Teamcenter servers and two-tier rich clients on Linux hosts cannot connect to Microsoft SQL Server database servers.

Corporate server

A Teamcenter corporate server installation includes the following components:

- Teamcenter shared binary executables and files
- Teamcenter shared data subdirectories and files
- Database connection
- Teamcenter volume
- Additional optional Teamcenter features such as File Management System (FMS)

A Teamcenter network requires one corporate server configuration. Additional servers are optional, but can help balance network loads and facilitate heterogeneous networks (networks with hosts running different operating systems).

Web tier server

The Teamcenter web tier provides communication between the client tier and enterprise tier (between Teamcenter clients and servers).

If you use the four-tier rich client or Active Workspace, install the **.NET web tier** or the **Java EE web tier**.

Teamcenter clients

Teamcenter provides clients suited to different uses and network configurations. These include the rich client and Active Workspace, plus integrations like Teamcenter Client for Microsoft Office and Teamcenter Extensions for Microsoft Office.

- **Rich client**

  The *rich client* is a platform-independent client implementation (Java application) for users who interact with Teamcenter frequently. It is extendable to run standard Teamcenter and customized applications.
  The rich client application is deployed on each user workstation using Teamcenter Environment Manager. The rich client is supported in both the **two-tier architecture** and **four-tier architecture**.

- **Active Workspace**

  Active Workspace is a web client that features a simplified interface highly configurable to an industry, group, role, or individual user. It provides a broad set of Teamcenter functionality with enhanced search capability and mobile device support.
  Installation and configuration of Active Workspace is described in the Active Workspace help, not in the Teamcenter help.

Teamcenter clients can be installed on Windows or Linux

Teamcenter network architectures

Two-tier architecture

The two-tier architectural model comprises the following tiers:

- Client tier
  The client tier comprises the Teamcenter rich clients.
  In a deployment of the two-tier architecture, the Teamcenter server runs on the client workstation.

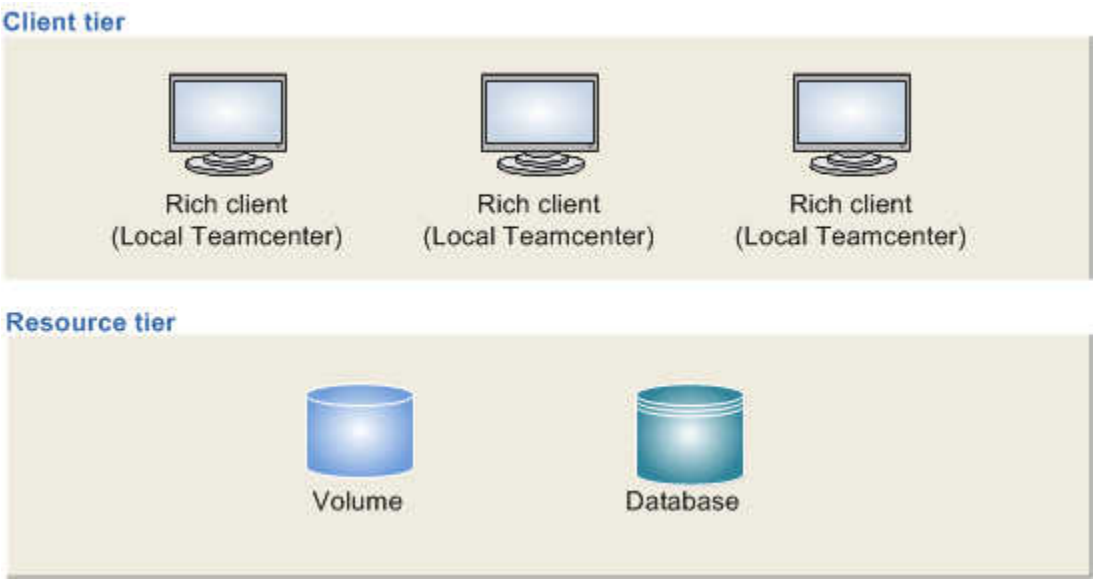
Note:

The two-tier rich client is installed through TEM.

Some Teamcenter client features, such as Teamcenter Integration for NX, Lifecycle Visualization, and Teamcenter Client for Microsoft Office, require the web tier, a component of the four-tier architecture. To enable these features for a two-tier rich client, you can **connect the two-tier rich client to a deployment of the web tier**.

- Resource tier
  The resource tier comprises a database server, database, volumes, and file servers.

Two-tier architecture

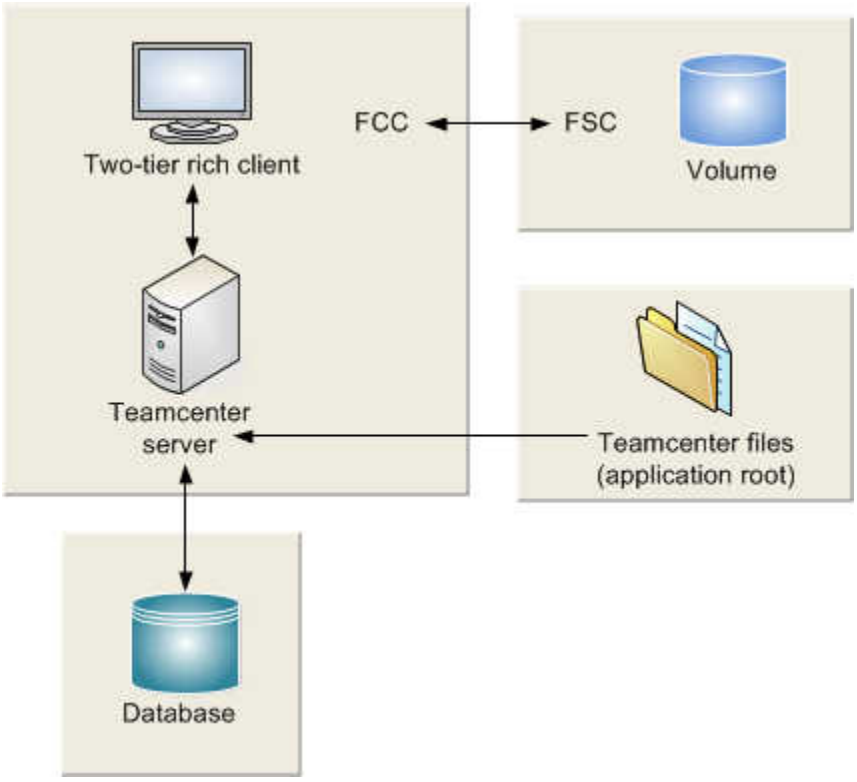


In the two-tier model, you deploy the Teamcenter rich client, which includes the local server, and the optional applications that integrate with the rich client on the client workstation. Typically, the database server, volumes, and file servers are installed on one or more separate hosts.

Teamcenter File Management System (FMS) manages the rich client access to volumes:

- The FMS server cache (FSC) process run on the server hosting the volume.
- The FMS client cache (FCC) process runs on the rich client host.

Two-tier deployment



Four-tier architecture

The four-tier architecture model comprises the following tiers:

- Client tier
  The client tier comprises the Teamcenter rich client, and other clients such as Teamcenter Client for Microsoft Office.

  > Note:
  >
  > The rich client can be deployed with additional functionality, such as Lifecycle Visualization, Teamcenter Client for Microsoft Office, and Teamcenter Integration for NX or NX Integration 4.0.1. (Teamcenter Integration for NX/NX Integration 3 is not supported.)

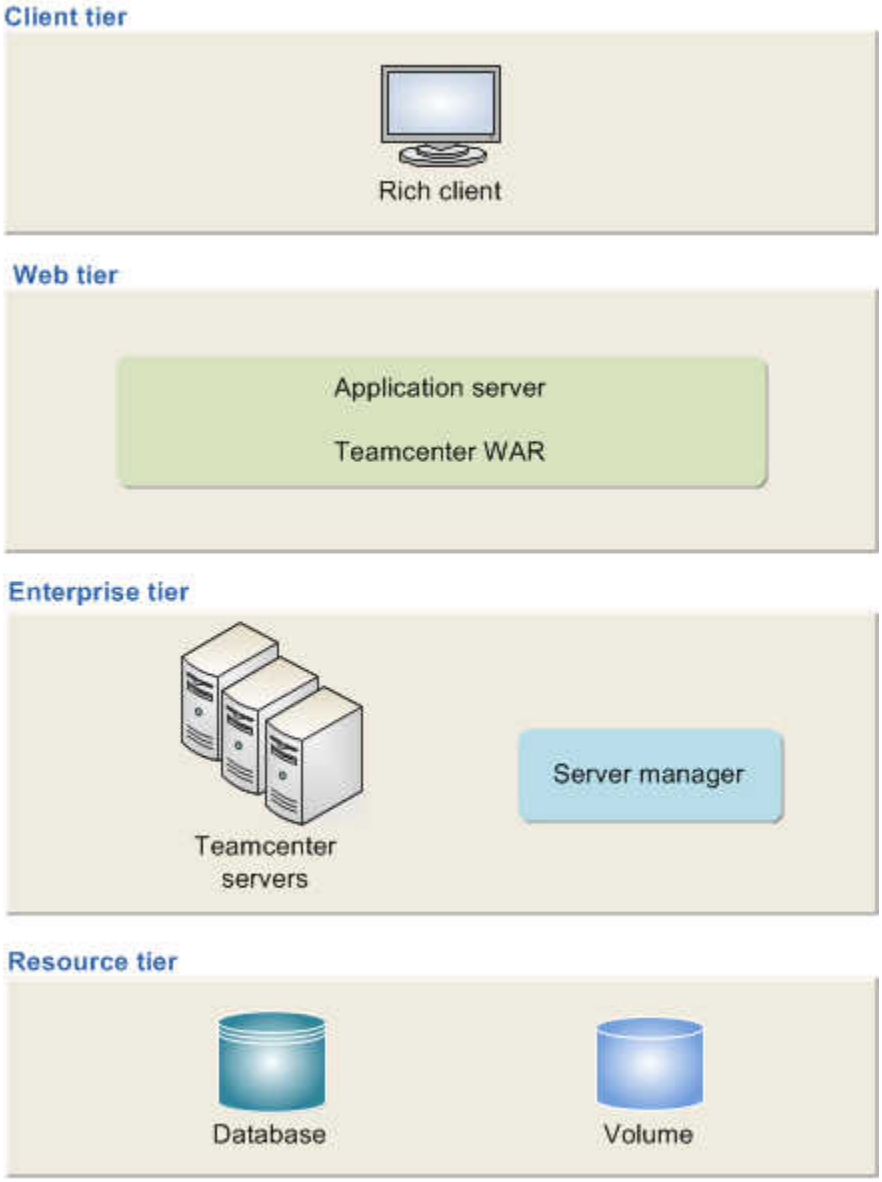
- Java EE web tier
  The Java EE web tier is a Java application that runs in a Java Enterprise Edition (Java EE) application server, such as Oracle WebLogic, and is responsible for communication between the client tier and enterprise tier. For information about supported application servers, the Hardware and Software Certifications knowledge base article on Support Center.

- Enterprise tier
  The enterprise tier comprises a configurable pool of Teamcenter C++ server processes and a server manager. The enterprise tier retrieves data from and stores data in the database.

A server manager manages a pool of Teamcenter server processes. You must install a server manager whenever you deploy the web tier.

- Resource tier
  The resource tier comprises a database server, database, volumes, and file servers.

Four-tier architecture



You can design deployments that host the web tier, resource tier, and enterprise tiers on the same computer or on separate computers:

- Smaller sites can run the pool of servers and the server manager on the same host as the web tier.
- Larger sites can distribute the pool of server processes across multiple hosts and optionally include an HTTP server to serve static files or multiple HTTP servers to support load balancing.
  For a multihost configuration, the server pool consists of multiple subpools, one or more for each host. Each subpool is managed by one server manager process. The web tier balances the load across the server pools.

To ensure communication between the web tier and the server manager, you must coordinate the values you specify for each component. For some values, you must provide the identical value when configuring the web tier application.

If you are setting up multiple web tier environments with separate domains, you must configure a minimum of one server manager for each web tier deployment.

The JMX HTTP adapter allows you to view the status of the server pool and dynamically alter the pool configuration values (the values are not persistent). Access this functionality from the following URL:

http://*host-name***:***jmx-port*

Replace *host-name* with the name of the host running the server manager. Replace *jmx-port* with the number of the port running the JMX HTTP adapter. This port number is defined when you install the server manager.

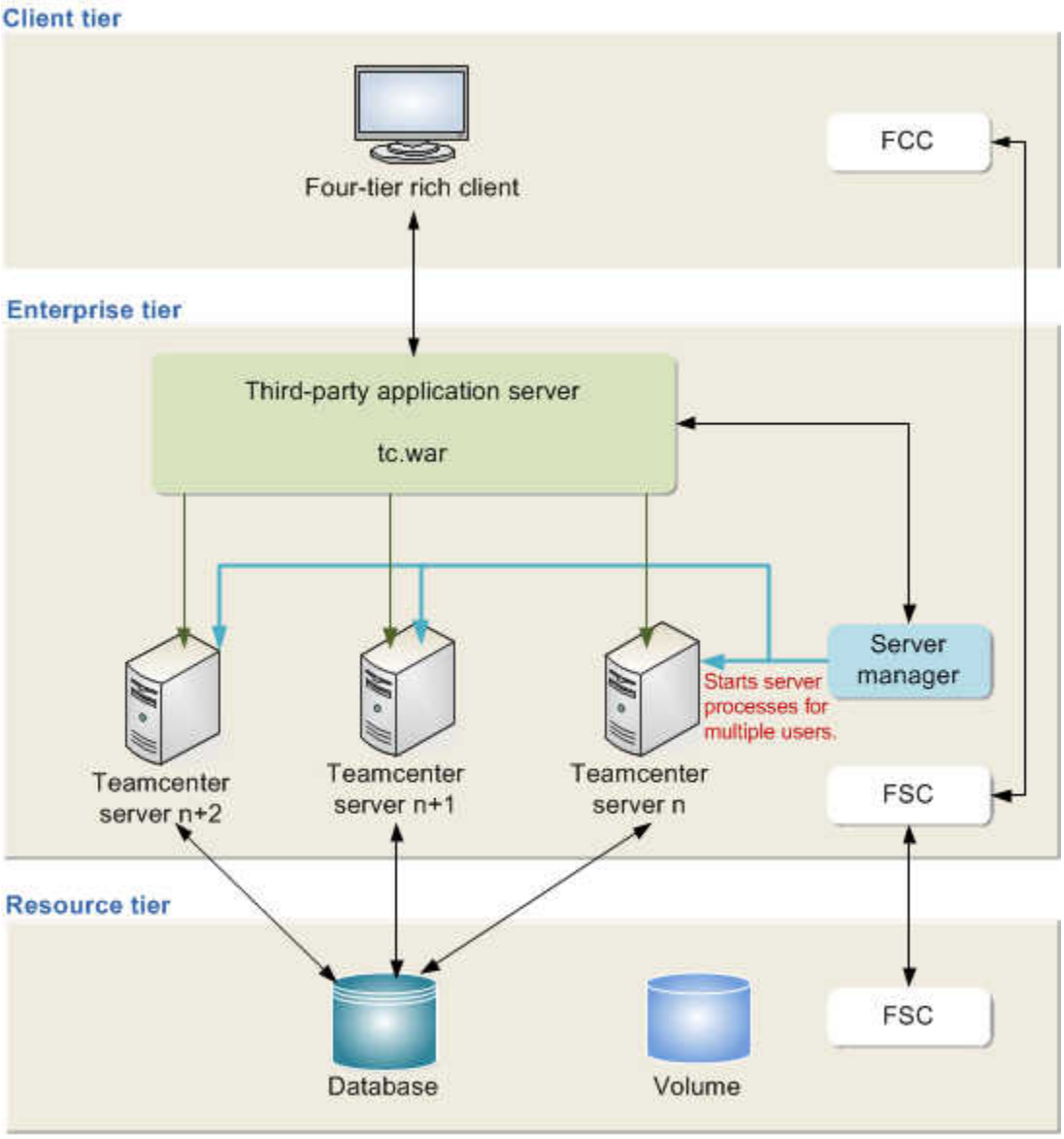
The first time you log on to the adapter, use **manager** for both the user name and the password. You can change the user name and password to unique values using the adapter.

Teamcenter File Management System (FMS) manages the rich client access to volumes:

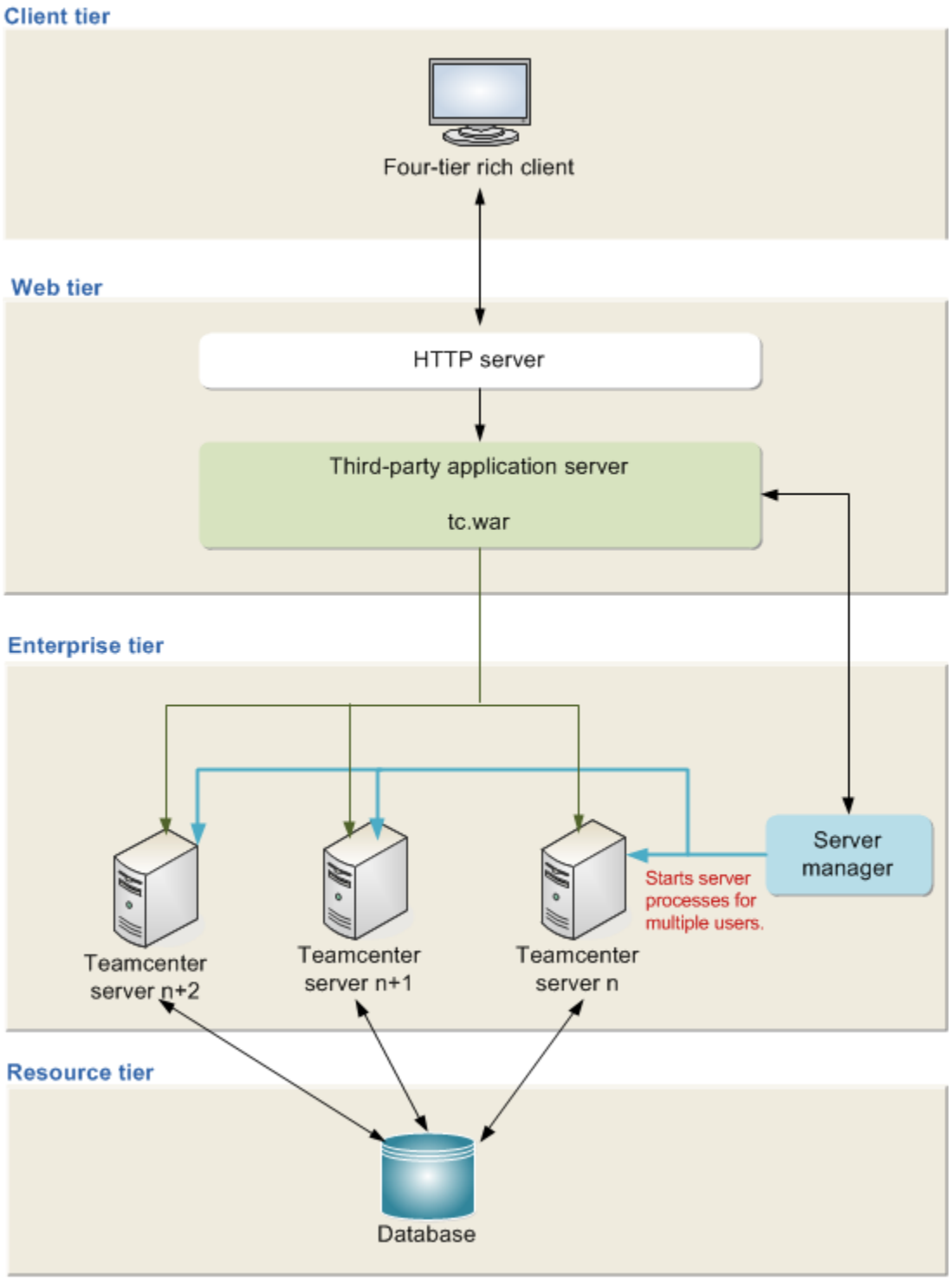
- The FMS client cache (FCC) process runs on the rich client host.
- The FMS server cache (FSC) process runs on each server hosting a volume and each server hosting a pool of Teamcenter servers (**TcServer**).

> Note:
>
> If you install File Management System, the FMS server cache (FSC) and the server manager must run on the same host server, with the same user ID.

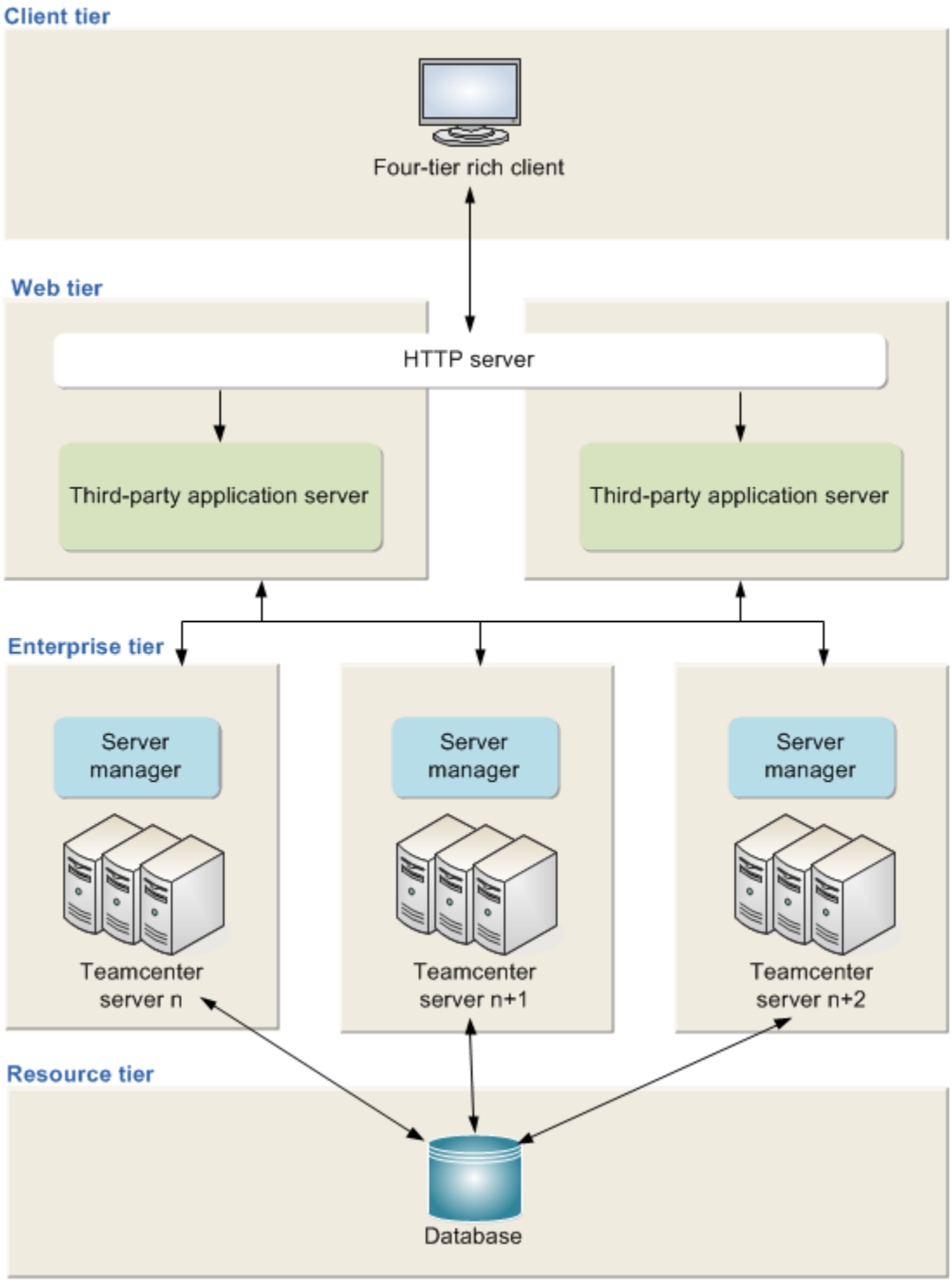
Four-tier deployment (enterprise and web tiers on same host)



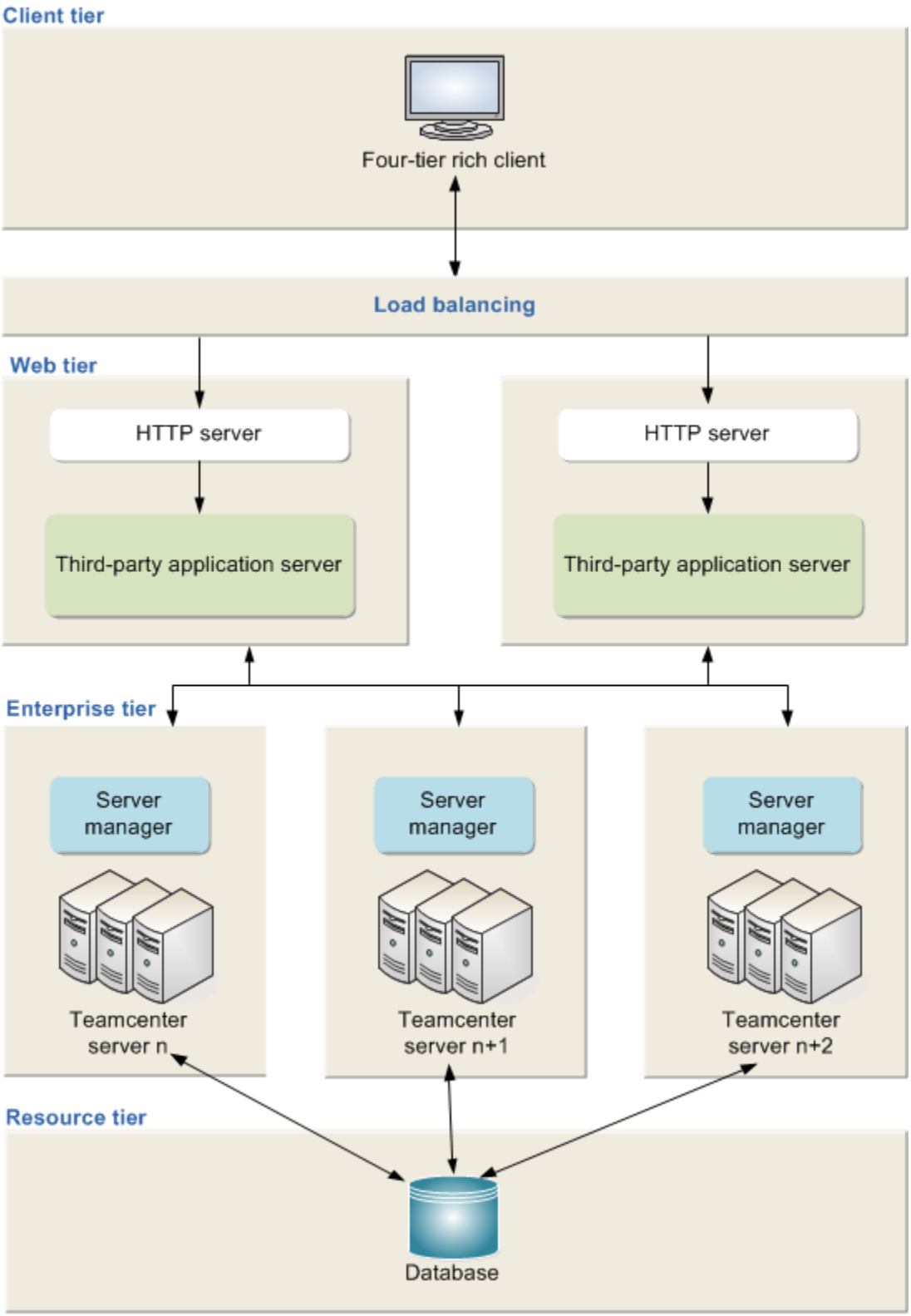
Four-tier deployment (enterprise and web tiers on separate hosts with HTTP server)



Four-tier deployment (multiple enterprise tier hosts and web tier hosts)



Four-tier deployment (load balancing)



Managing data with File Management System (FMS)

File Management System (FMS) is a file storage, caching, distribution, and access system. FMS provides global, secure, high-performance and scalable file management. Use FMS to centralize data storage volumes on reliable backup file servers, while keeping data close to users in shared data caches. This enables centralized storage and wide distribution of file assets to the needed locations within a single standard file management system. FMS provides WAN acceleration to effectively move large files across WAN assets.

Teamcenter client installation programs installs FMS executables and an FMS client cache (FCC) on client hosts and sets the **FMS_HOME** environment variable in the user environment.

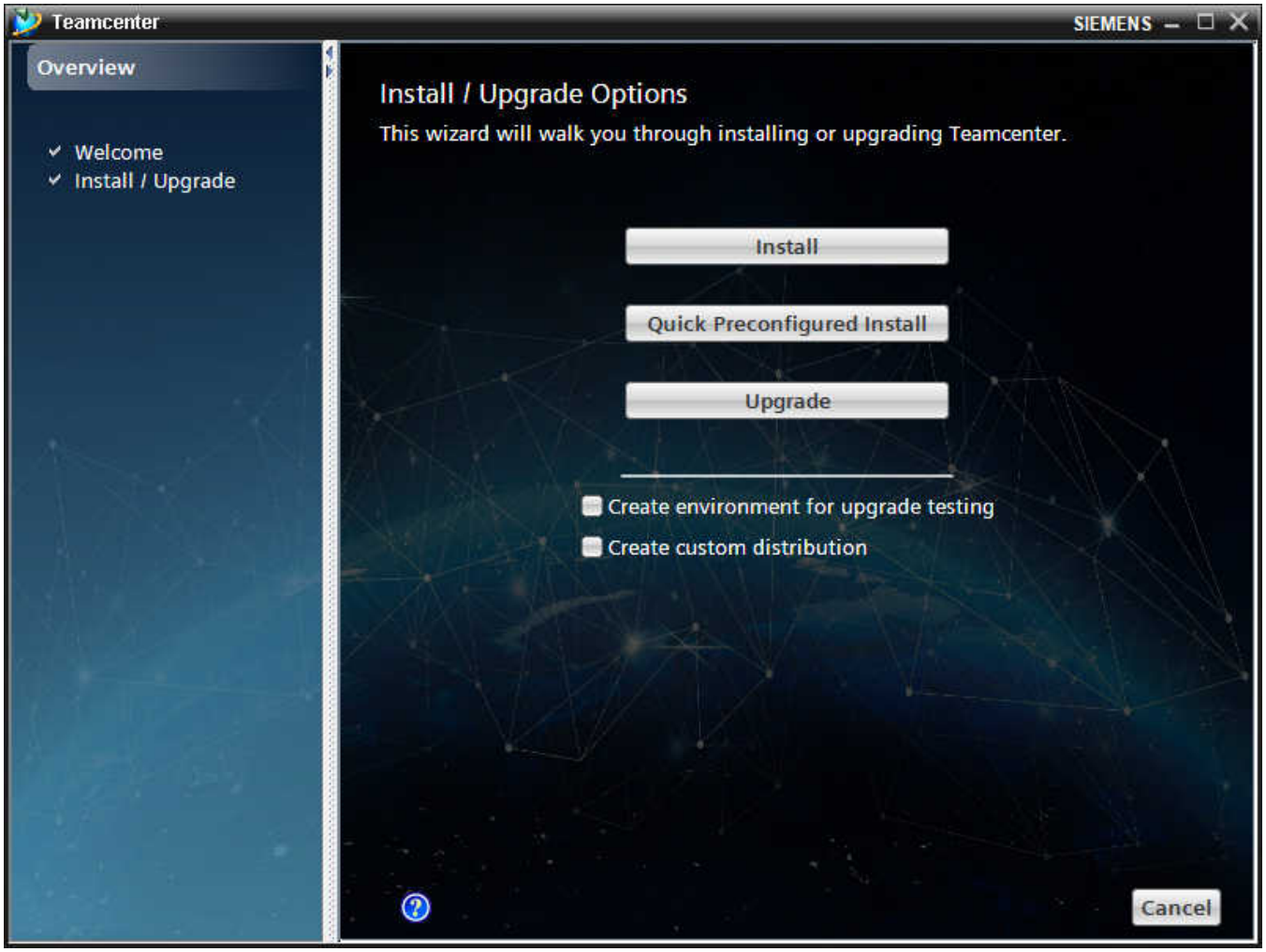
FMS downloads files to client hosts from Teamcenter volumes and uploads files from client hosts to Teamcenter volumes. **FMS_HOME** points to the location of the FMS executables on the client host. All Teamcenter clients installed on a host use the FMS executables defined in **FMS_HOME**.

If other users on a client host want to use the same installed client environment, they must manually set **FMS_HOME** in their user environments. Using the same installed environment shares only the binaries and run-time content; the file cache contents remain private to the user.

Teamcenter installation tools

Teamcenter Environment Manager

Teamcenter Environment Manager (TEM) is a tool that installs Teamcenter servers and two-tier and four-tier rich clients.



Teamcenter Environment Manager

TEM also performs maintenance operations, such as upgrading servers, applying minor releases, and installing patches.

During installation, upgrade, and maintenance, you can **select features** to add to a Teamcenter configuration in the **Features** panel in TEM. For a description of any feature, point to the feature in the list.

You launch TEM using the **tem.bat** command.

For more information about any panel in TEM, click the help button .

Web Application Manager

The Web Application Manager is a tool that builds Teamcenter Java EE web applications.

You launch the Web Application Manager by entering the **insweb** command. The Web Application Manager allows you to create web applications that contain different sets of Teamcenter solutions. This enables you to **create web applications** for different groups of users in your network. Your web applications can access the same Teamcenter corporate server, but provide different subsets of Teamcenter functionality. The Web Application Manager creates separate staging locations and separate deployable files[7] for each web application. Some Teamcenter solutions require other solutions and some solutions may not be combined with other solutions in the same web application. .

> Note:
>
> The .NET web tier is installed using Teamcenter Environment Manager, not the Web Application Manager.

7 A *deployable file* is a web archive (WAR) file.

2. Site planning

Configuring language support for Teamcenter

Teamcenter localizations provided by Siemens Digital Industries Software

Siemens Digital Industries Software provides localized versions of Teamcenter in the following languages:

Language	Locale code
Chinese (Simplified)	**zh_CN**
Chinese (Traditional)	**zh_TW**
Czech	**cs_CZ**
English	**en_US**
French	**fr_FR**
German	**de_DE**
Italian	**it_IT**
Japanese	**ja_JP**
Korean	**ko_KR**
Polish	**pl_PL**
Portuguese (Brazilian)	**pt_BR**
Russian	**ru_RU**
Spanish	**es_ES**

Use the appropriate locale codes to deploy Teamcenter localizations or launch Teamcenter clients in a desired locale.

If you provide your own localizations for locales not provided by Siemens Digital Industries Software, use the appropriate Java standard locale codes similar to the locale codes in the preceding table.[1]

1 Standard locale codes are composed of a two lowercase character language code from the ISO 639-1 standard, followed by an underscore, followed by a two uppercase character country code from the ISO 3166-1-alpha-2 standard.

Localizing Teamcenter in Hebrew

Siemens Digital Industries Software does not provide a Hebrew translation but provides recommended configuration settings for Hebrew locales. In Hebrew locales, set the locale code to **en_US**. This allows data entry in Hebrew, but user interface text is in English.

Choose the character set for Teamcenter

Choosing the correct character set for Teamcenter and the Teamcenter database is critical. If a Teamcenter client user enters a character that is not recognized by the Teamcenter database, the character is misinterpreted or corrupted when the user's data is checked into the Teamcenter database.

Determine the character set your Teamcenter network requires based on the following considerations.

Language support

Determine the languages you need to support, considering both initial needs and future needs. If you support one language currently but anticipate supporting additional languages in the future, choose a character set that accommodates those future requirements.

Some character sets support groups of languages. The **standard localizations provided with Teamcenter** support the following language groups:

Language group	Languages
Western European	English French German Italian Portuguese (Brazilian) Spanish
Eastern European:	Czech Polish English
Japanese	Japanese English
Chinese (Simplified)	Chinese (Simplified) English
Chinese (Traditional)	Chinese (Traditional) English
Korean	Korean English
Russian	Russian

Language group	Languages
	English

If the languages you plan to support are all in the same language group, you may choose a non-UTF-8 character set for your Teamcenter network. But, if you plan to support languages that are *not* all within a single language group, you must choose the UTF-8 character set.

For example, if your Teamcenter hosts run in English, French, and German locales, which are all in the Western European language group, you may choose a non-UTF-8 character set *or* you may choose UTF-8. However, if you also need to support hosts in Japanese locales, you must choose UTF-8 because Japanese is not in the Western European language group.

The UTF-8 character set supports *all* languages supported by standard Teamcenter.

Choosing UTF-8 or non-UTF-8

Unicode encodings like UTF-8 enable seamless manipulation of all existing characters in all languages. Teamcenter supports non-Unicode and UTF-8 Unicode encodings.

In a system fully configured for UTF-8 (for example, a server host configured for UTF-8 and a database encoding of Oracle **utf8** or Oracle **al32utf8**), all characters can be entered in the application.

In a system configured for a non-Unicode encoding, only characters belonging to it can be entered. ASCII characters are always part of that character list. For example, if you choose Western European setup (Microsoft **cp1252** or ISO **iso-88559-1** encodings), you cannot enter Russian, Japanese, Chinese, Czech, Polish, Taiwanese, or Korean characters. Furthermore, database migration from one encoding to Unicode can be tedious. It is important, then, to fully consider present and future needs when choosing encoding.

Character support

Determine what special or extended characters you must support in Teamcenter data, and choose a character set that supports them. For example:

En dash (–) or em dash (—)
: These characters are part of Windows 1252 code page, but not part of the **ISO8859_1** character set. However, the **UTF-8** character set supports these characters.

Currency symbols such as the euro (€)
: This symbol is in the **we8iso8859p15** character set, but not in the **we8iso8859p1** character set.

Platform and database

- **Platform**

  Choose a character set that accommodates the platforms in your Teamcenter network. For example, if your Teamcenter server is a Linux host but your client hosts are Windows, and you use default

character sets on each, data corruption can result because the default character sets for these platforms are not compatible. Choose a character set supported on both platforms.
The UTF-8 character set accommodates all platforms Teamcenter supports.

- **Database**

  Oracle supports UTF-8 and non-UTF-8 character sets on all platforms.
  Microsoft SQL Server does not provide native support for UTF-8. However, you can configure Teamcenter to use UTF-8 with a Microsoft SQL Server database. The **Enable UTF-8** option in Teamcenter Environment Manager (TEM) enables the Teamcenter server to convert character encoding to and from UTF-8 when interacting with the database.

Verify that your locale is supported

If you do not use UTF-8, ensure the locale you want to use is supported on your host. Perform the following steps to set the Windows system locale and install the required language packs:

1. Open the **Regional and Language Options** dialog box in the Windows Control Panel.
2. In the **Languages** tab, set the required language for the menus and dialog boxes.
3. In the **Region and Language** dialog box, click the **Administrative** tab.
4. Under **Language for non-Unicode programs**, click **Change system locale**.
5. In the **Region and Language Settings** dialog box, verify the correct locale (language and country) is selected. If not, choose the correct locale.
6. Close all dialog boxes and restart your system to install and configure the required language pack.

Configuring a UTF-8 environment for Teamcenter

Overview of UTF-8 configuration

Teamcenter supports the Unicode UTF-8 character set on Windows and Linux hosts that are configured to process UTF-8.

Set the required values for your platform, locale, and database type *before* you begin installing Teamcenter.

Enable UTF-8 support for Teamcenter servers and clients during Teamcenter installation:

- **Teamcenter servers**

  With UTF-8 support configured on your host, Teamcenter Environment Manager (TEM) can create a UTF-8-enabled Teamcenter database during Teamcenter installation.

If you use Microsoft SQL Server, select the **Enable UTF-8** option in the **Foundation Database** panel in TEM.

- **Two-tier rich client**

  If the Teamcenter database is configured for the UTF-8 character set, **UTF8** is selected by default in the **TcServer Character Encoding Settings** panel in TEM.

- **Four-tier rich client**

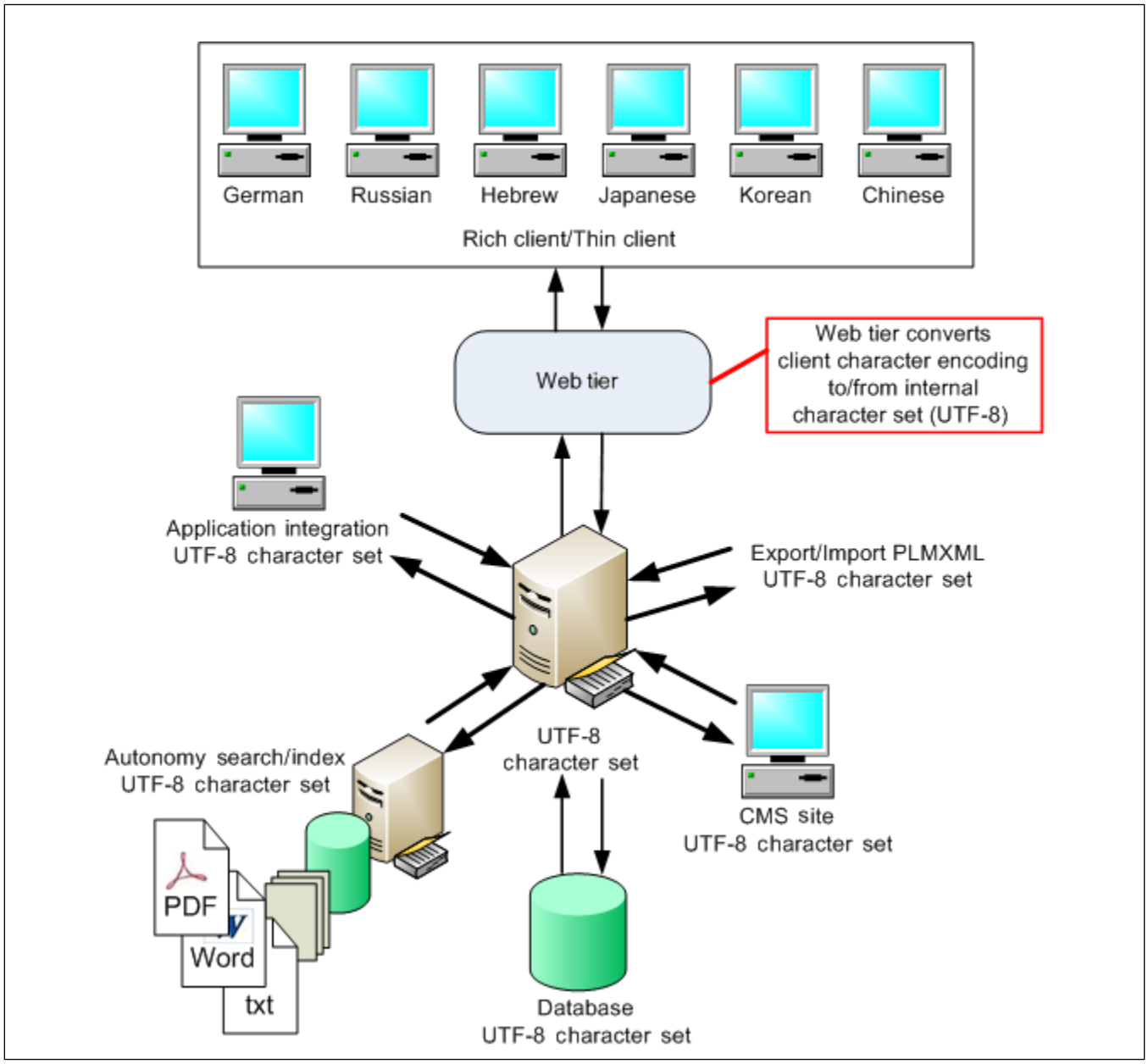
  When installing the Teamcenter web tier, in the **TcServer Character Encoding Settings** panel in TEM, select **UTF8**.
  The four-tier rich client can run on any Windows or Linux platform running any language character set.

- **Web tier**

  Make sure UTF-8 support is configured on the web tier host.
  The web tier can run on any Windows or Linux platform running any language character set. The Teamcenter web tier converts client character encoding to and from UTF-8 as it passes through the web tier.

The following example shows a Teamcenter configuration for restricted Unicode UTF-8 character set support with clients displaying multiple locales. Servers in this configuration run a Unicode UTF-8 character set operating system.

On Windows platforms, if the database is configured for the UTF-8 character set, the Teamcenter server operates in UTF-8 mode independent of the system locale.



Unicode homogeneous server platform configuration

Note:

- Teamcenter does not support Unicode Supplementary Characters.[2]
- If you import translated content in languages that require multibyte characters, such as Russian and Chinese Simplified, you must configure your Teamcenter installation to support the UTF-8

2 Unicode Supplementary Characters are characters in the Unicode Character Standard outside of the Basic Multilingual Plane (BMP), that is, characters with code point values larger than 0xFFFF.

character set to ensure that titles and other properties on this content display correctly in your environment.

Configure UTF-8 environment settings

If you use UTF-8, select the **al32utf8** or **utf8** character set when you install your database server.[3]

For Microsoft SQL Server, no special setting is needed during database server installation. If you select the **Enable UTF-8** option in TEM (in the **Foundation Database** panel), the Teamcenter server converts character encoding to and from UTF-8. This allows Teamcenter to use UTF-8 with Microsoft SQL Server's (non-UTF-8) internal encoding.[4]

In Hebrew locales, set the following additional variables:

1. In the *TC_DATA***/tc_profilevars** file, set **TC_XML_ENCODING** to **UTF-8**.

2. In two-tier environments, set **TC_CHARACTER_ENCODING_SET** to **UTF8** in the following files:

   - *TC_ROOT***/iiopservers/Start_TcServer1**
   - *TC_ROOT***/pool_manager/confs/MYDB/mgrstart**

Do not set the **TC_XML_ENCODING** or **TC_CHARACTER_ENCODING_SET** environment variables in the system environment. TEM sets these values in the Teamcenter configuration.

Configuring a non-UTF-8 environment for Teamcenter

To ensure correct display and processing of Teamcenter data, set the required values in your operating system environment. Use the appropriate values for your locale and platform.

3 Oracle recommends **al32utf8**. **UTF8** supports only supports Unicode Version 3.0 and earlier.
4 Microsoft SQL Server does not provide native support for UTF-8 character set encoding.

Environment settings on non-UTF-8 systems

		Value	
Locale	**Setting**	**Linux**	**Microsoft Windows**
Chinese (Simplified), GB2312-80 encoding	Database character set (Oracle)	**zhs16cgb231280** or **zhs16gbk**	**zhs16cgb231280** or **zhs16gbk**
	Database collation (MS SQL Server)[1]	N/A	**chinese_prc_bin**
	LANG and **LC_ALL**[2]	**zh_CN**	N/A
Chinese (Simplified), GBK encoding	Database character set (Oracle)	**zhs16cgb231280** or **zhs16gbk**	**zhs16cgb231280** or **zhs16gbk**
	Database collation (MS SQL Server)[1]	N/A	**chinese_prc_bin**
	LANG and **LC_ALL**[2]	**zh_CN.gb18030**	N/A
Chinese (Traditional)	Database character set (Oracle)	**zht16big5** or **zht16mswin950**	**zht16big5** or **zht16mswin950**
	Database collation (MS SQL Server)[1]	N/A	**chinese_taiwan_stroke_bin**
	LANG and **LC_ALL**[2]	**zh_TW**	N/A
Czech	Database character set (Oracle)	**ee8mswin1250**	**ee8mswin1250**
	Database collation (MS SQL Server)[1]	N/A	**czech_bin**
	LANG and **LC_ALL**[2]	**cs_CZ**	N/A
English	Database character set (Oracle)	**we8iso8859p1** or **we8iso8859p15**[3] or **we8mswin1252**[4]	**we8iso8859p1** or **we8iso8859p15**[3] or **we8mswin1252**[4]
	Database collation (MS SQL Server)[1]	N/A	**latin1_general_bin**
	LANG and **LC_ALL**[2]	**en_US** or **en_US.iso885915**	N/A

Notes:

1. The database collation you select during Microsoft SQL Server installation determines the database character set.
2. Set **LANG** and **LC_ALL** in the system environment variables. These variables must have identical values to function properly.
3. **we8iso8859p15** contains additional characters, including the euro symbol (€).
4. **we8mswin1252** contains more characters than **ISO-8859-15**.
5. No **ISO-8859-15** equivalent is available for this locale.
6. Siemens Digital Industries Software does not provide a Hebrew translation. The configuration settings shown allow data entry in Hebrew, but user interface text is in English.
7. If you migrate to **ko16ksc5601** from UTF-8, some data may be truncated. You must modify truncated valued because Teamcenter does not support modifying the default field size.

		Value	
Locale	**Setting**	**Linux**	**Microsoft Windows**
French	Database character set (Oracle)	**we8iso8859p1** or **we8iso8859p15**[3] or **we8mswin1252**[4]	**we8iso8859p1** or **we8iso8859p15**[3] or **we8mswin1252**[4]
	Database collation (MS SQL Server)[1]	N/A	**latin1_general_bin**
	LANG and **LC_ALL**[2]	**fr_FR**[5]	N/A
German	Database character set (Oracle)	**we8iso8859p1** or **we8iso8859p15**[3] or **we8mswin1252**[4]	**we8iso8859p1** or **we8iso8859p15**[3] or **we8mswin1252**[4]
	Database collation (MS SQL Server)[1]	N/A	**latin1_general_bin**
	LANG and **LC_ALL**[2]	**de_DE**[5]	N/A
Hebrew[6]	Database character set (Oracle)	**iw8iso8859p8** or **iw8mswin1255**	**iw8iso8859p8** or **iw8mswin1255**
	Database collation (MS SQL Server)[1]	N/A	**hebrew_bin**
	LANG and **LC_ALL**[2]	**iw_IL.utf8**	N/A
Italian	Database character set (Oracle)	**we8iso8859p1** or **we8iso8859p15**[3] or **we8mswin1252**[4]	**we8iso8859p1** or **we8iso8859p15**[3] or **we8mswin1252**[4]
	Database collation (MS SQL Server)[1]	N/A	**latin1_general_bin**
	LANG and **LC_ALL**[2]	**it_IT**[5]	N/A
Japanese (EUC)	Database character set (Oracle)	**ja16euc**	**ja16euc**
	Database collation (MS SQL Server)[1]	N/A	N/A
	LANG and **LC_ALL**[2]	**ja_JP.eucjp**	N/A

Notes:

1. The database collation you select during Microsoft SQL Server installation determines the database character set.
2. Set **LANG** and **LC_ALL** in the system environment variables. These variables must have identical values to function properly.
3. **we8iso8859p15** contains additional characters, including the euro symbol (€).
4. **we8mswin1252** contains more characters than **ISO-8859-15**.
5. No **ISO-8859-15** equivalent is available for this locale.
6. Siemens Digital Industries Software does not provide a Hebrew translation. The configuration settings shown allow data entry in Hebrew, but user interface text is in English.
7. If you migrate to **ko16ksc5601** from UTF-8, some data may be truncated. You must modify truncated valued because Teamcenter does not support modifying the default field size.

		Value	
Locale	**Setting**	**Linux**	**Microsoft Windows**
Japanese (Shift-JIS)	Database character set (Oracle)	**ja16sjis**	**ja16sjis**
	Database collation (MS SQL Server)[1]	N/A	**japanese_bin**
	LANG and **LC_ALL**[2]	**ja_JP.sjis**	N/A
Korean	Database character set (Oracle)	**ko16ksc5601**[7]	**ko16ksc5601**[7]
	Database collation (MS SQL Server)[1]	N/A	**korean_wansung_bin**
	LANG and **LC_ALL**[2]	**ko_KR.EUC**	N/A
Polish	Database character set (Oracle)	**ee8mswin1250**	**ee8mswin1250**
	Database collation (MS SQL Server)[1]	N/A	**polish_bin**
	LANG and **LC_ALL**[2]	**pl_PL.ISO8859-2**	N/A
Portuguese (Brazilian)	Database character set (Oracle)	**we8iso8859p1** or **we8iso8859p15**[3] or **we8mswin1252**[4]	**we8iso8859p1** or **we8iso8859p15**[3] or **we8mswin1252**[4]
	Database collation (MS SQL Server)[1]	N/A	**latin1_general_bin**
	LANG and **LC_ALL**[2]	**pt_BR**[5]	N/A
Russian	Database character set (Oracle)	**cl8mswin1251** or **cl8iso8859p5**	**cl8mswin1251** or **cl8iso8859p5**
	Database collation (MS SQL Server)[1]	N/A	**cyrillic_general_bin**
	LANG and **LC_ALL**[2]	**ru_RU**	N/A
Spanish	Database character set (Oracle)	**we8iso8859p1** or **we8iso8859p15**[3] or **we8mswin1252**[4]	**we8iso8859p1** or **we8iso8859p15**[3] or **we8mswin1252**[4]
	Database collation	N/A	**latin1_general_bin**

Notes:

1. The database collation you select during Microsoft SQL Server installation determines the database character set.
2. Set **LANG** and **LC_ALL** in the system environment variables. These variables must have identical values to function properly.
3. **we8iso8859p15** contains additional characters, including the euro symbol (€).
4. **we8mswin1252** contains more characters than **ISO-8859-15**.
5. No **ISO-8859-15** equivalent is available for this locale.
6. Siemens Digital Industries Software does not provide a Hebrew translation. The configuration settings shown allow data entry in Hebrew, but user interface text is in English.
7. If you migrate to **ko16ksc5601** from UTF-8, some data may be truncated. You must modify truncated valued because Teamcenter does not support modifying the default field size.

Locale	Setting	Value	
		Linux	Microsoft Windows
	(MS SQL Server)[1]		
	LANG and **LC_ALL**[2]	**es_ES**[5]	N/A

Notes:
1. The database collation you select during Microsoft SQL Server installation determines the database character set.
2. Set **LANG** and **LC_ALL** in the system environment variables. These variables must have identical values to function properly.
3. **we8iso8859p15** contains additional characters, including the euro symbol (€).
4. **we8mswin1252** contains more characters than **ISO-8859-15**.
5. No **ISO-8859-15** equivalent is available for this locale.
6. Siemens Digital Industries Software does not provide a Hebrew translation. The configuration settings shown allow data entry in Hebrew, but user interface text is in English.
7. If you migrate to **ko16ksc5601** from UTF-8, some data may be truncated. You must modify truncated valued because Teamcenter does not support modifying the default field size.

In Hebrew locales, set the following additional variables:

1. In the *TC_DATA***/tc_profilevars** file, set **TC_XML_ENCODING** to **ISO-8859-8**.

2. In two-tier environments, set **TC_CHARACTER_ENCODING_SET** to **ISO8859_8** in the following files:

   - *TC_ROOT***/iiopservers/Start_TcServer1**
   - *TC_ROOT***/pool_manager/mgrstartMYDB**

Do not set the **TC_XML_ENCODING** or **TC_CHARACTER_ENCODING_SET** environment variables in the system environment. TEM sets these values in the Teamcenter configuration.

Installation and deployment overview

Planning the Teamcenter network

A Teamcenter network can include server and client hosts from more than one vendor with each host running one of several supported operating systems.

The roles described in the following table are not restricted to one host on the Teamcenter network. A host often performs more than one of these roles. A role can be performed by more than one host in the network.

Network node	Role
Database server	Database service node that contains an installation of RDBMS software and services queries from several Teamcenter servers.

Network node	Role
	For large-scale installations, the database server is typically a dedicated high-performance server system that is optimized specifically for running database server software.
Corporate server	Teamcenter service node at the center of a Teamcenter network. The corporate server contains installations of the following Teamcenter components: • The Teamcenter shared binary executables. This installation directory is referred to as the *Teamcenter application root directory*, or *TC_ROOT*. The **TC_ROOT** environment variable in Teamcenter configuration files points to this location. A Teamcenter application root directory can be NFS/CIFS-mounted to more than one application client. • The Teamcenter shared data subdirectories and files. This installation directory is referred to as the *Teamcenter data directory*, or *TC_DATA*. The **TC_DATA** environment variable in Teamcenter configuration files contains this location. Each data directory is associated with a single database instance, but multiple data directories can point to a single database instance. The data directory is exported with full write access and mounted via NFS/CIFS by other Teamcenter nodes. • A minimum of one Teamcenter volume and File Management System (FMS). To install volumes on multiple hosts for the same database, install a server that points to the database and install FMS on any system that services a volume. • The server manager process required when the Teamcenter network includes the web tier.[5] The server manager starts and stops Teamcenter servers, informing a server assigner of its actions so that the assigner can assign available servers to user sessions. Multiple application clients can map to or mount the corporate server.
Web-tier application server	Teamcenter service node that contains an installation of the Teamcenter web tier application deployed in a third-party application server.
Teamcenter clients	Hosts containing an installation of the Teamcenter rich client executables and connected to a Teamcenter corporate server or application server.

5 Teamcenter provides server managers based on the Java EE and the Microsoft .NET platforms. Install the appropriate server manager for the web tier you use.

The following table describes additional network nodes you can include in your network.

Network node	Role
Multi-Site Collaboration ODS server	Network node that runs a daemon process to publish data objects within a Multi-Site Collaboration environment. Configuration of Multi-Site Collaboration is optional. Publication of a data object makes the object visible to other databases. At least one Teamcenter database on the network must be designated as an ODS database: this database stores publication records for the data objects. One ODS server node must be designated for each ODS database, and each server node can only act for one database.
Multi-Site Collaboration ODS proxy server	Network node running daemon processes that perform proxy services for ODS servers within a Multi-Site Collaboration environment. Configuration of Multi-Site Collaboration is optional. Typically, the proxy server node is connected between a firewall and the ODS server nodes. ODS requests originating from external sites go through the firewall directly into the proxy server node, which relays the ODS requests to the ODS servers. In this way, the proxy server protects the ODS servers from direct access from external sites. It also simplifies firewall management because the firewall manages only one TCP/IP port for all external ODS requests. Note: A node can act both as an ODS proxy server and IDSM proxy server at the same time.
Multi-Site Collaboration IDSM server	Network node running a daemon process that transfers data objects among databases (sites) in a Multi-Site Collaboration environment. You must designate one IDSM server node for each Teamcenter database from which objects are published. Each server node can act only for one database.
Multi-Site Collaboration IDSM proxy server	Network node running daemon processes that perform proxy services for IDSM servers. Typically, the IDSM proxy server node is connected between a firewall and the IDSM server nodes. IDSM requests originating from external sites go through the firewall directly into the proxy server node, which relays the IDSM requests to the IDSM servers. In this way, the proxy server protects the IDSM servers from direct access from external sites. It also simplifies firewall management because the firewall manages only one TCP/IP port for all external IDSM requests.
Quick part locator (QPL) server	Component of Repeatable Digital Validation (RDV). The QPL server provides a **qpl** daemon used with Design Context. This daemon coexists with all other Teamcenter daemons. For QPL-based Design Context, QPL

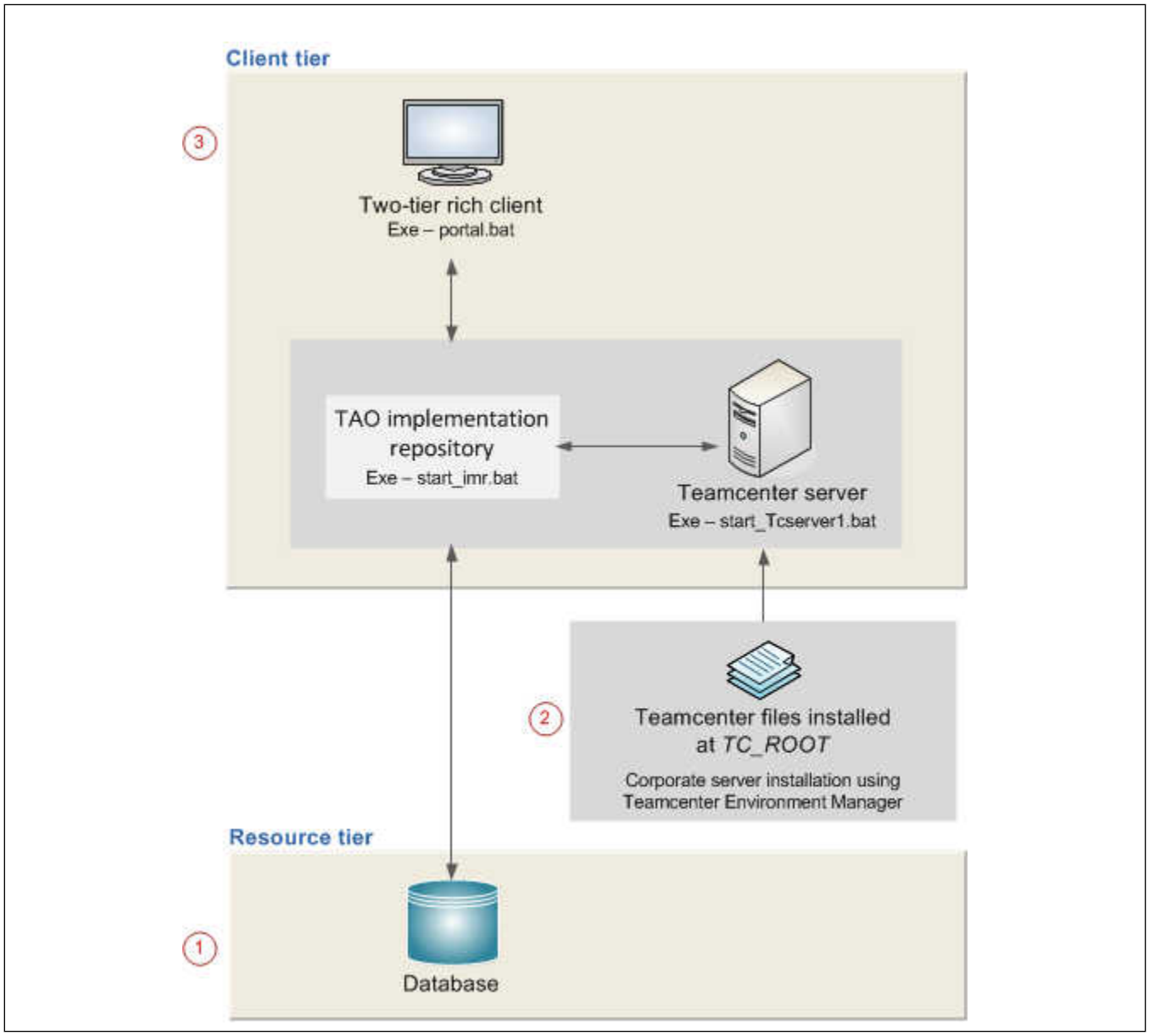
Network node	Role
	server setup is required. For Appearance-based Design Context, QPL server setup is not required.

Installing Teamcenter components

Two-tier architecture installation

The primary components of a two-tier installation require three general installation tasks:

1. **Install the database server** using Oracle or Microsoft SQL Server tools.
2. Install Teamcenter executables and files, create and/or populate the database, and configure a volume **using Teamcenter Environment Manager**.
3. Install the rich client on a Windows or Linux client workstation using Teamcenter Environment Manager.



Two-tier architecture installation

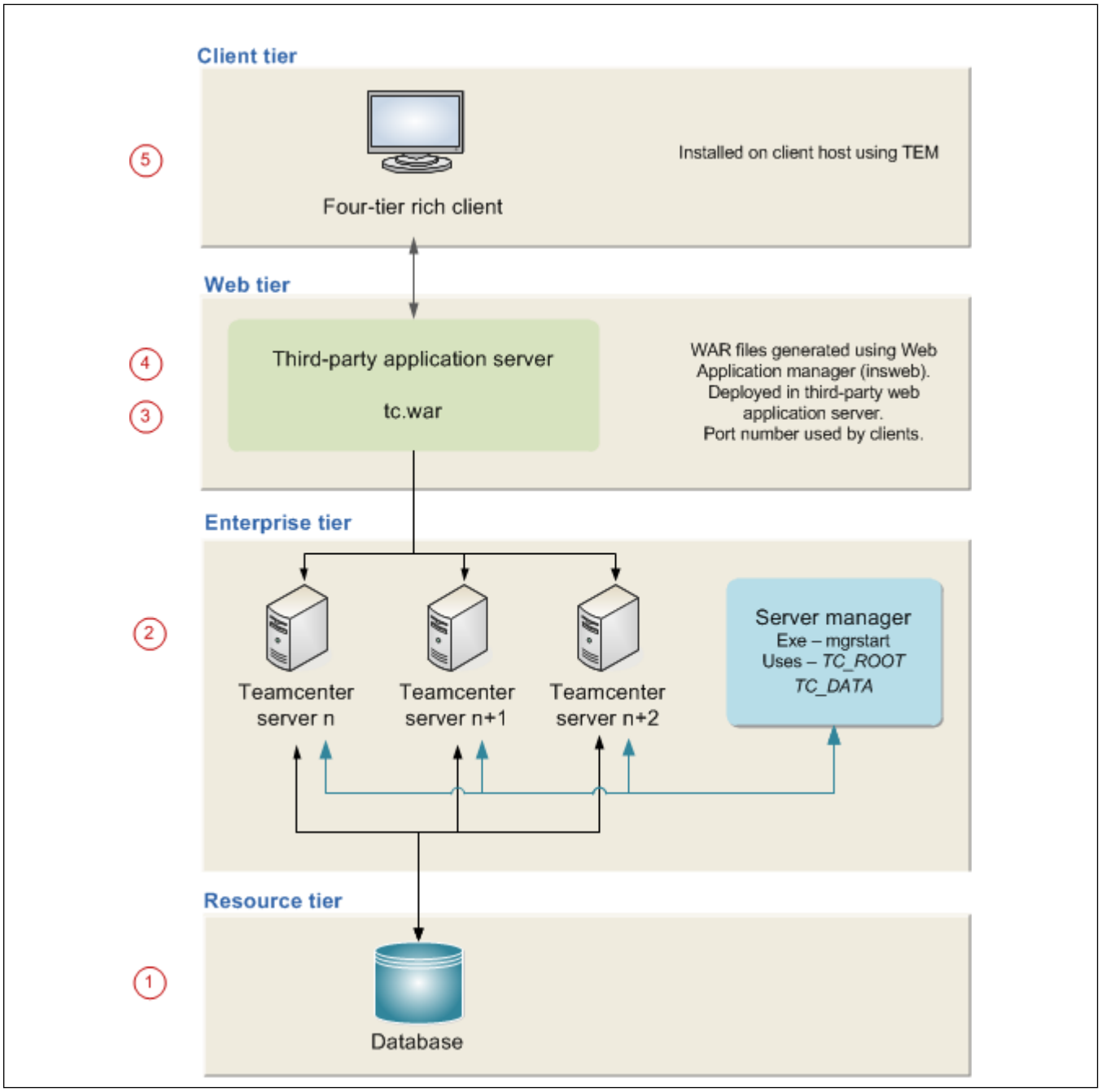
Four-tier architecture installation

A four-tier installation involves installation tasks for each tier:

1. Install the resource tier using the third-party database server installation software (Oracle or Microsoft SQL Server).
2. **Install the enterprise tier** using Teamcenter Environment Manager, being sure to choose the server manager component.
3. **Install the Java EE web tier** as a web archive (WAR) file using the Web Application Manager and deploy the WAR file in a Java EE application server.[6]
4. Install a third-party application server and deploy the Teamcenter WAR file.
5. Install the rich client using TEM on a Windows or Linux host.

> Note:
>
> The automatic logon feature is not supported in four-tier Teamcenter deployments.

6 This is not necessary if you use the .NET web tier and the .NET based server manager.



Four-tier architecture installation

Rich client installation

The Teamcenter *rich client* is a Java application that runs on client hosts. It connects to the Teamcenter corporate server through either a *two-tier* or *four-tier* architecture. The two-tier and four-tier rich clients are installed using Teamcenter Environment Manager (TEM).

The four-tier rich client requires a Teamcenter web tier to provide communication between the client host and the corporate server. Teamcenter provides two web tier types:

Type	Framework	Installed using	Deployed on
.NET web tier	Microsoft .NET	Teamcenter Environment Manager (TEM)	Microsoft Internet Information Server (IIS)
Java EE web tier	Java EE	Web Application Manager	Any supported Java EE web server

You can add functionality to the rich client by adding **features** in TEM, such as the following:

- Teamcenter Integration for NX or NX Integration
  When you choose this option, the rich client is enabled to use NX with Teamcenter. Users must separately install NX executable files on the client hosts.

- Teamcenter lifecycle visualization (embedded viewer)
  When you choose this option, Teamcenter lifecycle visualization executable files are installed on the local client host.

  > Note:
  >
  > Installing the rich client does not require that the user has system administration privileges on the client workstation. However, Teamcenter lifecycle visualization requires system administration privileges to install.

- Teamcenter lifecycle visualization (stand-alone application viewer)
  When you choose this option, the rich client is enabled to launch Teamcenter lifecycle visualization. Users must independently install Teamcenter lifecycle visualization executable files on the client hosts.

- Remote workflow
  When you choose this option, the rich client is enabled to support the linking of objects between Teamcenter and other applications such as Teamcenter portfolio, program and project management. Separate installation of remote workflow components and Teamcenter Application Registry are required.

- SCM ClearCase
  When you choose this option, the executable files are installed for the integration between Teamcenter and the IBM Rational ClearCase software configuration management (SCM) tool.

File Management System installation

FMS installation considerations

File Management System (FMS) downloads and uploads file data for the rich client, embedded viewer, and Lifecycle Visualization. Multi-Site Collaboration also uses FMS servers to transfer data.

> Note:
>
> If you install File Management System, the FMS server cache (FSC) and the server manager must run on the same host server, with the same user ID.
>
> If the FSC does not manage any volumes, that is, if it is purely a cache server, it can run as any user that is convenient.

Installing File Management System

Overview of FMS installation

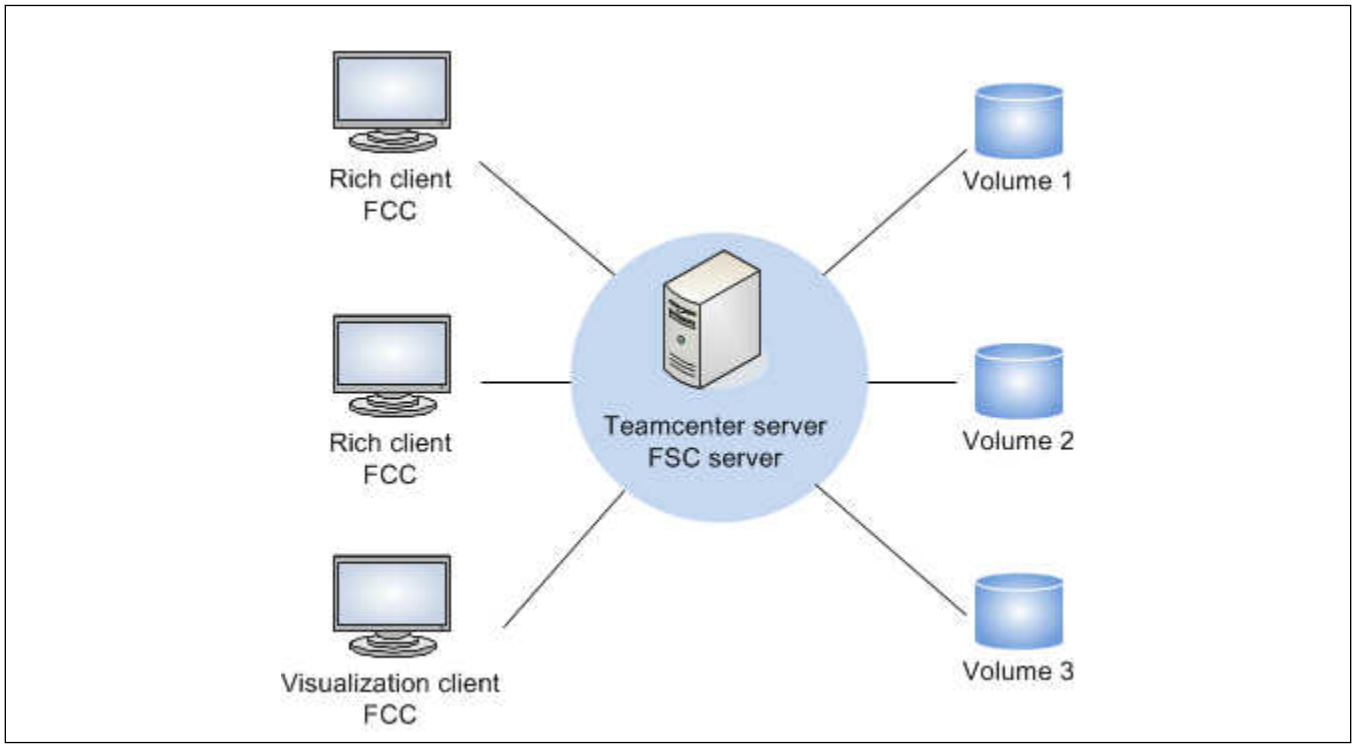
FMS provides the following functions:

- Volume server for file management
- Shared server-level performance cache for shared data access between multiple users
- Client-based private user cache for rich clients
- Transient data store mechanism for transporting reports, PLM XML, and other nonvolume data between the web and client tiers in the four-tier architecture

FMS caching enables placing the data close to the user, while maintaining a central file volume and database store.

FMS requires the installation of FMS server cache (FSC) and FMS client cache (FCC) components:

- The FSC component provides a server process and file caches for Teamcenter server hosts.
- The FCC component provides a client process and file caches for rich clients on user workstations.



Basic File Management System deployment

Installing the FMS server cache

You can configure the FMS server cache (FSC) server to perform any combination of the following functions:

- Volume server or performance cache server
  When running on a host where a volume is located or directly mounted on the computer hosting the FSC, the FSC acts as a volume server.
  When running on a host where a volume is not located or directly mounted, the FSC acts as a performance cache server.
  As a volume or cache server, the FSC checks all file access requests for a ticket that Teamcenter generates to authorize file access. As a cache server, it manages two segment caches, one for downloading files and one for uploading files.

- Configuration server
  As a configuration server, the FSC provides FMS configuration information to the FMS client caches and other FSCs.

- Transient server (in a deployment of the four-tier architecture only)
  As a transient server, the FSC delivers PLM XML and other transient files to clients.

Any deployment of Teamcenter requires a minimum of one FSC server. You can deploy multiple FSC servers, each performing a multiple roles or each performing a designated purpose as either a volume, a cache, or a configuration server. When you install multiple volumes on different hosts for the same

database, the multiple FSC servers are linked through a common master FSC. (You can manually configure more than one master FSC.)

You must install an FSC server on:

- Each host running a Teamcenter server manager.
- Each host that will contain a Teamcenter volume.

FSC servers and caches are configured using XML-based files, in a hierarchical structure:

- FMS master configuration file (**fmsmaster_***fsc_id***.xml**)
  The master configuration file describes the File Management System network and defines FSC groups. It is the highest file in the hierarchy and can define default values for FSCs and FCCs, such as the maximum sizes of the caches.
  Each installation of Teamcenter requires one FMS master configuration file. At least one FSC server reads this file and is called the *master FSC*. Other FSC servers in the network download FMS configuration information from the master FSC server.
  If you install only one FSC server in a Teamcenter network, it is the master.

- FSC configuration file (**fsc***fsc_id***.xml**)
  The FSC configuration file configures an individual FSC in a network. It specifies the address of the master FSC (for downloading FMS network information) and defines such values as the maximum sizes of the server segment file caches and the upload timeout value.
  This file can either inherit values from the master file or override them. It can also define default values for FCCs.

- The FCC configuration file defines values for the FCC on client hosts, such as the maximum sizes of the caches.
  It can either inherit values from the FSC configuration file or override them.

The Teamcenter installation program, Teamcenter Environment Manager, installs and initially configures the FSC servers, segment file caches, master configuration file, and FSC configuration file or files. For small deployments of Teamcenter, this may be the only installation and configuration required. For large deployments, you can take advantage of FMS flexibility by manually configuring the FMS network.

Installing the FMS client cache

The FMS client cache (FCC) process runs on a client host and performs the following functions:

- Uploads files to an FSC server
- Requests files from an FSC server
- Caches files on the client host

The FCC process manages three file caches:

- A write cache containing whole files uploaded to a Teamcenter volume
- A read cache containing whole files downloaded from a Teamcenter volume
- A segment cache for Teamcenter lifecycle visualization

Installing the FCC supports the rich client and some other Siemens Digital Industries Software products.

- The rich client requires an FCC, and TEM automatically installs an FCC with each rich client.
  The rich client uploads files to the Teamcenter volume and downloads files from the Teamcenter volume using the FCC. If Teamcenter lifecycle visualization 6.0 or later is installed on the workstation and used with the rich client, it optionally uses the FCC.
  When you install the rich client on user workstations, configure the location of the cache on the workstation and the maximum size of files downloaded from the volume or uploaded to the volume. Installing the rich client on a workstation simultaneously installs the FCC process and caches. No additional configuration steps are required.
  Configuring the FCC this way may be the only configuration you require, but you can take advantage of additional configuration options by manually configuring the FCC.

- If you use NX or Teamcenter lifecycle visualization, you can install the FCC and use it to upload files to and download files from the Teamcenter volume.
  Installing the FCC enables users to take advantage of FMS features:

  - Improved file transfer performance
    FMS is a high-performance file transfer solution that gives client applications direct access to files over a high-performance network connection.

  - File streaming
    Teamcenter lifecycle visualization uses proprietary file streaming technology to download appropriate portions of the JT files over the network as they are needed. FMS supports segment file transfer to keep network loads down and support this high-performance file streaming technology.

  - Built-in caching infrastructure
    The FCC is dedicated to a specific user on the client. The FSC server can be shared by groups of users.

  - Deployment flexibility
    FMS components support a multitude of deployment configurations. This enables administrators to geographically locate volumes and shared FSC servers close to client workstations, providing the ability to tune the system for optimal file transfer performance.

  Installing an FCC for use with NX and Teamcenter lifecycle visualization is described in the Teamcenter client installation guides for Windows and Linux.

Creating volumes

Using Teamcenter Environment Manager installation program, you create two types of Teamcenter volumes:

- Standard volumes
  Standard volumes are Microsoft Windows folders Teamcenter uses to store files managed by Teamcenter. Users cannot directly access the files in these volumes; they must do so via a Teamcenter session. One standard Teamcenter volume is required per database. You can optionally create multiple volumes for a database.
  You create a standard volume when installing Teamcenter and populating a Teamcenter database. Volumes require the installation of File Management System (FMS). FMS provides the volume services after the volume is created.

- Transient volumes
  A transient volume is a Microsoft Windows folder that Teamcenter uses to store temporary data for transport of reports, PLM XML, and other data between the web tier and client tier in a deployment of the four-tier architecture. One transient volume is required per Teamcenter server host.
  You can create a transient volume directory on a server host when installing Teamcenter and populating a Teamcenter database (the installation program adds the definition to the **fmsmaster_***fsc_id***.xml** configuration file). For examples of manually configuring transient volumes that cannot be accomplished using the installation program, see the *Environment Variables Reference*.

  > Note:
  >
  > Teamcenter uses transient volumes only in a deployment of the four-tier architecture. For a deployment of the two-tier architecture, Teamcenter stores this data into a temporary directory on the rich client host, rather than in a defined transient volume. The temporary directory is defined either by the **start_server** script or by the **Transient_Volume_RootDir** on the client host.

Teamcenter administrators can also create volumes using the rich client Organization application.

Lifecycle Visualization installation

For enterprise-wide product visualization capability, you can install Teamcenter lifecycle visualization and add a Lifecycle Visualization viewer to your Teamcenter configuration.

Siemens Digital Industries Software provides two Lifecycle Visualization viewers for use with Teamcenter:

- Lifecycle Visualization embedded viewer
  The Lifecycle Visualization embedded viewer is embedded in the rich client user interface. The embedded viewer provides full 2D visualization capabilities and 3D viewing and is available to all Teamcenter users.
  The embedded viewer is installed on user workstations as part of a rich client configuration. The license level is configured during installation.

- Lifecycle Visualization stand-alone application viewer
  The Lifecycle Visualization stand-alone application viewer is launched from the Teamcenter rich client user interface. Users can also run it as a stand-alone application. The suite includes the embedded viewer and Teamcenter lifecycle visualization mockup.
  The stand-alone application viewer is individually installed on each client workstation using the Teamcenter lifecycle visualization software kits.

Lifecycle Visualization uses Teamcenter client communication system (TCCS).

If your Teamcenter configuration includes a rich client and a Lifecycle Visualization viewer, Lifecycle Visualization uses Teamcenter volumes and FMS, including the FMS server cache (FSC) and FMS client cache (FCC). (FCC is a component of TCCS.)

When installed as a stand-alone application, Lifecycle Visualization can use Teamcenter volumes and FMS if you install TCCS on the client host.

If you use NX or Teamcenter lifecycle visualization, you can install the FCC and use it to upload files to and download files from the Teamcenter volume.

Installation of TCCS is described in the appropriate Teamcenter client installation guides for Windows and Linux.

For information about installing Lifecycle Visualization, see the *Teamcenter lifecycle visualization Installation Guide* in the Lifecycle Visualization online help library.

Lifecycle Visualization features provided with Teamcenter are installed through TEM and Deployment Center. You can also patch Lifecycle Visualization using TEM.

> Note:
>
> You can configure both Lifecycle Visualization viewers for use with a rich client. If you configure both products, you must install the embedded viewer in a separate directory from the stand-alone application viewer. The embedded viewer and the stand-alone application viewer require separate license files.
>
> For more information about software requirements for Lifecycle Visualization, see the Siemens Digital Industries Software certification site:
>
> **http://support.industrysoftware.automation.siemens.com/certification/tc_vis.shtml**

Remote workflow installation

Remote workflow enables users to create links between Teamcenter objects and objects in Teamcenter portfolio, program and project management. Users can launch the linked Teamcenter product from within the Teamcenter rich client.

Security Services installation

Security Services eliminates the need for multiple authentication challenges as users move from one Teamcenter application to another. Authentication is performed by an external identity service provider, such as lightweight directory access protocol (LDAP).

Security Services is an optional feature and is installed separately from Teamcenter. Installation and initial configuration involve the following steps:

1. Install Security Services, noting the following information for configuring Teamcenter:

   - Application ID for this instance of Teamcenter in the Security Services application registry
   - Complete URL of the Security Services Login Service web application
   - Complete URL of the Security Services Identity Service web application

   For more information, see the *Security Services Installation/Customization* manual provided in PDF format on the Teamcenter publications kit.

2. If you are deploying the two-tier architecture:

   a. Install Security Services on the **Teamcenter corporate server**, specifying the Teamcenter application ID and the URLs of the Security Services Login Service web and Identity Service web applications as determined in step 1.

   b. Install a two-tier rich client, configuring Security Services for the client by specifying the same Teamcenter application ID, Security Services Login Service URL, and Identity Service web URL as specified when configuring Security Services on the corporate server.

3. If you are deploying the four-tier architecture:

   a. **Configure the web tier application** to enable Security Services, specifying the Teamcenter application ID and the URLs of the Security Services Login Service and Identity Service web applications as determined in step 1.

   b. Install the Teamcenter rich client, configuring Security Services for the client by specifying the same Teamcenter application ID, Security Services logon Service URL, and Identity Service web URL as specified when configuring Security Services for the web tier.

Other considerations

Oracle server considerations

Determine whether to create a new Oracle database and/or upgrade existing Oracle databases. You must **install Oracle Server** if a certified version is not installed on the system. For certified versions of Oracle, see the Hardware and Software Certifications knowledge base article on Support Center.

Teamcenter 12 and later versions support pluggable databases (PDB) with container databases (CDB) if you use Oracle 12c or later.

You can install Oracle from either of the following sources:

- Oracle software kit supplied by Siemens Digital Industries Software
- Oracle software kit supplied by Oracle Corporation

You must create a database instance if one does not exist or if an additional database instance is required (for example, to support testing, training, or RDV). If you are installing RDV services, Siemens Digital Industries Software recommends strongly that you create a new database instance on an Oracle server with database partitions on a separate disk drive. RDV requires extensive data warehousing with large uploads and simple queries. Such a configuration also makes the fine-tuning of the database easier.

> Note:
>
> A separate RDV database is *not* required if you use cacheless search.

MS SQL server considerations

If you use Microsoft SQL Server, **install the MS SQL Server database server** before you begin installing Teamcenter. For certified versions of MS SQL Server, see the Hardware and Software Certifications knowledge base article on Support Center.

When deploying MS SQL Server in a Teamcenter network:

- The Teamcenter corporate server must be installed on a Windows platform.
- Two-tier and four-tier rich clients can be installed on Windows platforms. Only four-tier rich clients can be installed on Linux platforms.

If you plan to implement a Teamcenter network incrementally at multiple sites, consider configuring each site in a Multi-Site Collaboration environment with separate hosts for the MS SQL database server (including Multi-Site Collaboration), the rich client, and volume servers, starting with the first phase. This allows you to configure and manage the network consistently, as you scale it in each phase. You can add CPUs, memory, and disks to the appropriate servers or deploy additional servers as required,

without moving or reconfiguring server processes on different hosts or changing operational procedures.

For large or critical system implementations, consider implementing high-availability systems with mirrored, dual-ported disk arrays. For a Teamcenter volume, consider file servers with storage attached network (SAN) or network attached storage (NAS) disk arrays.

To minimize system maintenance interruptions, consider separate file backup server hosts to process metadata and volume data backups in real time. While the primary disk sets remain online, you can take secondary MS SQL Server and volume disk sets offline simultaneously and back them up together (assuring MS SQL Server and Teamcenter volume synchronization). When the backup is complete, you can return the secondary disk sets online and resynchronize them with the primary disk sets. The file backup servers also serve as fail-over machines.

Network environment considerations

Homogeneous network environment

In a *homogeneous environment*, all hosts run the same platform, for example, a corporate server, web tier, and Teamcenter clients all running on Microsoft Windows or all running on SUSE Linux.

When deploying the two-tier architecture, you can install Teamcenter application executable files on a single application server host, export the Teamcenter application root directory structure from the Teamcenter application server, and mount it using CIFS on client workstations to run Teamcenter locally. Typically, the Teamcenter application server is also the Teamcenter data server. Similarly, you can export the data directory structure and mount it using CIFS to other Teamcenter clients to provide access to the database-specific information.

Heterogeneous network environment

In a *heterogeneous environment*, hosts do not all run the same platform, for example, a corporate server and a web application server may run on Linux hosts, and workstations on Microsoft Windows.

Installation considerations for a heterogeneous environment are the same as for a homogeneous environment, except that you must install Teamcenter for each type of workstation on the network, resulting in a Teamcenter application directory structure for each different type of workstation. You can configure one Teamcenter application server to serve many Teamcenter directory structures for different platforms.

Teamcenter volume data must be accessible by all Teamcenter clients in a heterogeneous network. **Configure File Management System** for volume access for all clients.

Make sure your Windows and Linux server configurations contain identical sets of Teamcenter features. For example, if you install features or custom templates on a Linux server, you must install the same features and templates on your Windows server.

Note:

- The Teamcenter root directory is platform-specific. The files within it can be shared only between systems of the same platform type. For heterogeneous Teamcenter environments that include Windows clients or Windows volume servers, configure File Management System to allow all clients to communicate with all volume servers.

  The Teamcenter root directory is specific to Windows or Linux systems (endian-specific). Maintain separate Teamcenter data directories on Windows and Linux systems.

- Teamcenter servers and two-tier rich clients on Linux hosts cannot connect to Microsoft SQL Server database servers. Keep this in mind when planning database access in a heterogeneous network.

Required operating system and user accounts

Teamcenter uses the following user accounts for installation and maintenance:

- Operating system logon account
  You must create a logon account for the operating system before installation. This account can have any name. This account does not represent a person: it is a responsibility logon. Log on with this account name to install or upgrade Teamcenter or install patches.
  This account must belong to the Administrators group and must be granted the **Log on as a service** right.

- Teamcenter administrative user account
  Teamcenter requires an administrative user account named **infodba**. Teamcenter Environment Manager automatically creates this account when you install Teamcenter on a server host. This account is used by the Teamcenter administrator to access the Teamcenter system administration functions to perform setup and maintenance tasks, such as creating Teamcenter users and logons. When you are populating a database during installation, you must use a password of **infodba** for this account. After installation, change the **infodba** password immediately.

  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:

  ! @ $ % = & ' " ^ : ; . _ < > ( ) { }

Caution:

Never use the **infodba** user to create working data or initiate workflow processes. This user ID has special behavior in the system: using it to create data or initiate workflow processes can cause unpredictable and undesirable behaviors.

If you require a user with high-level privileges to create data, create a new user ID and add that user to the DBA group and other groups as appropriate.

The **infodba** user is to be used only for the specific tasks and activities described in the technical documentation for administrators.

In addition, Teamcenter requires a database user to be the owner of Teamcenter-created tables and to perform tasks required by Teamcenter. You create this database user either using the templates provided for Oracle databases or using Teamcenter Environment Manager to install Teamcenter and populate a database. Teamcenter Environment Manager refers to this user as **DB user**.

Note:

Each user and group is identified by an alphanumeric name and an ID number. The ID number is retained with the file information when a file is exported across a network. If the ID numbers do not match for a user or group, file access privileges may be unintentionally granted to the wrong user, or not granted at all, on an NFS/CIFS client.

Part II: Database server installation

Teamcenter requires a supported relational database management system (RDBMS) for storing Teamcenter data. Before you begin installing Teamcenter, you must install and configure one of the following supported database systems:

- **Oracle**
- **Microsoft SQL Server**

Before proceeding with database server installation, make sure you are correctly licensed through your database vendor for the database edition you install.

For information about database versions supported for use with Teamcenter, see Support Center.

Because of Teamcenter's high resource demands, Siemens Digital Industries Software recommends a dedicated database server. At a minimum, there should be a dedicated database instance for Teamcenter. This allows the instance to be tuned specifically for Teamcenter.

3. Oracle installation and configuration

Preparing the Oracle server

Your Oracle database server must be a version certified for use with Teamcenter 13. For information about certified Oracle versions, Oracle disk space requirements, and operating system and service patch requirements, see the Hardware and Software Certifications knowledge base article on Support Center.

Prepare an Oracle database server and configure an Oracle database for Teamcenter:

1. Choose a name for the Teamcenter user account. Teamcenter uses this account as the owner of all Teamcenter-created tables. This account is used by the database administrator to perform tasks required by Teamcenter.

   > Tip:
   >
   > If you use the Siemens Digital Industries Software-supplied templates to create the Teamcenter database, the name and password of the account is **infodba**.

2. If you do not have a certified version of Oracle, install or upgrade Oracle:

   - If you do not have an Oracle server installed, **install a certified version of Oracle**.
   - If you have an Oracle server installed, but it is not a version certified for Teamcenter 13, **upgrade your Oracle server**.

3. **Configure Oracle software** for Teamcenter.

4. **Create a database for Teamcenter**.

Upgrade an Oracle server and database

Export an Oracle database

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.

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

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
```

Back up an Oracle installation

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

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 files.

> Note:
>
> 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, Siemens Digital Industries Software recommends that you also back up these directories.

Upgrading an Oracle server

Oracle server upgrade methods

You can upgrade your Oracle server and databases two ways:

- *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.

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**. Then, **configure Oracle** and **create an Oracle database**.

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.

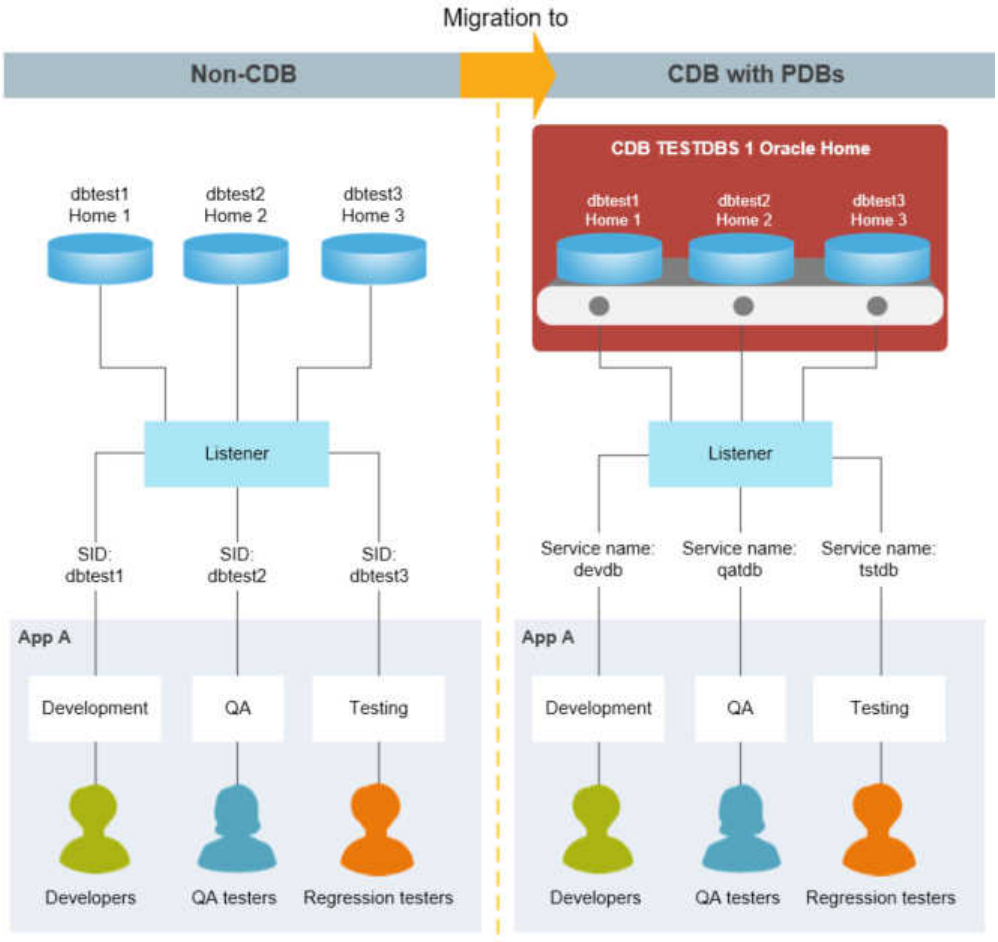
Migrate a non-CDB database to a CDB database

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 13.0.

Install Oracle server

You can install Oracle from the Oracle distribution media supplied by Siemens Digital Industries Software or Oracle Corporation.

If you install Oracle from a hard disk, copy the *entire* contents of the Oracle distribution media to the hard disk.

You can install Oracle application files on shared directories. However, Oracle Corporation does not support Oracle database files on shared directories. To ensure data integrity, create database files on local disk drives.

1. Log on to the server host as a member of the Administrators group. If you are installing on a primary domain controller (PDC) or a backup domain controller (BDC), log on as a member of the Domain Administrator group.

   > Note:
   >
   > The operating system user account under which you install the Oracle database server must have system administrator privileges.
   >
   > Siemens Digital Industries Software recommends you create a system user account named **oracle** to use during Oracle installation. When you use the **oracle** account to install Oracle, this account is automatically added to the Windows **ORA_DBA** local group, giving it **SYSDBA** privileges.

2. Record the name of the Oracle database server host. Teamcenter Environment Manager requires this name during corporate server installation.

3. In the Oracle RDBMS installation media, launch the **setup** program.
   If you install from a DVD, the system displays the **Autorun** dialog box when you insert the DVD.

4. In the **Configure Security Updates** dialog box, specify whether and how you want to be informed about security updates from Oracle, and then click **Next**.

5. In the **Select Installation Option** dialog box, select **Install database software only**, and then click **Next**.

6. In the **Select Database Installation Option** dialog box, select **Single instance database installation**, and then click **Next**.

7. In the **Select Database Edition** dialog box, select the database edition to install, and then click **Next**.

   > Note:
   >
   > Teamcenter supports **Enterprise Edition** and **Standard Edition**.

8. In the **Specify Oracle Home User** dialog box, specify the system account you created to install Oracle.

9. In the **Specify Installation Location** dialog box, specify:

   - **Oracle Base**
     Specifies the path in which to install all Oracle software and configuration files.

   - **Software Location**
     Specifies the path in which to install Oracle software files. This is the Oracle home directory.

> Note:
>
> Do not install a later version of Oracle into an existing Oracle home directory that contains an earlier version.

10. In the **Perform Prerequisite Checks** dialog box, verify that all the prerequisite checks succeeded and click **Next**.

> Note:
>
> If a check fails, review the displayed cause of the failure for that check, correct the problem, and rerun the check.
>
> A check occasionally fails erroneously, for example, when you install a later patch that obsoletes a listed patch. When you are satisfied that the system meets a requirement, manually verify the requirement by selecting the check box for the failed check.

11. In the **Summary** dialog box, review the information to ensure you have sufficient disk space, and then click **Install**.

12. In the **Install Product** dialog box, monitor the success of the installation stages.

13. When the **Finish** dialog box displays the **The installation of Oracle Database was successful** message, click **Close** to complete the installation.

Configure Oracle software

Configure Oracle Net

Teamcenter uses Oracle Net protocols to communicate with an Oracle database. These protocols require that you run a listener process (**OracleTNSListener**) on the Oracle server to listen for remote connect requests and that all clients can translate the service alias identifying the server and database.

Configure Oracle listener

1. Start Oracle Net Manager. For example, choose **Start→All Programs→Oracle -** *instance-name*→**Net Manager**, or search for **Net Manager**.

2. Create the **listener.ora** file:

   a. Expand the **Local** icon.

   b. Select the **Listeners** folder and choose **Edit→Create**.

   c. Accept the default listener name (**LISTENER**) and click **OK**.

d. Click the **Add Address** button.

e. Specify the port number.

> Note:
>
> For the first listener, Siemens Digital Industries Software recommends accepting the default port number (1521).

> Tip:
>
> Record the number of the port used by the Oracle database server listener for entry during corporate server installation. Teamcenter Environment Manager requires this port number.

f. In the **Local** tree, click **Profile**.

g. In the **Naming** list (to the right of the **Oracle Net Configuration** tree), choose **General**.

h. Click the **Advanced** tab.

i. In the **TNS Time Out Value** box, type **10**.

> Note:
>
> This step sets the Oracle server-side **SQLNET.EXPIRE_TIME** parameter. This value determines how often the Oracle server checks for aborted client connections. Teamcenter requires that this parameter be set to a nonzero value, and the recommended value is **10** (10 minutes).

j. Select the **Service Naming** folder and choose **Edit→Create**.

k. Type the **Net Service Name** for your pluggable database and then click **Next**.

l. Select **TCP/IP (Internal Protocol)** and then click **Next**.

m. Enter the host name for your Oracle server and then click **Next**.

> Note:
>
> If you chose to not use the default port during database creation, change the **Port Number**.

3. Type the **Service Name** and then click **Next**.

4. Click **Test...**

5. Change the **Login** value to the system user name and the **Password** value to the system password used during database installation and then click **Test**.

6. After the connection test is successful, click **Close**.

7. Click **Finish**.

8. Save the listener information, choose **File→Save Network Configuration**.
   Oracle Net Manager saves the listener information and creates the **network\admin\listener.ora** and **network\admin\sqlnet.ora** files in the Oracle home directory.

9. Exit Oracle Net Manager, choose **File→Exit**.

10. In a command prompt, create and start the listener service:

    ```
    cd ORACLE_HOME\bin
    lsnrctl start LISTENER
    ```

    Replace *ORACLE_HOME* with the path to the directory where you installed the Oracle server, for example, **d:\app\infodba\product\12.2.0\dbhome_1**. This command creates and starts the service if it does not exist. If the service exists, the command starts it.

Create an Oracle database

Create an Oracle database instance with Oracle Database Configuration Assistant (DBCA). Siemens Digital Industries Software provides two templates for creating the Teamcenter database:

- **Teamcenter_Oracle** template is used to create a traditional non-CDB database instance with Oracle user accounts and tablespaces.

- **Teamcenter_Oracle_multitenant** template is used to create a Container and Pluggable database instance where the two databases are identified by their Oracle service names. Teamcenter supports the Oracle 12c multitenant architecture.

> Note:
>
> The following are key considerations when creating an Oracle Container (CDB) database instance in the Oracle multitenant architecture with Oracle 12c:
>
> - Teamcenter Oracle database tablespaces and the **infodba** account are always created in the pluggable database.
>
> - Teamcenter cannot be installed into the container database. TEM detects if a Container database is specified and does not allow the Teamcenter installation to proceed.

- The Teamcenter tablespaces are *not* created using the DBCA template, as this is not supported by Oracle. After you configure the pluggable database, you can manually create a tablespace for the pluggable database, or allow Teamcenter to create the tablespace automatically.

  Using the existing non-CDB template *does* create tablespaces.

For best performance and reliability, database parameters set by Teamcenter templates should be customized to suit your installation. This can be performed by your Oracle administrator after Teamcenter installation is complete.

Teamcenter Environment Manager (TEM) verifies your Oracle version during installation. If your Oracle server does not meet the minimum required version, TEM does not allow installation to proceed. For information about supported database servers, see the Hardware and Software Certifications knowledge base article on Support Center.

1. Make sure you have access to the Teamcenter software kit.

2. Log on to the Oracle server host as a user who is a member of the **ORA_***instance-name***_DBA** group. This may be the user who installed Oracle on the server host or one assigned to **ORA_***instance-name***_DBA** by a member of the **ORA_***instance-name***_DBA** group.

3. Copy the Siemens Digital Industries Software-supplied Oracle database template files:

   a. Access the Teamcenter software kit.

   b. Copy all files in the **tc\dbscripts\oracle** directory on the Teamcenter software kit to the **templates** directory of the Oracle installation. For example:

      ```
      copy e:\tc\db_scripts\oracle\*    ORACLE_HOME\assistants\dbca\templates
      ```

   c. Repeat step **b**, copying files from the same directory on the Teamcenter 13.0 software kit.

4. Make sure you are logged on as the Oracle user.

5. Start Oracle Database Configuration Assistant (DBCA). For example:

   Start→All Programs→Oracle – *instance-name*→**Database Configuration Assistant**

   Alternatively, search for **Database Configuration Assistant**.

6. In the **Select Database Operation** dialog box, select **Create a database** and click **Next**.

7. In the **Select Database Creation Mode** dialog box, select **Advanced configuration** and click **Next**.

8. In the **Select Database Deployment Type** dialog box, in the list of templates, select the appropriate template:

- If you use a non-container (non-CDB) database, select the **Teamcenter_Oracle** template.
- If you use a container (CDB) database, select the **Teamcenter_Oracle_multitenant** template.

> Note:
>
> If you use a CDB database, the DBCA templates do *not* create tablespaces. The template no longer configures tablespaces for pluggable databases.

9. In the **Specify Database Identification Details** dialog box, enter the appropriate values according to the type of database you use:

   - **Container database:**

     a. Accept the default database name in the **Global Database Name** box or type a different name and click **Next**.

     > Note:
     >
     > The **SID** box is automatically filled in with the name you enter in the **Global Database Name** box.

     > Tip:
     >
     > Record the SID of the Oracle instance for entry during corporate server installation. Teamcenter Environment Manager requires this name.

     b. Select the **Create as Container Database** check box.
     The **Create a Container Database with one or more PDBs** radio button is selected by default. Do not change this setting.

     c. In the **PDB Name** text box, type the name of the pluggable database, and then click **Next**.

   - **Traditional (non-container) database:**

     a. Accept the default database name in the **Global Database Name** box or type a different name and click **Next**.

     > Note:
     >
     > The **SID** box is automatically filled in with the name you enter in the **Global Database Name** box.

> Tip:
>
> Record the SID of the Oracle instance for entry during corporate server installation. Teamcenter Environment Manager requires this name.

b. In the **Database Identification** dialog box, either accept the default database name in the **Global Database Name** box or type a different name and click **Next**.

> Note:
>
> The **SID** box is automatically filled in with the name you enter in the **Global Database Name** box.

> Tip:
>
> Record the SID of the Oracle instance for entry during corporate server installation. Teamcenter Environment Manager requires this name.

10. In the **Select Database Storage Option** dialog box, select **Use template file for database storage attributes**.

11. In the **Select Fast Recovery Option** dialog box, select the **Specify Fast Recovery Area** check box and accept the default values.

12. In the **Specify Network Configuration Details** dialog box, verify the **listener you created and started** is running and selected in the **Listener Selection** tab.
If the listener is not running, **start the listener** and make sure it is selected before you continue.

13. In the **Select Database Options** dialog box, click **Next**.

14. In the **Specify Configuration Options** dialog box, select **Use Automatic Shared Memory Management**, and then click **Next**.

15. In the **Specify Management Options** dialog box, accept the default selections, and then click **Next**.

16. In the **Specify Database User Credentials** dialog box, select **Use the Same Password for All Accounts**, and then enter and confirm the password.
The password you enter is applied to the **SYS**, **SYSTEM**, and **PDBADMIN** accounts.

17. In the **Select Database Creation Option** dialog box:

    a. Select **Create Database** check box.

    b. Click **Next**.

18. In the **Summary** dialog box, verify your selections, and then click **Finish** to begin creating the database.
    When the database is created, DBCA displays a window containing information about the created database.

19. In the **Progress Page** dialog box, click **Close** to exit DBCA.

After the database is created, check for possible errors in the installation log files. The Oracle DBCA displays the directory location of the installation log files in the window that contains information about the created database after the database is created.

> Note:
>
> - If this script did not execute successfully, execute it again using the Oracle SQL*Plus utility. Log on to SQL*Plus as **sysdba**.

Configure the pluggable database

If you use a container (CDB) database, create the **infodba** user and set permissions for the pluggable database:

1. Open SQL*Plus and type the following command to connect to the container database:

   ```
   connect user/password@container-database;
   ```

   Replace *user* and *password* with the Oracle administrator user name and password. Replace *container-database* with the container database you created earlier. For example:

   ```
   connect system/manager@tccdb;
   ```

2. Type the following command to set the pluggable database so the **infodba** user is created inside the pluggable database.

   ```
   connect alter session set container=pluggable-database;
   ```

   Replace *pluggable-database* with the name of the pluggable database you named in step **12c** earlier. For example:

   ```
   connect alter session set container=tcpdb;
   ```

   If successful, SQL*Plus responds:

   ```
   Session altered.
   ```

3. Set privileges for the **infodba** user:

```
grant Connect, Create table, Create tablespace, Create procedure,
Create view, create sequence, Select_catalog_role, alter user,
alter session, Create trigger to infodba identified by infodba;
```

If successful, SQL*Plus responds:

```
Grant succeeded.
```

Create a tablespace for the pluggable database

You can manually create a tablespace for the pluggable database using the following steps. If you do not perform these steps, Teamcenter automatically creates a tablespace with the default size.

1. Open a command prompt and log on to sqlplus as the Oracle administrator, for example, **system**.

2. Create a new tablespace for the pluggable database:

   create tablespace *tablespace-name* **datafile '***dbf-path***/***dbf-filename***' size** *dbf-size***M;**

   Replace *tablespace-name* with the tablespace name. Replace *dbf-path*, *dbf-file*, and *dbf-size* with the path, file name, and size of the database file in megabytes. For example:

   create tablespace tcpdb datafile 'D:\apps\oracle\oradata\tc\tcpdb.dbf' size 100M;

3. Grant all permissions on the new tablespace to **infodba**:

   a. Enter:

      alter user infodba quota *dbf-size***M on** *tablespace-name***;**

      For example:

      alter user infodba quota 100M on tcpdb;

   b. Enter:

      grant unlimited tablespace to infodba;

4. Log off **sqlplus** by typing **exit**.

4. Microsoft SQL Server installation and configuration

Install Microsoft SQL Server

The steps to install Microsoft SQL Server and to configure a database for Teamcenter depend on your operating system, your edition of SQL Server, and your selections during installation.

The following steps reflect a typical installation on Microsoft Windows.

For information about the SQL Server versions that are certified for use with Teamcenter, see the Hardware and Software Certifications knowledge base article on Support Center.

1. Log on to an account with system administrator privileges.

2. Launch the Microsoft SQL Server Installation Center application (**setup.exe**).

3. In the **SQL Server Installation Center** dialog box, click **Installation** in the navigation pane on the left side.

4. Click **New SQL Server stand-alone installation or add features to an existing installation**.

   The SQL Server Installation Center launches the SQL Server Setup wizard.

5. Proceed through the pre-installation tests and other initial setup panes to the **Install Setup Files** pane. Click **Install** to install SQL Server setup support files.

   After setup support files are installed, the wizard displays the **Install Rules** pane. Click **Next**.

6. In the **Feature Selection** pane, select **Instance Features→Database Engine Services** and any other features you want to include.

   Click **Next**.

7. In the **Instance Configuration** pane, select an instance type. Teamcenter supports both **Default Instance** and **Named Instance**.[1]

1 If you choose **Named Instance**, make sure you start the **SQL Browser** service before connecting to the database. If this service is not enabled, you can change these settings using the SQL Server Configuration Manager after installation is complete.

> Note:
>
> A default instance in a Microsoft SQL Server installation uses the name **MSSQLSERVER**. Teamcenter's persistent object manager (POM) utilities cannot connect to an instance with this name. If you use a default instance, make sure you connect to the instance using a port connection rather than the name.
>
> If you use a named instance, make sure the instance has a unique name other than **MSSQLSERVER**.

8. Enter remaining instance configuration values, and then click **Next**,

9. Proceed to the **Server Configuration** pane.

   a. Click the **Service Accounts** tab.

   b. Enter account information for starting SQL Server services.

   > Note:
   >
   > The SQL Server Setup wizard validates user accounts for SQL Server services. Make sure the accounts you enter exist on the host.

   c. Click the **Collation** tab.

   d. On the **Collation** tab, click **Customize**.

      The wizard displays a customization dialog box for database engine collation.

   e. Select **Windows Collation designator and sort order**.

   f. In the **Collation designator** box, select **Latin1_General** and then select **Binary**.

   g. Click **OK**.

   h. In the **Server Configuration** pane, click **Next**.

10. Proceed to the **Database Engine Configuration** pane.

    a. Click the **Server Configuration** tab.

    b. Under **Authentication Mode**, select **Mixed Mode** and define a password for the SQL Server **sa** logon account.

    c. Specify at least one SQL Server administrator account.

d. Click **Next**.

11. Proceed to the **Ready to Install** pane and click **Install** to install.

Teamcenter requires the TCP/IP protocol to be enabled, but this protocol is disabled by default when you install Microsoft SQL Server. Before you install Teamcenter, make sure you enable the TCP/IP protocol.

For information about enabling the TCP/IP protocol in Microsoft SQL Server, see **http://technet.microsoft.com**.

Create an SQL Server database

Teamcenter Environment Manager (TEM) can create and populate a SQL Server database when you install a Teamcenter corporate server.[2] If you want TEM to create your Teamcenter database automatically, skip this topic. Otherwise, create your Teamcenter database using the SQL Server Management Studio.

1. Make sure you have access to the Teamcenter software kit.

2. Launch Microsoft SQL Server Management Studio:

   Start→Programs→Microsoft SQL Server→SQL Server Management Studio

   Alternatively, search the start menu for **SQL Server Management Studio**.

3. In the SQL **Connect to Server** dialog box, log on using the system administrator (**sa**) logon name and password.

4. Choose **File→Open→File** or press Control+O.

5. Browse to the **tc\db_scripts\mssql** directory in the Teamcenter 13 software kit.

6. Select the **create_database.sql.template** file and click **Open**.

   If SQL Server Management Studio prompts you to log on, enter the system administrator (**sa**) logon name and password.

7. Edit the database template (**create_database.sql.template**) to replace the necessary values.

   The following table describes the database parameters to replace in the template. Within the template file, there are also comments on values that must be replaced.

2 In the **Database Engine Selection** panel, TEM prompts you for database information for the SQL Server database. To create a new database, enter new values. To connect to an existing database, enter values for the existing database. For information about installing a corporate server, see *Teamcenter server installation*.

Parameter	Example value	Description
@DB_NAME@	**TC**	Name of the database to create.
@DATA_PATH@	**D:\MSSQL_DATA**	Path to the directory in which to place the data file.
@USER_NAME@	**infodba**	Database logon name for the Teamcenter database.
@PASSWORD@	**infodba**	Password for the database logon name.
@COLLATION@	**Latin1_General_BIN**	Collation sequence you want the Teamcenter database to use. Choose the **appropriate collation for your locale**. The collation value must end with **_BIN**.[3]. *Collation* defines the alphabet or language whose rules are applied when data is sorted or compared. The collation value determines the character set used by the database server.
@LANGUAGE@	**us_english**	Database language.

8. Save the newly modified file as *filename***.sql**, removing the **_template** extension.

9. Open the new file in Microsoft SQL Server Management Studio.

10. In the SQL Editor toolbar, click **Execute** (or choose **Query→Execute** to begin creating the database.

11. When creation of the MS SQL database instance is complete, verify the newly created database. In the **Object Explorer** pane, under the MS SQL Server host name, expand the **Databases** tree. Verify the new database name is included in the list of databases.

3 Do not use the default collation value that ends with **_CI_AS**.

Part III: Teamcenter server installation

Prepare the Teamcenter server host, install the corporate server, then perform any required postinstallation tasks.

5. Teamcenter preinstallation tasks

Obtain a Teamcenter license file

Do I need a new license file?

Determine whether you need to obtain a new Teamcenter license file, based on the process you need to perform.

Process	Example	New license file needed?
Install (No existing version)	New Teamcenter 13.0 installation	Yes
Upgrade (Change in major version)	Teamcenter 11.*x* → 12.*x*	Yes
Patch (Change in minor version)	Teamcenter 12.1 → 13.0	No

Generate a composite host ID

To obtain a Teamcenter license file, you must provide the composite host ID of your Teamcenter license server host.

A *composite host ID* (CID) is a unique identifier used as the host ID on the **SERVER** line of the license file. It is distinguished from the default FlexNet host ID by the **COMPOSITE** keyword. It is the host ID that associates a permanent license file with a specific server. When the CID is used as the license server host ID, the **SERVER** line reads as follows:

```
SERVER serverA COMPOSITE=37B5ED1AC61D 28000
```

To obtain a composite host ID for your license server, run the **getcid** utility on your license server host. Download this utility:

1. Open the Siemens Digital Industries Software support site:

   https://support.sw.siemens.com

2. Click **Download and Upload Files**.

3. On the **Siemens PLM Download Server** page, click **Siemens PLM Licensing**.

4. Choose **Product updates→CID**, and then choose the platform type of your license server (**Wntx64** or **Lnx64**).

5. Click **getcid.exe** to download the **getcid** utility.

Run the **getcid.exe** utility on the target license server (or on all three servers in a redundant configuration). The utility provides the CID for license server as a 12-digit hexadecimal number. For example:

```
$ getcid.exe
The Siemens PLM Software licensing composite hostid is:
"COMPOSITE=37B5ED1AC61D"
```

> Note:
>
> After you install the Siemens Digital Industries Software License Server, the **getcid** utility is available in your license server directory.

Generate a permanent license file

After you obtain the CID, enter it into your customer record to generate a permanent license file. After your CID is entered into your customer record, you are sent a permanent license file to install on your license server.

Install the License Server (Windows systems)

Before you install Teamcenter, you must install the Siemens Digital Industries Software License Server to distribute licenses to Teamcenter hosts. If you already installed the License Server, make sure your version is equal to or higher than the version provided with Teamcenter 13.0.

To verify the license server version supported with Teamcenter 13.0, see the Hardware and Software Certifications knowledge base article on Support Center.

Teamcenter employs *named user licensing*, which ties each user in the system to an available license and ensures the total number of active licenses of each type in the system is always less than or equal to the number of licenses purchased.

For descriptions of the available license types, see your license agreement documentation.

This procedure assumes you have **obtained a Teamcenter license file**.

1. Obtain a Teamcenter 13.0 license file from Siemens Digital Industries Software. Save the license file in a directory accessible to the license server host. This procedure assumes the license file is named **tc.lic**, but you may give the license file any name you choose.

   If you choose to install Teamcenter using a temporary license file, edit the temporary license file to reflect your designated Teamcenter corporate server host.

   a. Open the license file in a plain text editor and locate the following line in the file:

      ```
      SERVER YourHostname ANY 28000
      ```

b. Replace **YourHostname** with the host name of the designated license server host. Update your Siemens Digital Industries Software customer service representative with your license server host information.

c. Save the changes to the license file.

Siemens Digital Industries Software recommends you do *not* change the license server port from its default value (**28000**[1]) unless it is necessary to resolve a port conflict.

Record the host name and port for the license server. Teamcenter Environment Manager (TEM) prompts you for these values during Teamcenter server installation.

2. Set the **SPLM_LICENSE_SERVER** environment variable to the following value on the designated Teamcenter corporate server host:

   port@*host*

   Replace *port* with the port number and *host* with the host name of the license server, for example, **28000@tchost**. The *port* and *host* values must match those you specified in the **SERVER** line of the Teamcenter license file.

   The value of this variable is designated as the default local license server during corporate server upgrade. TEM verifies that the specified license server exists and is running a supported version of the Siemens Digital Industries Software common licensing server. If the configured license server is not valid, the upgrade is stopped until a valid license server is installed.

3. Set the **TCP_NODELAY** environment variable to **1** on the licensing server host. This helps optimize logon time when launching Teamcenter.

4. Change to the **additional_applications** directory in the Teamcenter software kit.

5. Copy the Siemens Digital Industries Software License Server installation program (**SPLMLicenseServer_***version***_setup.exe**) to a temporary directory on your local hard drive.

6. Launch the License Server installation program:

   a. Launch the **SPLMLicenseServer_***version***_setup.exe** program.

   b. During license server installation, enter the following values:

      - Destination location for the license server
      - Location of the Teamcenter license file (**tc.lic**)

1 Port 28000 is registered for the License Server with the Internet Assigned Numbers Authority (IANA). For more information, see http://www.iana.org/assignments/port-numbers.

When the installation is complete, the license server installation program starts the license daemon (**ugslmd**).

> 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.

Information about installing the Siemens Digital Industries Software Common License Server is available in the License Server documentation in the software download page on the Siemens Digital Industries Software support site. This documentation is available under **Siemens PLM Licensing→Product updates→Documentation**.

Select destination directories

Select destination directories for Teamcenter using the following guidelines:

- Ensure that all directories and files are owned and writable by the operating system user installing Teamcenter over an existing installation.
- If your Teamcenter installation directory is on a mapped drive or a UNC path (not on the local host) you must be logged on as an authenticated domain user to ensure the remote host recognizes you. Alternatively, you can set the permissions on the remote host to allow an anonymous user to access it. This is necessary to ensure Teamcenter services such as the FMS server cache (FSC) and Multi-Site Collaboration services can start.
- The Teamcenter installation directory must be in a location excluded from real-time virus scanning. Real-time virus scanning prevents Teamcenter from updating the persistent object manager (POM) schema during installation, causing installation errors.

> Note:
>
> Siemens Digital Industries Software requires that you store or create Teamcenter files on NTFS partitions, not FAT partitions, to take advantage of the file security features of NTFS.

Install a volume server

By default, you can create volumes only on local disks, but if you want to write files to volumes residing on remote disks (shared across the network), you can create a stand-alone volume server.

1. Log on to the operating system with the user account you want to own the volume.
2. Start Teamcenter Environment Manager (TEM):
    a. Browse to the root directory of the Teamcenter software kit.

b. Right-click the **tem.bat** program icon and choose **Run as administrator**.
Teamcenter Environment Manager starts and displays the **Choose Install Language** dialog box.

c. Select a language for the installation program and click **OK**.
The language you select is used only for the installation program.

3. In the **Welcome to Teamcenter** panel, select **Teamcenter**.

4. Proceed to the **Install/Upgrade Options** panel. Click **Install**.

5. (Optional) In the **Media Locations** panel, enter paths to any Teamcenter patches or minor releases you want to apply during installation.

6. Proceed to the **Configuration** panel. Enter a unique ID and description for the new Teamcenter configuration.

7. Proceed to the **Solutions** panel. Select the **Volume Server** solution.

> Note:
>
> For descriptions of solutions, point to the solution in the list or click **Help** or see the complete **list of features**.

8. Proceed to the **Features** panel. This panel shows the **FMS Server Cache** feature preselected by the **Volume Server** solution.

9. In the **Installation Directory** box, enter the absolute path to the directory where you want to install the volume server.

10. Proceed to the **Operating System User** panel. Type the password for the operating system account to which you logged on to install the volume server.

11. Proceed to the **File System Cache Service (FSC)** panel. Enter required values for the FMS server cache (FSC) service. For information about required values, click the help button  .

12. Proceed through the remaining panels, entering required values for the volume server.

13. Proceed to the **Confirmation** panel. Verify the information you entered. If you want to change any values, click **Back** to return to the panels you want to change. Otherwise, click **Next** to begin installing the volume server.

14. When installation is complete, close TEM.

Install NX and Teamcenter Integration for NX or NX Integration

Installing NX is not a prerequisite for installing or using Teamcenter. However, if this is a new installation of both Teamcenter and NX, Siemens Digital Industries Software strongly recommends installing NX prior to installing Teamcenter.

When installing NX for use with Teamcenter, you must install the Teamcenter Integration for NX or NX Integration executables. Although installed independently, Teamcenter Integration for NX and NX Integration cannot be used until Teamcenter is configured.

To use Teamcenter Integration for NX or NX Integration with Teamcenter, you must install NX locally on every workstation. This is a requirement for Teamcenter Integration for NX or NX Integration to function in a rich client local server environment on Windows platforms.

Teamcenter Integration for NX and NX Integration provide the same NX user interface and are both installed with NX.

For more information about using Teamcenter with NX, see the installation guides distributed with NX. Installing Teamcenter varies depending on whether you have a license for NX Integration or Teamcenter Integration for NX.

> Note:
>
> If you use Teamcenter Integration for NX, when you upgrade to a new version of NX, uninstall the **NX Rich Client Integration** feature in TEM, and then reinstall this feature, specifying the path to the new NX installation in the **NX Install Location** box in TEM.

Best installation practices

A Teamcenter network requires one corporate server configuration. Additional servers are optional, but can help balance network loads and facilitate heterogeneous networks (networks with hosts running different operating systems).

If you install the optional servers, Siemens Digital Industries Software recommends installing in the following order:

1. Install a Teamcenter corporate server.
   The corporate server is a network node used as an application file server (from the Teamcenter application root directory) and database-specific configuration file server (from the Teamcenter data directory). Run Teamcenter Environment Manager and install the Teamcenter executables and the directory containing the database-specific configuration files. Teamcenter can also run locally on this network node.
   A Teamcenter corporate server contains the **Teamcenter Foundation** and **FMS Server Cache** features as a minimum.

2. Optionally install additional Teamcenter servers to provide the following capabilities:

- Run Teamcenter executables and point to the existing data directory on the corporate server host or another Teamcenter server. This server can contain a Teamcenter application root directory structure on a network node that may be configured to run Teamcenter in the future.

- Run Teamcenter Environment Manager and point to an existing database. This server can contain a Teamcenter network node to be used as a database-specific configuration file (Teamcenter data directory) server when the Teamcenter application root directory is mapped from a Teamcenter application server. Teamcenter can also be run locally on this system. You are creating an additional Teamcenter database for use with an existing Teamcenter application root directory.

Note:

Teamcenter servers and two-tier rich clients on Linux hosts cannot connect to Microsoft SQL Server database servers. Keep this in mind when planning database access in a heterogeneous network.

6. Teamcenter server installation

Before you start

- Locate the Teamcenter software kit for your platform. If you install Teamcenter online help, locate the Teamcenter publications kit.
- On the local host, create the Teamcenter operating system user account.

  > Note:
  >
  > All Teamcenter services run as this user account. Ensure this account belongs to the Administrators group and is granted the **Log on as a service** right.

- Obtain the host name of the licensing server and the port number used for licensing processes.
- Ensure that a database server is installed for Teamcenter and obtain the following information from the database administrator:
  - The type of database server used for this installation of Teamcenter.
  - The following information about the database server:
    - Name of the host on which the database server runs.
    - Number of the port on which the database server listens.
    - For Oracle database servers, the service name of the Oracle instance.
      Typically, the service name is the same as the SID.
    - For MS SQL database servers:
      - ◊ Name of the database
      - ◊ Name of a system data source (DSN) to be created by Teamcenter Environment Manager
    - Whether you can create a database user or must use an existing database user:
      - ◊ If you can create a database user, obtain the following information about the generic Oracle instance:
        - Name of the database system user.
        - Password for the database system user.

- Absolute path to the tablespace directory on the database server.

◊ If you must use an existing database user:

- Database user name
- Database user password

- Determine a parent directory to contain a Teamcenter volume or volumes.
  This parent directory must exist before installation. Only the parent directory should exist; the volume directory is created during installation.

  Note:

  Siemens Digital Industries Software recommends the volume location *not* be under the Teamcenter application root directory. Doing so can cause problems when upgrading to a new version of Teamcenter.

- Select the features to install. Point to any feature to view a description.[1]

- Obtain the information required to install File Management System.

Note:

- If you install File Management System, the FMS server cache (FSC) and the server manager must run on the same host server, with the same user ID.
- Teamcenter provides server managers based on the Java EE and the Microsoft .NET platforms. Install the appropriate server manager for the web tier you use.

Data	Description
Read cache directory and size?	For FMS to operate correctly, the location you specify must be on the local host. If you are installing a volume on the host, FMS does not use the read cache; Siemens Digital Industries Software recommends accepting the default cache size (10 megabytes). Do not specify 0; specifying 0 creates a file cache with a default size larger than 10 megabytes. If you are not installing a volume on this host, FMS acts as a cache server. In this case, Siemens Digital Industries Software recommends increasing the value to 1000 megabytes. However, choose a size that represents the maximum size of the data that

1 For further descriptions of server features, see *Teamcenter features*.

Data	Description
	must be processed. If you choose 1000 megabytes, and a user requests a 3 gigabyte assembly, the request fails.
Write cache and size?	This cache is required when the FSC acts as a cache server. For FMS to operate correctly, the location you specify must be on the local host. If you are installing a volume on this host, FMS does not use the write cache; Siemens Digital Industries Software recommends accepting the default cache size (10 megabytes). Do not specify 0; specifying 0 creates a file cache with a default size larger than 10 megabytes. If you are not installing a volume on this host, FMS acts as a cache server. In this case, Siemens Digital Industries Software recommends increasing the value to 512 megabytes or more. However, choose a size that represents the maximum size of the data that must be processed.
Communication mode between FMS components?	Either HTTP or HTTPS.
Configure proxy servers?	Either HTTP proxy server or HTTPS proxy server. If you choose to configure proxy servers, you must provide: • The name of the host running the proxy server. • The number of the port the proxy server listens on.
Is this host an FMS master?	If you are installing only one FSC server in the network, it must be the master host. Each Teamcenter network must have at least one master configuration file and one FSC designated to read this file.
Default settings for the FCC?	• Location of the cache directory for all Windows systems and for all Linux systems. • Default maximum size in megabytes of whole files downloaded from the volume to rich client hosts. Users cannot download a file whose size exceeds the value you set for this value. This default setting can be overridden by the FMS client cache configuration file. Choose a size large enough to accommodate the largest whole file that users download from the volume. If the user requests a 3-gigabyte assembly when the cache size is set to 1000 megabytes, the request fails.

Data	Description

	• Default maximum size in megabytes of whole files uploaded to a volume from rich client hosts. Users cannot upload a file whose size exceeds the value you set for this value. This default setting can be overridden by the FMS client cache configuration file.
	Choose a size large enough to accommodate the largest whole file that users upload to the volume.
	
	• Default maximum size in megabytes of the segment file cache used by the embedded viewer and the stand-alone application viewer on rich client hosts.
	This default setting can be overridden by the FMS client cache configuration file.
	
	  • If no or few rich client users in the network deploy Lifecycle Visualization, Siemens Digital Industries Software recommends setting this cache size to 10 megabytes. Do not specify 0; specifying 0 creates a file cache with a default size larger than 10 megabytes.
	
	  • If rich client users in the network deploy Lifecycle Visualization, Siemens Digital Industries Software recommends setting this cache size in the range of 2000 megabytes to 4000 megabytes.
	The cache size is initially small, expanding to the maximum size only if a user launches Lifecycle Visualization to view a file of that size. The initial size of the cache is proportional to the value specify.

Install a Teamcenter corporate server

1. Log on to the operating system with the Teamcenter user account you created for installing and maintaining the Teamcenter installation.

2. **Specify the path to the required Java Runtime Environment (JRE)** by setting the **JRE64_HOME** environment variable on your host.[2]

3. Start Teamcenter Environment Manager (TEM):

   a. Browse to the root directory of the Teamcenter software kit.

   b. Right-click the **tem.bat** program icon and choose **Run as administrator**.

2 Alternatively, you can **specify the JRE path when you launch TEM** from a command prompt using the **-jre** *JRE-path* argument.

TEM starts and displays the **Installer Language** dialog box.

c. In the **Installer Language** dialog box, select a language and click **OK**.
Your language selection applies only to the TEM session, not the Teamcenter installation.

> Note:
>
> For information about any TEM panel, click the help button  .

4. In the **Welcome to Teamcenter**, select **Teamcenter**.

5. Proceed to the **Install/Upgrade Options** panel. This panel contains the following options:

   - **Install**
     Installs a new Teamcenter configuration using a fully configurable installation process.

   - **Quick Preconfigured Install**
     Installs preconfigured corporate server and client configurations using a simplified installation process.

   - **Upgrade**
     Upgrades an existing Teamcenter configuration.

   Click **Install** to begin installing a corporate server.

   > Note:
   >
   > The **Install/Upgrade Options** panel also provides these installation options:
   >
   > - Create environment for upgrade testing
   >
   >   TEM can create a copy of an existing Teamcenter environment for upgrade testing *only*. The copied environment *cannot* be used as a production database.
   >
   > - **Create custom distribution**
   >
   >   To simplify installations of Teamcenter on multiple hosts, TEM can create a *silent distribution* or a *compact distribution*. Compact distribution is recommended only for Teamcenter client configurations, not for servers.

6. In the **Media Locations** panel, enter paths to any Teamcenter patches or minor releases you want to apply during installation. This step is optional.

7. In the **Configuration** panel, type a unique ID and description for the new Teamcenter configuration.

The configuration ID identifies your Teamcenter configuration when you maintain, upgrade, uninstall, or add features to the configuration. Installation log files are also named based on the ID you enter.

8. In the **Solutions** panel, select the **Corporate Server** solution.

9. Proceed to the **Features** panel. This panel shows the corporate server features preselected by the **Corporate Server** solution:

   Teamcenter Foundation
   FMS Server Cache
   NX Part Family Classification Integration

10. Select any **additional features** you want to include in your configuration.

    If you select additional features, TEM displays additional panels during installation that are not described in this procedure.

    For help with any panel in TEM, click the help button  .

    You can also add features to the corporate server later using TEM in maintenance mode.

    Note:

    - If you are deploying the Java EE web tier or the .NET web tier, under **Server Enhancements** select the feature **Server Manager**.
    - You can also install custom features by **installing a custom solution or third-party template**.
    - If you install Teamcenter Automotive Edition and GM Overlay with the rich client, make sure you complete the required postinstallation steps provided in the client installation guides for Windows and Linux.

11. In the **Installation Directory** box, enter the path to a new directory where you want to install Teamcenter.

    The **Installation Directory** value is the Teamcenter application root directory (*TC_ROOT*).

    Do not set the **TC_ROOT** environment variable in the system environment. TEM sets this variable as required in Teamcenter configuration files. Setting this variable in the operating system can cause conflicts if you install multiple Teamcenter configurations.

    The installation directory must meet the following requirements:

- The directory must *not* already exist on your system. (TEM creates the directory during installation.)
- The path to the installation directory must not exceed 64 characters.
- The directory must be in a location excluded from real-time virus scanning.[3]

> Note:
>
> If your Teamcenter installation directory is on a mapped drive or a UNC path (not on the local host) you must be logged on as an authenticated domain user to ensure the remote host recognizes you. Alternatively, you can set the permissions on the remote host to allow an anonymous user to access it. This is necessary to ensure Teamcenter services such as the FMS server cache (FSC) and Multi-Site Collaboration services can start.

12. In the **File System Cache (FSC)** panel, type a unique identifier and port for the FMS server cache in the **FSC ID** and **Port** boxes.

    A Teamcenter network must have at least one master FSC. If you want to designate the current FSC as an FSC master, select the **Enable configuration master** check box. Otherwise, type the URL to the parent FSC in the **FSC Parent URL** box.

    For advanced FSC configuration options, click **Advanced**.

13. In the **Operating System User** panel, type the password for the operating system account under which you install Teamcenter.

14. In the **Foundation** panel, select how you want to create or designate the Teamcenter database and Teamcenter data directory (*TC_DATA*).

Database exists?	Database populated?	TC_DATA exists?	Select this option
No	*N/A*	No	**Create and populate database, create new data directory** No Teamcenter database or data directory exists and you want TEM to create both. This option is selected by default.
Yes	No	No	**Populate database, create new data directory** A database exists but is not populated with Teamcenter data. You want TEM to populate the database and create a new data directory.

3 Real-time virus scanning prevents Teamcenter from updating the persistent object manager (POM) schema during installation, causing installation errors.

Database exists?	Database populated?	TC_DATA exists?	Select this option
Yes	Yes	No	**Create new data directory using existing populated database** A database exists and is populated. You want TEM to use this database and create a new data directory.
Yes	Yes	Yes	**Use populated database and existing data directory** A database exists and is populated, and a data directory exists. You want TEM to use both of these.

15. Enter the required values for your Teamcenter database according to your selection in the **Foundation** panel.

- **Create and populate database, create new data directory**:

  a. Proceed to the **Foundation Database** panel.

  b. Select the appropriate database server vendor (**Oracle** or **MS SQL Server**).

  c. Enter the required values for the database server, the database user, and the database administrator account.

- **Populate database, create new data directory**:

  a. Proceed to the **Foundation Database** panel.

  b. Select the appropriate database server vendor (**Oracle** or **MS SQL Server**).

  c. Enter the required values for the database server and the database user.

- **Create new data directory using existing populated database**:

  a. Proceed to the **Foundation Database** panel.

  b. Select the appropriate database server vendor (**Oracle** or **MS SQL Server**).

  c. Enter the required values for the database server and the database user.

- **Use populated database and existing data directory**:
  No database information is required. Proceed to the **Data Directory** panel.

> Note:
>
> The directory you specify in the **Database Path** box must exist and you must have write permission to the directory.
>
> For more information about database configuration values, click the help button  .

16. In the **Data Directory** box, enter a location for the Teamcenter data directory.

    The Teamcenter data directory is called the *TC_DATA* directory. TEM stores this location as the **TC_DATA** variable in Teamcenter configuration files. TEM creates shared data subdirectories and files in this location. Each data directory is associated with a single database user within a database instance.

    Do *not* set **TC_DATA** as a system environment variable. Setting this variable in the operating system can cause conflicts if you install more than one configuration.

17. Proceed to the **Volume Information** panel.

    In the **Name** box, type a name for the Teamcenter volume you want TEM to create.

    In the **Directory** box, type the absolute path to the directory in which to create the volume, or accept the default location.

    > Note:
    >
    > Siemens Digital Industries Software recommends not defining the volume location under the Teamcenter application root directory. Doing so leads to complications when upgrading to a later version of Teamcenter.

18. Proceed to the **Foundation Settings** panel.

Value	Description
Transient Volume Directories	Specifies transient volume locations for Windows hosts, Linux hosts, or both. A *transient volume* is an operating system directory controlled by Teamcenter and used to store temporary data for transport of reports, PLM XML data, and other nonvolume data between the enterprise tier and client tier in a deployed four-tier architecture. All four-tier clients that access the corporate server you are installing use this transient volume.

Value	Description
	Caution: You cannot define the path as a UNC path, for example, *****server******shared-transient-folder*. You must use a direct path location. This is partly due to the fact that some ZIP archive utilities do not accept UNC paths, resulting in failure of exports to Excel or Word.
Windows clients	Specifies the location for a transient volume for Windows client hosts.
Linux clients	Specifies the location for a transient volume for Linux client hosts.
Generate server cache	Specifies you want to generate a shared server cache. If you select this option, TEM runs the generate_client_meta_cache utility at the end of the install, upgrade, or update action. This option reduces Teamcenter memory consumption by moving metadata to shared memory. Types, property descriptors, and constants are placed in a shared cache that is shared by all Teamcenter server instances. This option is selected by default in a Teamcenter server installation.
Generate client cache	Specifies 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 runs the generate_client_meta_cache utility 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. This option is selected by default in a Teamcenter server installation.
Production Environment	Specifies your new environment is to be used as a live environment where you will store your product data.
Test Environment	Specifies your new environment is to be used for development, testing, or training. Selecting **Test Environment** enables the bulk loader tool to copy

Value	Description
	data from another environment (such as a production environment) into this test environment. Note: If you designate this environment as a test environment, the designation cannot be changed. Additionally, a test environment cannot participate in Multi-Site sharing with a production environment.

For advanced Teamcenter Foundation options, click **Advanced**.

19. If you want to configure Teamcenter online help, click **Advanced** in the **Foundation Settings** panel and perform the following steps:

    a. Click the **Online Help** tab.

    b. Select the **Enable Online Help** check box.

    c. In the **PLM Document Server URL** box, type the Teamcenter online help URL.

20. Proceed to the **Flex License Client** panel. Enter settings for the Siemens PLM License Server.

    Note:

    The **Siemens PLM License Server must be installed** before you begin Teamcenter installation.

21. Proceed to the **Teamcenter Administrative User** panel. During a corporate server installation, the values in this panel are read-only.

22. Proceed to the **Password Security** panel. In the **Administrative Password Directory** box, enter the directory in which to place Teamcenter password files. TEM locks access to this directory to all users except the user performing Teamcenter installation.

23. Proceed through any remaining panels, entering the required information for the features you selected.

    For information about these panels, click the help button .

24. Proceed to the **Confirmation** panel. Verify the information you entered.

    If you want to change any values, click **Back** to return to the panels you want to change. Otherwise, click **Start** to begin installing the Teamcenter corporate server.

    > Note:
    >
    > If an error occurs during installation, follow the instructions in the error message displayed by TEM or see the available **troubleshooting solutions**.

25. When installation is complete, close TEM.

> Note:
>
> After installation, you can find Teamcenter in the list of installed programs in the Windows control panel. The program name is displayed as **Teamcenter 13 (x64) (***TC_ROOT***)**.

7. Teamcenter postinstallation tasks

Start database daemons

If you select Teamcenter **database daemon features** during Teamcenter installation, Teamcenter Environment Manager (TEM) configures the database daemons to start automatically as Windows services. After installation, you can find these services in the **Services** dialog box in the Windows Control Panel:

Teamcenter Task Monitor Service
Teamcenter Subscription Manager Service
Teamcenter Action Manager Service
Teamcenter Tesselation Manager Service

If the services do not start automatically, see the available **troubleshooting solutions**.

Each service behaves as follows:

1. After the services are started, a program runs in *TC_ROOT***bin** named **tc_server.exe**.
   Windows displays **tc_server.exe** in the task manager. If you do not see this process, either your registry entry for that service is corrupted (specifically the path to the image) or the file is not on the system.

2. The **tc_server.exe** program identifies the service that launched it by examining the service name. It expects the service name to contain either **actionmgrd**, **subscripmgrd**, **task_monitor**, or **tess_server**. The default service names for Teamcenter are **tc_actionmgrd**, **tc_subscripmgrd**, **tc_taskmonitor**, and **tc_tess_server**. These services are defined in **\HKEY_LOCAL_MACHINE \SYSTEM\CurrentControlSet\Services**.

3. The **tc_service.exe** program assembles a .bat file name by prefixing the service name with **run_** and appending the extension of .bat. For example, the **tc_actionmgrd** service has the file name **run_tc_actionmgrd.bat**.

4. The **tc_service.exe** program calls the .bat file (created by the setup program during configuration and placed in the **\bin** directory of the Teamcenter application root directory).

5. The task manager displays the process, for example, **actionmgrd.exe**.
   If the process is not displayed in the task manager, either the service name is not one of the three supported names, the .bat file for the process does not exist, or the process executable is missing.

6. The **Services** dialog box is updated to **Started**.

Configure online help access

To configure online help after Teamcenter rich client installation, or to change online help access for the rich client, set the **online help URL** in the client configuration:

1. Launch TEM in maintenance mode and proceed to the **Feature Maintenance** panel.
2. Under the appropriate rich client type,[1] select **Modify settings**.
3. In the **Rich Client Settings** panel, select the **Enable Online Help** ☑ check box, and then type the appropriate **online help URL** in the **Web server URL** box.
4. Proceed through the remaining panels to complete the configuration update.

After you complete these steps, online help is available from the **Help→Help Library** menu option (or control-F1) in the rich client.

Configure Multi-Site Collaboration

Overview of Multi-Site Collaboration configuration

Multi-Site Collaboration allows the exchange of Teamcenter data objects between databases. Each database should be easily accessible via TCP/IP, either over the Internet or the company intranet. Configuration of Multi-Site Collaboration is optional.

Coordinate configuration of Multi-Site Collaboration with the system administrators of the other Teamcenter databases to be part of the Multi-Site Collaboration environment. Information about all participating Teamcenter database sites must be stored in each database and in the site preference files. In addition, you must identify the network nodes to run Multi-Site Collaboration server processes for these databases and configure those systems to run the processes.

Prepare the Multi-Site Collaboration environment

Perform the following steps to configure Multi-Site Collaboration for a wide area network:

1. Identify all Teamcenter databases to be part of the Multi-Site Collaboration environment.
2. Identify the Teamcenter database to act as the ODS database.
   This database stores records about the data objects published by other databases in the Multi-Site Collaboration environment (that is, made public to the other databases).
   This can be one of the databases identified in step 1 or it can be a dedicated database. The database must be populated with Teamcenter data.

1 The rich client type may be **Teamcenter Rich Client 2-tier**, **Teamcenter Rich Client 4-tier**, or **Teamcenter Rich Client (2-tier and 4-tier)**.

3. For each database identified in step 2, identify a network node local to that database to act as the ODS server.
   The **ods** service runs on this system to listen for publication queries from other databases.

4. For each database identified at step 1, identify a network node local to that database to act as the IDSM for that database.
   When other databases request an object published from this database, the **idsm** service is run on this network node to export the object.

5. For each database identified in step 1, obtain the site name and site ID.
   The site ID of the database is generated during installation and cannot be changed. The site name is customizable but by default is based on the site ID. To obtain the site name and site ID, use the administration application named **Organization** in Teamcenter rich client (in the rich client application manager, click **Admin** and then click the **Organization** symbol). Within **Organization**, choose the top-level **Sites** node from the **Organization** tree. The site details for the local database are listed first.

6. Using the information obtained in steps 2 through 5, populate each database site table with information about the other sites using the Organization application in the Teamcenter rich client. The node for each site is the name of the network node to run the necessary Multi-Site Collaboration services (**idsm** and/or **ods**). If the site is an ODS database, check the ODS site flag. To publish objects from the ODS database, define the site of the ODS database in the site table and configure the ODS server as an IDSM server.

7. For each database identified in step 1 and step 2, edit the site preference for the database and modify the following preferences to reflect the Multi-Site Collaboration environment:

   ODS_permitted_sites (ODS database only)
   ODS_site (Non-ODS databases)
   ODS_searchable_sites
   ODS_searchable_sites_excluded
   IDSM_permitted_sites
   IDSM_permitted_users_from_site_*site-name*
   IDSM_permitted_transfer_sites
   IDSM_permitted_transfer_users_from_site_*site-name*
   IDSM_permitted_checkout_sites
   IDSM_permitted_checkout_users_from_site_*site-name*
   Fms_BootStrap_Urls
   TC_publishable_classes
   TC_transfer_area

8. For each database identified in step 1 and step 2, copy all POM transmit schema files for that database into the POM transmit schema directories for each of the other databases.
   This step is required to allow the import of data objects from other databases. Devise a strategy for regularly synchronizing POM transmit schema directories.

9. For each network node identified at step 3 and step 4, run the Teamcenter setup program on that node to configure and start the Multi-Site Collaboration daemons.

Install a proxy server

Configure a proxy server to be used with Multi-Site Collaboration.

Configure heterogeneous operating system environment

If you are adding Windows Teamcenter clients to a Linux Teamcenter environment, you must perform the following tasks:

1. Install Teamcenter and configure the database (Teamcenter application root and data directories) on a Windows system that can serve a common mount point for all Windows clients.
This allows the Windows and non-Windows Teamcenter clients to interoperate, particularly in volume management.

2. Synchronize the following files in the separate Teamcenter data directories:

   - POM schema files (*TC_DATA***pom_schema_server_sid**)
   - POM transmit files (**\pom_transmit*.sch**)
   - Dataset definition files (*TC_DATA***gs_info*.des**)

3. Make sure your Windows and Linux server configurations contain identical sets of Teamcenter features. For example, if you install features or custom templates on a Linux server, you must install the same features and templates on your Windows server.

4. Configure File Management System (FMS) on Linux and Windows volume servers.

Conversely, if you create a Teamcenter database by running the Teamcenter setup program from a Windows workstation, you must install Teamcenter on Linux clients you want to connect to the database.

Back up new installations

Terminate Teamcenter sessions

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:

   From the **Start** menu, choose **Programs**→**Teamcenter**, and open a command prompt.

Replace *version* with the Teamcenter version.

3. Use the **clearlocks** utility to remove locks on the database:

```
%TC_BIN%\clearlocks -u=infodba -p=infodba-password -g=dba
-assert_all_dead
```

4. Stop all Teamcenter services, including FMS.

Back up existing Teamcenter data

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.

Back up Teamcenter databases

Back up your Oracle server and databases:

1. **Export existing Oracle databases.**
2. **Terminate Teamcenter-Oracle sessions.**
3. **Back up the Oracle installation.**

Part IV: Web tier installation

Install the Teamcenter web tier, which manages communication between the Teamcenter clients and the enterprise tier.

8. Install the .NET web tier

.NET web tier installation

The Teamcenter .NET web tier is an alternative to the Teamcenter Java EE web tier for Microsoft Windows systems. The .NET web tier supports four-tier Teamcenter deployments and does not require a Java EE application server.

Before you start

Install required software

Before you begin installing the .NET web tier, make sure you log on using an account with administrative privileges and that you have access to the Teamcenter software kit. Also, make sure your host has the required software and is correctly configured for the Teamcenter .NET web tier.

The Teamcenter .NET web tier requires a supported Microsoft Windows server operating system and also the following Microsoft components:

- Microsoft Internet Information Services (IIS)
- Microsoft .NET Framework

During installation of the .NET web tier, Teamcenter Environment Manager (TEM) verifies that you have the required software and operating system versions.

For information about required versions of these products, see the Hardware and Software Certifications knowledge base article on Support Center.

Configure Microsoft IIS on Windows Server platforms

If you use Microsoft Internet Information Services (IIS) on a Windows Server host, make sure the required role services are installed on your host. You can perform this from a command line *or* by using the Windows Server Manager.

Install role services from a command line

Open a Windows command prompt as an administrator and enter the following command:

```
dism.exe /enable-feature /all /online /featureName:IIS-CommonHttpFeatures
/featureName:IIS-DefaultDocument /featureName:IIS-DirectoryBrowsing /
featureName:IIS-HttpErrors
/featureName:IIS-StaticContent /featureName:IIS-HttpRedirect /
featureName:IIS-HealthAndDiagnostics
/featureName:IIS-HttpLogging /featureName:IIS-LoggingLibraries /
featureName:IIS-RequestMonitor
```

```
/featureName:IIS-HttpTracing /featureName:IIS-Performance /
featureName:IIS-HttpCompressionStatic
/featureName:IIS-HttpCompressionDynamic /featureName:IIS-Security /
featureName:IIS-RequestFiltering
/featureName:IIS-BasicAuthentication /
featureName:IIS-ClientCertificateMappingAuthentication
/featureName:IIS-DigestAuthentication /
featureName:IIS-IISCertificateMappingAuthentication
/featureName:IIS-IPSecurity /featureName:IIS-URLAuthorization /
featureName:IIS-WindowsAuthentication
/featureName:IIS-ApplicationDevelopment /featureName:IIS-NetFxExtensibility45 /
featureName:IIS-ASP
/featureName:IIS-ASPNET45 /featureName:IIS-CGI /featureName:IIS-ISAPIExtensions
/featureName:IIS-ISAPIFilter /featureName:IIS-ServerSideIncludes
/featureName:IIS-WebServerManagementTools /featureName:IIS-ManagementConsole
```

Install role services using Windows Server Manager

Open the Windows Server Manager. Verify the **Web Server (IIS)** role is installed on your host. If this role is not installed, install it according to your operating system documentation.

In the Windows Server Manager, under the **Web Server (IIS)** role, install the following role services:

Common HTTP Features

- **Default Document**
- **Directory Browsing**
- **HTTP Errors**
- **Static Content**
- **HTTP Redirection**

> Caution:
>
> Do *not* install the **WebDav Publishing** role service.

Health and Diagnostics

- **HTTP Logging**
- **Logging Tools**
- **Request Monitor**
- **Tracing**

Performance

- **Static Content Compression**
- **Dynamic Content Compression**

Security

- **Request Filtering**
- **Basic Authentication**
- **Client Certificate Mapping Authentication**
- **Digest Authentication**

IIS Client Certificate Mapping Authentication
IP and Domain Restrictions
URL Authorization
Windows Authentication
Application Development

.NET Extensibility 4.*x*
ASP
ASP.NET 4. *x*
CGI
ISAPI Extensions
ISAPI Filters
Server Side Includes

> Note:
>
> Install only the available **ASP.NET 4.*x*** role services. Do not install ASP.NET 3.*x* role services.

Management Tools

IIS Management Console

Install the .NET web tier

1. Launch Teamcenter Environment Manager (TEM).
   If you **create a new Teamcenter configuration**, launch TEM from the Teamcenter software kit. If you want to add the .NET-based server manager to an existing configuration, **launch TEM in maintenance mode**.

2. Launch Teamcenter Environment Manager. In the Windows start menu, click **Programs→Teamcenter 13**, and then right-click **Environment Manager** and select **Run as administrator**.

   > Note:
   >
   > - This procedure assumes you are adding the .NET web tier to an existing Teamcenter configuration. Alternatively, you can **create a new configuration** and select the **Web Tier for .NET** feature in the **Features** panel.
   > - For a description of any TEM panel, click the help button in the panel.

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

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

5. In the **Old Configuration** panel, select the configuration to which you want to add the .NET web tier.

6. In the **Feature Maintenance** panel, select **Add/Remove Features**.

7. In the **Features** panel, under **Server Enhancements→Teamcenter Web Tier**, select **Web Tier for .NET**.

8. Proceed to the **Multiplexing Proxy** panel. Accept the default values or type new values for the Teamcenter multiplexing proxy (*MUX*).

Value	Description
Port	Specifies the TCP/IP port on which the MUX listens for web tier requests. This is the Jetty server connector port.
TECS Admin Port	Specifies the port used by the Teamcenter Enterprise Communication System (TECS).

> Note:
>
> The MUX listens on a single port for incoming requests from the .NET web tier, forwarding those requests to an appropriate Teamcenter server using operating system named-pipe communication protocol, and then streaming the response back to web tier. The MUX runs as an application within the Teamcenter Enterprise Communication System (TECS). The TECS container is based on the Teamcenter client communication system (TCCS) container used in the client tier.

9. In the **Server Manager Performance Tuning** panel, accept the default performance tuning values or optionally enter your own preferred values.

10. In the **TcServer Character Encoding Settings** panel, make sure the values reflect the character set you use for Teamcenter. If you are not sure, accept the default settings.

11. Proceed to the **.NET Web Tier** panel. Type values for the following required parameters:

Parameter	Description
Web Tier Language	Specifies the same locale that is specified for Teamcenter server. This locale is used for localization of messages coming from web tier. The default web tier language is **English**.
Server Manager Peers	Specifies server manager peer hosts for the .NET web tier. Enter one or more hosts using the **Add** button and entering host and port numbers for each.

Parameter	Description
	At least one server manager must be configured for a working deployment. The port number each server manager peer must match the port you specify during the corresponding server manager installation.

The remaining parameters in the **.NET Web Tier** panel are optional. Enter values for these parameters as needed.

> Note:
>
> TEM examines settings in your Microsoft Internet Information Services (IIS). If any required settings or roles are missing, you must correct them in IIS before you continue.

12. In the **Internet Information Services (IIS) Settings** panel, accept the default settings, or specify IIS settings for the .NET web tier:

Parameter	Description
Use Existing Web Site	Specifies whether to use an existing web site. If you select this option, select the web site you want to use from the list. The IIS virtual directory for .NET web tier deployment is created in the selected web site and the application is hosted on that web Site. Alternatively, you can select **Create New Web Site**, and then type a name, port, and root path for the new web site.
Use Existing Application Pool	Specifies whether to use an existing application pool from the list provided. An application pool is a set of one or more applications assigned to an IIS worker process. The Teamcenter .NET web tier is an ASP.NET application, so the application pool that hosts it can only host applications based on the same version of ASP.NET. Keep this in mind if you have this application pool host other applications. If possible, use a dedicated (stand-alone) application pool for Teamcenter web Tier deployment. The default value is **Use Existing Application Pool**. Alternatively, you can create a new application pool.
Virtual Directory Name	Specifies the IIS virtual directory name for Teamcenter .NET web tier deployment. The default value is **tc**. Web URLs for Teamcenter four-tier deployments are based on this value. For example, if you specify the default value as **tc**, the URLs are of the form: **http://***host***:***port***/tc**.

For more information about these values, click the help button  .

13. In the **Confirmation** panel, click **Start** to begin installing the .NET web tier.

14. When installation completes, exit TEM.

Start the web client

After you install the server manager and the .NET web tier, complete the .NET web tier installation:

- Launch the Teamcenter Management Console.
- Install Teamcenter clients.

9. Java EE web tier installation

Overview of Java EE web tier installation

Installing the Teamcenter Java EE web tier consists of the following general steps:

1. **Install required software for the Java EE web tier**.
2. **Install the Web Application Manager,** a tool that builds Teamcenter web applications.
3. **Build the Teamcenter web tier application**.
4. Deploy the web application on a supported Java EE application server.

Install required software for the Java EE web tier

Before you install the Java EE web tier, install the following software:

- **Teamcenter server** with the **Java EE server manager**.
- A supported third-party Java EE application server and the Java Runtime Environment (JRE) on the web tier host.[1]
- If you use Security Services, install Security Services.

Install the Web Application Manager

1. Create a home directory for the Teamcenter web tier, for example, **c:\tcweb**. This directory is referenced as *WEB_ROOT*.
2. In the Teamcenter software kit, browse to the **Web_tier** directory and double-click the **INSTALL_TCWEB.EXE** program icon.
   7-Zip displays a self-extractor dialog box.
3. In the **Unzip To Folder** box, type the path to *WEB_ROOT*, and then click **Unzip**.
   After 7-Zip extracts the installation files, click **Close** to close the 7-Zip self-extractor dialog box.
4. To launch the Web Application Manager, browse to the *WEB_ROOT* directory and double-click the **insweb.bat** program icon.

1 For information about supported application servers and Java versions, see the Hardware and Software Certifications knowledge base article on Support Center.

Build Java EE web applications

Build the Teamcenter web tier application

The Teamcenter web tier application connects Teamcenter clients to the corporate server in a four-tier architecture.

1. Launch the Web Application Manager (**insweb.bat**).

2. Copy ICD files from the Teamcenter software kit. This populates the list of solutions available to install.

   a. Click **Copy ICDs**. In the **Copy ICD Files** dialog box, click **Browse**.

   b. Browse to the **Web_tier** directory in the root directory of the Teamcenter 13 software kit and select the **icd** directory, and then click **Open**.

   c. In the **Copy ICD Files** dialog box, click **OK** to load ICD files.

3. Click **Add** to begin creating a web application.
   Web Application Manager displays the **Add Web Application** dialog box.

4. Create the Teamcenter Web Tier web application:

   a. In the **Name** box, type a name for the application, for example, **Teamcenter Web Tier**.

   b. In the **Staging Location** box, enter a path where you want to place the web application files. Typically, this is a directory under the *WEB_ROOT* directory. Web Application Manager creates the directory if it does not exist.

   c. Optionally, in the **Description** box, type a description of the application.

   d. Enter software locations:

      A. Click **Add**, next to the **Disk Locations for Install Images** box.

      B. In the **Add Disk Location** dialog box, enter the path to the **Web_tier** directory on the Teamcenter 13 software kit:

         *path***Web_tier**

> Note:
>
> To modify or remove a location in the **Disk Locations for Install Images** list, click **Modify** or **Remove**.

> Note:
>
> Do not change the default solution type (**Web tier**) shown in the **Solution Type** box.

5. Select the solutions to include in the Teamcenter web tier web application:

   a. Click **Solutions**.

   b. In the **Select Solutions** dialog box, select the required solutions:

      Teamcenter – Web Tier Infrastructure

      Teamcenter – Web Tier Core Applications

   c. If you use the Teamcenter service-oriented architecture (SOA), select the **Teamcenter Services WSDL/SOAP Support** solution.
   The Teamcenter SOA architecture provides the ability to develop task-specific clients, utilities, and system integrations for the Teamcenter server. The SOA architecture also ships with WS-I compliant WSDL files for all operations, supporting open industry standards.

6. If you require the deployable file for the web application to be a distributable file, click **Advanced Web Application Options** and select the **Distributable** option.

> Note:
>
> A distributable file is required only if you deploy the web tier application in a cluster configuration.

7. Click **OK**.
   The Web Application Manager displays the **Modify Required Context Parameters** dialog box.

8. Enter or verify values for the following required context parameters. Default values are acceptable for most parameters

   Local Service Port (when using TCP communication protocol)

   Connection Timeout

   Server_Manager_URIs

   Enterprise Application Lookup ID

   Deployable File Name

   IS_SSO_ENABLED

LogVolumeName	**SSO_APPLICATION_ID**
LogVolumeLocation	**SSO_LOGIN_SERVICE_URL**
Enterprise Application Registration ID	**SSO_SERVICE_URL**
Max_Capacity	**TcLocale**

To set a context parameter, double-click the **Value** box for the given parameter and enter the new value. To view a description of any context parameter, click the parameter name in the **Modify Required Context Parameters** dialog box.

> Note:
>
> If your network uses IPv6 (128-bit) addresses, use the hostname in URIs and do not use the literal addresses, so the domain name system (DNS) can determine which IP address should be used.

9. Click **OK** to begin building the web application.
When the application is complete, click **OK** to close the **Progress** dialog box.

10. Click **Exit** to exit the Web Application Manager.

11. Locate the deployable file (**tc.war**) generated during installation. This file is in the **deployment** directory under the staging location you specified.

12. Deploy the web application on a supported application server.[2]

Deploying on an IPv6 network

If your network includes client hosts running on an IPv6 network, the Java EE web tier must be deployed in an application server that supports an IPv6 URL as an external endpoint and uses IPv4 addresses to support all communication with the Teamcenter enterprise tier, such as communication with the Java EE server manager.

A typical environment for the Java EE web tier is a dual-stack machine that supports both IPv4 and IPv6 addresses in which the application server accepts HTTP requests from either IPv4 or IPv6.

Teamcenter enterprise tier server components that communicate with other server components in the same network are assumed to be on an IPv4 network and are not supported on IPv6. Teamcenter IPv6 support is limited to clients or integrations that use Teamcenter client communication system (TCCS) and Teamcenter components that communicate with clients on IPv6-enabled networks.

2 *Web Application Deployment* provides Teamcenter web tier deployment procedures for several supported application servers.

Sharing an application server instance for multiple four-tier environments

Teamcenter supports deploying more than one instance of the same Teamcenter web tier application (WAR file) into one application server instance. Multiple WAR files can be configured to run as discrete applications, each with a unique entry point. This allows you to connect each application to a different enterprise tier without the need to manage multiple application server instances. The following example shows a possible scenario with three web applications (WAR files) deployed in a single application server instance.

Client tier		Web tier		Enterprise tier		Resource tier
Clients		Single application server instance		Server managers		Databases
Client A	← →	**http://***host***:***port***/tc01**	← →	**svrmgr11**	← →	**DB1**
Client B	← →	**http://***host***:***port***/tc02**	← →	**svrmgr2**	← →	**DB2**
	← →	**http://***host***:***port***/tc03**	← →	**svrmgr3**	← →	**DB3**

To deploy multiple web applications in a single web application server instance, perform the following tasks:

1. **Install multiple server managers** with unique server manager cluster configuration settings.

2. **Create web applications**. Assign each application a unique name.

3. Set the following web tier context parameters to *unique* values for each web application.

Context parameter	Description
DEPLOYABLE-FILE-NAME	Name of the deployable file you are creating for the web tier application.
Enterprise Application Registration ID	Identifier for the web application. If you want to deploy multiple Teamcenter web tier applications in a single application server instance, each application must be assigned a unique ID.
Enterprise Application Lookup ID	Specifies the ID by which the Teamcenter presentation tier accesses the application identified by the **Enterprise Application Registration ID** parameter. If you deploy your WAR file with other WAR files in the same

Context parameter	Description
	application server instance, these two IDs should be set to the same value for a given application.
Server_Manager_URIs	The server manager URI(s) for the appropriate server manager.

4. Deploy web application WAR files in the web application server instance.

> Note:
>
> Multiple WAR file deployment is not supported on JBoss. If you use JBoss as your web application server, you must deploy each WAR file in a separate application server instance.

Part V: Adding features

You add features to Teamcenter configurations using Teamcenter Environment Manager and the Web Application Manager. Some features require additional steps to install or configure. See the appropriate topics for the features you want to install.

10. Installing the server manager

Install the server manager

1. Launch Teamcenter Environment Manager (TEM).
   If you **create a new Teamcenter configuration**, then launch TEM from the Teamcenter software kit. If you want to add the server manager to an existing configuration, then **launch TEM in maintenance mode**.

2. Proceed to the **Features** panel. Under **Server Enhancements**, select **Server Manager**.

3. Proceed to the **Multiplexing Proxy (MUX)** panel and specify values for the Teamcenter multiplexing proxy (*MUX*).

Value	Description
Port	Specifies the TCP/IP port on which the MUX listens for web tier requests. This is the Jetty server connector port.
TECS Admin Port	Specifies the port used by the Teamcenter Enterprise Communication System (TECS).

> Note:
>
> The MUX listens on a single port for incoming requests from the web tier, forwards those requests to an appropriate Teamcenter server using operating system named-pipe communication protocol, and then streams the response back to web tier. The MUX runs as an application within the Teamcenter Enterprise Communication System (TECS). The TECS container is based on the Teamcenter client communication system (TCCS) container used in the client tier.

4. Proceed to the **Communication Configuration** panel and enter the required values.

Parameter	Description
Pool ID	Type a name for the server pool.
JMX RMI Port	Type a port for the server pool.
Assignment Service Port	Type a port number for the Server Manager Assignment Service. The Server Manager Assignment Service is a service used by the Java EE web tier for business logic server assignment requests to the server

Parameter	Description
	manager. The assignment request is a **POST HTTP** request in which the input and output parameters are transmitted as XML payload.
Server Host	Type the logical host name of the server manager host. This value allows you to control which IP address is used when connecting to Teamcenter servers.
Startup Mode	Select one of the following: • **Service/Daemon** Specifies that you want to run the server manager as a Windows service. This is the default mode. • **Command Line** Specifies you want to run the server manager manually from a command line.

5. Proceed to the **Server Manager Cluster Configuration** panel and enter remaining values as needed. For more information about fields in this panel, click the help button  .

6. Proceed through remaining panels to the **Confirmation** panel. Click **Start** to begin installing the Teamcenter server with the server manager.

7. When installation completes, exit TEM.

8. After you install the server manager, install the Teamcenter Management Console using the appropriate steps for the Windows platform.

> Note:
>
> If you experience connection delays during server manager startup, then see the **available troubleshooting solutions**.

Java EE configuration files

You can install multiple server manager services on the same host. Each server manager service has its own configuration directory:

*TC_ROOT***pool_manager\confs***config-name*

where *config-name* is the name of the server manager.

The server manager configuration directory contains configuration files, log files, and server manager scripts. These include the following.

File/Directory	Description
mgrstart	Script that launches the server manager in console mode.
mgrstop	Script that stops the server manager when started from a command line. If you run the server manager as a Windows service, stop the service using the Windows services manager. Note: You can also stop the server manager using the Teamcenter Management Console.
mgr.output	If you run the server manager as a Windows service, this file contains all output from the server manager. This file is *not* used if you run the server manager from the command line.
logs	Directory that contains all server manager log files.

If you run the server manager as a Windows service, then the starts automatically.

11. Install the Business Modeler IDE

Choose a Business Modeler IDE installation type

Several types of Business Modeler IDE installation are possible. All BMIDE installation types can be used to create, import, and modify a template project, and can generate a template package which can be deployed using TEM or Deployment Center.

An important difference among the installation types is whether and how the BMIDE connects to a Teamcenter site. A Teamcenter site connection is necessary for some tasks:

Perform data exchanges, such as:

- Synchronize the data model in a BMIDE template project with the Teamcenter server database.
- Live update non-schema data, such as lists of values (LOVs), from the BMIDE to a production server without shutting down the production server.
- Live deploy a template to a test Teamcenter server.
- Incorporate live update changes made to the production environment into a BMIDE standard template project.

Create certain data model elements, such as:

- Business object display rule
- Dynamic list of values
- Business context rule
- Item revision definition configuration (IRDC)
- System stamp configuration
- subtype of AppInterface, and many others

Use the following general procedure for choosing a Business Modeler IDE installation type.

1. Ensure that the machine meets prerequisites for a BMIDE.

   > Caution:
   >
   > Do not install BMIDE on a production environment corporate server. Doing so could have unintended consequences, especially during Teamcenter upgrade.

2. Choose the BMIDE installation type that you want to perform.

   - Add BMIDE functionality into your existing Eclipse environment. This consists of manually patching your Eclipse environment with BMIDE jar files.
     Advantage: Exists within your custom Eclipse environment.
     Limitation: Cannot perform actions that require connection to a Teamcenter site.

   - One of three types of BMIDE stand-alone application:

Stand-alone type	Teamcenter connection type	Advantage	Limitation
2-tier	2-tier environment via IIOP server.	Allows live deployments even while a web tier is inactive or down for maintenance.	Requires local network access.
4-tier	4-tier environment via HTTP server.	Allows remote access and live deployments.	Requires an active web tier.
Standalone	None	No requirement for or possibility of unintentional interaction with any Teamcenter site.	Cannot perform actions that require connection to a Teamcenter site.

Install the Business Modeler IDE

1. Ensure that the proper version of JRE is installed and the **JRE_HOME** environment variable (32-bit system) or the **JRE64_HOME** environment variable (64-bit system) is set.

2. Start Teamcenter Environment Manager (TEM). For example, from the Teamcenter software kit, run **TEM.bat** (Windows) or **TEM.sh** (Linux).

3. Proceed to the **Solutions** panel. In the **Solutions** panel, select **Business Modeler IDE**, and then click **Next**.

   Caution:

   Do not install the Business Modeler IDE on a production environment corporate server. Doing so could have unintended consequences, especially during Teamcenter upgrade.

4. Perform the following steps in the **Features** panel:

   a. Under **Base Install**, select one of the following:

   - **Business Modeler IDE 2-tier**
     Connects to a Teamcenter site in a two-tier environment via IIOP server.
   - **Business Modeler IDE 4-tier**
     Connects to a Teamcenter site in a four-tier environment via HTTP server.
   - **Business Modeler IDE Standalone**
     Does not connect to a Teamcenter site.

When you select one of these options, a server connection profile is added in the Business Modeler IDE.

b. (Optional) Select **Extensions→Platform Extensibility→Global Services→Mapping Designer**.
This installs the Mapping Designer data model mapping tool into the Business Modeler IDE.

c. (Optional) Select **Extensions→Mechatronics Process Management→EDA for Business Modeler IDE**.
This installs the EDA Derived Data configuration tool into the Business Modeler IDE. This tool is used to configure Teamcenter EDA, an application that integrates Teamcenter with electronic CAD (E-CAD) design applications, such as Cadence and Mentor Graphics.
If you install this option, you must ensure that the **Extensions→Mechatronics Process Management→EDA Server Support** option is also installed to the server.
In addition, later in the installation process when you select templates to install to the Business Modeler IDE, you must select the **EDA Server Support** template (**edaserver_template.xml**).

d. In the **Installation Directory** box, enter the location where you want to install the Business Modeler IDE. The Business Modeler IDE files are installed to a **bmide** subdirectory.

e. Click **Next**.

5. In the **Java Development Kit** dialog box, click the browse button to locate the JDK installed on your system. The kit is used for creating services. Click **Next**.

6. Depending on whether you selected Business Modeler IDE two-tier or four-tier installation, perform the following steps:

- If you selected the **Business Modeler IDE 2-tier** option, perform the following steps in the **2-tier server settings** panel:

  a. In the **Connection Port** box, type the server port number. The default is **1572**.

  b. Click the **Edit** button to the right of the **2-tier Servers** box to change the server connection profile settings, or click the **Add** button to add another server to connect to.

  c. Click the **Advanced** button.

     A. Click the arrow in the **Activation Mode** box to select the mode to use when connecting to the server. The default is **NORMAL**.
     If you want to allow multiple concurrent user sessions to the two-tier rich client, select **PER_CLIENT**.

     B. Click the ellipse button to the right of the **Configuration Directory** box to select the folder where you want this configuration saved. The default is *TC_ROOT***iiopservers**.

C. Click **OK**.

d. Click **Next**.

- If you selected the **Business Modeler IDE 4-tier** option, perform the following steps in the **4-tier server configurations** panel.

  a. Leave the **Compress (gzip) the responses from the Web application servers** check box selected if you want faster connection performance from the server.

  b. Click the **Add** button to the right of the **4-tier Servers** table if you want to add another server to connect to.

  c. Click **Next**.

- If you have previously installed Teamcenter client communication system (TCCS) on your system, and you also selected the **Business Modeler IDE 4-tier** option, the **TcCS Settings** panel appears. This panel is used to configure TCCS for use with the Business Modeler IDE. TCCS is used when you need secure Teamcenter communications through a firewall using a forward proxy.

  Note:

  If you want to use TCCS, you must install it first. To install TCCS, run the *installation-source* **\additional_applications\tccs_install\tccsinst.exe** file. To change the TCCS setup later, run the *tccs-installation-location***\tccs_Teamcenter Communication Service_installation \Change Teamcenter Communication Service Installation** file.

  - If you do not want to use TCCS, ensure that the **Use TcCS Environments for 4-tier clients** check box is cleared and click **Next**.
    If this check box is cleared, the **4-tier server configurations** panel is displayed after you are finished with the current panel.

  - If you want to use TCCS, perform the following steps:

    a. Select **Do not use proxy** if you do not want to use a forward or reverse proxy.

    b. Select **Use web browser settings** to automatically use proxy settings already configured in a web browser.

    c. Select **Detect setting from network** to automatically use proxy settings from the network.

    d. Select **Retrieve settings from URL** and type a valid proxy URL to use a proxy autoconfiguration file.

    e. Select **Configure settings manually** to type valid host and port values for proxy servers.

f. Select the **Use TcCS Environments for 4-tier clients** check box if you want to use TCCS, or clear it if you do not. (This check box is automatically selected if TCCS is installed.)

g. If the **Use TcCS Environments for 4-tier clients** check box is selected, you can use the **Client Filter Text** box to specify a filter text on the available TCCS environments to avoid displaying undesired environments in the rich client logon window. This box is optional and can hold any string.

h. Click **Next**.

7. Perform the following steps in the **Business Modeler IDE Client** panel:

a. Click the **Add** button to the right of the table to select the templates to install. *Templates* contain the data model for Teamcenter solutions. The **Teamcenter Foundation** template is installed by default. The Foundation template contains the data model used for core Teamcenter functions. All customer templates must extend the Foundation template. Select the same templates that were installed on the server so that you can see the same data model definitions in the Business Modeler IDE that were installed on the server.

> Tip:
>
> Make sure that you select the same templates that are on the server. To find the templates installed on the server, look in the *TC_DATA***model** directory on the server.

If you installed the **EDA** option to the Business Modeler IDE, select the **EDA Server Support** template (**edaserver_template.xml**).

b. If you have any templates of your own to install or a template from a third-party, click the **Browse** button and browse to the directory where the templates are located.

c. Click **Next**.

8. Complete the remaining panels to finish the installation in Teamcenter Environment Manager. When the installation is complete, exit Teamcenter Environment Manager.

9. Verify the installed files in the *install-location***bmide** directory.
The following data model files are placed into the *install-location***bmide\templates** folder:

- **icons***template-name*_icons.zip**
  Contains the icons used by that template.

- **lang***template-name*_template_***language_locale***.xml**
  Contains the text that is displayed in the Business Modeler IDE user interface for all languages.

- *template-name*_**dependency.xml**
  Lists the other templates that this template is built on top of, for example, the Foundation template.

- *template-name*_**template.xml**
  Contains the data model for this template, including business objects, classes, properties, attributes, lists of values (LOVs), and so on.

- **master.xml**
  Lists the template XML files included in the data model, for example, the **foundation_template.xml** file.

10. Allocate memory so that Business Modeler IDE has enough memory to run.

Add the Business Modeler IDE to an existing Eclipse SDK environment

If you already have an existing Eclipse SDK environment with the version of Eclipse that is certified for your Teamcenter platform, and Business Modeler IDE plugins have never been installed into the environment, then you can install the Business Modeler IDE plugins into your existing Eclipse environment.

> Caution:
>
> If your Eclipse environment contains Business Modeler IDE plugins installed from an earlier version of Business Modeler IDE, then installing a later version of Business Modeler IDE plugins into the same environment results in version incompatibilities and is not supported.

1. Ensure that your Eclipse SDK environment uses the Eclipse version that is certified for your Teamcenter platform.
   For information about system hardware and software requirements, see the Hardware and Software Certifications knowledge base article on Support Center.
   To check your Eclipse version, start Eclipse and select **Help**>**About Eclipse SDK**.

2. In the Teamcenter software kit for your Teamcenter platform, go to the following directory:

   additional_applications\bmide_plugins

   In that directory, find the file **bmide_plugins.zip**.
   This archive contains the Business Modeler IDE plug-ins within an internal **eclipse\plugins** directory.

3. Extract the contents of the **eclipse\plugins** directory within **bmide_plugins.zip** to your *ECLIPSE_HOME***eclipse\plugins** directory.

4. In the Teamcenter software kit for the major release for your Teamcenter platform, go to the following directory:

   bmide\compressed_files

   In that directory, find the file **bmide.zip**.

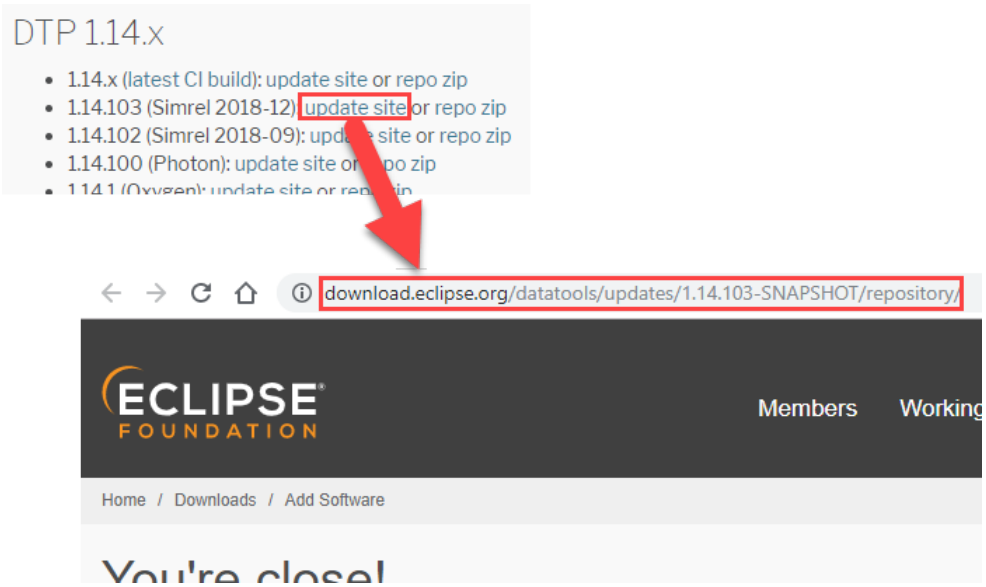
5. Extract the **bmide.zip** content to some temporary local directory (for example C:\bmide).

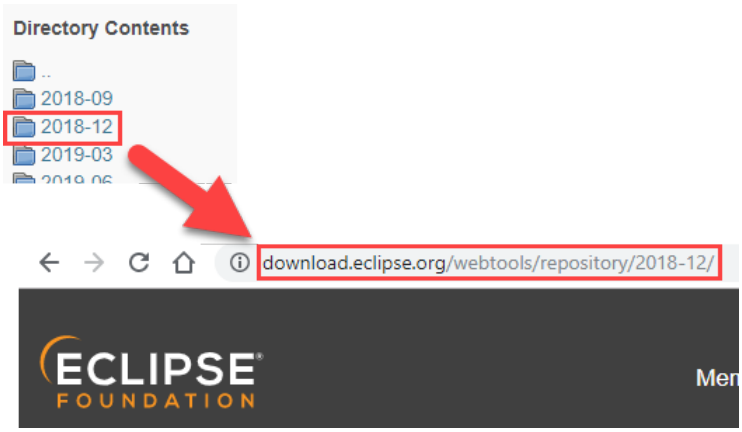
6. From the **plugins** directory within this local directory (C:\bmide), copy the following directories and their contents to your *ECLIPSE_HOME***eclipse\plugins** directory.

   - antlr
   - commons_lang
   - commons_xmlschema
   - httpclient_*version*
   - org.apache.poi.39

7. Create a list of software repository site URLs for the following plugins. Use the Eclipse site to identify the proper URLs. The examples shown are for Eclipse SDK version 2018-12 (4.1.10.0). You will use this list in step 9.

For this plugin	Do this
CDT	Browse to **https://www.eclipse.org/cdt/downloads.php** and find the URL for the CDT software repository for your Eclipse version. The URL looks similar to this: **https://download.eclipse.org/tools/cdt/releases/9.6** Record the URL in your list of plugin software repository sites. 
DTP	Browse to **https://www.eclipse.org/datatools/downloads.php** and find the DTP row for your Eclipse version. Click the **update site** link. The URL of the page that opens looks similar to this: **https://download.eclipse.org/datatools/updates/1.14.103-SNAPSHOT/repository/** Record the URL in your list of plugin software repository sites.

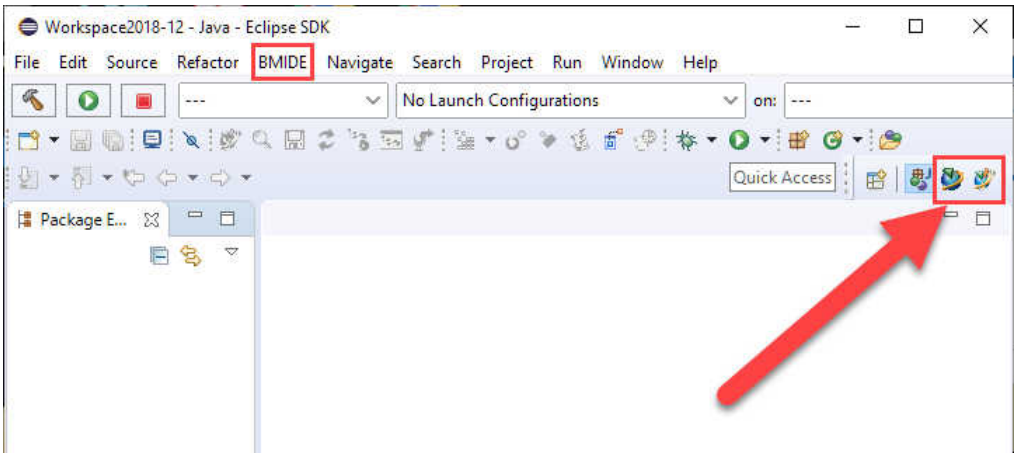
For this plugin	Do this
	
EMF	Add **http://download.eclipse.org/modeling/emf/updates/releases/** to your list of plugin software repository sites. Note: For details about the requirement for Eclipse version and software repository URL for **EMF**, browse to **https://www.eclipse.org/modeling/emf/updates/**
GEF	Add **http://download.eclipse.org/tools/gef/updates/releases** to your list of plugin software repository sites. Note: For details about the requirement for Eclipse version and software repository URL for **GEF**, browse to **https://projects.eclipse.org/projects/tools.gef**
WTP	Browse to **https://download.eclipse.org/webtools/repository/** and then find the directory for your Eclipse version. Click the directory link. The URL for the resulting page looks similar to this: **https://download.eclipse.org/webtools/repository/2018-12/** Record the URL in your list of plugin software repository sites.

For this plugin	Do this
	

8. Launch Eclipse.

9. From the top menu bar, choose **Help→Install New Software**. Use the Eclipse software installation feature to add the CDT, DTP, GEF, EMF and WTP plugin software update sites and install all of the plugins. Refer to the list of plugin software update URLs you created in step 7.

After all the plugins are installed and you have restarted Eclipse, a **BMIDE** item appears on the top menu bar. Command buttons to open the BMIDE **Advanced** and **Standard** perspectives appear on the toolbar.



Allocate memory to the Business Modeler IDE

Allocate memory to the Business Modeler IDE so that it has enough to launch and run.

Note:

If you perform live updates, you must have a minimum of 2 GB of RAM on the system running the Business Modeler IDE to allow for other processes.

You can allocate memory in the following ways:

- **BusinessModelerIDE.ini** file
  To increase the memory allocated to the Business Modeler IDE, open the *install-location***bmide\client\BusinessModelerIDE.ini** file and change the **-Xmx1024M** value to a higher number to allocate maximum Java heap size. For example, if you have 2 GB available to dedicate for this purpose, set the value to **-Xmx2048M**. Do this only if your machine has the available memory.
  The **Xms** value in this file sets the initial Java heap size, and the **Xmx** value sets the maximum Java heap size.

- **BMIDE_SCRIPT_ARGS** environment variable
  To allocate the memory required by scripts during installation, update, or load of templates with large data models, create a **BMIDE_SCRIPT_ARGS** environment variable. Set the **BMIDE_SCRIPT_ARGS** variable to **-Xmx1024M** to allocate 1 GB of RAM to the Business Modeler IDE scripts. If your system has more memory that you can allocate to the Business Modeler IDE, you can set the value higher.

Caution:

Java standards require that no more than 25 percent of total RAM be allocated to virtual memory. If the amount allocated to the Business Modeler IDE is higher than 25 percent of total RAM, then memory disk swapping occurs, with possible performance degradation.

If you set the **Xmx** value to a higher value than the RAM your system has, you may get the following error when you launch the Business Modeler IDE:

```
Could not create the Java virtual machine.
```

Set the **Xmx** value to a setting that your system supports, in both the **BMIDE_SCRIPT_ARGS** environment variable and the **BusinessModelerIDE.ini** file.

Note:

If you are running the Business Modeler IDE in an Eclipse environment, run the following command to increase virtual memory to 2 GB:

```
eclipse.exe -vmargs -Xmx2048M
```

Start the Business Modeler IDE

> Note:
>
> You must have a minimum of 2 GB of RAM on the system running the Business Modeler IDE to allow for other processes.

1. You start a Business Modeler IDE in one of several ways, depending on how it is installed:

Installation type	Platform	Procedure to start Business Modeler IDE
Stand-alone Note: To ensure that you have enough memory to run the Business Modeler IDE, **allocate memory** in the **BusinessModelerIDE.ini** file and in a **BMIDE_SCRIPT_ARGS** environment variable.	Windows	Click the **Start** button and choose **All Programs→Teamcenter** [*version*] **→Business Modeler IDE**. This runs the **bmide.bat** file.
	Linux	Run the **bmide.sh** file in the *install-location*/**bmide/client** directory.
Eclipse environment to which BMIDE plug-ins have been added Note: To ensure that you have enough memory to run Eclipse, run the command with a virtual memory argument. In the examples, the argument increases virtual memory to 2 GB.	Windows	Navigate to the directory where Eclipse is installed and execute the **Eclipse.exe** command. `Eclipse.exe -vmargs -Xmx2024M`
	Linux	Navigate to the directory where Eclipse is installed and execute the **Eclipse** command. `Eclipse -vmargs -Xmx2024M`

2. When you start a Business Modeler IDE for first time, the **Welcome** window is displayed. Click one of the buttons in the **Welcome** window to learn more about the Business Modeler IDE:

   - The **Overview** button provides links to online help topics.
   - The **Tutorials** button provides links to tutorials.

3. To work in the IDE, click the **Workbench** button in the right side of the **Welcome** window. The **Workbench** is the main window in Eclipse. The **Workbench** window shows one or more perspectives. A *perspective* is an arrangement of views (such as the Navigator) and editors. At the

top of the **Workbench** is a toolbar that allows you to open new perspectives and move between ones already open. The name of the active perspective is shown in the title of the window.

> Note:
>
> You can access the **Welcome** window again later by choosing **Help→Welcome** from the Business Modeler IDE.

4. Examine the **BMIDE** view in the **Standard** perspective. This view provides a centralized location for favorites, data model elements, and project files.

> Note:
>
> If a perspective fails to open, it could be that not enough memory is being allocated to the Business Modeler IDE.

12. Installing a custom solution or third-party template

Installing a custom solution or third-party template

Use TEM to install custom templates you package using the Business Modeler IDE.

Install a template using TEM

After you package extensions, install the resulting template to a production environment using Teamcenter Environment Manager. You can also use this procedure to install a third-party template.

You could also install a template using Deployment Center, or the **tem** command line utility with its –`install` argument.

1. Ensure that you have a good back up of the Teamcenter environment.

2. Copy the template files from the **packaging** directory on your Business Modeler IDE client to a directory that is accessible by the server.
   By default, packaged template files are located in the Business Modeler IDE workspace directory in the folder under the project.
   On Linux, users must have permissions to the workspace directory.

3. Start Teamcenter Environment Manager (TEM).

4. In the **Maintenance** panel, choose **Configuration Manager** and click **Next**.

5. In the **Configuration Maintenance** panel, choose **Perform maintenance on an existing configuration** and click **Next**.

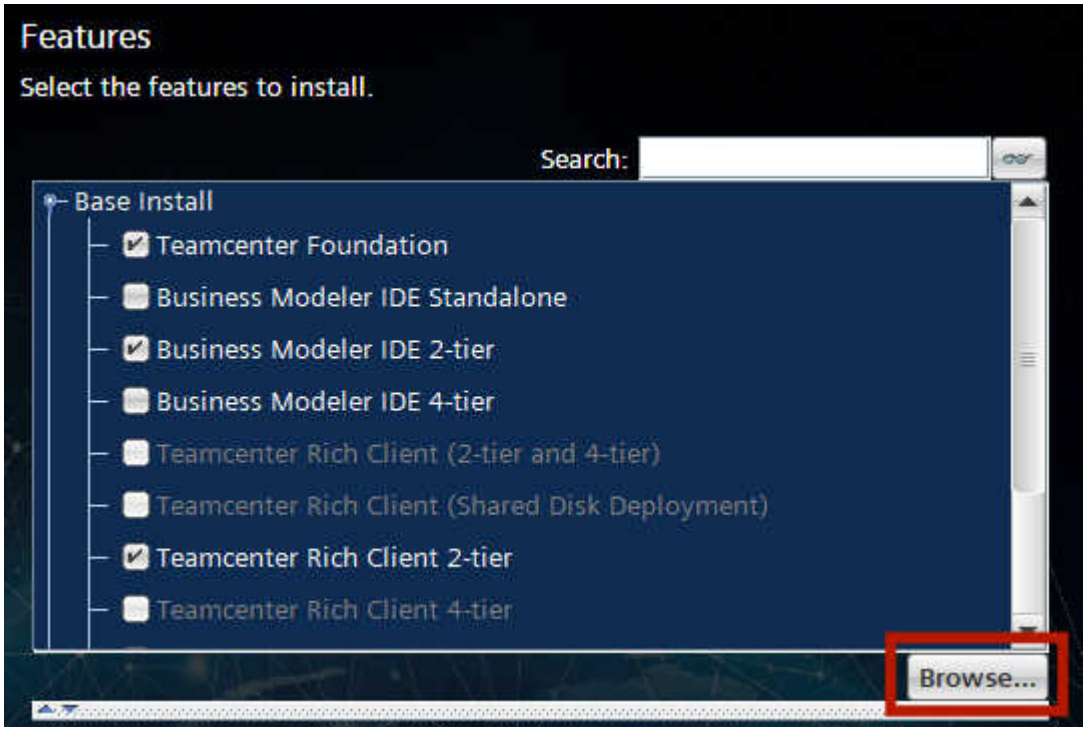
6. In the **Configuration** pane, select the configuration from which the corporate server was installed. Click **Next**.

7. In the **Feature Maintenance** panel, under the **Teamcenter** section, select **Add/Remove Features**. Click **Next**.

   > Note:
   >
   > If you already installed a template to the database and want to update the template, under the **Teamcenter Foundation** section, select **Update the database**. This option should not be used to install a new template but only to update an already installed template.

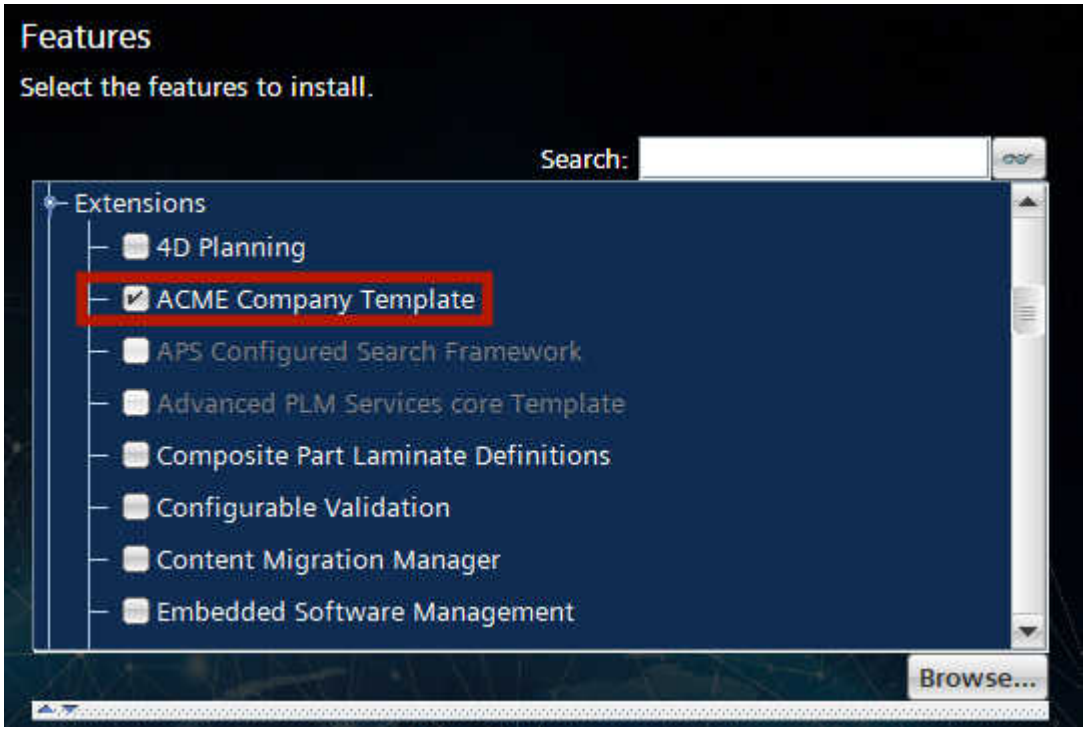
Use the **Add/Update templates for working within the Business Modeler IDE client** option under **Business Modeler Templates** only if you want to add a dependent template to your Business Modeler IDE.

8. In the **Features** panel, click the **Browse** button beneath the features list on the right side of the panel.



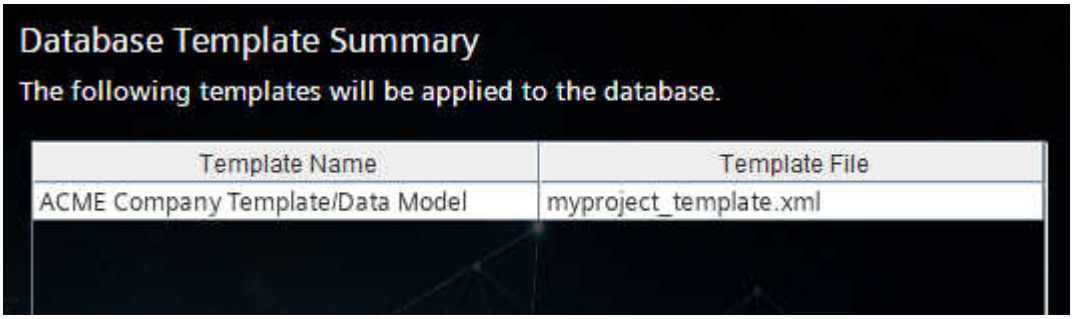
9. Browse to the directory where you have copied the template files. In the **Files of type** box, ensure that **Feature Files** is selected so that you see only the installable template (feature) file. Select your template's feature file (**feature_***template-name***.xml** in the **tem_contributions** directory) and click the **Select** button.
The template appears as a new feature under **Extensions** in the **Features** panel.
You can change the location of the feature in the **Features** panel and add a new group to place the feature under.

10. Select the new template in the **Features** panel. Click **Next**.



11. In the **Teamcenter Administrative User** panel, enter your user name and password to log on to the server. Click **Next**.

12. The **Database Template Summary** panel displays the list of templates that are installed as part of your template install. Click **Next**.



13. In the **Confirmation** panel, click **Start**. The new template is installed.

> Note:
>
> If the installation fails because of invalid data model, perform the following steps:
>
> a. Fix the incorrect data model and repackage the template.

b. Locate the *template-name*_**template.zip** in your project's **packaging** directory and unzip it to a temporary location. Copy the following files to the server in the *TC_ROOT*/**install/***template-name* folder:

*template-name*_**template.xml**
*template-name*_**dependency.xml**
*template-name*_**tcbaseline.xml** (if the file exists)

c. Launch Teamcenter Environment Manager in the maintenance mode and continue with recovery.

14. To verify the installation of the new template, confirm that the *TC_DATA* directory on the Teamcenter server contains the new template files.
Also log on to the server and confirm that you can create instances of your new data model.

Note:

To have libraries read on the user system, the **TC_LIBRARY** environment variable must be set to the platform-specific shared library path. This environment variable is set to **LD_LIBRARY_PATH** on Linux systems. The platform is detected when the Teamcenter session is initiated.

Update a template using TEM

If you already installed a template as a new feature and want to update it because you have added more data model definitions to it, perform the following steps in the Teamcenter Environment Manager (TEM).

Note:

You can also update a template using the **tem** command line utility, for example.

```
tem -update -full -templates=template-name-1,template-name-2 -path=location-of-template-files
-pass=password
```

1. Ensure that you have a good back up of the Teamcenter environment.

2. Copy the packaged template files from the **packaging** directory on your Business Modeler IDE client to a directory that is accessible by the server.
By default, packaged template files are located in the Business Modeler IDE workspace directory in the folder under the project. .

3. Start Teamcenter Environment Manager (TEM).

4. In the **Maintenance** panel, choose **Configuration Manager** and click **Next**.

5. In the **Configuration Maintenance** panel, choose **Perform maintenance on an existing configuration** and click **Next**.

6. The **Configuration** panel displays the installed configuration. Click **Next**.

7. In the **Feature Maintenance** panel, under the **Teamcenter Foundation** section, select **Update Database (Full Model - System Downtime Required)**. Click **Next**.

> Note:
>
> Use the **Add/Update Templates for working with the Business Modeler IDE Client** option under **Business Modeler** only if you want to add or update a dependent template to your Business Modeler IDE.

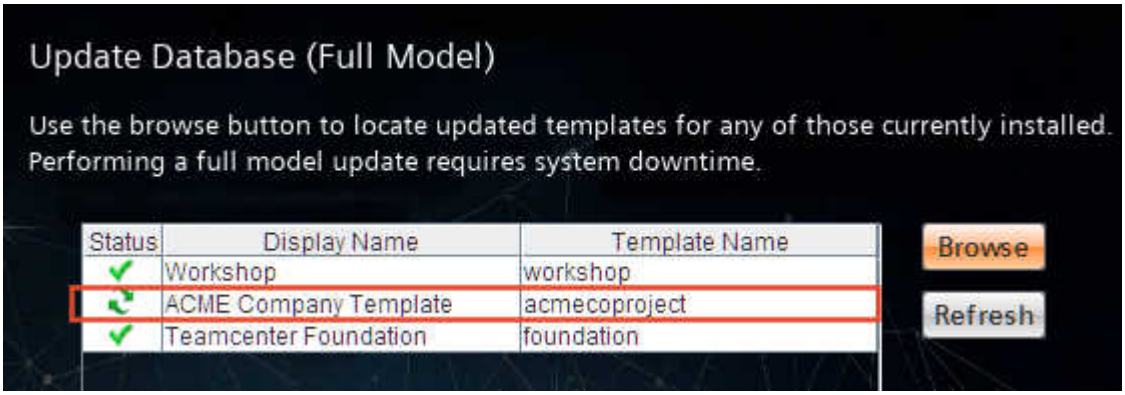
8. Click **Next**

9. In the **Teamcenter Administrative User** panel, enter your user name and password to log on to the server. Click **Next**.
   The **Update Database** panel displays currently installed templates.

10. Click the **Browse** button to navigate to the directory where the packaged template files are located. Select the updated **feature_***template-name***.xml** file.

> Note:
>
> If you are fixing a COTS template (for example, the Foundation template) using a new template file provided in a patch, you must copy the template's **feature_***template-name***.xml** and the *template-name***_install.zip** files to the same temporary directory containing the new *template-name***_template.zip** file.

   The template displays a refreshed status icon .



11. Click **Next**.

12. In the **Confirmation** panel, click **Next**.

The new template is installed.

13. To verify the installation of the revised template, log on to the server and confirm that you can create instances of your new data model.

13. Installing and configuring the Manufacturing Resource Library

Installation overview and workflow

The Manufacturing Resource Library (MRL) is a collection of data that you can import into the database. It includes a classification hierarchy for resources such as tools, machines, and fixtures. You use this data in the Classification and Resource Manager applications. In addition, you can access these resources from NX CAM. To do this, you must **configure NX Library**.

To populate the database with sample Teamcenter manufacturing process management data, make sure that the Teamcenter corporate server is installed on the installation host and the Teamcenter database is configured or upgraded.

There are general workflows for installing or updating the Manufacturing Resource Library.

Installing for the first time	Upgrading from an earlier MRL version
1. **Configure the users, groups, and roles in the database**.	1. **Begin the installation**.
2. **Begin the installation**.	2. **Update the class hierarchy**.
3. **Import the class hierarchy**.	3. **Import or update rules and preferences**.
4. **Import rules and preferences**.	4. **Import or update seed parts**.
5. **Import seed parts**.	5. **Import or update part family templates and template parts**.
6. **Import part family templates and template parts**.	6. **Import or update sample parts**.
7. **Import sample parts**.	

Configure Manufacturing Resource Library users, groups, and roles

If you have already defined your own database user, group, and role settings in the Organization application, you can use those existing users to populate the Manufacturing Resource Library (MRL). If not, run the MRL installation setup to populate the following user structure.

Perform the following task before installing the Manufacturing Resource Library.

> Note:
>
> Before you begin this task, in the Organization application, ensure that a default volume is assigned to the application user that you specify in this installation procedure.

1. In the **resource_management** directory, click **Setup.exe** and proceed to the **Setup Type Selection** dialog box.

2. Select **Manufacturing Resources — Configure MRL Users** and click **Next**.

   > Tip:
   >
   > Press the F1 key to see the help for each page in the installation wizard.

3. Select one or more of the following:

   - **Create and Configure TC/MRL Users**
     Creates and configures MRL-specific users:

     CAMUser01
     Planner01
     TOOLAdmin01
     MFGAdmin01

   - **Create Manufacturing Admin User in DBA Group**
     Creates and configures the **MFGAdmin01** user in the **dba** group.

   - **Assign Manufacturing Applications to MRL Users**
     Assigns the created MRL users to Teamcenter applications as follows:

CAMUser01: Part Planner, Resource Manager

Planner01: Classification, Part Planner, Resource Manager

TOOLAdmin01: Classification, Resource Manager

MFGAdmin01: Organization, Classification Admin, Classification, Part Planner, Resource Manager

4. Click **Next**.

   Teamcenter displays the **Choose TC_ROOT Directory** dialog box.

5. Select the path to your Teamcenter installation and click **Next**. The path must point to an existing installation.

   Teamcenter displays the **Choose TC_DATA Directory** dialog box.

6. Select the path to the directory containing the database-specific data files and click **Next**.

   The path must point to an existing **TC_DATA** directory.

7. Enter the user name, password, and group of two valid Teamcenter logon accounts.

   Teamcenter requires two types of user accounts to configure the ownership of MRL objects correctly:

   - An administrative user account
     Used to create the classification hierarchy.

   - An application user account
     Used to populate the database MRL data such as sample resources items and part family templates. This user is the owner of the content including sample data for tools, machines, and fixtures.

8. Enter the name of a valid Teamcenter volume name.

9. Click **Next** and complete the user configuration.

Populating the database

Beginning the installation

To populate the Manufacturing Resource Library (MRL) on the Teamcenter server:

1. In the **advanced_installations** directory in the Teamcenter software kit, locate the **advanced_installations.zip** file and unzip it to a local directory.

   > Note:
   >
   > Before you begin installation, make sure you have the latest available version of the Manufacturing Resource Library. If a later version is available, download and extract the latest version and browse to the **advanced_installations** directory in the location of the extracted files.
   >
   > For information about later versions, see Support Center.

2. In the **resource_management** directory, click **Setup.exe**.
   Teamcenter displays the **Teamcenter Configuration Setup** dialog box.

3. Click **Next**.
   Teamcenter displays a notification that you must check for the most recent version of the resource library.

4. Click **Next**.
   Teamcenter displays the **Setup Type Selection** dialog box.

5. Select **Manufacturing Resources — Database Population**.

6. Click **Next**.
   Teamcenter displays the **MRL Database Population - Type Selection** dialog box.

7. Select from the following, and then click **Next**:

   - **Import Class Hierarchy**
     Initially populates the Teamcenter database with MRL classification structures for tools, machines, fixtures, factory resources, machining data library, manufacturing process templates, vendor catalogs, and measuring devices.

   - **Update Class Hierarchy**
     Updates an existing MRL classification structure. Teamcenter analyzes the available MRL class structures and creates individual update scripts to migrate your class hierarchy to the latest MRL classes.

   - **Import Rules and Preferences**
     Imports and updates rules and preferences required to use the MRL in Resource Manager.

   - **Import MRL NX Seed Parts**
     Imports the NX part files that are used by the MRL. This includes template part files to build tool assemblies, a seed part to import GTC STEP files, and sample drawing templates to generate resource setup sheets.

- **Import 3D Template Parts**
  Imports the template part files to generate 3D graphics. For tools, the system provides template part files (TPs); for factory resources, part family templates are provided (PFTs).

- **Import MRL Sample Resources**
  Imports sample data for the individual modules. This includes sample tool assemblies, fixtures, and factory resources. This option also imports technology data such as feeds and speeds records for the Machining Data Library. Currently, sample machines are no longer delivered with the MRL kit. You must import your machines manually.

Click one of the links to proceed in the documentation. The installer continues with three more common steps.

8. Select the path to your Teamcenter installation in the **Choose TC_ROOT Directory** dialog box and click **Next**. The path must point to an existing installation.
   Teamcenter displays the **Choose TC_DATA Directory** dialog box.

9. Select the path to the directory containing the database-specific data files and click **Next**. The path must point to an existing **TC_DATA** directory.

10. Enter the user name, password, and group of two valid Teamcenter logon accounts.
    Teamcenter requires two types of user accounts to configure the ownership of MRL objects correctly:

    - An administrative user account
      Used to create the classification hierarchy.

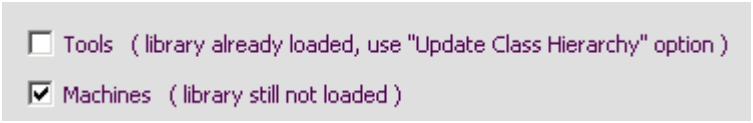
    - An application user account
      Used to populate the database MRL data such as sample resources items and part family templates. This user is the owner of the content including sample data for tools, machines, and fixtures.

Import the class hierarchy

Use this procedure to initially populate the Teamcenter database with MRL classification structures for tools, machines, fixtures, factory resources, machining data library, manufacturing process templates, and vendor catalogs.

The following procedure assumes you have completed the steps in *Beginning the installation*. The installation wizard should currently display the **Manufacturing Resource Library — Content Selection** dialog box.

1. Specify which types of data you want to load. The options listed indicate which modules have already been imported to the database. Depending on the information shown in brackets, you may have to return to the **MRL Database Population - Type Selection dialog box** to update the existing hierarchy for a particular module.
   For example, if this is displayed:



You must return to the **MRL Database Population - Type Selection** dialog box and select **Update hierarchy** if you want to import the tool hierarchy, but you can proceed with this dialog to import the machine hierarchy.
The following modules are available:

- **Tools (Assemblies and Components)**
  Imports the groups and classes used to classify tool assemblies and components.

- **Machines**
  Imports the groups and classes used to classify machines and devices such as chucks, jaws, or tool holders.

- **Fixtures** (New in MRL 6.0)
  Imports the groups and classes used to classify clamping fixtures.

- **Measuring Devices**
  Imports the groups and classes used to gauge, measure, and probe.

- **Factory Resources**
  Imports the groups and classes used to classify resources used in the NX Line Designer such as conveyors or industrial components.

- **Machining Data Library**
  Imports the groups and classes used to classify technology data such as feeds and speeds or material tables.

- **Manufacturing Process Templates**
  Imports the groups and classes used to classify manufacturing processes, operations, or activities.

- **Vendor Catalogs**
  Imports the empty **MRM_Vendor** class into which vendor catalogs can be imported.

2. Click **Next**.
   Teamcenter displays the **Confirmation** dialog box.

3. Confirm that all your selections are correct and then click **Next**.
   Teamcenter installs the specified classification hierarchies.

Update the class hierarchy

When you are upgrading from an earlier Teamcenter version, Teamcenter checks whether you have previously installed all or parts of the library during the Manufacturing Resource Library (MRL) installation. If you have done so, you can now choose to update older class hierarchies. Teamcenter automatically checks whether first installation (database population) or an update is required for an existing structure.

This procedure assumes you have completed the steps in *Beginning the installation*. The installation wizard should currently display the **Choose MRL Update Work Directory** dialog box.

1. Specify the path for the MRL update files you are creating.
   During the course of the update, Teamcenter creates script files for the update and stores them in this directory.

2. Click **Next**.
   Teamcenter displays the **MRL Update Type Selection** dialog box, where you must take action in this sequence:

   a. Select **Export existing class hierarchy**.
      This step exports the class hierarchies that you want to update to the update directory you specified.

      A. Click **Next**.
         Teamcenter displays the **MRL Update Class Hierarchy for Modules** dialog box, which contains a list of the available hierarchies, with version information. For example:

         The hierarchies that need to be updated are already selected.

      B. Select the hierarchies you want to update and click **Next**.

      C. Confirm your selections and click **Next**.

Teamcenter exports the selected hierarchies to an **EXPORT** directory in the update directory that you specified at the beginning of this procedure.
The installation wizard returns to the **MRL Update Type Selection** dialog box.

b. (Optional) Select **Modify configuration file in a text editor** to specify certain objects that are not changed during the update process. Selecting this option allows you to modify the **MRL_Update_Configurationfile.xml**. Although it is optional, if you choose to do it, you must do this before moving to the next step. For more information see **Configuring the update**.

> Note:
>
> The **MRL_Update_Configurationfile.xml** is located here: *D:\TC_Kits \TC13.0\wntx64\advanced_installations\resource_management\MRL\conf\"*

c. Select **Compare your hierarchy to new class hierarchy**.
This step compares the exported hierarchies to the corresponding hierarchy in the newest MRL kit.

A. Click **Next**.
Teamcenter displays the **MRL Update Class Hierarchy for Modules** dialog box, which contains only the hierarchies that you exported.

B. Select the hierarchies that you want to update and click **Next**.

C. Confirm your selections and click **Next**.
Teamcenter compares the selected hierarchies to the ones in the **EXPORT** directory and creates individual update scripts with detailed information about what has changed in the hierarchies. The scripts are stored in a new **UPDATE** directory in the update directory that you specified.
When complete, the installation wizard returns to the **MRL Update Type Selection** dialog box.

d. Select **Update to new class hierarchy**.
This step updates the hierarchies that you compared to the new hierarchies in the MRL kit.

A. Click **Next.**
Teamcenter displays the **MRL Update Class Hierarchy for Modules** dialog box, which contains only the hierarchies that you compared.

B. Select the hierarchies that you want to update and click **Next**.

C. Confirm that all your selections are correct and then click **Next**.

> Warning:
>
> The update requires an extended period of time. The length of time required depends on the performance of your hardware.
>
> Upgrading the tool classification hierarchy can take up to 20 hours.

Teamcenter does the following during the update:

- Adds new classes to the hierarchy
- Adds new attributes to classes in the hierarchy
- Updates class images and hierarchy icons

3. If necessary, remove obsolete classes manually.

Configuring the update

You can exclude some objects from the update by modifying the **MRL_Update_Configurationfile.xml** configuration file found in the directory where you extracted the installer:

advanced_installations\resource_management\MRL\conf

You can modify this configuration file during the MRL update by selecting **Compare your hierarchy to new class hierarchy** and then selecting **Modify configuration file in a text editor**. You must save modifications before you execute the comparison because this file will be used during the compare step.

```
<Configurationfile>
    <!-- This file is used for the MRL update procedure -->

    <!-- The following parameters configure what object types are processed -->
    <ProcessDictionaryAttributes value="true"/>
    <ProcessKeyLovs value="true"/>
    <ProcessAdminClasses value="true"/>
    <ProcessAdminViews value="true"/>

    <!-- The following parameters configure whether the output files are generated.  -->
    <!-- Files in the INFO_FILES folder are always created.  -->
    <WriteOutputTextfiles value="true"/>

    <!-- The following parameters configure keylovs that will NOT be updated. -->
    <IgnoreKeyLovs>
        <KeyLov id="-40922"/>     <!-- Tool: Material reference for NX-CAM -->
        <KeyLov id="-40928"/>     <!-- Tool: Machine Adapter to assign a pocket in
NX-CAM  -->
        <KeyLov id="-45210"/>     <!-- Tool: Status (old) -->
        <KeyLov id="-45211"/>     <!-- Tool: Plant assignment (old) -->
        <KeyLov id="-45212"/>     <!-- Tool: Machine Group -->
        <KeyLov id="-46001"/>     <!-- Resource Status -->
        <KeyLov id="-46002"/>     <!-- Resource Location -->
```

```
        <KeyLov id=" ---- Add your ID here ---- "/>
    </IgnoreKeyLovs>

    <!-- The following parameters configure whether attribute groupings are updated -->
    <Applicability1 update="true"/>     <!-- NX-CAM related attributes -->
    <Applicability2 update="true"/>     <!-- Graphics creation related attributes -->
    <Applicability3 update="true"/>     <!-- GCS connection attributes -->
    <Applicability4 update="false"/>     <!-- User configurable attribute set -->
    <Applicability5 update="false"/>     <!-- User configurable attribute set -->

    <!-- The following parameters configure whether the User1 and User2 class properties
are updated -->
    <ClassUser1 update="true"/>
    <ClassUser2 update="true"/>

    <!-- The following parameters configure whether class icons and images are updated
-->
    <Icon update="true"/>
    <Image update="true"/>
    <ICS-ClassImage1 update="true"/>
    <ICS-ClassImage2 update="true"/>
    <ICS-ClassImage3 update="true"/>
    <ICS-ClassImage4 update="true"/>
    <ICS-ClassImage5 update="true"/>
    <ICS-ClassImage6 update="true"/>
    <ICS-ClassImage7 update="true"/>
    <ICS-ClassImage8 update="true"/>
    <ICS-ClassImage9 update="true"/>
</Configurationfile>
```

Import or update rules and preferences

The following procedure assumes you have completed the steps in *Beginning the installation*. The installation wizard should currently display the **MRL Database Population: Import Rules and Preferences** dialog box.

1. Select the data that you want to import or update:

   - **Update Teamcenter preferences for MRL**
     Installs all preferences required to install the Manufacturing Resource Library and configure its behavior.

   - **Guided Component Search rules for tool components**
     Imports or updates rules that are used by the guided component search in Structure Manager.

   - **Import tool checking rules**
     Imports or updates rules used by the tool checker in Resource Manager.

   - **Import tool catalog vendor mapping**
     Imports or updates mapping rules required to map tool vendor data from the catalog to the tool component classes.

2. Confirm that all your selections are correct and then click **Next**.
Teamcenter installs the specified rules and preferences.

Import MRL NX seed parts

The following procedure assumes you have completed the steps in *Beginning the installation*. The installation wizard should currently display the **MRL Database Population: Import MRL NX seed parts** dialog box.

1. Select the seed parts that you want to import or update:

   - **Template parts for Auto-Assembly**
   Imports the template part file used to build tool assemblies in Resource Manager.

   - **Template parts for STEP (GTC 3D model Import)**
   Imports the seed part used to import GTC STEP files for vendor catalog objects.

   - **Template parts for setup sheet creation**
   Imports sample drawing templates to generate resource setup sheets.

   - **Template parts for fixtures graphics creation**
   Imports the template file used to create fixture graphics with the Tcl graphics method.

   - **Template parts for temporary tool retrieval**
   Imports the template required to extract tool holder data and system tracking points.

   Caution:

   If you have modified any of these objects, for example, created custom setup sheets, importing or updating these objects overwrites your modifications.

2. Confirm that all your selections are correct and then click **Next**.
Teamcenter installs the specified seed parts.

Import 3D template parts

The following procedure assumes you have completed the steps in *Beginning the installation*. The installation wizard should currently display the **MRL Database Population: Import 3D Template Parts** dialog box.

1. Select one or more of the part family templates or template parts to import or update:

   - **Metric Template Parts (3D templates for Tools)**
   Imports metric template part files to generate 3D tool component graphics. These template parts (TPs) are attached to the corresponding MRL tool component classes.

- **Inch Template Parts (3D templates for Tools)**
  Imports inch template part files to generate 3D tool component graphics. These template parts (TPs) are attached to the corresponding MRL tool component classes.

- **Metric Part Family Templates (PFT for Factory Resources)**
  Imports part family templates (PFTs) and attaches them to the **Factory Resources** classes.

2. Select the item type with which each of the objects is imported into the database.
   The item types you enter must already exist in the database. For a list of existing item types, move the cursor into the dialog box and press F1. The item types that are requested depend on which types of templates you elected to import in the previous step.
   If you enter an item type, you must be aware of the name of the revision of this item. The name of the revision consists of the item name appended by the word **Revision**, for example, **MyItem Revision**. These two terms may or may not have a space between them. You must ascertain whether the revision has a space. If so, type "*item_name* ". Note the empty space after the item name, for example "**MyItem** ". If the item revision contains no spaces, such as **ItemRevision**, this is not necessary, and you can simply type **Item**.
   You must specify the *internal* item type. This name can be different from the displayed item type name. The following table shows the default item types used by the installation.

Internal item type	Item display name	Typical usage	Symbols (item, item revision)
Mfg0MENCTool	**NC Tool**	Tools (components, assemblies)	
Mfg0MEEquipment	**Equipment**	Factory resources	

3. Click **Next**.
   Teamcenter displays the **Overwrite Existing Data** dialog box.

4. Confirm that all your selections are correct and then click **Start**.
   Teamcenter installs the specified classification hierarchies and data into your database.

Import or update MRL sample resources

This procedure assumes you have completed the steps in *Beginning the installation*. The installation wizard should currently display the **Load 'Sample Resource' for Module(s)** dialog box.

1. Specify which sample data you want to load. You can choose from the following:

   - **Tools**
     Imports sample tool assemblies and tool components.

- **Machines**
  Currently, sample machines are no longer delivered with the MRL kit.
  Sample machines must be imported manually from the NX directory.

- **Fixtures** (New in MRL 6.0)
  Imports sample fixture components.

- **Measuring Devices**
  Imports the groups and classes used to gauge, measure, and probe.

- **Factory Resources**
  Imports sample records used for the **Factory Resources** classification.

- **Factory Conveyors**
  Imports sample records used for the **Factory Resources** classification.

- **Factory Robots**
  Imports sample records used for the **Factory Resources** classification.

- **Factory Weld Guns**
  Imports sample records used for the **Factory Resources** classification.

- **Machining Data Library**
  Imports technology data, such as materials and feeds and speeds records, for the Machining Data Library.

2. Load the sample data for the specified modules by selecting the corresponding item type for each module. The item types you select here must already exist in the database. For a list of existing item types, move the cursor into the dialog box and press F1.
   You must specify the *internal* item type. This name can be different from the displayed item type name. The following table shows the default item types used by the installation.

Item Display Name	Item-Type (Internal)	Icons
Introduced in Version 8.3.0:		
MENCTool	**Mfg0MENCTool**	
Typical usage: Tools (components and assemblies) used for CAM		
Introduced in Version 8.3.0:		
MENCMachine	**Mfg0MENCMachine**	
Typical usage: Machines and robots used for CAM		

Item Display Name	Item-Type (Internal)	Icons
Introduced in Version 8.3.0:		
Resource Typical usage: Fixtures and devices used for CAM	**Mfg0MEResource**	
Introduced in Version 8.3.0:		
MEEquipment Typical usage: Factory resources	**Mfg0MEEquipment**	
Introduced in Version 10.0.0:		
Robot Typical usage: Factory robots	**Mfg0MERobot**	
Introduced in Version 10.1.3:		
Conveyor Resource Typical usage: Factory conveyors	**Mfg0Conveyor**	
Introduced in Version 11.4:		
Factory Tool Typical usage: Factory tools such as Screwdriver and Weld Gun	**Mfg0MEFactoryTool**	
Introduced in Version 11.4:		
Fixture Root Typical usage: Factory fixtures to locate an assembly in a station	**Mfg0MEFixtureRoot**	

3. Click **Next**.
   Teamcenter displays the **Overwrite Existing Data** dialog box.

4. Confirm that all your selections are correct and then click **Start**.
   Teamcenter installs the specified classification hierarchies and data into your database.

Import part family templates when you use custom item IDs

By default, the Manufacturing Resource Library installer creates items that are associated with the part family template that have the same ID as the name of the part family template. If your company uses custom IDs, you cannot use the installer to import the part family templates. You must import them using scripts delivered with the software kit.

1. Locate the scripts in the following directory:

   advanced_installations\resource_management\MRL\PartFamilyTemplates

2. Rename the part family templates located in the **Parts** subdirectory to reflect your custom item IDs.

3. Adjust the **PFT_3_Sample_TC101_assign_pfts.bat** script to reflect the new IDs.

4. Adjust the **PFT_MRL_import_one_pft.bat** script and specify the correct user, password, and group.

5. Run the **PFT_0_MRL_PartFamily_Templates.bat** script to install the part family templates with the new IDs.

Install localization data for MRL

Use this procedure to populate the Teamcenter database with a translated version of the Manufacturing Resource Library.

1. In the **advanced_installations** directory in the Teamcenter software kit, locate the **advanced_installations.zip** file and unzip it to a local directory.

   > Note:
   >
   > Before you begin installation, make sure you have the latest available version of the Manufacturing Resource Library. If a later version is available, download and extract the latest version and browse to the **advanced_installations** directory in the location of the extracted files.
   >
   > For information about later versions, see Support Center.

2. In the **resource_management** directory, click **Setup.exe**.
   Teamcenter displays the **Teamcenter Configuration Setup** dialog box.

3. Click **Next**.
   Teamcenter displays a notification that you must check for the most recent version of the resource library.

4. Click **Next**.
   Teamcenter displays the **Setup Type Selection** dialog box.

5. Select **Manufacturing Resources — Localization** and click **Next**.
   Teamcenter displays the **Choose TC_ROOT Directory** dialog box.

6. Select the path to your Teamcenter installation and click **Next**. The path must point to an existing installation.
   Teamcenter displays the **Choose TC_DATA Directory** dialog box.

7. Select the path to the directory containing the database-specific data files and click **Next**. The path must point to an existing **TC_DATA** directory.

8. Enter the user name, password, and group of the valid Teamcenter administrative logon account and click **Next**.

9. Select the languages for which you want to make the Manufacturing Resource Library available, and then click **Next**.

10. Confirm your selections and click **Next**.
    Teamcenter populates the database with localized classification structures for the selected languages.

Configure NX Library using the installation wizard

When you install the manufacturing tooling data, you must configure NX Library so that the new data appears in the library selection dialog boxes when searching for classified tools in NX CAM.

You must perform this configuration on the client on which NX is installed. If your environment includes a shared **MACH** directory, see *Configure NX Library when using a shared MACH directory*.

1. In the **advanced_installations** directory in the Teamcenter software kit, locate the **advanced_installations.zip** file and unzip it to a local directory.

   > Note:
   >
   > Before you begin installation, make sure you have the latest available version of the Manufacturing Resource Library. If a later version is available, download and extract the latest version and browse to the **advanced_installations** directory in the location of the extracted files.
   >
   > For information about later versions, see Support Center.

2. In the **resource_management** directory, click **Setup.exe**.
   Teamcenter displays the welcome dialog box for the Manufacturing Resource Library installer. Proceed to the **Setup Type Selection** dialog box.

3. Select **Configure NX-CAM**.
   Teamcenter displays the **NX CAM Resource Base Directory** dialog box.

4. Enter the path to the directory where NX is installed (**UGII_BASE_DIR**) and click **Next**.

5. In the operating system explorer window, select the CAM configuration you want to configure for MRL. The default file is **cam_part_planner_mrl.dat**.
Teamcenter displays the **LANGUAGE Selection** dialog box.

6. Select the language in which you want the NX Library selection dialog boxes to appear and click **Next**. English and German are supported.
Teamcenter displays the **Configure NX Library for Tools** dialog box.

7. Select the database to be used by the NX tool library.
This option specifies whether tools are retrieved from the Teamcenter MRL tool database or from the tool ASCII file. If you select **No change**, the existing setting for tools in the CAM configuration file is retained (**LIBRARY_TOOL** entry).
Teamcenter displays the **Configure NX Library for Machines** dialog box.

8. Select the database to be used by the NX machine library.
This option specifies whether machines are retrieved from the Teamcenter MRL machines database or from the machines ASCII file. If you select **No change**, the existing setting for machines in the CAM configuration file is retained (**LIBRARY_MACHINE** entry).
Teamcenter displays the **Configure NX Library for Devices** dialog box.

9. Select the database to be used by the NX device library.
This option specifies whether devices are retrieved from the Teamcenter MRL devices database or from the devices ASCII file. If you select **No change**, the existing setting for devices in the CAM configuration file is retained (**LIBRARY_DEVICE** entry).
Teamcenter displays the **Configure NX Library for Machining Data** dialog box.

10. Select the database to be used by the NX machining data library.
This option specifies whether machining data is retrieved from the Teamcenter MRL machining data database or from the machining data ASCII file. If you select **No change**, the existing setting for machining data in the CAM configuration file is retained (**LIBRARY_MACHINING DATA** entry).
Machining data includes the following libraries:

    - **Feeds_speeds**
    - **Machining_data**
    - **Tool_machining_data**
    - **Part_material**
    - **Tool_material**
    - **Cut_method**

    Teamcenter displays the **Confirmation** dialog box.

11. Confirm your selections and click **Start**.
    Teamcenter performs the following actions:

    - Copies the definition files to the target directory.
    - Copies event handler files to the target directory.
    - Copies the images for the NX CAM tool dialogs to the target directory.

12. Select the **cam_part_planner_mrl.dat** configuration file when working in NX CAM.
    When you retrieve a tool from the Teamcenter database in NX CAM, the library selection dialogs now show the classification structure from the customer assembly hierarchy, including images corresponding to the new tooling data. You can search for and retrieve your customer-specific tool assembly data.

Configure NX Library when using a shared MACH directory

If your enterprise installs NX using a shared **MACH** directory, there are several steps that you must perform manually. These steps mirror the steps automatically performed by the *Configure NX Library using the installation wizard* procedure performed when you use a local **MACH** directory.

This procedure pertains to the following files:

MACH\resource\configuration\cam_part_planner_mrl.dat

MACH\resource\library\tool\inclass\dbc_mrl_tooling_library_tlas.tcl

MACH\resource\library\tool\inclass\dbc_mrl_tooling_library_tlas_en.def

MACH\resource\ug_library\dbc_mrl_general.tcl

1. Create a copy of your **cam_part_planner_library.dat** file and rename it to **cam_part_planner_mrl.dat**.

2. Change the following line in the **cam_part_planner_mrl.dat** file:

   Old:

   ```
   LIBRARY_TOOL,${UGII_CAM_LIBRARY_TOOL_INCLASS_DIR}dbc_inclass_tlas.def,
   ${UGII_CAM_LIBRARY_TOOL_INCLASS_DIR}dbc_inclass_tlas.tcl
   ```

   New:

   ```
   LIBRARY_TOOL,$
   {UGII_CAM_LIBRARY_TOOL_INCLASS_DIR}dbc_mrl_tooling_library_tlas_en.def,
   ${UGII_CAM_LIBRARY_TOOL_INCLASS_DIR}dbc_mrl_tooling_library_tlas.tcl
   ```

If you use a customized configuration file at your company, make the change in the customized file and continue to use this file to initialize NX CAM.

3. Copy the following files to your **MACH\resource\library\tool\inclass** directory.

   dbc_mrl_tooling_library_tlas.tcl
   dbc_mrl_tooling_library_tlas_en.def

4. Copy **dbc_mrl_general.tcl** to **MACH\resource\ug_library**.

5. When you initialize NX CAM, use the modified **cam_part_planner_mrl.dat** file or the customized configuration file that you modified in step 2.

Configure the graphics builder for MRL

To use the following features in Teamcenter, you must configure the NX graphics builder:

- Part family member creation
- NX auto assembly
- 3D model import for catalog data
- **Check NX CAM tool retrieve** in MRL
- Extract Holder Data

Prerequisites:

- The graphics builder must be installed on the Teamcenter server. This is the server that runs the **tcserver** process.
- **The mrl_retrieve_camsetup_metric or mrl_retrieve_camsetup_inch NX part file item must be imported using the Template parts for temporary tool retrieval option**. You can search for an item with this ID to check the existence of this file.
- The **...\MACH\resource\configuration** directory of the NX installation that resides on the Teamcenter server where the graphics builder is installed must contain the **cam_part_planner_mrl.dat** file. This file points to the **dbc_mrl_tooling_library_tlas.tcl** event handler file required for graphics creation. The event handler file must be up-to-date. You can copy the most recent file by setting the tool database to MRL when you complete the *Configure NX Library using the installation wizard* procedure.

The following procedure installs the graphic macros on the server where the graphics builder is installed.

1. Obtain the Manufacturing Resource Library software kit.

2. Click **Setup.exe**.
   Teamcenter displays the **Setup Type Selection** dialog box.

3. Select **Configure Fixture TCL Graphic Macros**.

4. Click **Next**.
   Teamcenter displays the **Choose TC_ROOT Directory** dialog box.

5. Select the path to your Teamcenter installation and click **Next**. The path must point to an existing installation.
   Teamcenter displays the **Choose TC_DATA Directory** dialog box.

6. Select the path to the directory containing the database-specific data files and click **Next**. The path must point to an existing **TC_DATA** directory.

7. Enter the user name, password, and group of a valid Teamcenter administrative logon account. The **plmxml_import** utility uses this logon information to import the data into the Teamcenter database.

8. Click **Next**.
   Teamcenter displays the **Choose MRL Graphic Macros Directory** dialog box containing the default path to store graphic macros.
   The installation procedure modifies the **NXGraphicsBuilder** preference and copies required files into Teamcenter directories (*TC_ROOT***bin\nx_graph\TCL_Create_Graphics**).

9. Verify that this path is the correct path or modify it by clicking **Browse**.
   Teamcenter displays the **Confirmation** dialog box.

10. Click **Start**.
    Teamcenter copies the graphic macros to the database and modifies the **NXGraphicsBuilder** preference.

Configure MRL Connect

MRL Connect allows native NX users to retrieve cutting tool assemblies from the Manufacturing Resource Library (MRL) in Teamcenter. New tools must be created in the library using Teamcenter.

Prerequisites:

- A Teamcenter four-tier server installation must exist.
- Teamcenter client communication system (TCCS) must be installed on the machine running NX.
- Java Runtime Environment (JRE) must be installed on the machine running NX.
- The Manufacturing Resource Library must be populated on the Teamcenter server.

- The manufacturing preferences in NX CAM must point to a configuration file that has been set up for Resource Manager access, for example, the **cam_native_rm_library.dat** configuration file provided with NX.

To configure MRL on the computer running NX:

1. In the **advanced_installations** directory in the Teamcenter software kit, locate the **advanced_installations.zip** file and unzip it to a local directory.

   > Note:
   >
   > Before you begin installation, make sure you have the latest available version of the Manufacturing Resource Library. If a later version is available, download and extract the latest version and browse to the **advanced_installations** directory in the location of the extracted files.
   >
   > For information about later versions, see Support Center.

2. In the **resource_management** directory, click **Setup.exe**.

   Teamcenter displays the **Teamcenter Configuration Setup** dialog box.

3. Click **Next**.

   Teamcenter displays a notification that you must check for the most recent version of the resource library.

4. Click **Next**.

   Teamcenter displays the **Setup Type Selection** dialog box.

5. Select **Configure MRL Connect**.

6. Select **MRL Connect for NX - Configure environment on NX Client**.

   This option creates the command file **start_nx_using_mrl_connect.bat** in the location *user-profile* **\MRLConnect**, for example:

   C:\Users*login_username***\MRLConnect\start_nx_using_mrl_connect.bat**

7. Enter the path to the NX base directory.

8. Enter the path to the directory where FMS is locally installed.

9. Enter the path to the Java Runtime Environment.

10. Enter server name and port number of the Teamcenter server.

This information is used to build the NX environment variable on the NX client.

> Tip:
>
> Ask your Teamcenter installer for the port number.

11. Check your selections and complete the installation.

> Note:
>
> MRL Connect supports only the retrieval of tools from MRL into NX CAM.
>
> Machines, devices, feeds and speeds data, machining data, cut methods, part materials, and tool materials are *not* supported. Those modules should use ASCII, not MRL, in the configuration file.

14. Installing Teamcenter reporting and analytics

Before you begin

Download the Teamcenter reporting and analytics software kit for Windows from the Siemens Digital Industries Software FTP site.

Reporting and Analytics requires additional preinstallation steps.

For information about steps to perform before you install Reporting and Analytics, see the current version of the *Teamcenter Reporting and Analytics Deployment Guide* in the **Documentation** directory in the Reporting and Analytics software kit.

After you complete these steps and install Reporting and Analytics, you can begin using the Reporting and Analytics integration in Report Builder.

Create the Reporting and Analytics database

Reporting and Analytics requires an Oracle or Microsoft SQL Server database for Reporting and Analytics metadata. Your database administrator must create this database before you launch Teamcenter Environment Manager (TEM) to install Reporting and Analytics.

TEM creates the required table structure for Reporting and Analytics, but the database user and tablespaces must exist before you install Reporting and Analytics. Metadata tables are divided into three categories based on the number of rows they will hold and the growth potential. These tables can be stored in the same tablespace or in separate tablespaces for better performance and manageability. Siemens Digital Industries Software recommends creating the following tablespaces:

Tablespace	Description
Small	Typical number of rows 1000. Minimum size 50MB Growth is very slow.
Medium	Typical number of rows 10000. Minimum size 150MB Growth is Slow.
Large	Typically 1000000 rows or more. Minimum size 500MB Growth very rapid with usage.
Indexes	Typically 1000000 rows or more. Minimum 400MB.

For more information about creating the metadata database for Reporting and Analytics, see *Planning for Installation* in the *Teamcenter Reporting and Analytics Deployment Guide* for the current version of Reporting and Analytics.

Configure the Reporting and Analytics license file

Reporting and Analytics requires an eQube license file (**license.dat**) on the host where the Reporting and Analytics license server runs. TEM requires the location of the license file to install the Reporting and Analytics license server during Reporting and Analytics installation.

The Reporting and Analytics license server uses the host's MAC address to identify the host. You must supply this information when you request a Reporting and Analytics license file from eQ Technologic.

For information about starting the Reporting and Analytics license server, see the *Teamcenter Reporting and Analytics Deployment Guide* in the Reporting and Analytics software kit.

Install Reporting and Analytics

1. Launch TEM.

2. Create a new Teamcenter configuration or select an existing configuration to which you want to add Reporting and Analytics.
   In the **Features** panel, select the following features:

   Teamcenter for Reporting and Analytics
   Installs the Teamcenter Reporting and Analytics integration.
   Reporting and Analytics is a standalone reporting application that introduces a new folder in Report Builder called **TcRA Reports**, which contains reports created with Reporting and Analytics.

   Dashboard
   Installs the Reporting and Analytics Dashboard application for the rich client. Dashboard provides an embedded viewer for Reporting and Analytics reports in the rich client.

3. Proceed to the **TcRA Install Options and General Settings** panel. Select one or more of the following options to include in your Reporting and Analytics installation:

Create license server	Specifies you want to install a Reporting and Analytics license server. If you select this option, TEM later prompts for the location of the eQube license file (**license.dat**). If you do not select this option, TEM later prompts for the location of the Reporting and Analytics license server.
Create WAR file	Specifies you want to generate a Reporting and Analytics WAR file.
Create metadata	Specifies you want to populate the metadata database for Reporting and Analytics. Select this only during the first installation of Reporting and Analytics. If you are upgrading

	from a previous version of Reporting and Analytics or adding additional hosts, do not select this option.
Secure Connection	Specifies you want to connect to the Reporting and Analytics license server through a secure (HTTPS) connection.

The remaining sequence of TEM panels varies according to the options you select.

4. Enter the required information in TEM for the selected Reporting and Analytics options.

> Note:
>
> For more information about any TEM panel, click the help button  .

Selected option	TEM panel	Tasks
Create license server	**TcRA License Server Settings**	Enter the location of the Reporting and Analytics license file (**license.dat**), the license authentication time-out in seconds, and license keystore settings for the Reporting and Analytics license server.
Create WAR file	**TcRA WAR Settings**	Type the web application context, server name, and port for the Reporting and Analytics web application.
Create WAR file	**TcRA WAR SMTP Properties**	Specify SMTP settings to enable users to receive e-mail messages generated by Reporting and Analytics.
Create WAR file	**TcRA Web Parts and Services**	Specify whether to enable web services and integration with SharePoint and Teamcenter community collaboration with Reporting and Analytics.
Create WAR file	**TcRA Authentication Settings**	Select the Reporting and Analytics authentication method (eQube, SSO, or Windows NTLM) and specify related settings. Note: Selecting **SSO Authentication** requires that you install Teamcenter with Security Services enabled and configure the LDAP server before you install Reporting and Analytics.

Selected option	TEM panel	Tasks
Create WAR file	**TcRA License Settings**	Type the host and port of the Reporting and Analytics license server.
Create WAR file **Create metadata** or	**TcRA WAR and Metadata Settings**	Type an owner for Reporting and Analytics metadata and select your web application server vendor.
Create metadata	**TcRA Metadata Settings**	Specify metadata settings for the Reporting and Analytics integration. Note: The values you type under **Oracle Tablespace Names** must match the names of the Oracle tablespaces you created in *Create the Reporting and Analytics database*.
Any option	**TcRA Database Selection**	Specify the database engine you use for Reporting and Analytics (**Oracle** or **Microsoft SQL Server**) and type the required values for the Reporting and Analytics database you created in *Create the Reporting and Analytics database*.

5. Proceed through the remaining TEM panels and begin installing Reporting and Analytics. During installation, TEM prompts you for the location of the **TCRA2008.zip** file. When installation is complete, close TEM.

Install Remote Reporting and Analytics

Install Remote Reporting and Analytics as described in *Deploying Remote Teamcenter Reporting and Analytics Plugin* in the *Teamcenter Reporting and Analytics Deployment Guide*.

The *Teamcenter Reporting and Analytics Deployment Guide* is in the **Documentation** directory in the Teamcenter reporting and analytics software kit.

Deploy Reporting and Analytics

Deploy the Reporting and Analytics WAR file as described in the *Teamcenter Reporting and Analytics Deployment Guide* in the Reporting and Analytics software kit.

Note:

Before you deploy the Reporting and Analytics WAR file, make sure that Remote Reporting and Analytics is installed and running.

For more information, see *Deploying Remote Teamcenter Reporting and Analytics Plugin* in the *Teamcenter Reporting and Analytics Deployment Guide*.

The *Teamcenter Reporting and Analytics Deployment Guide* is in the **Documentation** directory in the Teamcenter reporting and analytics software kit.

Complete Reporting and Analytics installation

1. Set the TC_RA_server_parameters preference using the rich client. Set the preference with following values:

Value	Description
Host	Specifies the host on which you deploy the Reporting and Analytics WAR file.
Port	Specifies the port used by the Reporting and Analytics web application.
Context	Specifies the name of the Reporting and Analytics WAR file
ServletName	Specifies the name of the Reporting and Analytics servlet, for example, **BuildNPlay/ eQTCnectIntegrationController**.

   This preference must be set to enable Reporting and Analytics to communicate with Teamcenter.

2. Test connections to Reporting and Analytics applications. Log on to Reporting and Analytics at the following URLs and click **Test Connections**:

   Teamcenter reporting and analytics Mapper:

   `http://`*host*`:`*port*`/`*Reporting and Analytics-context*`/Mapper`

   Teamcenter reporting and analytics BuildNPlay:

   `http://`*host*`:`*port*`/`*Reporting and Analytics-context*`/BuildNPlay`

   Reporting and Analytics Portal:

   `http://`*host*`:`*port*`/`*Reporting and Analytics-context*`/Portal`

If connections are not successful, you cannot create reports in Reporting and Analytics until connection problems are resolved.
For more information about Reporting and Analytics Mapper and BuildNPlay, see the *Mapper User's Guide* and the *BuildNPlay User's Guide* in the Reporting and Analytics software kit.

3. Log on to the Reporting and Analytics administrative console using user name **ADMIN** and password **ADMIN**.
Click **Manage Instance→Properties**, and then set the following values as appropriate:

   - **SMTP Host**
   - **Authentication required for SMTP** (Set to **True** or **False**)
   - **SMTP User ID**
   - **SMTP User Password**

4. If Reporting and Analytics is installed with Security Services enabled, set the following values for the Teamcenter connection (**Connection 1**):

   - Set the user ID and password values to the LDAP user ID and password.
   - Under **Advanced Properties**, set **SSO Enabled** to **yes**, and set the **SSO Application ID** to the Teamcenter application ID.

15. Installing Render Management

Installing Render Management

During installation using Teamcenter Environment Manager (TEM), along with the selections made to support general installation, your administrator must select to install the following features to support document rendering. The administrator can accept default values unless otherwise directed.

> Note:
>
> This topic describes an installation using a single server machine. Installation in a distributed configuration using multiple server machines is supported.

Part VI: Additional configuration and maintenance

Create additional Teamcenter configurations, apply patches, or uninstall Teamcenter as described in the appropriate topics.

16. Managing installations and configurations

Managing installations and configurations

A Teamcenter *configuration* is a collection of features associated with one Teamcenter data directory. The collection of configurations that share the same Teamcenter application root directory is a Teamcenter *installation*.

When you installed Teamcenter executables using Teamcenter Environment Manager (TEM) from the software kit, you created the first configuration.

You can create a new Teamcenter configuration or modify features in your existing Teamcenter configuration using Teamcenter Environment Manager.

> Caution:
>
> If you create a desktop shortcut to TEM, make sure the working directory (or **Start in** location) for the shortcut is *TC_ROOT***install**. If the working directory for the shortcut is incorrect, TEM displays errors during installation or updating of a configuration.

Create a configuration

1. Launch Teamcenter Environment Manager (TEM). In the Windows start menu, choose **Programs→Teamcenter 13**, and then right-click **Environment Manager** and choose **Run as administrator**.

   > Note:
   >
   > - You can also run the **tem.bat** file in the **install** directory in the application root directory for the Teamcenter installation. Right-click the **tem.bat** program icon and choose **Run as administrator**.
   > - If you create a desktop shortcut to TEM, make sure the working directory (or **Start in** location) for the shortcut is *TC_ROOT***install**. If the working directory for the shortcut is incorrect, TEM displays errors during installation or updating of a configuration.

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

3. In the **Configuration Maintenance** panel, choose **Create new configuration**.

4. In the **Configuration** panel, type a description and unique ID for the new configuration.

5. In the **Solutions** panel, optionally select one or more solutions.
   For a description of a solution, point to the solution name in TEM or see the **solutions reference**.

   > Note:
   >
   > *Solutions* are preselected groups of features that provide starting points for recommended Teamcenter configurations. You can add features or deselect features in the **Features** panel in Teamcenter Environment Manager (TEM).

6. In the **Features** panel, select features to include in the configuration.
   For a description of a feature, point to the feature name in TEM or see the **features reference**.

7. Proceed through the remaining panels in TEM, entering the required information for the features you selected.

   For information about each panel, click the help button  .

8. When TEM displays the **Confirmation** panel, click **Start** to begin installation.

Modify a configuration

Add **Teamcenter features** to an existing configuration, or remove them from a configuration:

1. Launch Teamcenter Environment Manager. In the Windows start menu, click **Programs→Teamcenter 13**, and then right-click **Environment Manager** and choose **Run as administrator**.

   > Note:
   >
   > You can also run the **tem.bat** file in the **install** directory in the application root directory for the Teamcenter installation. Right-click the **tem.bat** program icon and select **Run as administrator**.

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

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

4. In the **Old Configuration** panel, select the configuration you want to modify.

5. In the **Feature Maintenance** panel, select **Add/Remove Features**.

> Note:
>
> Options in the **Feature Maintenance** panel vary depending on the features in your configuration.

6. In the **Features** panel, select features to add to the configuration, or deselect features you want to remove.

   > Note:
   >
   > If you remove a feature that added data model objects to the Teamcenter database, the data model is not removed when you remove the feature. Relations and objects created using the removed feature persist in the database.
   >
   > If no instances of the feature's data model objects were created in the database, you can attempt to remove the template.

7. Proceed through the remaining panels in TEM, entering the required information for the features you selected.

   For information about each panel, click the help button  .

8. When TEM displays the **Confirmation** panel, click **Start** to begin installation.

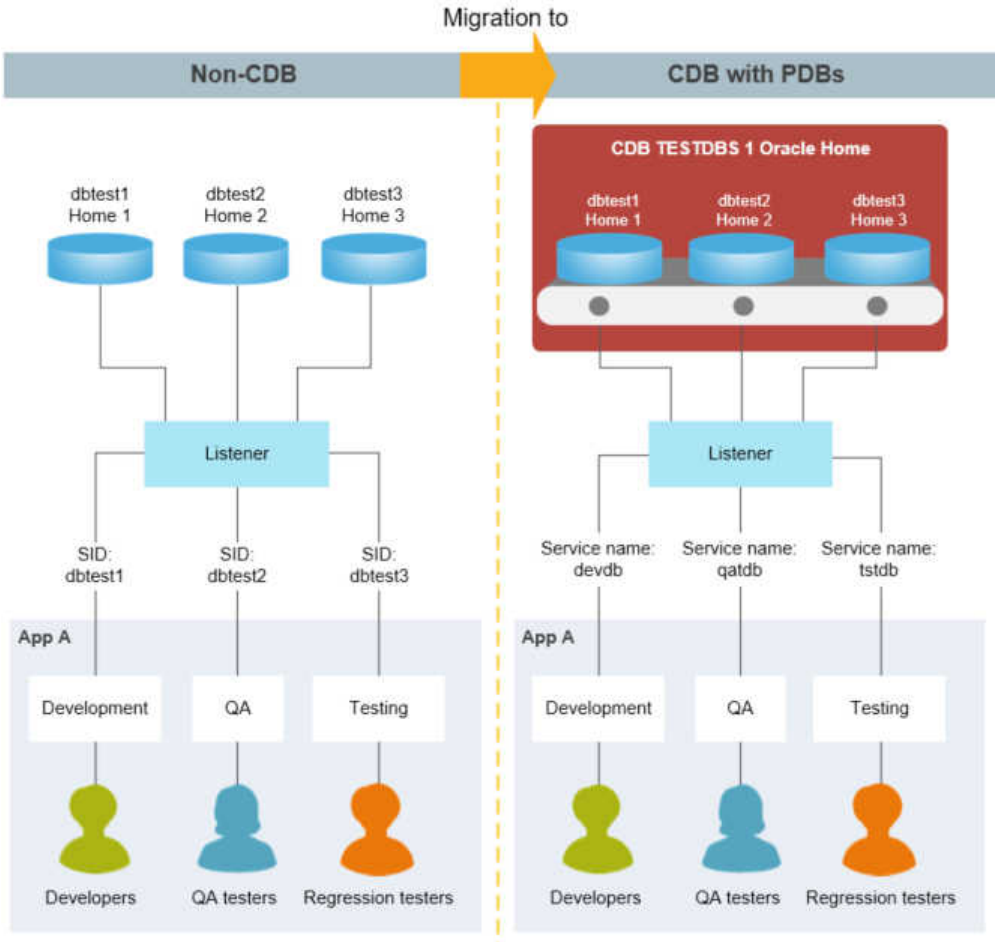
Migrate a non-CDB database to a CDB database

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 13.0.

Add an existing Teamcenter database

You can add a Teamcenter database to an installation by creating a configuration that references an existing Teamcenter data directory and its configured database. A data directory is associated with one (and only one) database instance.

1. Launch Teamcenter Environment Manager. In the Windows start menu, choose **Programs→Teamcenter 13**, and then right-click **Environment Manager** and choose **Run as administrator**.

> Note:
>
> You can also run the **tem.bat** file in the **install** directory in the application root directory for the Teamcenter installation. Right-click the **tem.bat** program icon and choose **Run as administrator**.

2. In the **Configuration Maintenance** panel, select **Add new configuration**.

3. In the **Configuration** panel, enter a description of and unique ID for the configuration you are creating.

4. Proceed to the **Features** panel. Select the **Teamcenter Foundation** feature only and specify an installation directory for the new configuration the **Installation Directory** box. The installation directory must not already exist on your system. (TEM creates the directory.)

5. In the **Foundation** panel, select **Use populated database and existing data directory** and enter the full path to the existing data directory in the **Data Directory Location** box.

6. In the **Data Directory** box, enter a location for the Teamcenter data directory. The directory must exist.
   The Teamcenter data directory is called the *TC_DATA* directory. This value is stored in the **TC_DATA** environment variable on your system. TEM creates shared data subdirectories and files in this location.
   Do not set **TC_DATA** in the system environment. TEM sets this variable as required in various scripts. Setting this variable in the operating system can cause conflicts if you install more than one configuration.

7. In the **Teamcenter Administrative User** panel, enter the password for the Teamcenter administrator.

   > 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. In the **Confirmation** panel, review your selections and click **Start** to add the database.

Add or configure a database

You can simultaneously configure a Teamcenter database and add it to an installation by creating a new configuration. Because you are configuring a database, you must also install and configure File Management System and create a data directory.

Prerequisites:

- **A database server must be installed** (Microsoft SQL Server or Oracle).
- A database instance must exist, either a specific instance configured for Teamcenter or a multipurpose instance to be configured in this procedure.

1. Launch Teamcenter Environment Manager. In the Windows start menu, choose **Programs→Teamcenter 13**, and then right-click **Environment Manager** and choose **Run as administrator**.

   > Note:
   >
   > You can also run the **tem.bat** file in the **install** directory in the application root directory for the Teamcenter installation. Right-click the **tem.bat** program icon and select **Run as administrator**.

2. In the **Configuration Maintenance** panel, select **Add new configuration**.
3. In the **Configuration** panel, enter a description of and unique ID for the configuration you are creating.
4. Proceed to the **Features** panel. Select the **Teamcenter Foundation** feature only and specify an installation directory for the new configuration the **Installation Directory** box. The installation directory must not already exist on your system. (TEM creates the directory.)
5. In the **Foundation** panel, select **Create new data directory using existing populated database**.
6. In the **Foundation Database** panel, enter access information for the existing database.
   In the **Data Directory** box, enter a location for the Teamcenter data directory. The directory must exist.
   The Teamcenter data directory is called the *TC_DATA* directory. This value is stored in the **TC_DATA** environment variable on your system. TEM creates shared data subdirectories and files in this location.
   Do not set **TC_DATA** in the system environment. TEM sets this variable as required in various scripts. Setting this variable in the operating system can cause conflicts if you install more than one configuration.
7. In the **Teamcenter Administrative User** panel, enter the password for the Teamcenter administrator.

   > 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. In the **Confirmation** panel, review your selections and click **Start** to add the database.

Change the Oracle password

How to change the Oracle password

If you use an Oracle database and want to change the password Teamcenter uses to connect to the database, you can do this two ways using the **install** utility:

- *Encrypt the password file* using the **-encryptpwf** argument.
- *Encrypt the database connection string* using the **-encrypt** argument.

Encrypt the password file

To encrypt a password file, you set a temporary environment variable to the password you want to encrypt, and then generate an encrypted password file using the **-encryptpwf** argument for the **install** utility.

1. Open a Teamcenter command prompt.
2. Create a temporary environment variable and set it to the password you want to encrypt:

   ```
   set variable-name=password
   ```

   For example:

   ```
   set temp_pw=mypassword
   ```

   Note:

   For security, choose a unique and obscure name for the environment variable, and delete the variable promptly after completing this procedure.

3. Type the following command:

   ```
   install -encryptpwf –e=variable-name –f=password-file
   ```

   Replace *variable-name* with the name of the environment variable you created. Replace *password-file* with the path and name of the password file to create. For example:

```
install -encryptpwf –e=temp_pw –f=pwd.txt
```

This command generates an encrypted password file that can be used for connecting to the Teamcenter database. The password file can also be used with Teamcenter utilities that use the password file (**-pf**) argument.

4. Delete the temporary environment variable you created in step 2.

> Caution:
>
> This step is important for security.

Encrypt the database connection string

To encrypt the database connection string, you must temporarily set the **TC_DB_CONNECT** environment variable and then re-encrypt the connection string using the **-encrypt** argument for the **install** utility.

1. Open a Teamcenter command prompt.

2. Set the **TC_DB_CONNECT** environment variable:

```
set TC_DB_CONNECT="db-user:password@database-ID"
```

Replace *db-user* with the database user name (the Oracle user). Replace *password* with the new database password. Replace *database-ID* with the Oracle database name.

3. Type the following command:

```
install -encrypt
```

This command generates a new database connection string with the new Oracle password encrypted. Copy the new database connection string.

4. Open the *TC_DATA***tc_profilevars.bat** file in a plain text editor.

5. Locate the following line in the file:

```
set TC_DB_CONNECT=connection-string
```

6. Replace the existing *connection-string* with the string generated by the **install -encrypt** command.

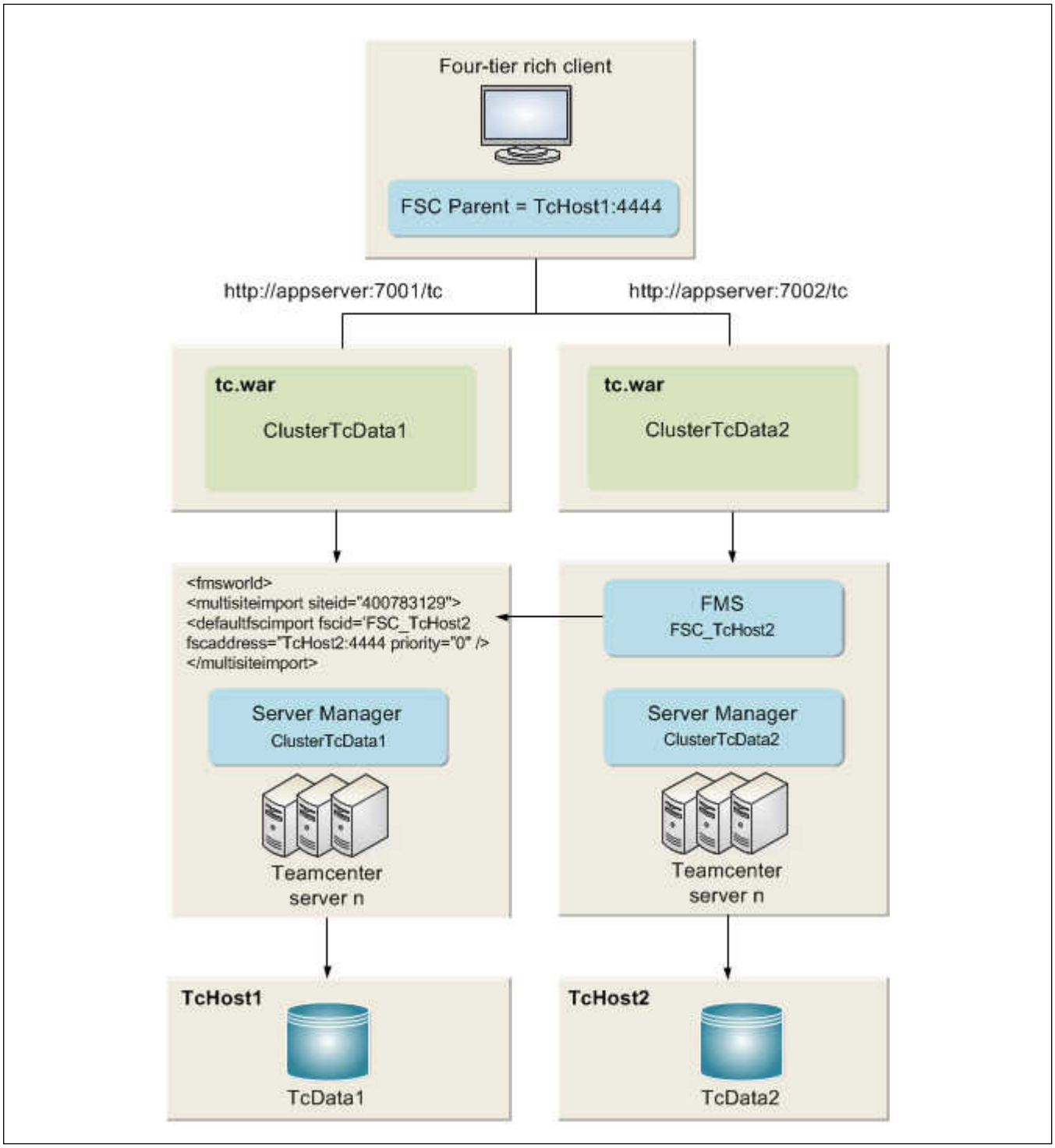
7. Save the changes to the **tc_profilevars.bat** file.

Configure multiple databases for a four-tier rich client

Multiple database overview (four-tier rich client)

To configure a four-tier rich client with access to multiple databases, install a Teamcenter corporate server, including a server manager, for each database and deploy a web tier WAR file for each server manager. For example, to configure rich client access to two databases, configure:

- In the enterprise tier, install two corporate servers with server managers and connect each server to a different database.
- In the web tier, deploy two web tier files, each connecting to one of the server managers.



Multiple databases (four-tier rich client)

Multiple database example (four-tier rich client)

Step 1: Install the corporate server

To enable a rich client to access two databases, **install and configure** two corporate servers:

1. Using Teamcenter Environment Manager, install Teamcenter in a corporate server configuration on host 1 (**TcHost1**):

   - Configure the corporate server to connect to database 1 (**TcData1**).
   - Select the server manager component and configure it with the cluster name of **ClusterTcData1**.

2. Using Teamcenter Environment Manager, install Teamcenter in a corporate server configuration on host 2 (**TcHost2**):

   - Configure the corporate server to connect to database 2 (**TcData2**).
   - Select the server manager component and configure it with the cluster name of **ClusterTcData2**.

3. On **TcHost1**, edit the FMS master file to make FMS aware of the FSC on **TcHost2**:

   a. Go to the **fms** directory in the Teamcenter application root directory.

   b. Open the **fmsmaster_FSC_***service-id***.xml** file and find the following lines:

```
<fmsworld>
  <multisiteimport siteid="othersite">
    <fscimport fscid="otherfsc" fscaddress="host:4444">
     <volumeimport volumeid="othervol" />
    </fscimport>
  </multisiteimport>
```

   c. Edit the lines, adding the bold text and deleting the indicated text:
   Original:

```
<fmsworld>
  <multisiteimport siteid="othersite">
    <defaultfscimport fscid="otherfsc" fscaddress="host:4444"
priority="0"/>
    <volumeimport volumeid="othervol" />
    </fscimport>
  </multisiteimport>
```

   Revised:

```
<fmsworld>
  <multisiteimport siteid="othersite">
    <defaultfscimport fscid="otherfsc" fscaddress="host:4444"
priority="0"/>
  </multisiteimport>
```

d. In the revised section:

- Replace the value for the **siteid** parameter with the FMS enterprise ID of the FSC on **TcHost2**. This value is in the FMS master file on **TcHost2** in the **fmsenterprise id** parameter.
- Replace the value for the **fscid** parameter with the FSC ID on **TcHost2**. This value is in the FMS master file on **TcHost2** in the **fsc id** parameter.
- Replace the value for the **fscaddress** parameter with the host name and port number of host 2. This value is in the FMS master file on **TcHost2** in the **fsc address** parameter.

For example:

```
<fmsworld>
  <multisiteimport siteid="400783129">
  <defaultfscimport fscid="FSC_TcHost2"
fscaddress="TcHost2:4444" priority=”0”/>
  </multisiteimport>
```

e. On **TcHost1**, stop and restart the FSC service.

Step 2: Deploy the web tier

Deploy and configure the web tier WAR files to connect to the server managers:

1. Generate the web tier WAR file, configuring it to connect to the server manager of **TcHost1** by specifying the same values for the server cluster name.
For example:

TcHost1 server manager	Web tier application
Server manager cluster name: **ClusterTcData1**	Server manager cluster name: **ClusterTcData1**

2. Generate the web tier WAR file, configuring it to connect to the server manager of **TcHost 2** by specifying identical values for the server cluster name.
For example:

TcHost 2 server manager	Web tier application
Server manager cluster name: **ClusterTcData2**	Server manager cluster name: **ClusterTcData2**

> Note:
>
> Make sure you choose distinct sets of ports for each WAR file.

3. Deploy each web tier WAR file in a third-party application server in a separate domain.

Users who connect to this web tier instance can choose from two databases, **TcData1** and **TcData2** when logging on to Teamcenter.

Step 3: Configure the web tier

Configure the web tier to include the two databases:

1. For the **ParentFSCAddressTable** parameter, specify the host name and port number of **TcHost1**. For example:

   TcHost1:4444

   TcHost1 has the site information about the FSC on **TcHost2**.

2. For the **HTTPServerTable** parameter, specify two URLs, one for each deployed web tier application. For example:

URI	Name
http://appserver:7001/tc	**TcData1**
http://appserver:7002/tc	**TcData2**

Migrate Teamcenter to a different JRE

The Java Runtime Environment (JRE) used by Teamcenter and Teamcenter Environment Manager (TEM) is set by TEM during Teamcenter installation. If you upgrade or install a new JRE, you must migrate Teamcenter to the new JRE using TEM.

> Caution:
>
> Do not remove your previous JRE until after you complete migrating Teamcenter to the new JRE. If you removed your old JRE before performing this procedure, **problems or error messages may occur**, and TEM fails to start.

To change the JRE used by Teamcenter and TEM, perform the following steps.

1. If you changed the password for the Teamcenter administrative user after you installed the FMS server cache (FSC) service, update the logon credentials for the FSC service to specify the current password.

2. Start Teamcenter Environment Manager (TEM). From the **Start** menu, choose **All Programs→Teamcenter 13→Environment Manager**, then right-click and choose **Run as administrator**.

   Alternatively, you can run the **tem.bat** file in the **install** directory in the application root directory for the Teamcenter installation.

3. In the **Maintenance** panel, select **Migrate Teamcenter to another JRE** and then click **Next**.

4. The **Migrate Teamcenter to another JRE** panel lists Teamcenter services that depend on the JRE and must be shut down before the migration can begin.

   After you make sure these services are shut down, select **All features from the above list have been shut down**, and then click **Next**.

5. In the **JRE Location** panel, enter the path to the JRE you want Teamcenter to use.

   > Caution:
   >
   > Make sure you specify a 64-bit JRE.

   > Note:
   >
   > Depending on the features in your configuration, TEM may prompt you for the operating system user password.

6. In the **Confirmation** panel, click **Start** to migrate Teamcenter to the specified JRE.

If you encounter problems migrating Teamcenter to the new JRE, see the available **troubleshooting solutions**.

17. Deploying localized versions of Teamcenter

Deploying rich client localizations

Deploy rich client localizations

If you change the strings of a localized rich client user interface, you must convert the files to Unicode and regenerate the Java archive (JAR) file.

To identify the localized user interface files you need, look for the language and country identifier added to the base resource file. For example, for the **aif_locale.properties** English resource file, which must remain in English, the equivalent Japanese file is named **aif_locale_ja_JP.properties**.

Convert native **.properties** files to Unicode as follows:

1. Copy the base file to a temporary file name, for example, from **aif_locale.properties** to **aif_locale_temp.properties**.

2. Edit the *base*_**locale**_*temp*.**properties** file, modifying the values to the correct native language.

3. Save the file.

4. Run the **native2ascii** utility against the temporary properties file to convert it to a Unicode properties file.
   The **native2ascii** utility is in the **\bin** directory of Java SDK 1.4.
   For more information, access the following URL:

   http://download.oracle.com

   For example, to convert the properties file from Japanese to Unicode, enter the following command from the command line:

   ```
   native2ascii -encoding SJIS aif_locale_temp.properties aif_locale_ja_JP.properties
   ```

   The final locale-specific properties file or the output of the **native2ascii** file must have the *base*_**locale**_*locale-id_language-id*.**properties** file format.
   The rich client finds the value of a key in the following order:

   BASE_user.properties
   BASE_locale-ID_language-ID.properties
   BASE_locale.properties
   BASE.properties

5. Recompile the JAR file.

6. Install fonts if necessary.
   For information about fonts, see the Oracle Java web site.

For more information about converting files to Unicode, see the Unicode Consortium web site:

http://www.unicode.org/

Display Siemens Digital Industries Software-provided rich client localizations

To display a Siemens Digital Industries Software-provided localized rich client user interface, set the locale of the client workstation to one of the Siemens Digital Industries Software-provided locales. No other steps are required.

In addition to English, Siemens Digital Industries Software provides the Teamcenter rich client user interface localized for the following languages:

- Chinese (Simplified)
- Chinese (Traditional)
- Czech
- French
- German
- Hebrew
- Italian
- Japanese
- Korean
- Polish
- Portuguese (Brazilian)
- Russian
- Spanish

Update rich client localized text

If you change the strings of a localized rich client user interface, you must convert the files to Unicode and regenerate the Java archive (JAR) file.

To identify the localized user interface files you need, look for the language and country identifier added to the base resource file. For example, for the **aif_locale.properties** English resource file, which must remain in English, the equivalent Japanese file is named **aif_locale_ja_JP.properties**.

Convert native **.properties** files to Unicode as follows:

1. Copy the base file to a temporary file name, for example, from **aif_locale.properties** to **aif_locale_temp.properties**.

2. Edit the *base*_**locale**_*temp*.**properties** file, modifying the values to the correct native language.

3. Save the file.

4. Run the **native2ascii** utility against the temporary properties file to convert it to a Unicode properties file.
   The **native2ascii utility** is in the **\bin** directory of Java SDK 1.4.
   For example, to convert the properties file from Japanese to Unicode, enter the following command from the command line:

   ```
   native2ascii -encoding SJIS aif_locale_temp.properties aif_locale_ja_JP.properties
   ```

   The final locale-specific properties file or the output of the **native2ascii** file must have the *base*_**locale**_*locale-id*_*language-id*.**properties** file format.
   The rich client finds the value of a key in the following order:

   BASE_user.properties
   BASE_locale-ID_language-ID.properties
   BASE_locale.properties
   BASE.properties

5. Recompile the JAR file.

6. Install fonts if necessary.
   For information about fonts, see the Oracle Java web site.

For more information about converting files to Unicode, see the Unicode Consortium web site:

http://www.unicode.org/

Configuring client display language

Choose a display language

The default language displayed is the one specified by your operating system locale settings. You can choose to override the default display language if required.

At each logon, you can choose between multiple languages, depending on your company's policy and installation. There are two ways you can specify the language:

- Specify the language in the URL. For example:
  - To specify French, type **http://myhost:7001/tc/webclient?lang=fr** in the URL.
  - To specify Russian, type **http://myhost:7001/tc/webclient?lang=ru** in the URL.

Note:

- When specifying a language in the URL, use standard **W3C locale identifiers**.
- If your network uses IPv6 (128-bit) addresses, use the hostname in URIs and do not use the literal addresses, so the domain name system (DNS) can determine which IP address should be used.

- Specify the language in your browser preferences. For example, in Microsoft Internet Explorer, perform the following steps:

  1. Choose **Tools** → **Internet options...**.
  2. Click **Languages** in the **Internet Options** dialog box.
  3. Click **Add** in the **Language Preference** dialog box.
  4. Click any language in the **Add Language** dialog box.
  5. Click **OK** in the **Add Language** dialog box.
  6. Click the language you want to see in the user interface in the **Language Preference** dialog box.
  7. Click the **Move Up** button.
     The language you move to the top of the list in the **Language Preference** dialog box is the language you see in the user interface.
  8. Click **OK** in the **Language Preference** dialog box.
  9. Click **OK** in the **Internet Options** dialog box.
  10. Log on and view the user interface in the language you chose.

      Note:

      An error message is displayed if the specified language is unavailable.

Your ability to set the language for the client depends on the character set encoding of the Teamcenter server host and also the character set encoding of the Teamcenter database.

Note:

To prevent mixed-language display after you change the client display language, clear your web browser cache. This prevents the interface from displaying in mixed languages.

You can also **configure language display during Teamcenter installation**.

Choose a display language for the rich client

By default, the rich client is displayed in the language specified by the operating system. If you want to override the default language, you can choose the display language for the rich client.

Note:

- Your ability to set the language for the rich client depends on the character set encoding of the Teamcenter server host and also the character set encoding of the Teamcenter database.
- **Other systems**

  Set your system font to a font that supports Asian multibyte characters. For example, on Windows systems other than Windows 10, the **Arial Unicode MS** font can be set to **Message Box** to correct this problem.

Similarly, if you find that Asian multibyte characters do not display correctly when you start the rich client using the native language (**-nl**) option, restart your system in the appropriate locale and set your system font to a font that supports Asian multibyte characters.

If you want to override the default language to launch the rich client in a desired language, add the **-nl** argument to the rich client launch command:

```
TC_ROOT\portal.bat -nl locale-code
```

Replace *TC_ROOT* with the Teamcenter home directory, and replace *locale-code* with the **desired locale code**.

For example, to launch the rich client Italian user interface, enter the following from a command prompt:

```
D:\tc\rac\portal.bat -nl it_IT
```

Alternatively, on Windows systems, you can customize the properties for the Teamcenter rich client desktop shortcut icon  to specify a desired language:

1. On your desktop, right-click the Teamcenter rich client shortcut icon  .
2. Choose **Properties**.
   A properties dialog box is displayed.
3. Click the **Shortcut** tab.

4. In the **Target** box, add an **-nl** argument to specify the desired language.
   The **-nl** argument accepts a single string as value. The string must be one of the **supported locale codes**.
   For example, to run the rich client Italian user interface:

   ```
   D:\tc\rac\portal.bat
   ```

   becomes:

   ```
   D:\tc\rac\portal.bat –nl it_IT
   ```

> Note:
>
> To prevent mixed-language display the next time you run the rich client after you change the **-nl** argument value, or after you change your operating system locale, delete the **Teamcenter** directory under your user directory (**C:\Documents and Settings***user-name***Teamcenter**).

> Caution:
>
> If you use the Lifecycle Visualization embedded viewer, do *not* use the **-nl** argument when you launch the rich client.
>
> For the embedded viewer to work properly, the operating system locale and the rich client runtime locale must match. The **-nl** argument overrides the Java locale and can cause incorrect behavior in the embedded viewer.

Choose the default language for the Teamcenter server process

Teamcenter server (TcServer) processes and other Teamcenter processes, and Teamcenter command-line utilities, start in the language specified in the **TC_language_default** environment variable. To make these display in a different preferred locale, set the **TC_language_default** environment variable to a supported locale code.

Teamcenter allows users to select a locale on their client hosts, regardless of the locale used by the Teamcenter server pool manager. Requested locales *must* be installed on the Teamcenter server (which may not be true for customized locales) and the server system be configured to accept the locale encoding.

Add multibyte character support in an English rich client

1. In the rich client **\rac\plugins\configuration_***config-name* directory, create the **customer.properties** file, if it does not already exist.

> Note:
>
> Do not save the **customer.properties** file in Unicode or UTF-8 format. The **customer.properties** file must be in the default format (for example, ANSI) to be read successfully by the rich client.

2. Open the **customer.properties** in a plain text editor.
3. Add the following line to the file to set the **UseDefaultSwingFonts** property.

   ```
   UseDefaultSwingFonts=true
   ```

4. Save the file and exit the text editor.
5. Change to the **rac\registry** directory.
6. Run the **genregxml.bat** utility to register the change.

> Note:
>
> When you run Teamcenter in a multibyte environment, make sure the **TC_XML_ENCODING** environment variable is set to **UTF-8** and the **UGII_UTF8_MODE** environment variable is set to **1**.

18. Creating a custom distribution

Overview of custom distributions

Teamcenter supports the following custom distributions to simplify installation of Teamcenter on multiple hosts.

- Silent distribution
  A *silent distribution* is an XML-based configuration file you can use to install Teamcenter *silently* (without user interaction) on another host. Silent installation suppresses most installation prompts and requires minimal user interaction. As an alternative to installing and configuring Teamcenter on individual hosts in your network, silent installation provides an efficient way to deploy Teamcenter on multiple hosts in your network.
  The silent installation configuration file records the selections and values you enter during a Teamcenter installation and enables TEM to perform these steps noninteractively on other hosts. You can modify a silent configuration file to change certain Teamcenter settings before installation.
  Silent distributions are supported for Teamcenter servers, two-tier rich clients, and four-tier rich clients.

- Compact distribution
  A *compact distribution* is an installable package with a selected subset of Teamcenter client features. It is much smaller than a full Teamcenter software kit and is more easily distributed to multiple hosts in an organization.
  A compact distribution is an alternative to installing Teamcenter from a full Teamcenter software kit. A compact deployable package can contain a selected subset of Teamcenter features rather than the entire set of features in the release. This reduces network loads and simplifies large-scale Teamcenter deployments by providing an installation package that is smaller and more easily distributed to an organization. For example, a two-tier rich client installation can be packaged in a deployable media as small as 580 MB, where a full Teamcenter distribution can require up to 5 GB. A four-tier rich client compact distribution can be as small as 283 MB, and a Client for Office compact distribution can be only 93 MB.
  Compact distributions are supported for Teamcenter two-tier and four-tier rich clients.

Create a silent distribution

Create a silent installation configuration file

1. Log on to the Teamcenter corporate server host and browse to the root directory of the Teamcenter software kit.

2. Start Teamcenter Environment Manager (**tem.bat**) from the Teamcenter software kit. Right-click the **tem.bat** program icon and choose **Run as administrator**.

3. In the **Welcome to Teamcenter** panel, select **Teamcenter**.

4. In the **Install/Upgrade Options** panel, select the **Create custom distribution** check box, and then click **Install**.

5. In the **Custom Distribution Options** panel, select **Create silent configuration file**, and then specify the path to the silent installation file, for example, **C:\silent.xml**. The specified path must be to an existing directory and the file name must end in **.xml**.

6. Proceed through the remaining panels to complete the Teamcenter installation.

   Teamcenter Environment Manager creates the silent installation file you specified in step 5. This file records your settings and selections during the installation. You can use this file to silently install Teamcenter on another host with the same settings.

> Caution:
>
> If you install a rich client silently using a compact distribution and your silent configuration file requires features not included in the compact distribution, the silent installation fails. To avoid this, make sure your silent configuration requires only features in the **compact distribution**, or install using a full Teamcenter software kit.

Launch a silent installation

To launch a **silent installation**, type the following command:

tem.bat -s *file-name*.**xml**

Replace *file-name* with the name of the silent installation configuration file.

After installation is complete, you can view a log of the installation in the **install***xxx*.**log** file under the **install** directory in the Teamcenter application installation directory.

> Note:
>
> The rich client can be uninstalled only through the TEM interface. Silent uninstallation is not supported.

Modify the silent installation configuration file

The **silent installation configuration file** is XML-based. After creating the file and establishing the file structure using Teamcenter Environment Manager, you can change the installation by manually modifying the values of the XML elements described in the following table.

Caution:

Siemens Digital Industries Software recommends using an XML editor to ensure well-formed XML code. Do not change the XML structure of the file. If XML file structure is incorrect, or the XML code is not well-formed, installation fails.

Element	Description
features	Lists all the Teamcenter modules and features to be installed. These are selected on the **Features** panel of Teamcenter Environment Manager.
feature	Specifies one feature of a Teamcenter module. The **code** attribute identifies the feature. To define whether Teamcenter Environment Manager installs the feature, set the **selected** attribute to either **true** or **false**.
data	Lists all Teamcenter Environment Manager Java classes and values defining aspects of installation, such as the path to the installation directory for Teamcenter application files. For additional information, see the comments in the configuration file. The comments describe the class and valid values.

Sample silent installation configuration file

```
<?xml version="1.0" encoding="UTF-8"?>
<root>
<tem engine="2008.0.0" />
 <settings>
   <installDir value="C:\\Program Files\\Siemens\\Teamcenter13.0" />
   <sourceDir value="D:\\kits\\tc13.0\\win64" />
   <application value="tceng" />
   <silentMaintenance value="false" />
   <installingUser value="osuser" />
   <installLanguage value="ENGLISH" />
   <aboutFullVersion value="13.0" />
   <version value="12000.1.0.20181207" />
 </settings>
 <sourceLocations>
   <coreLocations>
      <directory value="D:/kits/tc13.0/win64" />
   </coreLocations>
   <browsedLocations />
 </sourceLocations>
 <config name="My Configuration 1" id="config1">
   <mode type="install" clone="false">
    <checkpoints>
      <checkpoint value="featureProperties">
         <point value="vcruntimes:vc2005,latest" />
         <point value="minMSSQL2005Version:10.50" />
         <point value="coreTemplate:foundation_template.xml" />
         <point value="feature_id:datamodel,rtserver" />
         <point value="vcruntimes:latest" />
         <point value="template_file:foundation_template.xml" />
         <point value="minDB2Version:9.7.4" />
         <point value="minOracleVersion:11.2.0.1" />
         <point value="template_name:foundation" />
         <point value="typeAnalysis:true" />
      </checkpoint>
    </checkpoints>
   </mode>
   <comments />
   <data>
    <adminUser guid="2E53CFC3AC75665E50FF0F207D1D013B">
      <password value="holrvg6fpj40nGt7ZlCM2Q" encrypt="true" />
      <user value="infodba" />
    </adminUser>
    <director guid="661AA2A766CA975D998EBE61455F3EA3">
      <saveStateOnFail value="true" />
      <status value="0" />
      <script>
        <temBase />
        <copyFeature name="Microsoft Visual C++ Runtimes"
feature="A0CF69C3A0BC61770EB81BD22667EA52" />
        <copyFeature name="Business Modeler IDE"
feature="A9CECD82127A11DB9804B622A1EF5492" />
        <copyFeature name="VC 2008 Redistributables"
feature="DPBL8RC6MUS0LCPS10NIPGR85RI7HPHQ" />
        <copyFeature name="Teamcenter File Services"
feature="BC76F9D1AB7C93A848D0FE3602F59097" />
        <copyFeature name="Flex License Server"
```

```
feature="D1D683A8B2CE1EB821B97CD2EE5D7627" />
        <copyFeature name="VC 2005 Redistributables"
feature="UDR4NG0DEZ1TN9XHKG7Z8AFDPVVTZXL2" />
        <copyFeature name="VC 2013 Redistributables"
feature="NJCMQH3ZMYTPPPGA8BS4Q1C7OV6IXVXU" />
        <copyFeature name="VC 2010 Redistributables"
feature="R08U30BA5KZYSNDFKMGXKKHWEYOOVD7V" />
        <copyFeature name="VC 2012 Redistributables"
feature="Z9ICW073V9QXU4H5F8BK6CXG6KFYWBQZ" />
        <copyFeature name="Business Modeler Templates"
feature="A909338A1CB411DB8AF6B622A1EF5492" />
        <copyFeature name="Digital Dashboard"
feature="A9CECD82127A11DB9804B622A1EF5599" />
        <copyFeature name="FMS Server Cache"
feature="90C2A1C96F6A61FAB397AF88ABE4AAC1" />
        <copyFeature name="Teamcenter Foundation"
feature="8C061DD51E13E0CB9DC4687B1A3348BE" />
        <copyFeature name="NX Part Family Classification Integration"
feature="B176F6B6E9E91D9804EFB0D2
        010FD613" />
        <copyFeature name="Server Manager" feature="BF0E78AFE4280DCB08594EA2F3671BE8" />
.
.
.
        <unpack name="Microsoft Visual C++ Runtimes"
feature="A0CF69C3A0BC61770EB81BD22667EA52" />
        <unpack name="FMS Server Cache" feature="90C2A1C96F6A61FAB397AF88ABE4AAC1" />
        <unpack name="Teamcenter Foundation"
feature="8C061DD51E13E0CB9DC4687B1A3348BE" />
        <unpack name="NX Part Family Classification Integration"
feature="B176F6B6E9E91D9804EFB0D2010FD
        613" />
        <preInstall name="Microsoft Visual C++ Runtimes"
feature="A0CF69C3A0BC61770EB81BD22667EA52" />
        <preInstall name="FMS Server Cache" feature="90C2A1C96F6A61FAB397AF88ABE4AAC1" />
        <preInstall name="Teamcenter Foundation"
feature="8C061DD51E13E0CB9DC4687B1A3348BE" />
        <preInstall name="NX Part Family Classification Integration"
feature="B176F6B6E9E91D9804EFB0D20
        10FD613" />
        <install name="Microsoft Visual C++ Runtimes"
feature="A0CF69C3A0BC61770EB81BD22667EA52" />
        <install name="FMS Server Cache" feature="90C2A1C96F6A61FAB397AF88ABE4AAC1" />
        <install name="Teamcenter Foundation"
feature="8C061DD51E13E0CB9DC4687B1A3348BE" />



        <install name="NX Part Family Classification Integration"
feature="B176F6B6E9E91D9804EFB0D2010F
        D613" />
        <postInstall name="Microsoft Visual C++ Runtimes"
feature="A0CF69C3A0BC61770EB81BD22667EA52" />
        <postInstall name="FMS Server Cache"
feature="90C2A1C96F6A61FAB397AF88ABE4AAC1" />
        <postInstall name="Teamcenter Foundation"
feature="8C061DD51E13E0CB9DC4687B1A3348BE" />
        <postInstall name="NX Part Family Classification Integration"
feature="B176F6B6E9E91D9804EFB0D2
        010FD613" />
```

```
        <featureInstalled name="Microsoft Visual C++ Runtimes"
feature="A0CF69C3A0BC61770EB81BD22667EA5
        2" />
        <featureInstalled name="FMS Server Cache"
feature="90C2A1C96F6A61FAB397AF88ABE4AAC1" />
        <featureInstalled name="Teamcenter Foundation"
feature="8C061DD51E13E0CB9DC4687B1A3348BE" />
        <featureInstalled name="NX Part Family Classification Integration"
feature="B176F6B6E9E91D9804E
        FB0D2010FD613" />
      </script>
    </director>
    <FSCService guid="F2FCBCEC03DFF7F9D1E3A11EC9B64BD2">
      <fscReadCacheDir value="$HOME\\FSCCache" />
      <fscWriteCacheDir value="$HOME\\FSCCache" />
      <addToBootstrap value="true" />
      <fscReadCacheSize value="10" />
      <serverID value="FSC_tchost_osuser" />
      <log value="" />
      <fscWriteCacheSize value="10" />
    </FSCService>
    <FSCMasterSettings guid="EBC3422F77C6BF18FE0E3A821EFE1134">
      <masterModel value="Simple Model" />
    </FSCMasterSettings>
    <FscSiteImport guid="630BECF927EC742A748A97486D5868DA">
      <remoteSites value="" />
    </FscSiteImport>
    <tcdata guid="4500621E2BE24BF0DD6ABF31EBA01088">
      <serverHostLocation value="tchost" />
      <path value="C:\\Program Files\\Siemens\\tcdata" />
      <create value="true" />
      <shareName value="" />
      <dsmKeyPath value="" />
    </tcdata>
    <FSCServiceFCCDefaults guid="7311DC5E94724BED0DD7419FCDE055CF">
      <writeCacheSize value="1000" />
      <readCacheSize value="1000" />
      <cacheDirUnix value="/tmp/$USER/FCCCache" />
      <partialReadCacheSize value="3000" />
      <cacheDirWin value="$HOME\\FCCCache" />
    </FSCServiceFCCDefaults>
    <FccSite guid="35EE6A66B85467D5EDE5B3D91871EACE">
      <siteListString value="" />
    </FccSite>
    <FSCServiceConnections guid="E4BDA0B521CB10A49F0CE123C9F326F1">
      <connections value="http,4544,;" />
    </FSCServiceConnections>
    <OSUser guid="CA769D31FD7E122E5E509A0BBBD7E809">
      <password value="+rfq6mTJVSuqaYJixkwntg" encrypt="true" />
      <user value="DOMAIN\\osuser" />
    </OSUser>
    <flexClient guid="7221ECFBC9555CDF997FC3F575022761">
      <nX5String value="28000@flexhost" />
      <port value="27000" />
      <nX4String value="27000@flexhost" />
      <nX5Port value="28000" />
      <host value="flexhost" />
      <nX5Host value="flexhost" />
      <nX5CheckBox value="true" />
      <envServerString value="28000@flexhost" />
```

```
    </flexClient>
    <signatureCertificate guid="RRK3WTCSY4020QSZO90QFJWMISFAC2AX">
      <replaceCerts value="false" />
      <certificates value="" />
    </signatureCertificate>
    <foundationSettings guid="LHBY67ZYMYHSKED26FHDNDHFJTZD84I7">
      <templatesToBeInstalled value="" />
      <genClientCache value="generate all" />
      <genServCache value="" />
      <productionEnvironment value="true" />
      <requestMetaCacheRebuild value="true" />
      <enableGenServCache value="true" />
      <quickClone value="false" />
    </foundationSettings>
    <transientVolume guid="983980098FF188A8C4BF08E8168A32A8">
      <windowsVolume value="C:\\Temp\\transientVolume_tcdbuser" />
      <unixVolume value="/tmp/transientVolume_tcdbuser" />
    </transientVolume>



    <TcOracleSystem guid="1EF0859AC04962CBFA41C4C8C84499A1">
      <password value="WsRDrEfD0/4vnLO0/mj2wA" encrypt="true" />
      <user value="system" />
      <tablespaces
value="tcdbuser_IDATA:90;tcdbuser_ILOG:5;tcdbuser_INDX:5;tcdbuser_TEMP:5;tcdbuser_MM
      V:5" />
      <tablespacePath value="/db/oradata/tc/tcdbuser" />
    </TcOracleSystem>
    <security guid="ZUG63OE2YRNFD1VY13KCEZM52XFJP45D">
      <adminDirectory value="$TC_ROOT\\security" />
    </security>
    <volume guid="1F16971107DE44C0C7827F800EE4AEF8">
      <port value="4544" />
      <fscModel value="Simple Model" />
      <location value="C:\\Program Files\\Siemens\\volume" />
      <name value="volume" />
      <hostName value="tchost" />
      <fscId value="FSC_tchost_osuser" />
    </volume>
    <TcOracleEngine guid="F4F7C0852B27D6E56B8C64BE77FFA14C">
      <port value="1521" />
      <createUser value="true" />
      <host value="dbhost" />
      <flush value="false" />
      <populate value="true" />
      <service value="tc" />
      <uTF8Enabled value="true" />
      <password value="AdxT7Jmz2/WbYF6O/eqX9g" encrypt="true" />
      <user value="tcdbuser" />
      <create value="true" />
    </TcOracleEngine>
   </data>
   <features>
      <add feature="A0CF69C3A0BC61770EB81BD22667EA52" name="Microsoft Visual C++
Runtimes" />
      <add feature="90C2A1C96F6A61FAB397AF88ABE4AAC1" name="FMS Server Cache" />
      <add feature="8C061DD51E13E0CB9DC4687B1A3348BE" name="Teamcenter Foundation" />
      <add feature="B176F6B6E9E91D9804EFB0D2010FD613" name="NX Part Family
Classification Integration"
```

```
        />
      </features>
    </config>
    <updateManager />
  </root>
```

Create a compact distribution

Create a *compact distribution*, a Teamcenter installation package that contains selected features, using Teamcenter Environment Manager (TEM).

> Note:
>
> Compact distribution is recommended only for Teamcenter client configurations, not for servers.

1. Log on to the Teamcenter corporate server host and browse to the root directory of the Teamcenter software kit.

2. Start TEM (**tem.bat**) from the Teamcenter software kit. Right-click the **tem.bat** program icon and choose **Run as administrator**.

3. Proceed to the **Install/Upgrade Options** panel, select the **Create custom distribution** check box, and then click **Install**.

4. In the **Custom Distribution Options** panel, select **Create compact deployable media**. Enter the path in which to create the compact distribution and a file name for the package, for example, **C:\tc.zip**.

   The specified path must be to an existing directory and the file name must end in **.zip**.

5. Proceed through the remaining panels to complete the Teamcenter installation.

   TEM creates the compact distribution file you specified in step 4. You can use this file to install Teamcenter clients on other hosts.

> Caution:
>
> If you **create a silent installation** using a compact distribution and your silent configuration file requires features not included in the compact distribution, the silent installation fails. To avoid this, make sure your silent configuration requires only features in the compact distribution, or install using a full Teamcenter software kit.

19. Installing Teamcenter patches

Using Updates Manager

On Teamcenter servers and two-tier rich clients, you install patches using the Updates Manager, a feature of Teamcenter Environment Manager (TEM). 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

Distribution of Teamcenter updates

Teamcenter 13 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.

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

Before you apply downloaded Teamcenter 13 patches to your server, you must do the following:

- Install the base Teamcenter 13 release.

- Stop all Teamcenter 13 related processes and services (such as FSC, database daemons, and others).

Note:

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 10.1 patch to a Teamcenter 13 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 *TC_ROOT* **\install** directory and skip the following steps.

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

2. Open a command prompt.

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

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
   ```

   Note:

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

   - Add the path to your *TC_ROOT***install****install** directory to your **PATH** environment variable and enter the **7za** command again.

   - Enter the **7za** command with the full path to your *TC_ROOT***install** directory, for example:

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

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.

> Note:
>
> 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=infodba -p=infodba -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.

Estimate tablespace requirements for update

Updating to Teamcenter 13.0 temporarily requires additional database tablespace.

To improve system performance, Teamcenter 13.0 converts **POM_Stub** and **ImanExportRecord** objects to lightweight objects (LWOs). This changes the persisted schema, and these schema changes require some of the persisted data (including the **POM_Object** class table) to be reorganized. For large databases, these changes could take many days to complete by the prior approach of updating each row of the table. The Teamcenter 13.0 update process makes a copy of the table, inserting and modifying rows into the copy during the copying process. This update process then replaces the original data tables with the modified data tables. This update performance improvement requires more disk space, but only for the duration of the update process.

Make sure your system has sufficient disk space to accommodate these needs during the update process.

Oracle databases:

1. **Back up existing Teamcenter data**.

2. Determine the tables affected by the update to Teamcenter 13.0.

   a. Enter the following SQL command:

   ```
   SELECT ptname FROM PPOM_CLASS
   WHERE BITAND(pproperties, 8192) <> 0
   UNION
   SELECT ptname FROM PPOM_CLASS
   ```

```
WHERE BITAND(pproperties, 32768) <> 0;
```

b. To the resulting list of tables, add the **PIMANEXPORTRECORD** and **PPOM_STUB** tables, which are also affected by the update process.

3. Determine the amount of space consumed by each affected table.
For each table identified in step 2 (including **PIMANEXPORTRECORD** and **PPOM_STUB**), enter the following SQL command:

```
WITH cte1
       AS (SELECT table_name
          FROM   user_tables
          WHERE  table_name = 'TABLE-NAME'),
       cte2
       AS (SELECT SUM(blocks) * 8 / 1024 MB
          FROM   dba_extents,
                  cte1

  WHERE  owner = (SELECT SYS_CONTEXT('userenv', 'current_schema')
                         FROM   dual)
                 AND segment_name = cte1.table_name)
SELECT ROUND(SUM(mb), 0) || ' MB' AS ESTIMATED_SPACE
FROM   cte2;
```

Replace *TABLE-NAME* with the name of the given table.

4. Determine the amount of additional free space you need to complete the update to Teamcenter 13.0.

Table	Space needed	Where space is needed
Tables found in step 2a	1.5 times current space	Current tablespace of the given table
PIMANEXPORTRECORD	1.5 times current space	Database user's default tablespace
PPOM_STUB	1.5 times current space	Database user's default tablespace

5. Optionally, specify locations for new tablespaces and indexes.

- If you want to ensure tables are rebuilt in a specific tablespace, set the **TC_UPGRADE_TABLE_STORAGE** environment variable to the appropriate tablespace name before you launch TEM to begin the update.

- If you want to ensure indexes for the upgraded tables are rebuilt in a specific tablespace, set the **TC_UPGRADE_INDEX_STORAGE** environment variable to the appropriate tablespace name before you launch TEM to begin the update.

> Note:
>
> This applies *only* to tables identified in step 2a. The **PIMANEXPORTRECORD** and **PPOM_STUB** tables can only be rebuilt in the default tablespace.
>
> After the update is complete, you can move tables back to their original tablespaces.

Microsoft SQL Server databases:

1. **Back up existing Teamcenter data**.

2. Change the recovery model of the SQL Server database to **SIMPLE**.

> Note:
>
> - After the update, set the recovery model back to its previous value.
>
> - For information about changing the recovery model, see Microsoft SQL Server help:
>
> **https://msdn.microsoft.com**

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

3. Launch TEM (**Start→Programs→Teamcenter 13→Environment Manager**).

> Note:
>
> 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.

> Note:
>
> 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.

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

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 7, 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. After you patch your first server, you can patch remaining servers concurrently.

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 Teamcenter 13 software kit, locate the **data.zip** in the **tc** directory.

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

3. Launch TEM (**Start→Programs→Teamcenter 13→Environment Manager**).

   Note:

   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.

> Note:
>
> 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.

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

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:

```
tem.bat -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 **tem.bat**, see the *Utilities Reference*.

> Note:
>
> If the path to the patch location contains spaces, you must enclose the path in quotation marks (**"**). For example:
>
> ```
> tem.bat –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. In Windows Explorer, browse to the *WEB_FILES_LOC***Web_tier** directory and inspect its contents.

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

4. Update the Web Application Manager:

   a. Browse to the **Web_tier** directory in the Teamcenter 13.0 software kit.

   b. Expand the **INSTALL_TCWEB.EXE** file into your existing *WEB_ROOT* directory, overwriting existing files.

5. Open the *WEB_ROOT* directory and run the Web Application Manager (**insweb.bat**).

6. Click **Copy ICDs**.

7. Browse to the *WEB_FILES_LOC***Web_tier\icd** directory and click **OK**.

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**.

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

10. In the **Modify Disk Locations** dialog box, click **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

The *patch-id*_**pub.zip** file includes a **release_info** directory that contains the patch set **README** file. Review this **README** file for information about the patch and possible additional steps required to complete the patch installation.

20. Uninstalling Teamcenter

Uninstall Teamcenter configurations

You can remove Teamcenter configurations using Teamcenter Environment Manager (TEM). To completely uninstall a Teamcenter deployment, you must remove all configurations in the deployment.

To remove a single Teamcenter configuration, use the **Remove configuration** option in the **Configuration Maintenance** panel in TEM.

To remove an entire Teamcenter deployment, perform the following steps:

1. Log on to the operating system using the user account under which you installed Teamcenter.

2. Stop all Teamcenter services using the **Services** dialog box in the Windows Control Panel.

3. Start Teamcenter Environment Manager (TEM):
   From the **Start** menu, choose **Programs→Teamcenter 13→Environment Manager**, then right-click and choose **Run as administrator**.
   You can also run the **tem.bat** file in the **install** directory in the application root directory for the Teamcenter installation.

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

5. Select the configuration to uninstall from the displayed list.

   > Note:
   >
   > TEM removes *only* the configuration you select.

6. Proceed to the **Uninstall** panel. Select
   The **Configuration Display** panel shows all configurations in the Teamcenter installation. Review the configuration details, and then click **Next**.

7. Proceed to the **Uninstall** panel. Select **Yes** to confirm that you want to remove the selected configuration.

8. If the configuration includes Teamcenter Foundation, TEM displays the **Uninstall Teamcenter Foundation** panel. Specify whether you want to remove the Teamcenter database, *TC_DATA* directory, and volume. You must enter database server credentials to remove the database.

9. Proceed to the **Confirmation** panel and click **Start** to begin the uninstallation.
   TEM removes the Teamcenter configuration.

If the uninstallation is not successful, TEM stops processing when it encounters the error and displays a message indicating the location of the log file containing the error.

10. If you selected the option in TEM to remove the Teamcenter database, the database is moved to the Oracle recycle bin. To permanently remove the database, launch SQL*Plus and enter the following command:

```
PURGE RECYCLEBIN;
```

11. If you want to remove additional configurations, return to step 5.

TEM does not remove TCCS cache files (cache files generated by the FSC or FCC). After Teamcenter uninstallation, you can manually delete these cache files.

If you shared the *TC_DATA* directory, TEM may not completely remove this directory because it may be locked by sharing. To completely uninstall this directory, you must unshare it before you begin uninstallation.

Uninstall TCCS

If you installed Teamcenter client communication system (TCCS) as part of an installation of the rich client or Teamcenter Microsoft Office interfaces, uninstalling those clients automatically uninstalls TCCS from your system.

If you installed TCCS using the stand-alone installation wizard, perform the following steps to uninstall TCCS.

1. Stop the FMS client cache (FCC) process:

   a. Open a command prompt.

   b. Change to the **\tccs\bin** directory in the TCCS installation directory.

   > Note:
   >
   > The default TCCS installation directory is **C:\Program Files\Siemens\Teamcenter***version* **\tccs**.

   c. Type the following command:

   ```
   fccstat -stop
   ```

   After stopping the FCC process, the **fccstat** command reports that the FCC is offline.

   d. Close the command prompt.

2. Uninstall TCCS:

    a. In the Windows Control Panel, open the **Add or Remove Programs** dialog box.

    b. In the list of installed programs, select and remove **Teamcenter client communication system**.

    c. Restart the system to unset the **FMS_HOME** environment variable.

Uninstall Oracle

For information about uninstalling Oracle, see the Oracle installation guide on the appropriate Oracle CD-ROM.

Uninstall SQL Server

1. Open the **Add or Remove Programs** dialog box in the Windows Control Panel.

2. Double-click **Add or Remove Programs**.
   Windows displays the **Add/Remove Programs** dialog box.

3. From the list of installed programs, select **SQL Server** *version* and click **Remove**.
   The program removes all files and directories created during the initial installation. For more information about uninstalling SQL Server, see the SQL Server documentation.

A. Troubleshooting

Troubleshooting Teamcenter server installation

Installation log files

Teamcenter Environment Manager generates files in the **install** directory under the Teamcenter application root directory.

- **install***date-time_configuration-ID***.log**
  Teamcenter Environment Manager generates a log file for each installation and configuration you create. The log file contains a record of activities performed by Teamcenter Environment Manager. Keep these files to maintain a complete history for troubleshooting purposes.

- **insautonomy.log**
  This file contains an installation record for Intelligent Data Operating Layer (IDOL) server, the default full-text search engine.

- **configuration.xml**
  This file contains a record of the Teamcenter installation. Teamcenter Environment Manager uses the configuration file to enable you to maintain the installation, including adding and removing components, patching installations, and upgrading installations.

  > Caution:
  >
  > Do not remove the **configuration.xml** file. Removing the **configuration.xml** file results in the inability to modify the installation using Teamcenter Environment Manager.

- **uninstall.xml**
  This file contains a record of the Teamcenter uninstallation.

In addition, auxiliary programs called by Teamcenter Environment Manager generate files in the **logs** directory under the Teamcenter application root directory. Most files have the format:

*program-name***.syslog**
*program-name***.log**

Of these files, the system log (**.syslog**) files usually contain the most relevant error data.

Problems/error messages

See the following information for help resolving errors encountered during Teamcenter installation.

Problem/error message	Possible cause	Solution
TEM does not start, reports JRE not found.	JRE path is not set in the system environment.	Set the **JRE_HOME** or **JRE64_HOME** environment variable to specify the path to the required Java Runtime Environment (JRE). For more information, see *Java Runtime Environment*.
	JRE path is set incorrectly in the system environment.	Make sure the path specified in the **JRE_HOME** or **JRE64_HOME** environment variable is correct. For more information, see *Java Runtime Environment*.
	The specified JRE has been removed from the system.	If you installed a new Java Runtime Environment (JRE) and removed the previous JRE after you installed Teamcenter, TEM cannot find the JRE, even if **JRE_HOME** or **JRE64_HOME** is set correctly. To resolve this problem, perform the following steps. 1. Open the following file in a plain text editor: *TC_ROOT***install****tem_init.bat** 2. Locate the following line in the file: `set TC_JRE_HOME=`*jre_location* 3. Replace *jre_location* with the path to the new JRE. 4. Save and close the file. 5. Perform the steps in *Migrate Teamcenter to a different JRE*.

Problem/error message	Possible cause	Solution
		To avoid this problem in the future, do not remove your previous JRE until after you complete migrating Teamcenter to the new JRE.

Siemens PLM License Server reports an error similar to the following:
`Cannot find license file.`
	Make sure the **SPLM_LICENSE_SERVER** system environment variable contains the correct port and host name of the Siemens PLM License Server, for example, **28000@myhost** .	If a path in the **CLASSPATH** environment variable contains whitespace characters, those paths must be enclosed in double quotes (**"**). For example:
		`"C:\Program Files \Microsoft\Web Platform`
		`Installer";D:\TcSE \apache-ant-1.9.4\bin`

An error similar to the following is displayed during a Teamcenter installation, upgrade, or patch:
`Error: Could not find or load main class files.`
	The **CLASSPATH** environment variable contains an incorrectly formatted path.	If a path in the **CLASSPATH** environment variable contains whitespace characters, those paths must be enclosed in double quotes (**"**). For example:
		`"C:\Program Files \Microsoft\Web Platform`
		`Installer";D:\TcSE \apache-ant-1.9.4\bin`

TEM reports the installation path must not contain spaces.	The installation drive specified in the **Installation Directory** does not support short file names (8.3 convention). TEM requires this capability.	Change the **Installation Directory** to a path with no spaces, or to a path on a drive that supports 8.3 file names. Tip: To determine whether support for the 8.3 file name convention is enabled for a given drive, type the following command in a command prompt: `fsutil 8dot3name query` *drive-letter*

Problem/error message	Possible cause	Solution
Teamcenter Environment Manager (TEM) cannot connect to the Microsoft SQL Server database.	If your Microsoft SQL Server database uses a named instance and the Server Browser service is not running on the database host, TEM cannot verify the connection to the database.	Make sure the Server Browser service is running on the database host.
Running Teamcenter in an IPv6 network environment, the Teamcenter client does not connect to the server at all or hangs when trying to connect to the server.	Some Teamcenter components are sensitive to link-local IPv6 addresses. You must make sure your hosts have global IPv6 addresses and use those when connecting to the Teamcenter server. Problems can occur if you use local-link IPv6 addresses.	Find your IP address using the **ping** or **nslookup** command. Make sure these commands find the a global IPv6 address, not a link-local IPv6 address. If not, or if you are unsure, contact your network administrator. Make sure your host name resolves to a global IPv6 address, not a link-local IPv6 address. Note: You can also view your host's network addresses using the **ipconfig** command (on Windows systems) or the **ipconfig** command (on Linux systems).
During logon using Kerberos authentication, Teamcenter displays the following error: `Mechanism level: Clock skew too great`	The system clock time on the Teamcenter client is significantly different from the system clock time at the Kerberos Key Distribution Center (KDC).	Synchronize the system clock times between the Teamcenter client and the KDC.
TEM displays errors like the following during installation of features: *path*`\feature_acadgmo.xml: Error on line 1 of document file: `*path*`/feature_acadgmo.xml: Premature end of file.`	If you launched TEM from a shortcut with an incorrect working directory, TEM encounters problems installing or updating features.	If you create a desktop shortcut to TEM, make sure the working directory (or **Start in** location) for the shortcut is *TC_ROOT***install**.

Problem/error message	Possible cause	Solution
Database daemon services do not start. These can include the following: • **Teamcenter Task Monitor Service** • **Teamcenter Subscription Manager Service** • **Teamcenter Action Manager Service** • **Teamcenter Tesselation Manager Service**	If the database daemon services run on the same host as the database server, the database daemons may attempt to start before the database server is fully running. If this happens, the daemons fail to start.	If the database daemons run on the same host as the database server, perform one of the following steps: • Manually start the database daemon services after the database server is started. • Modify the startup settings for the database daemon services to create a dependency on the database service. This ensures the daemons do not start before the database server is fully running.

During an installation or upgrade, the FMS server cache (FSC) reports a startup failure with a message similar to the following:
 	
`Installation interrupted due to the following reason:`
 	
`Processing <upgrade> of feature FMS Server Cache failed: FSC service failed to start with an error 1`
 	
However, the FSC startup log shows no errors and indicates the FSC is left running.
	Another service on the same host was running on the same port that the FSC is configured to use. This causes a fatal error to the FSC and the FSC startup log shows a bind exception on the port.
	
	Some services, such as JBoss, allow the FSC to bind to its port, resulting in failure of the FSC to start, but no errors in the FSC log.
		Change the FSC settings to use a different port.

`<<null>>\\<<null>> on host` *host-name* `does not have administrator privileges`	This error most likely indicates you attempted to start Teamcenter Environment Manager using the Windows **runas** command or the **Run as** menu command. Teamcenter Environment Manager cannot be started as a user other than the user logged on to the operating system.	Start Teamcenter Environment Manager as **a user logged onto the system with Administrator group privileges** and the **Log on as a service** right.

Update Manager FTP errors

The following table describes errors that can occur while connecting to the update server or while downloading updates.

Error	Resolution
Cannot contact server	Host or port may be incorrect. Check **Host** and **Port** values and try again.
Cannot log on	User name or password may be incorrect. Check **User** and **Password** values and try again.
Incorrect Path	Path to the directory on the update server may be incorrect. Check the path and try again.
Timeout Error	The update manager received no response from the update server. Try connecting later or contact your system administrator for assistance.
Transfer Error	Contact with the update server was interrupted. Try your operation again or contact your system administrator for assistance.

Resolving web tier connection problems

Diagnosing web tier connection problems

If the Teamcenter web tier and the corporate server do not reference the same web application name, the web tier cannot connect to the Teamcenter server.

The web application name specified in the Teamcenter web tier must match the web application name specified on the corporate server.

During installation of the Teamcenter corporate server, you specify this value in the **Web Application Name** box in the **Default Site Web Server** panel of Teamcenter Environment Manager. The default web application name is **tc**.

During installation of the Teamcenter web tier, the Web Application Manager assigns the web application the default name of **tc**.

If you specify a web application name other than **tc** during corporate server installation, you must change the corresponding value during web tier installation. If the web tier and the corporate server do not reference the same web application name, the web tier cannot connect to the Teamcenter server.

To ensure the web tier and the corporate server reference the same web application name, perform one of the following procedures:

Change the deployable file name on the corporate server

Using Teamcenter on a two-tier rich client host, set the **WEB_default_site_deployed_app_name** preference to reflect the deployable file name specified in Web Application Manager. (Alternatively, you can set this preference using the **preferences_manager** utility from a command prompt.)

Change the deployable file name on the web tier

1. In Web Application Manager, select your web application and click **Modify**.
2. In the **Modify Web Application** dialog box, click **Modify Web Application Information**.
3. Change the value in the **Deployable File Name** box to reflect the web application name you entered during corporate server installation.
4. Click **Generate Deployable File** to rebuild your web application.
5. Deploy the rebuilt web application on your web application server.

Java exception errors during command-line updates

When making updates in TEM through the command-line interface, such as adding Teamcenter features or data model update operations, certain Java exception errors may occur.

TEM performs error checking when processing command line parameters and exits quickly if it detects an error such as an invalid parameter setting. In such cases, a Java exception error similar to the following may occur:

```
Data model update
    Loading features from path
    Type: FULL
    Configuration: TEMFLOW1
    Verifying password
    Unable to locate:
        alpha1_template.zip Exception while removing reference:
java.lang.InterruptedException
        java.lang.InterruptedException at java.lang.Object.wait(Native Method) at
        java.lang.ref.ReferenceQueue.remove(ReferenceQueue.java:118) at
        java.lang.ref.ReferenceQueue.remove(ReferenceQueue.java:134) at
        sun.java2d.Disposer.run(Disposer.java:125) at
java.lang.Thread.run(Thread.java:619)
```

These types of Java exception errors are not a cause for concern because TEM begins shutting down when a problem is detected, *before* any data model updates are performed. These errors occur while

threads are closing. In the above example, the **java.lang.InterruptedException** error occurs because the main Java thread begins to exit while the Swing (GUI) thread is waiting to close.

Web Application Manager needs location of Java file when installing rich client

Under certain circumstances, the Web Application Manager does not find the Java **jakarta-regexp-1.3.jar** file required to install the four-tier rich client.

To resolve this problem, make the **jakarta-regexp-1.3.jar** file available to the Web Application Manager.

1. Locate the **bmide\compressed_files** directory in the Teamcenter software kit.
2. Expand the **bmide.zip** file to a temporary directory. (This file contains the **jakarta-regexp-1.3.jar** file.)
3. Add the temporary directory to the list of **Disk Locations for Install Images** in the Web Application Manager.
4. Build your web application WAR file using the Web Application Manager.
5. Deploy your WAR file.

Troubleshooting four-tier architecture deployment

Identify the problem you encountered in your four-tier rich client architecture and perform the solution described.

Problem	Solution
Out-of-memory error during a call to **getAttrMappingsForDatasetType**	If you use WebSphere and this occurs when launching NX from the rich client, you must **modify the JVM arguments** in WebSphere to increase memory allocation.
Error messages about the server manager pool ID	These messages indicate that the pool ID is in use by another server manager in the cluster. Either place the server managers in different clusters or configure a distinct pool ID.
Configuration is correct, but run-time errors occur	Determine from logs whether users are frequently losing a server due to the server timing out and are then having a new server assigned. Server startup can consume a great amount of CPU. Consider increasing timeout values and/or the pool size.
CFI_error displays when running AIE export in batch mode	When you run AIE Export in batch mode, Teamcenter displays a CFI error. This error occurs because **jt.exe** (Microsoft Task Scheduler) file is missing from the **%WINDOWS%** directory.

Problem	Solution
	To resolve this problem, download the Microsoft Task Scheduler from the Microsoft Developer Network: **https://msdn.microsoft.com**

Client-side Java session cookies are overwritten by web tier applications deployed in the same domain on a WebLogic application server.	Multiple applications deployed in the same WebLogic domain can cause client session cookies to overwrite each other. To avoid this, deploy your Teamcenter web application in a domain by itself or ensure each application has a separate cookie path.
	
	To set your web application session cookie path:
	
	1. Navigate to the *WEB-ROOT/staging-directory*/**webapp_root/WEB-INF** directory for the application.
	
	Note:
	
	WEB_ROOT is the location where you installed the **Web Application Manager (insweb)**, and *staging-directory* is the directory where the specific web application was generated.
	
	2. Open the **weblogic.xml** file and add the following elements:
	
	`<session-param>`
	`<param-name>CookiePath</param-name>`
	`<param-value>/`*deployable-name*`</param-value>`
	`</session-param>`
	
	Replace *deployable-name* with the deployable file name set in the Web Application Manager, for example, **tc**.
	
	3. Launch the Web Application Manager (**insweb**).
	
	4. Select the web application name and click **Modify**.
	
	5. In the **Modify Web Application** dialog box, click **Generate Deployable File**.
	
	6. In the **Generate Deployable File** dialog box, click **OK**. The Web Application Manager displays the status of the installation in the **Progress** dialog box. When the installation is complete, click **OK** to close the **Progress** dialog box.

Problem	Solution
	7. Click **OK** to close the **Modify Web Application** dialog box.
During peak activity, the web tier encounters errors obtaining JCA connections.	The Teamcenter web application is using all available connections in the connection pool. To avoid this, increase the number of available connections by increasing the **Max_Capacity** context parameter value in the web application WAR file. To set your web application maximum connection pool size: 1. Launch the **Web Application Manager (insweb)**. 2. Select the web application name and click **Modify**. 3. In the **Modify Web Application** dialog box, click **Modify Context Parameters**. 4. In the **Modify Context Parameters** dialog box, locate **Max_Capacity**, double-click the **Value** column, and type a larger number. 5. Click **OK** and click **Generate Deployable File**. 6. In the **Generate Deployable File** dialog box, click **OK**. The Web Application Manager displays the status of the installation in the **Progress** dialog box. When the installation is complete, click **OK** to close the **Progress** dialog box. 7. Click **OK** to close the **Modify Web Application** dialog box. 8. Redeploy the WAR file in your application server.
Chinese characters are displayed as square blocks in the Teamcenter rich client.	If you use a nonnative 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.

Problem	Solution
	4. In the **Advanced** tab and the **Regional Options** tab, set the required language.
Teamcenter web application fails to deploy on JBoss with the following error message: `Did not receive a response to the deployment operation within the allowed timeout period [60 seconds]. Check the server configuration file and the server logs to find more about the status of the deployment.`	The Teamcenter web application takes longer than the default 60 seconds the JBoss deployment scanner allows for deployments. Add the **deployment-timeout** attribute to the **deployment-scanner** element and set the value to at least **600** seconds before attempting to deploy the web application. `<subsystem xmlns="urn:jboss:domain:deployment-scanner:1.1"> <deployment-scanner path="deployments" relative-to="jboss.server.base.dir" s scan-interval="5000" deployment-timeout="600"/> </subsystem>`

Troubleshooting the .NET web tier

Resolving .NET server manager port conflicts

When starting the .NET Server Manager Service, Teamcenter may display a message that no Teamcenter servers are available. This can be caused by a port conflict.

To diagnose and resolve this problem, perform the following steps.

1. Open the following file in the *TC_ROOT***net_servermanager\logs** directory:

   TcServerManager_*timestamp***.log**

2. Search the log file for errors similar to the following example:

```
2014-02-12 21:06:33 [6] ERROR Teamcenter.Enterprise.ServerManager.ServerPoolManager
[(null)] - Remoting port configured for Pool ID: TcPoolA, is already in use. Stop
and start server manager on a different port. Message is: Only one usage of each
socket address (protocol/network address/port) is normally permitted
```

3. If you find an error that states a remoting port is already in use, another process is using the same port as the .NET server manager.

To resolve this problem, either change the .NET server manager port to different value or stop the other process that uses the .NET server manager port.

Note:

You can use the Windows **netstat** utility to view all TCP ports currently in use by the system. For example, typing **netstat -a -b** or **netstat -aon** lists the TCP ports currently in use.

Troubleshooting Oracle

Finding Oracle errors

When Oracle detects an error, an error code is displayed in the system console window and written to the Teamcenter trace and log files. To assist troubleshooting, Oracle embeds object names, numbers, and character strings in error messages.

The **oerr** utility provides additional troubleshooting information. Often, the additional information offers a solution to the problem.

View additional information about an Oracle error message

1. Manually set the Oracle environment by entering the following command:

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

   Replace *oracle-version* with the installed Oracle version, for example, **920**.

2. Enter the following command:

   ```
   $ORACLE_HOME/bin/oerr facility error-number
   ```

   Replace *facility error-number* with the Oracle error code, for example **ORA 7300**. ORA is the facility and 7300 is the error number.
   This command displays cause and action messages that you can use to troubleshoot the problem.

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

Tuning WebSphere JVM memory consumption

If your Teamcenter application requires more memory than what is currently allocated in WebSphere, out-of-memory errors can occur. For example, if you use the NX Integration and attempt to launch NX from the rich client, Teamcenter may report an out-of-memory error during a call to **getAttrMappingsForDatasetType**.

If errors like this occur, you must modify the JVM arguments in WebSphere to increase memory allocation. For information about how to modify JVM arguments, see the IBM support article titled *Setting generic JVM arguments in WebSphere Application Server* at the following site:

http://www-01.ibm.com

Before you tune JVM arguments, use memory profiling tools to analyze your memory issues and determine which tuning options you need to use. The following table provides some suggestions, but these may not be suitable in all cases.

JVM options for tuning the WebSphere Application Server memory usage

JVM option	Description	Typical default value	Suggested value
-Xms	Controls the initial size of the Java heap. Properly tuning this parameter reduces the overhead of garbage collection, improving server response time and throughput. For some applications, the default setting for this option may be too low, resulting in a high number of minor garbage collections.	50 MB	512 MB
-Xmx	Controls the maximum size of the Java heap. Note: In general, increasing the minimum/maximum heap size can improve startup, reduce the number of garbage collection occurrences, and increase the throughput until the heap no longer resides in physical memory. After the heap begins swapping to disk, Java performance suffers drastically. Therefore, The heap sizes should be set to values such that the maximum	256 MB	1024 MB

JVM option	Description	Typical default value	Suggested value
	amount of memory the VM uses does not exceed the amount of available physical RAM.		
-XX:PermSize	Sets the section of the heap reserved for the permanent generation of the reflective data for the JVM. This setting should be increased to optimize the performance of applications that dynamically load and unload many classes. Note: **PermSize** memory consumption is in addition to the **-Xmx** value set by the user on the JVM options. Setting this to a value of 128 MB eliminates the overhead of increasing this part of the heap.	Client: 32 MB Server: 64 MB	128 MB
-XX:MaxPermSize	Allows for the JVM to be able to increase the **PermSize** setting to the amount specified. Initially, when a VM is loaded, the **MaxPermSize** is the default value, but the VM does not actually use that amount until it is needed. If you set *both* **PermSize** and **MaxPermSize** to 256 MB, the overall heap increases by 256 MB in addition to the **-Xmx** setting. Note: If an application needs to load or reload a large number of classes, the following error may result: `messageOutOfMemoryError: PermGen space` Typically, this means that the JVM started with an insufficient maximum value for permanent generation.	N/A	256 MB

Troubleshooting document rendering

If you are not successful rendering document revisions to translate dataset files, your administrator should review your installation and configuration systematically and verify the following requirements are met.

- Installation of Teamcenter lifecycle visualization Convert software is required by the **previewservice** feature.
  - You must select the **Convert** feature; the **Print** feature is optional.
  - The destination installation directory name must not contain spaces.
  - To accommodate high levels of input and output, modify the **vvcp.ini** file on Windows systems, or the **vvcp.***platform***.cfg** file on Linux systems.

    ```
    FileCheckWait=600
    FileCheckWaitForZero=30
    ```

  - When the installation is complete, verify the **Convert** option **prepare.exe** program exists under the **VVCP** installation directory.
- Installation of Ghostscript 8.53 software required by the **previewservice** feature.
  - Download the Ghostscript installer at the following link:

    https://download.industrysoftware.automation.siemens.com/open-source/ghostscript/gs853/
  - On Linux platforms, after you install Ghostscript, set the **PSPath** setting in the **Convert** and **Print** configuration file (**vvcp.ini**) to the location of the Ghostscript application.
    For example: ***PSPath: /apps/gs853/bin/gs**.
  - Set **AllowOpenApplication=on** to support the use of applications, such as Microsoft Word, that may already be open when the **Convert** process begins.
- You must enable the **RenderMgtTranslator** service and one or both of the following services:
  - **PreviewService**

  Configure translation services by enabling and configuring translators using TEM.

  - **PreviewService**
    Requires Teamcenter Visualization Convert. Ghostscript and source authoring applications such as Microsoft Office applications are also required.

- **RenderMgtTranslator**
  Required for either **PreviewService**, **PdfGenerator**, or any other service to be added.

- Use Business Modeler IDE to set up and deploy IRDC and dispatcher service configuration objects to the Teamcenter database.

Troubleshooting Teamcenter Integration for NX

Teamcenter Integration for NX may be unresponsive in a four-tier rich client if you specify an incorrect value for **Web Application Name** during installation of the Teamcenter corporate server.

During corporate server installation, TEM prompts for the web application name in the **Default Site Web Server** panel. The web application name you enter is used to populate the **WEB_default_site_deployed_app_name** preference in the Teamcenter database. When you build the Teamcenter Integration for NX web application in Web Application Manager, you specify the actual name of the web application.

If the name of the deployed web application does not match the value specified in TEM, the web application fails to connect to the Teamcenter server.

If you experience problems starting Teamcenter Integration for NX from the four-tier rich client, inspect the **ugs_router** system log for messages that resemble the following example:

```
INTEROP: Executing: O:\win32\ugnx5.0.0.22\ugii\ugraf.exe -pim=yes -
http_url=http://AcmeCorp:8080/tc/aiws/aiwebservice -soa_url=http://AcmeCorp:8080/tc"-
http_cookie=IMAN=08100000000000madakash45b765e1cd0ea854705e5f8f; path=/;" -
http_vmid=b6e51c5aaaf5b200:-58275229:1104f3e3952:-8000 "-role=ALL" -
portalinfo=localhost:2377:PROCESS_COMMAND_LINE -
invoke=com.teamcenter.rac.commands.objectschanged.ObjectsChangedCommand+-uids=%s+-
src=madakash@4Tier_w__NX :madakash@4Tier_w__NX 4-tier
INTEROP: Waiting for UG/Manager V23.0 1 to start up...
```

This message results from the rich client expecting a web application named **tc** but being unable to find it.

To resolve this problem, set the **WEB_default_site_deployed_app_name** preference to the correct name of the deployed web application. You can update this preference using the preferences manager from the command line or from within the rich client.

Recovering a corrupted database

Overview of recovery from a corrupted database

If you attempt to install Teamcenter using a database that is only partially installed, Teamcenter Environment Manager (TEM) allows you to drop all existing data before beginning a new installation.

If the Teamcenter database is corrupted beyond repair, you can alternatively delete the database and repeat the installation using an empty database. To do this, perform the appropriate procedure, depending on your database vendor:

- *Recovering from a corrupted Oracle database*
- *Recovering from a corrupted Microsoft SQL Server database*

Recovering from a corrupted Oracle database

1. Delete the database using Oracle Database Configuration Assistant (DBCA).
2. Create a new empty database using the appropriate DBCA template file.
3. Launch TEM and reinstall Teamcenter.

Recovering from a corrupted Microsoft SQL Server database

1. Remove the corrupted database using the Microsoft SQL Server Management Studio. Right-click the appropriate database in the tree view and choose **Delete**.

   This removes the database and the associated data files.

2. Launch TEM and reinstall Teamcenter.

   TEM creates a new database during installation.

B. Distribution media

Teamcenter distribution media

Siemens Digital Industries Software distributes the following software for Teamcenter 13.0:

Kit	Description
Teamcenter software	Contains Teamcenter software for your operating system (Linux or Microsoft Windows). The software kit includes Teamcenter installation programs (Teamcenter Environment Manager and Web Application Manager) and required files for Teamcenter features such as Security Services.
Visualization	Contains the files required to install Teamcenter lifecycle visualization on all supported operating systems.
Oracle	Contains directories, files, and scripts used to install Oracle Enterprise Edition. The contents of this kit are identical to the Oracle Enterprise Edition CD-ROM distributed by Oracle.

Teamcenter software kit

The following table describes the directories in the Teamcenter software kit:

Directory	Description
additional_applications	Contains directories containing applications such as Teamcenter client communication system (TCCS), Security Services, and the Siemens Digital Industries Software Common Licensing Server.
advanced_installations	Contains the **resource_management** subdirectory that contains Resource Manager application files for Teamcenter manufacturing process management.
bmide	Contains the Business Modeler IDE.
cci	Contains the CCI client.
install	Contains files required for installing Teamcenter.
localization	Contains localization and internationalization files for the rich client.
logmanager	Contains the log manager application.
mappingdesigner	Contains the mapping manager application.

Directory	Description
portal	Contains Teamcenter rich client files.
tc	Contains the Teamcenter software files.
Web_tier	Contains the Web Application Manager program and supporting files for generating the web tier application WAR files.

The base directory of the Teamcenter software kit also contains Teamcenter Environment Manager program (**tem.bat**) that installs Teamcenter executables and data directories.

C. Solutions and features reference

Teamcenter solutions

Solutions are preselected groups of features that provide starting points for recommended Teamcenter configurations. You can add features or deselect features in the **Features** panel in Teamcenter Environment Manager (TEM). For information about a solution, point to the solution name in the list. TEM displays a description.

Solution	Features
Corporate Server	Teamcenter Foundation FMS Server Cache NX Part Family Classification Integration
Volume Server	FMS Server Cache
Rich Client 2-tier	Teamcenter Rich Client 2-tier
Rich Client 4-tier	Teamcenter Rich Client 4-tier
Multisite Collaboration Proxy Server	Multisite Collaboration IDSM Service Multisite Collaboration ODS Service
Business Modeler IDE	Business Modeler IDE Standalone
Rich Client (2-tier and 4-tier)	Teamcenter Rich Client (2-tier and 4-tier)
Dispatcher (Dispatcher Server)	Dispatcher Server

Teamcenter features

TEM provides the following features and feature groups in the **Features** panel. Features are grouped by related applications. For information about a feature, point to the feature name in the list. TEM displays a description of the feature.

To search for a feature by name, enter a keyword in the **Search** box, then click the search button. To see the next search result, click the search button again.

Note:

- Some features are disabled because they require other features. To enable a feature, select its prerequisite features. For information about feature prerequisites, see the feature description.
- Some features cannot be installed in the same configuration, so selecting one disables the other.

Teamcenter features

Feature/Subfeature	Description
Base Install	Base Teamcenter server and client components.
Teamcenter Foundation	Installs the complete Teamcenter application root directory (*TC_ROOT*), including the Teamcenter server process (**tcserver**), and either creates a data directory for storing database-specific files or configures this installation to connect to an existing data directory. If you create a data directory, you also provide information about the database to use with this installation. If you specify a new database, Teamcenter Environment Manager populates the database and creates a volume. Installing Teamcenter Foundation is optional only when you install the following components: the Multi-Site Collaboration proxy servers, File Management System, online help, or sample files. When you install these components, Teamcenter Environment Manager creates an *TC_ROOT* directory, but populates it with only the subdirectories necessary for these components to run.
Business Modeler IDE Standalone	Installs only the Business Modeler IDE client without requiring a connection to a Teamcenter server.
Business Modeler IDE 2-tier	Installs the two-tier Business Modeler IDE client. This client connects to the Teamcenter server using IIOP.
Business Modeler IDE 4-tier	Installs the four-tier Business Modeler IDE client. This client connects to a Teamcenter server in a four-tier environment using HTTP.
Teamcenter Rich Client (2-tier and 4-tier)	Installs a rich client that uses the communication infrastructure introduced in Teamcenter 11.2. This rich client is configurable for both two-tier and four-tier deployments. It connects to the Teamcenter server (in a two-tier environment) or web tier (in a four-tier environment) using Teamcenter client communication system (TCCS). This differs from the existing two-tier rich client that connects directly to the Teamcenter server using IIOP protocol, and the existing four-tier rich client that connects directly to the Teamcenter web tier using HTTP protocol. The newer TCCS-based rich client architecture provides the ability to stream responses from the Teamcenter server (**tcserver**) to the client, an advantage over the previous two- and four-tier architectures that required server responses be completely prepared before sending. This streaming is performed by a multiplexing proxy, or *MUX*, that is part of Teamcenter Enterprise Communication System (TECS), a Java component of the Teamcenter enterprise tier. The MUX supports four-tier communication through its internal Jetty HTTP server, which services requests from the Teamcenter web tier. The MUX communicates with the **tcserver** using Teamcenter Transfer Protocol (TCTP).
Teamcenter Rich Client (Shared Disk Deployment)	Installs the rich client in a shared location. This client can be run from multiple hosts.
Teamcenter Rich Client 2-tier	Installs a Teamcenter two-tier rich client that communicates with the Teamcenter corporate server using IIOP protocol. It supports most Teamcenter features and does not require a web tier.

Feature/Subfeature	Description
	Note: IIOP-based communication in the two-tier rich client is deprecated and will be removed in a future version of Teamcenter. Siemens Digital Industries Software recommends using the **Teamcenter Rich Client (2-tier and 4-tier)** feature, which uses TCCS communication.
Teamcenter Rich Client 4-tier	Installs a four-tier rich client that connects directly to the Teamcenter web tier using HTTP protocol. Note: This rich client is an alternative to the newer four-tier rich client provided by the **Teamcenter Rich Client (2-tier and 4-tier)** feature, which communicates with the Teamcenter web tier using Teamcenter client communication system (TCCS).
Teamcenter Rich Client (Lite Edition)	Installs a rich client and configures it for use with the NX Manager feature. This feature requires **NX Manager for Rich Client**.
TcRS Multisite Enablement	Select this feature to enable multisite collaboration between Teamcenter Rapid Start and Teamcenter sites for OOTB objects. Note: Multisite collaboration for OOTB objects between Teamcenter Rapid Start 12.x, and any version of Teamcenter or Teamcenter Rapid Start prior to 12.x, is not possible.
Server Enhancements	Additional features for Teamcenter servers.
Server Manager	Installs the process that manages the pool of Teamcenter server processes. This option is applicable only when you are deploying the web tier. This feature requires **Teamcenter Foundation** and **FMS Server Cache** features. For a smaller site, you can install the server manager and Teamcenter servers on the same host as the web tier application. For deployment options for larger sites, you can install the server manager on a separate host.
Full Text Search Engine	Installs the Intelligent Data Operating Layer (IDOL) server, the default full-text search engine, and configures searching for the local database. IDOL enables users to retrieve objects from the Teamcenter database based on search criteria. It allows users to specify searches on metadata values, as well as full text retrieval searches on both metadata and common forms of text data. IDOL works with the IDOL server and File System Fetch as two services installed. The IDOL installer does not support the silent install option.
Sample files	Installs sample source code for customizing Teamcenter and generating reports. This component is optional. You can install the sample files individually; you need not install any other components.
Teamcenter Management Console	Installs Teamcenter Management Console, an SSL-secured console for managing and monitoring server-side components such as the Java EE server manager and

Feature/Subfeature	Description
	Java EE web tier. The console's tabbed interface resembles a web application server console. Teamcenter administrators can use the console to access multiple Teamcenter management features from a single page.
Teamcenter Security Services	Configures Security Services for Teamcenter. These services eliminate prompts for logon credentials when users switch Teamcenter products within a user session. Prerequisite: Installation and configuration of Security Services. Required information: • Application ID for this instance of Teamcenter in the Security Services application registry. • Complete URL of the Security Services logon Service web application. • Complete URL of the Security Services Identity Service web application.
Database Daemons	Optional database support services.
Action Manager Service	Monitors the database for the creation of action objects and dispatches events that have a specific execution time and events the Subscription Manager daemon fails to process. Installing the Action Manager service is required to enable the rich client Subscription Administration application.
Subscription Manager Service	Monitors the database event queue for the creation of subscription event objects. Installing the Subscription Manager service is required to enable the rich client Subscription Administration application. To subscribe, right-click an item and choose **Subscribe**. To modify your subscription settings, right-click an item and choose **Subscription Manager**.
Task Manager Service	Checks user inboxes for tasks that have passed due dates, notifies the delegated recipients, and marks those tasks as late. Installing the Task Monitor service is required to enable notification of late tasks.
Tesselation Manager Service	Tessellates **UGMASTER** and **UGALTREP** datasets to the JT (**DirectModel**) dataset and attaches the JT dataset back to the item revision and **UGMASTER** and **UGALTREP** dataset. Installing the Tessellation service is required to create the tessellated representations in Repeatable Digital Validation (RDV) that enable users of the Design Context application to quickly visualize components in context. The tessellated representations are created during the workflow release process, ensuring that JT files of the **DirectModel** datasets are updated as the NX files are released.
Teamcenter Shared Metadata Cache Service	Installs the Shared Metadata Cache Service.
File Management	File management features.

Feature/Subfeature	Description
FMS Server Cache	Installs the File Management System FSC server and file caches. You must install an FSC server on each host that runs a server manager and on each host that is to provide volume services. You can optionally choose to install the FSC as a configuration server or a performance cache server.
Hierarchical Storage Management (HSM)	Adds support for third-party hierarchical storage management software.
Teamcenter Web Tier	Features to support the Teamcenter .NET web tier.
ASP .NET State Service	Installs the middle tier processes that communicate with Teamcenter server processes.
Web Tier for .NET	Installs the middle tier processes that communicate with Teamcenter server processes. Note: The **.NET Server Manager** feature is installed along with the **Web Tier for .NET** feature on the same machine in one configuration. You cannot install the **.NET Server Manager** feature independently on a separate machine.
Extensions	Extensions to Teamcenter server and client functionality.
4D Planning	Installs the 4D Planning feature. *4D Planning* is the capability to add a time component to process planning to simulate and visualize construction over an extended period of time.
APS Configured Search Framework	Installs the search framework for Advanced PLM Services.
Advanced PLM Services core Template	Installs the core functionality for Advanced PLM Services.
Composite Part Laminate Definitions	Installs support for composite part laminate definitions. This enables visualization of plies for composite part definition outside of authoring tools, with particular emphasis on change visualization to intuitively manage part changes.
Configurable Validation	Installs support for creating custom validation applications to manage the validation results in a Teamcenter database. For more information about this functionality, see *Validation Manager*.
Content Migration Manager	Installs the Content Migration Manager feature. For more information about this feature, see the *Content Migration Manager and NX Migration User's Guide* provided with the Content Migration Manager software media.
Embedded Software Management	Installs Embedded Software Management support for the Teamcenter server.
Engineering Views	Installs Engineering views for Teamcenter rich client.
Object Data Services	Adds support for the OData framework for Teamcenter.
Product Line Planning	Installs Product Line Planning. Product Line Planning facilitates development of a collection of products by outlining product assortment goals. The purpose of such assortment planning is

Feature/Subfeature	Description
	to identify an assortment that maximizes sales or gross margin within constraints such as limited budget, space, vendors, and others.
Program Planning Infrastructure	Installs Program Planning support for the rich client. For more information about this feature, see *Active Workspace Installation* in the Active Workspace help.
Sample Document Management	Installs the sample template for Document Management.
Symbolica Integration	Installs the Teamcenter integration to Symbolica software. Symbolica is a Siemens Digital Industries Software product that allows you to visually create and perform complex mathematical equations. The Symbolica integration enables you to create, save, and revise Symbolica files within Teamcenter. These files can also be referenced by NX part files stored within Teamcenter. Symbolica software can be downloaded from **Support Center**.
Teamcenter Office Online	Installs the Teamcenter integration to Microsoft Office Online, which allows users to edit and view documents within Active Workspace instead of using Microsoft Office desktop applications.
Teamcenter integration for Intosite	Installs the Teamcenter integration with Siemens Intosite.
Test Manager	Installs the application model used to manage assembly tests for virtual assessment processes in Automotive Edition and Aerospace and Defense.
Translation Service Database Module	Installs the database module for the Dispatcher Server.
Weld Management	Installs the template that manages NX welding features in Teamcenter.
Advanced PLM Services for Applications	Installs basic functionality for Advanced PLM Services applications.
Build Conditions	Installs build condition support for Product Configurator, a feature that enables you to formally introduce and manage variability across your product suite.
Advanced PLM Services for Realization	Installs realization support for existing items, item revisions, BOM views or BOM view revisions into collaborative designs.
Aspect Infrastructure Support	Installs Aspect Infrastructure support for Teamcenter.
Change Management 4th Generation Interface	Installs Change Management support for 4th Generation Design.
Dimensional Planning and Validation Multi Field Key	Installs multifield key functionality in Dimensional Planning and Validation.
Product Configurator	Installs Product Configurator, a feature that enables you to formally introduce and manage variability across your product suite.
Volume Planning	Installs volume planning for Teamcenter. This feature adds the **cfp0featureplanning** template.
Advanced PLM Services for Partitioning	Installs support for creating partitions in collaborative designs.
Change Management Configurator Interface	Installs Change Management support for Product Configurator.

Feature/Subfeature	Description
Change Management Realization Interface	Adds realization capability to Change ManagerChange Manager. *Realization* is the process of representing data from one product design (the source) into another product design (the target).
Product Configurator Support for Structure Manager	Provides the ability to use the Product Configurator variants to configure product structures in Structure Manager. This feature requires **Product Configurator**.
Configurator Partition Interface	Installs the Configurator Partition Interface, which provides the Partition Variability View for Product Configurator.
4th Generation Target Management	Installs target management support for 4th Generation Design.
Capital Asset Lifecycle Management Automation Designer	Adds management of plant data to Teamcenter.
Automation Designer	This feature provides the data model and server functionality for Automation Designer. For more information, see the Line Designer documentation available with NX.
Change Management 4th Generation Product Master Interface	Installs Change Management support for 4th Generation Design objects to be managed by Change Manager.
Partitioned Design Guidelines	Installs partition design support for 4th Generation Design.
Teamcenter Office Online Connection	Installs components to connect the Teamcenter integration to Microsoft Office Online to Microsoft Internet Information Server (IIS). Teamcenter Office Online allows users to edit and view documents within Active Workspace instead of using Microsoft Office desktop applications.
Advanced PLM Services	4th Generation Design features.
4th Generation Design	Installs 4th Generation Design (4GD) functionality for the Teamcenter server. 4GD allows users of NX CAD or Lifecycle Visualization to cooperate in real time during the design cycle of a product.
MDConnectivity	Installs support for multidisciplinary (MD) objects. This enables management of files from piping and instrumentation diagram/drawing (P&ID) applications in Teamcenter.
System Modeling	Installs the system modeling template for multidisciplinary (MD) objects.
4GD Change Detection Service	Installs the change detection service for 4th Generation Design functionality for Issue Manager. This feature requires **Teamcenter Foundation** and **4th Generation Design**.
Change Management 4th Generation Design Interface	Installs 4th Generation Design functionality for Change Manager. This feature requires **Teamcenter Foundation** and **Change Management**.
Diagramming	Installs the diagramming template for multidisciplinary (MD) objects.
4th Generation Design Issue Management	Installs 4th Generation Design functionality for Issue Manager. This feature requires **Teamcenter Foundation** and **4th Generation Design**.
Aerospace and Defense	Aerospace and Defense features.
Aerospace and Defense Foundation	Installs Aerospace and Defense functionality for the Teamcenter server. This feature requires **Teamcenter Foundation** and **Vendor Management**.

Feature/Subfeature	Description
Aerospace and Defense Change Management	Installs the change management functionality for the Aerospace and Defense **Foundation** feature. This feature requires **Teamcenter Foundation** and **Aerospace and Defense Foundation**.
Aerospace and Defense Foundation Training	Installs the Aerospace and Defense Foundation training program for the **Aerospace and Defense Foundation** feature. This feature requires **Teamcenter Foundation**, **Vendor Management**, and **Aerospace and Defense Foundation**.
Automotive	Teamcenter Automotive Edition and additional supporting features.
Teamcenter Automotive Edition	Installs the optional Teamcenter Automotive Edition application.
GM Overlay	Installs the Teamcenter Automotive Edition GM Overlay application. Installing GM Overlay requires that you also install **Teamcenter Automotive Edition**.
Configure AutoCAD Integration for GM Overlay	Configures AutoCAD Integration/AutoCAD Manager to operate in a Teamcenter Automotive Edition GM Overlay environment. Choose this option only when you add GM Overlay to a Teamcenter environment that includes AutoCAD Integration. If you attempt to include this configuration before installing GM Overlay and the standard AutoCAD Integration, the install fails. Both GM Overlay and the base AutoCAD integration must be installed and functioning before you choose this option. Requires **Teamcenter Foundation** and **GM Overlay**.
Wire Harness Configuration in GM Overlay	Configures wire harness configuration for a Teamcenter Automotive Edition GM Overlay environment. Requires **Teamcenter Foundation**, **Wire Harness Configuration**, **Teamcenter Automotive Edition**, and **GM Overlay**.
GM PAD/TWP Customization	Installs additional GM data types for PAD/TWP Customization. This feature requires **Teamcenter Foundation**, **GM Overlay**, **Customization for eM-Server Integration**, and **PAD/TWP Customization**.
BOM Management	Features that support Product Master Management.
Product Master Automation	Installs automation capabilities for Product Master Manager.
4th Generation Product Master	Installs 4th Generation Product Master Manager support for 4th Generation Design. Provides formal BOM management capabilities in Teamcenter. It supports features like release of a formal bill of materials by Engineering, Engineering solve requests including order solves and forecast order solves.
Product Master Manager (PMM)	Product Master Manager features.
Change Management Color BOM Interface	Provides support for color BOM objects to be managed by Change Management. With this feature, color rule objects can be related to change item revision objects as problem, impacted, and solution objects.
CAE Simulation Management	Features to support Computer-Aided Engineering (CAE) Simulation Management in Teamcenter.
Simulation Process Management	Installs Simulation Process Management, a packaged solution that provides unique simulation process and data management capabilities for CAE engineers and CAE analysts performing analysis work.
Extended Simulation Process Management	Installs extended capabilities of Simulation Process Management.

Feature/Subfeature	Description
Consumer Packaged Goods	Features to support Consumer Packaged Goods.
Consumer Products and Retail Foundation	Installs the Consumer Products and Retail Foundation template, which supports datasets that are used to integrate Teamcenter with external graphics design tools.
Finished Product Management	Installs the Finished Product Management functionality for Consumer Packaged Goods.
Specification Manager	Installs the Specification Manager feature.
Brand Management	Installs the Brand Management template for Consumer Packaged Goods.
CPG Materials	Installs Consumer Packaged Goods objects such as raw materials, formulated materials, and so on.
Packaging and Artwork	Installs packaging and artwork functionality for Consumer Packaged Goods.
Consumer Product Management	Installs consumer product management functionality for Consumer Packaged Goods.
Finished Product Management to CPG Materials Bridge	Provides a bridge between finished products and Consumer Packaged Goods materials.
Packaging and Artwork to Finished Product Management Bridge	Provides a bridge between Packaging and Artwork and Finished Product Management for Consumer Packaged Goods.
Content and Document Management	Content and document management features.
Acrobat/Reader Plugin	Installs the Teamcenter plug-in for Adobe Acrobat and Adobe Acrobat Reader. This solution is optional.
Content Management Base	Installs the data model for Content Management.
Content Management DITA	Enables management of documentation for the DITA standard in Content Management.
Content Management S1000D	Enables management of documentation for the S1000D standard in Content Management.
Content Management S1000D 4.0	Enables management of documentation for the S1000D 4.0 standard in Content Management.
Engineering Process Management	Engineering Process Management features.
Spatial Search	Installs Spatial Search capabilities of the cacheless search engine. This feature requires **Dispatcher Server**. Note: Cacheless search is installed with Teamcenter Foundation, but its capabilities must be enabled through TEM.
Bounding box generation from JT	Enables generation of bounding box data from JT files, providing secondary data for the cacheless search engine.

Feature/Subfeature	Description
	This feature requires **Dispatcher Server**. Also, during Teamcenter installation, you must install the Spatial Search translator (**JtToBboxAndTso**). Note: Cacheless search is installed with Teamcenter Foundation, but its capabilities must be enabled through TEM.
Trueshape generation from JT	Enables generation of Trushape data from JT files, providing secondary data for the cacheless search engine. This feature requires **Dispatcher Server**. Also, during Teamcenter installation, you must install the Spatial Search translator (**JtToBboxAndTso**). Note: Cacheless search is installed with Teamcenter Foundation, but its capabilities must be enabled through TEM.
Bounding Box generation from NX	Enables generation of bounding box data when saving NX files, providing secondary data for the cacheless search engine. Note: Cacheless search is installed with Teamcenter Foundation, but its capabilities must be enabled through TEM.
Enterprise Knowledge Foundation	Enterprise Knowledge Foundation features.
Remote Workflow	Configures linking between Teamcenter sites for remote workflow operations. This option is applicable only when you are deploying the four-tier architecture. Prerequisites: • Remote Workflow components, including Application Registry, must be separately installed and configured. • The web tier application, including the optional Remote Workflow parameters, must be installed and configured. Required information: • Host name and port number of the Java servlet running the Teamcenter Application Registry. • The host name and port number of the host running a web tier application. • If you are linking to Teamcenter portfolio, program and project management, the chooser servlet name.

Feature/Subfeature	Description
Teamcenter Client for Microsoft Office	Installs the Teamcenter Client for Microsoft Office.
Change Management	Provides a flexible change management framework that integrates with other Teamcenter products. Note: If you install this feature, you may need to set the **HiddenPerspectives** preference in the rich client.
Contract Data Management	Installs Contract Data Management, which allows you to manage, initiate review processes, and monitor correspondence for procurement documents, such as design information, drawings, status reports, purchase orders, and so on.
Dispatcher Client for Rich Client	Installs Dispatcher Client for the rich client. This feature requires **Teamcenter Rich Client 2-tier** or **Teamcenter Rich Client 4-tier**.
Finish Management	Installs Finish Management for Teamcenter. A *finish* represents a finishing process on a part. It may be used to improve appearance, adhesion, corrosion resistance, tarnish resistance, chemical resistance, wear resistance, and remove burrs and so on.
Materials Management	Installs the Materials Management solution, which stores approved material and substance information imported from a third-party database (for example, Granta, IMDS) into a material library in the Teamcenter database.
Stock Material	Installs the Stock Material feature for Teamcenter. Many parts are made from stock materials such as bar stock, tubing stock and sheet stock. This features enables you to manage stock materials in Teamcenter, performing actions like creating libraries of stock materials and assigning stock materials to parts.
Work Package Management	Enables management of work packages in Teamcenter. *Work packages* or *packages* are typically collections of CAD files and documentation that outsourcing partners require to build, test or maintain components or subassemblies of larger products. Packages serve as revisable collections of product information that can be used in a variety of contexts.
Change and Schedule Management Interface	Installs support for using **Change Management** with Schedule Management.
Issue Management	Installs Issue Manager, which allows you to track problems, or issues, with products by managing the review, approval, and implementation of issues.
Render Document for Rich Client	Provides Render Management capabilities for the rich client. This feature requires **Dispatcher Client for Rich Client**.
Dispatcher Server	Installs the following Dispatcher Server components: scheduler, module and administration client.
Penetration Request Management	Installs the penetration request management feature. This feature requires the **Change Management** and **Issue Management** features and also Teamcenter Foundation or a rich client.

Feature/Subfeature	Description
Dispatcher Client (4-tier)	Installs an integration of the Dispatcher Server and Teamcenter for the four-tier rich client that enables users to translate Teamcenter data files to various visualization formats for viewing in Teamcenter. This feature requires **Teamcenter Foundation**.
Dispatcher Client (2-tier)	Installs an integration of the Dispatcher Server and Teamcenter for the two-tier rich client that enables users to translate Teamcenter data files to various visualization formats for viewing in Teamcenter. This feature requires **Teamcenter Foundation**.
Lifecycle Visualization	Features to support Lifecycle Visualization.
Teamcenter Visualization (Embedded) for Rich Client	Installs the embedded viewer for the rich client. This feature requires **Teamcenter Rich Client 2-tier** or **Teamcenter Rich Client 4-tier**.
Teamcenter Visualization (Stand-alone) for Rich Client	Installs stand-alone application viewer for the rich client. This feature requires **Teamcenter Rich Client 2-tier** or **Teamcenter Rich Client 4-tier**.
Localization	Features that support localization of Teamcenter.
Classification L10N	Installs the classification localization template, which enables localization in the Classification environment.
Service Lifecycle Management	Teamcenter service lifecycle management features.
MRO Core	Installs the **PhysicalPart** business object used to designate physical instances of parts for Service Lifecycle Management.
As-Built Management	Installs theAs-Built template for Teamcenter service lifecycle management.
As-Maintained Management	Installs the As-Maintained feature to support the As-Maintained physical structure management for Service Manager.
Service Planning	Installs the Service Planner application that supports service planning capabilities within Teamcenter. Service Planner requires a separate license and is installed as an optional overlay to standard Teamcenter.
As-Built and As-Maintained Alignment	Enables interoperability of data created by the As-Built Management and As-Maintained Management features of Service Manager.
Transaction Processing	Installs transaction processing functionality for Service Request Manager.
Service Processing	Installs service processing capability for Service Request Manager.
Service Event Management	Installs Service Event Management to support service process management for Teamcenter service lifecycle management.
Service Planning and Service Processing Alignment	Installs the Service Planning functionality for Service Processing.
Service Request Processing	Installs the Service Planning and Service Processing Alignment module to support using discrepancies in Service Planner.
Service Scheduler	Installs Service Scheduler, which supports scheduling within Teamcenter. Service Scheduler lets companies define, schedule, and implement services for their products. Service Scheduler is a separately licensed application that is installed as an optional overlay on top of standard Teamcenter and Service Manager.
SLM Automated Scheduling 1.0	SLM Automated Scheduling features.

Feature/Subfeature	Description
Service Forecasting	Installs the Service Forecasting plug-in to Service Scheduler.
Service Automated Scheduling	Installs the Service Automated Scheduling plug-in to Service Scheduler.
Manufacturing Process Management	Teamcenter manufacturing process management features.
Configure Resource Browser and NC Package Browser	Installs libraries for the Resource Browser and NC Package Browser applications.
Advance Planner	Installs Advance Planner, which configures Teamcenter installation to scope and report data during pre-planning activities to determine the plant in which a vehicle will be built. This feature will assist in determining cost and plant space needed within Line Designer.
Composites Process Planning	Installs Composites Process Planning, which leverages the benefits of Manufacturing Process Management BOM and BOP to plan and manufacture composite parts.
Customization for eM-Server Integration	Installs additional data types for Tecnomatix server integration customization.
Logistic Process Planning	Installs the logistic process planning feature for Manufacturing Process Planner.
MTM Data Card	Installs the Methods Time Measurement (MTM) data card system for Manufacturing.
Work Instructions	Installs the work instructions feature for Manufacturing Process Planner.
Customization for Process Simulate Integration	Installs additional data types for Process Simulate Integration Customization.
MES Integration	Installs the Manufacturing Execution System Integration (MES Integration), which collects the bill of process, bill of materials, and any relevant work instructions into a work package that is released to the MES system.
Manufacturing Characteristics Information	Installs additional data types for Manufacturing Characteristics Information.
eBOP Reports Customization	Installs additional data types for eBOP Reports Customization. This feature requires **Teamcenter Foundation** and **Customization for eM-Server Integration**.
MES Issue Management	Installs additional data types required for shop floor issue management when integrating with a manufacturing execution system. This feature provides Issue Manager support for the Manufacturing Execution System Integration (MES Integration).
PAD/TWP Customization	Installs additional data types for PAD/TWP Customization. This feature requires **Teamcenter Foundation** and **Customization for eM-Server Integration**.
Manufacturing core using APS	Installs Manufacturing support with Advanced PLM Services.
Manufacturing support for 4th Generation Design	Installs additional data types required to work with 4th Generation Design (4GD) objects in Manufacturing Process Planner.
Mechatronics Process Management	Features to support Mechatronics Process Management.

Feature/Subfeature	Description
EDA for Business Modeler IDE	Integrates Teamcenter EDA with the Business Modeler IDE. For information about installing EDA, see the EDA help on **Support Center**, under **Teamcenter→Electronic Design Automation (EDA)**.
EDA Server Support	Installs the dataset types and transfer modes required to support Teamcenter EDA, the application that integrates ECAD applications with Teamcenter. For information about installing EDA, see the EDA help on **Support Center**, under **Teamcenter→Electronic Design Automation (EDA)**.
EMPS - Foundation	Installs electronic design and manufacturing types to support ECAD translation and PCB design collaboration using Teamcenter embedded viewer.
ESM Base	Installs ESS base types and updates preferences. Without these, ESS operations do not work from any interface (rich client, custom utilities, and other clients).
SCM ClearCase for Foundation	Installs ClearCase types and sets Teamcenter preferences to enable the integration between Teamcenter and the IBM ClearCase software configuration management (SCM) tool. For more information about installation, see the Teamcenter *ClearCase Integration*.
Calibration and Configuration Data Management	Installs the Calibration and Configuration Data Management (CCDM) feature for Embedded Software Solutions, which allows you to manage the calibration and configuration-related parameter data of embedded systems. CCDM allows you to define, create, view, update, and delete parameter data, and to group related parameter definitions together and associate parameter values to a project.
ECAD Part Library Management	Installs ECAD part types to support ECAD part library management. This feature requires **Teamcenter Foundation**, **Vendor Management**, and **EDA Server Support**.
ESM Processor	Installs ESS processor types and updates preferences. Without these, ESS operations do not work from any interface (rich client, custom utilities, and other clients).
ESM Software	Installs ESS software types and updates preferences. Without these, ESS operations do not work from any interface (rich client, custom utilities, and other clients).
Electrical and Wire Harness Configuration	Installs Teamcenter schema support for wire harnesses.
Embedded Software Design Data Management	Installs **Embedded Software Design Data Management** for Embedded Software Solutions.
Embedded Software Design Data Management with SCM Clear Case Integration	Enables management of Embedded Software Design data in the SCM Clear Case integration.
Multi-Disciplinary Associations	Installs multidisciplinary (MD) associations in Teamcenter. Multidisciplinary (MD) objects help facilitate collaboration between various disciplines during the product design phase.
Model Management	Model Management features.
Server	Model Management server features.

Feature/Subfeature	Description
Branch Data Organization	Adds support for organizing model revisions using branching.
Branching and Versioning Foundation	Adds support for branching and versioning in Teamcenter.
System Synthesis Modeling	Installs the LMS System Synthesis Modeling tool.
Part Manufacturing	Part Manufacturing features.
Part Manufacturing Shopfloor Integration	Installs the Part Manufacturing Shopfloor integration for Part Manufacturing.
NX Fixed Plane Additive Manufacturing Integration	Installs the NX Fixed Plane Additive Manufacturing Integration, which enables importing of Additive Manufacturing printer files into datasets under fixed plane Additive Manufacturing activities.
NX Machining Line Planner Integration	Installs the Machining Line Planner Integration for NX.
Platform Extensibility	Platform extensibility features.
Global Services	Global Services features.
Global Services Preferences	Installs preferences for Global Services.
Mapping Designer	Installs the Mapping Designer client. Mapping Designer is dependent on third-party external eclipse plug-ins from Altova MapForce. The Altova Mapforce eclipse plug-ins are dependent on the MapForce client. Requires MapForce Professional client and MapForce eclipse plug-ins. Download these plug-ins from Altova at the following URL: **http://www.altova.com** A valid license for the MapForce client is required to run Mapping Designer. This feature requires the Business Modeler IDE **Client** feature.
Multisite Collaboration IDSM Service	Installs the distributed services manager (IDSM) required to replicate data between multiple Teamcenter sites, enabling the exchange of data objects with other Teamcenter databases over a wide area network (WAN).
Multisite Collaboration ODS Service	Installs the object directory service (ODS) required to replicate data between multiple Teamcenter sites, enabling the exchange of data objects with other Teamcenter databases over a wide area network (WAN).
Catia Non BOM	Installs the CATIA Non BOM feature.
ERP Connect	Installs the ERP Connect Toolkit interface that integrates Teamcenter with other Enterprise Resource Planning (ERP)-supported applications, such as BAAN.
Linked Data Framework Services	Linked Data Framework Services features.
Java EE Based Linked Data Web Services	Installs web services that allow other lifecycle tools to use Teamcenter services like change management. This feature builds the OSLC WAR file and installs the Linked Data Services (LIS) core service.

Feature/Subfeature	Description
LDF Foundation	Installs the linked data framework for **Linked Data Services**. This feature enables linking external applications to Active Workspace.
LDF Change Management Integration	Installs the Change Management integration module of Linked Data Services (LIS).
LDF Embedded Software Management Integration	Installs the Embedded Software Management integration module of Linked Data Services (LIS).
LDF Requirements Management Integration	Installs the Requirements Management integration module of Linked Data Services (LIS).
LDF Server Support	Installs the Linked Data Services (LIS) framework. This includes the data model for LIS.
Portfolio, Program and Project Management	Portfolio, Program and Project Management features.
Workflow to Scheduling Integration	Allows workflow to send updates to the related tasks in a schedule. This feature requires a four-tier installation and Dispatcher to be installed/configured. This feature requires **Teamcenter Foundation**. Note: You must create the proxy user account (**projproxy**) before you install the Workflow to Scheduling Integration.
Reporting and Analytics	Features to support Teamcenter reporting and analytics.
Teamcenter for Reporting and Analytics	Installs the Teamcenter reporting and analytics (TcRA) integration. TcRA is a standalone reporting application that introduces a new folder in Report Builder called **TcRA Reports**, which contains reports created with TcRA.
Dashboard	Installs the **Teamcenter reporting and analytics** dashboard interface.
Reuse and Standardization	Reuse and Standardization features.
Classification Interface	Installs the Classification interface for Reuse and Standardization.
Next Generation Classification foundation	Installs the Next Generation Classification foundation feature for **Library Management**.
Classification Standard Taxonomy support	Installs standard taxonomy support for Classification.
Library Management	Installs a data model and functionality for Library Management that supports creating and configuring multiple libraries to meet the reuse needs of business processes and targeted sets of users. Library Management leverages Classification and includes a rules-based search capability for enforcing technical constraints in the context of a design process (known as Specifications, which is a distinct and separate feature from Specification Manager used to support the Consumer Packaged Goods industry). The **lbrmanager** command line utility is also included with this feature.

Feature/Subfeature	Description
	Note: Deploying the Library Management feature automatically deploys the following prerequisite features: • Advanced PLM Services for Applications • Advanced PLM Services for Partitioning • Advanced PLM Services for Realization • Next Generation Classification foundation
Supplier Relationship Management	Supplier Relationship Management features.
SRM Integration	Installs the Supplier Relationship Management integration for data exchange.
Vendor Management	Installs the optional Vendor Management solution.
Model-Based Systems Engineering	Features that support Model-Based Systems Engineering. For more information about these features, see *Model-Based Systems Engineering* in the Active Workspace help.
Attribute and Parameter Base Definitions	Installs attribute and parameter definitions for Product Planning. For more information about this feature, see the topics about domain engineering in *Model-Based Systems Engineering* in the Active Workspace help.
Parameter Management	Adds parameter management capabilities to Model-Based Systems Engineering.
Verification and Validation Planning and Reporting	Installs the Verification and Validation Planning and Reporting feature. For more information about this feature, see the topics about domain engineering in *Model-Based Systems Engineering* in the Active Workspace help.
Verification Management	Installs support for verification request management. For more information about this feature, see the topics about verifying system models in *Model-Based Systems Engineering* in the Active Workspace help.
Systems Engineering and Requirements Management	Features that support Systems Engineering and Requirements Management.
Systems Engineering Base	Installs core functionality for Systems Engineering and Requirements Management.
Teamcenter Extensions for Microsoft Office	Installs Teamcenter Extensions for Microsoft Office.
Requirements Management for Rich Client	Installs the Requirements Management functionality for Systems Engineering and Requirements Management.
Systems Engineering	Installs the Systems Engineering application, which provides capabilities such as functional modeling and budgets. This feature requires the **Teamcenter Foundation** feature and also a rich client or a two-tier Business Modeler IDE client.
Teamcenter Integration for I-deas	Teamcenter Integration for I-deas features.
Teamcenter integration for I-deas - Database Extensions	Installs data model for Teamcenter integration for I-deas.

Feature/Subfeature	Description
Teamcenter Integration for NX	Teamcenter Integration for NX features.
NX Part Family Classification Integration	Installs core functionality of **Teamcenter Integration for NX**. This feature requires a local installation of NX. Teamcenter Integration for NX is a data management tool used with NX. When you use NX with this integration, Teamcenter runs at the same time as a separate process, enabling NX and Teamcenter to communicate so you can create, store, and access your NX data within a Teamcenter database. For information about using Teamcenter Integration for NX, see *Teamcenter Integration for NX* in the NX help.
NX Foundation	Installs default data types and loads template NX data to support **Teamcenter Integration for NX/NX Integration**, the Teamcenter integration with Siemens Digital Industries Software NX.
NX Rich Client Integration	Installs Teamcenter Integration for NX for the rich client. This feature requires **Teamcenter Rich Client 2-tier** or **Teamcenter Rich Client 4-tier**.
Teamcenter Integration for NX Change Management	Installs Change Management support for Teamcenter Integration for NX. For information about using Teamcenter Integration for NX, see *Teamcenter Integration for NX* in the NX help.
NX 4th Generation Design	Installs 4th Generation Design (4GD) support for Teamcenter Integration for NX. 4GD allows users of NX CAD or Lifecycle Visualization to cooperate in real time during the design cycle of a product.
NX Piping and Instrumentation Diagram (P&ID) Design	Installs support for managing NX piping and instrumentation diagram/drawing (P&ID) files in Teamcenter. Teamcenter supports P&ID files as part of its support for multi-disciplinary (MD) objects. Note: NX Piping and Instrumentation Diagram (P&ID) Design is not supported with Teamcenter Rapid Start. This feature is only available in Teamcenter.
Teamcenter Quality Base	Features to support Teamcenter Quality functionality.
Teamcenter Quality Base	Adds Teamcenter Quality support to Teamcenter. For more information, see *Teamcenter Quality* in the Active Workspace help.
Control and Inspection PlanData Model	Installs support for control and inspection planning. This feature allows you to manage critical characteristics of Failure Mode Effect Analysis (FMEA) and create a control plan that generates bill of process (BOP) elements.
Quality Issue Management and Problem Solving base	Installs Issue Manager capabilities for Teamcenter Quality.
Miscellaneous	Additional Teamcenter features.
Color and Visual Appearance Management	This feature provides appearance parameters such as color, gloss, and texture along with a color specification. The combination of color, gloss, and texture with the color specification is called a *visual appearance*. Once a visual appearance is defined, it can be associated with objects such as parts in the BOM system.

Feature/Subfeature	Description
	This feature is automatically selected when you select **Color BOM for Product Master Management**.
LOGISTICS for Rich Client	Installs the logistics feature for the rich client.
Product Variants	Installs product variant support for **Mechatronics Process Management**. This feature is required by **Calibration and Configuration Data Management**
Color Explosion Rule Management	This feature which provides a common infrastructure support for definition of Color Rule and its behavior. Color Rules can be associated with one or more visual appearances and variant conditions. They are revisable and participate in workflows. These rules can interact with systems such as Product Master Manager to author color parts and usages automatically when invoked. This feature may be further used associate a design object's color and variant condition. This feature is automatically selected when you select **Color BOM for Product Master Management**.

D. Web tier context parameters

The following tables describe web tier context parameters provided by Teamcenter web tier solutions.

Web tier required parameters

Parameter	Description
	General parameters
TcLocale	Locale of the Teamcenter server for localization of web tier messages. This locale must match the locale of the Teamcenter server. For example, if Teamcenter server is running in the Russian locale, specify **ru_RU** for this parameter.
Max_Capacity	Specifies the maximum number of concurrent connections to Teamcenter servers the server pool maintains. The default value of 500 connections may be too low to prevent performance slowdowns when running Websphere as a middle tier server. To avoid performance slowdowns and possible connection errors, increase the number of available connects by setting **max_capacity** to a value greater than 500. Note: This parameter applies to web application deployment on WebLogic, JBoss, and Oracle Application Server. For other application servers, the maximum pool size must be set using the application server console.
Server_Manager_URIs	Specifies a list of server manager URIs, separated by semicolons. For example: **http://hostA:8086/PoolA;http://hostB:8086/PoolB**
LogVolumeName	Name of the log volume.
LogVolumeLocation	Log volume location, the root directory under which log files are created. The default location logs represent a child folder beneath the default root directory of the target application server instance. This location varies depending on the application server vendor.

Parameter	Description
	Note: If the path you enter contains backslash characters (\) as path delimiters, use double backslash characters (\\) to represent single backslash characters.
DEPLOYABLE-FILE-NAME	Name of the deployable file you are creating for the web tier application. The name is configurable; Web Application Manager adds the file extension.
	Security Services parameters
IS_SSO_ENABLED	Specifies whether Security Services is enabled for this instance of Teamcenter.
SSO_APPLICATION_ID	Application ID assigned to this instance of Teamcenter in the Security Services application registry. This information is required only when you are configuring the optional Security Services. This ID is determined when Security Services is installed and configured.
SSO_logon_SERVICE_URL	Complete URL of the Security Services logon Service web application. This information is required only when you configure the optional Security Services. This URL is determined when Security Services is installed and configured.
SSO_SERVICE_URL	Complete URL of the Security Services Identity Service web application. This information is required only when you configure the optional Security Services. This URL is determined when Security Services is installed and configured.

Web tier optional parameters

Parameter	Description
	General parameters
webmaster	E-mail address of the administrator to whom questions and comments about this application are addressed.
staticResourceClientCache ExpiryTime	Maximum time in seconds that a client can use a locally cached static content (for example, images or JavaScript) before requesting a fresh copy from the server. Setting this value too low causes the client to unnecessarily request content. Setting this value too high risks stale content. Typical values range from several hours to one day. Setting the value to 0 is valid and causes the client to always ask for static content. The default value is 28800 seconds (8 hours).
compressResponse	Specifies whether a response to the client can be compressed if the requesting client supports it. Compressing the response typically yields faster response time to the client but requires additional processing in the web container. Set this parameter value based on trial and error for your instance of the server, bandwidth, and client access environment. The default value is **true**.
cacheCompressedStatic ResourceOnServer	Specifies whether responses for static resources are cached on the server. This parameter is used only when the **compressResponse** parameter is set to **true**. If the value is set to **true**, compressed responses for static resources are cached on the server, memory permitting. If the value is set to false, the compression occurs each time the client requests a static resource. The default value is **true**.
responseCompression Threshold	Threshold in bytes beyond which the server should compress responses sent back to the client.

Parameter	Description
	Typically compressing smaller responses does not yield much compression - so all responses equal to or smaller than this value will be sent to the client uncompressed. Setting the value to 0 is valid and causes the server to compress every response sent to the client (assuming other parameters permit compression). The default value is 500 bytes. Change this value only if absolutely required.
calculateResponseTime	Specifies whether the group of response time filters are on (by setting to **true**) or off (by setting to **false**). These filters are used for instrumentation purposes (for example, the average time spent in processing a request from a rich client). The response time filters should remain turned off unless you are collecting statistics. The default value is **false**.

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