TEAMCENTER

Schedule Management — Deployment and Rich Client Usage

Teamcenter 2412

SIEMENS

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Introduction to Schedule Manager

Use Schedule Manager for planning and tracking activities in Teamcenter.

As a schedule owner, you can add your team to the schedule and decide which users have rights to update the scheduling information (change assignees, schedule dates, estimated work, and so forth) and which users can update the execution data (status, percent complete, work complete, and so forth).

> Note:
>
> Multi-Site functionality is not supported with Schedule Manager.

Before you begin

Prerequisites	You do not need any special permissions to use the Schedule Manager application. If you are upgrading and have existing data, see asynchronous attribute consolidation utility for information on the procedure required to successfully upgrade data.
Enable Schedule Manager	Schedule Manager does not need to be enabled before you use it. If you have trouble accessing Schedule Manager, see your system administrator. It may be a licensing issue. > Note: > > You can log on to Teamcenter only once. If you try to log on to more than one workstation at a time, you see an error message.
Configure Schedule Manager	There are additional steps you must perform to configure Schedule Manager before you can use it. For information about configuring Schedule Manager, see **Configuring Schedule Manager**.
Start Schedule Manager	Click **Schedule Manager**  in the navigation pane.

> Note:
>
> Teamcenter Dispatcher is required for some schedule operations, such as:

- In My Teamcenter, using **File→Save As** for a schedule using the **Background** option.
- Using the **Shift Schedule** command when the **Run in Background** option is selected.
- Creating a new schedule from a template with **Background Copy** selected.

For more information, see Configuring asynchronous services in the *Dispatcher Server Translators Reference*.

Workflow to Scheduling integration

You must install and configure the **Workflow to Scheduling Integration** option in Teamcenter Environment Manager (TEM) to initiate workflows on schedule tasks where the workflow trigger type is **Scheduled start date**, **Both Scheduled start date and predecessors complete**, or **Either Scheduled start date and predecessors complete**.

Workflow to Scheduling Integration is discussed in Teamcenter features.

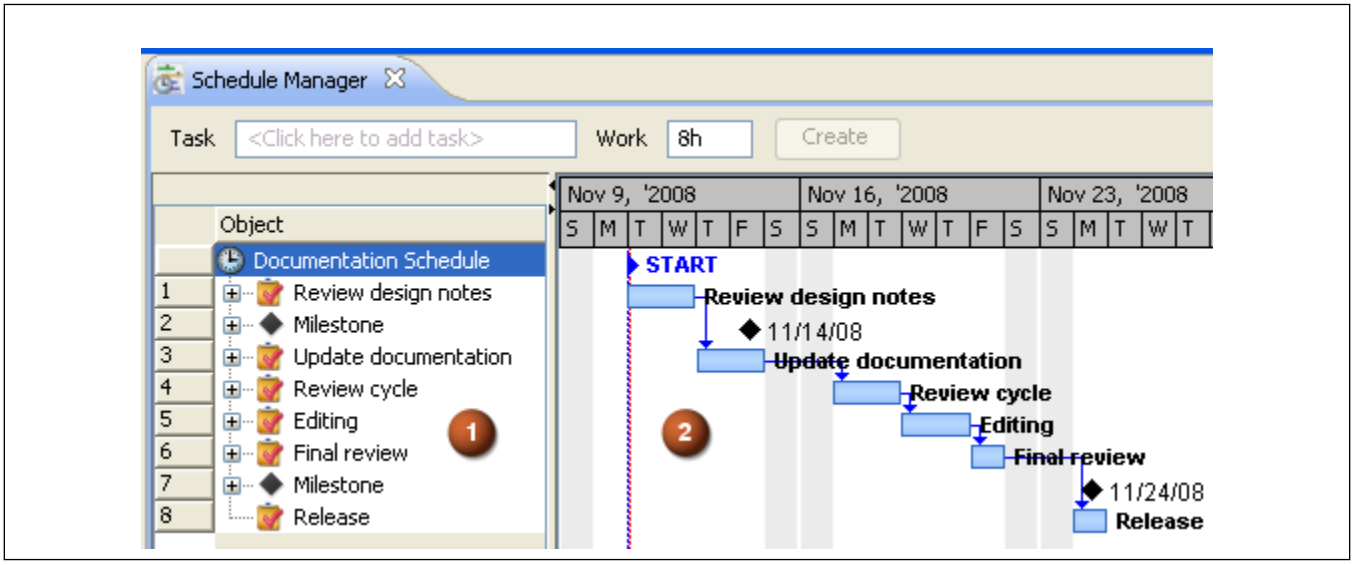
Schedule Manager interface

Schedule Manager view

The Schedule Manager interface combines many features of the standard user interface with unique features designed to fit the needs of users. Schedule Manager presents information to introduce the two formats, a task table and a Gantt chart.

You can resize these views by dragging the border between the two views.

When you select a task from the task table, the corresponding task bar appears in the Gantt chart.



Schedule Manager interface

1	Task table	Displays all tasks and milestones in a table format.
2	Gantt chart	Provides a visual representation of a project's tasks.

Task table

The task table displays all tasks and milestones in a table format. Columns provide information including task number, task name, description, start date, finish date, duration, predecessor task, and successor task. Each task is automatically assigned a task number.

The first line in the task table is called the *schedule summary task*. It displays a schedule-like symbol. The schedule summary task rolls up the information from all the tasks in the schedule the same way a regular summary task does.

> Note:
>
> To select or reorder columns in the task table, as described in the following sections, requires a schedule to be present in Schedule Manager.
>
> If you do not already have a schedule, create one.

Select columns to appear in the task table

1. Right-click any column heading and choose **Column Chooser**.

2. To add display columns, select columns from the **Available Columns** list and click the right arrow.

3. To remove display columns, select columns from the **Displayed Columns** list and click the left arrow.

4. Click **Apply**.

Reorder the columns in the task table

1. Right-click any column heading and choose **Column Chooser**.

2. Select a column from the **Displayed Columns** list.

3. Use the up and down arrows to reorder the columns in the task table. Moving a column up results in the column being moved to the left in the task table; moving a column down results in the column being moved to the right in the task table.

4. Click **Apply**.

Using the Gantt chart

The Gantt chart allows you to view the schedule by week, month, quarter, or year. The Gantt chart provides a visual representation of a project's tasks. Using your mouse, you can manipulate items in the Gantt chart.

Schedule Manager menus

File menu

Command	Description
New→Task	Creates a new task.
New→Proxy Task	Creates a new proxy task.
New→Milestone	Creates a new milestone.
New→Schedule	Creates a new schedule.
New→Program View	Creates a new program view.
Save	Saves the current contents of the schedule.
Close	Closes the Schedule Manager perspective.
Print	Views, prints, or saves information about the currently selected item.
Print Preview	Previews your print job and updates the preview options.
Exit	Ends the rich client session.

Note:

You can also **create a new schedule from an existing schedule** using the **File→Save As** command in My Teamcenter. This capability is not available for individual schedule tasks.

Create schedules using Save As

You can create a new schedule from an existing schedule using the **File→Save As** command in My Teamcenter. This capability is only available for schedules and not individual schedule tasks.

1. In My Teamcenter, select the base schedule you want to use to create the new schedule.
2. Click **File→Save As**.

   The **Save Schedule As** dialog box opens.
3. Enter a schedule **Name** and an optional **Description**.
4. (Optional). In the **Copy Options** section, select any of the following options:

   - **Baseline.** Select this option if you want to include any baselines created for the base schedule in the new schedule.
   - **Reset Work.** Select this option if you want to reset the work hours on the schedule tasks.
   - **Background.** Select this option if you want to perform the save as operation in the background. This is helpful if your base schedule is very large.
   - **Copy to Clipboard.** Select this option if you also want to copy the new schedule to your clipboard.
   - **Proxies.** Select this option to copy the proxy tasks in the base schedule to your new schedule.
   - **Proxy Dependencies.** Select this option if you want to also copy the cross-schedule dependencies for the proxy tasks.
   - **Open on Create.** Select this option if you want to open the new schedule once it is created.

Edit menu

Command	Description
Cut (Ctrl+X)	Marks the selected lines for removal and copies the content to the clipboard. Cut lines are only removed once pasted elsewhere in the structure.
Copy (Ctrl+C)	Copies the selected lines to the clipboard.
Copy Append (Ctrl+Shift+C)	Copies the selected object to the Teamcenter clipboard with the intention of appending the copied object to the destination object, and retaining the current contents of clipboard.
Paste (Ctrl+V)	Inserts the Clipboard contents below the selected item.
Delete (Delete)	Deletes the selected object from the database.
User Setting	Displays the **User Settings** dialog box, where you can change your group, role, or volume assignments, and your application logging and journaling options.
Options	Changes your user interface settings that affect all applications, not only Schedule Manager.
Paste as Proxy Task	Pastes a copied task in another schedule as a proxy task. For more information, see **Using proxy tasks**.
Rename	Renames the selected schedule or task.
Notification Rules	Displays and updates the notification rules for a selected schedule or task.
Subscription Rules	Displays and updates the subscription rules for a selected schedule or task.

View menu

Command	Description
Refresh (F5)	Updates the information displayed for a selected line and all of its children.
View Properties (Alt+P)	Shows the properties for the selected object.
View Baseline	Displays the current baseline for the selected task or schedule.
Expand All	Expands the complete substructure below the selected lines.
Collapse All	Collapses the complete substructure below the selected lines.

Command	Description
EVM→EVM Options	Sets the calculation basis for earned value management, either cost or hours, and whether to calculate the work complete by percent or actual hours. Also specifies the labels to be used in the results display.
EVM→EVM Calculations	Calculates the earned value management values and displays them in the **EVM Results** dialog box.
Critical Path→View Critical Path	Highlights the critical path in red in both the tree table and the Gantt chart or removes the highlight.
Critical Path→Set Color	Sets the color for the critical path.
Zoom Factor→Week	Displays the Gantt chart in a weekly format.
Zoom Factor→Month	Displays the Gantt chart in a monthly format.
Zoom Factor→Quarter	Displays the Gantt chart in a quarterly format.
Zoom Factor→Year	Displays the Gantt chart in a yearly format.

Schedule menu

Command	Description
Workflow Task	Defines workflow triggers and workflow templates for the selected task.
Launch Workflow Now	Initiates the workflow for the selected task.
Check In	Checks a selected component into the database.
Check Out	Checks the selected object out of the database.
Cancel Checkout	Cancels a request checkout action.
Rate Modifiers	Defines user rates for calculating both schedule and task costs.
Costs	Displays the summary of the costing information and enables you to update the fixed costs and default billing codes.
Abort	If a schedule is selected, cancels the schedule, all of its unstarted and in-progress tasks, and associated workflow processes. If tasks or summary tasks are selected, cancels the tasks or summary tasks, all of their unstarted and in-progress subtasks, and associated in-progress workflow processes. This status cannot be changed or reversed.

Command	Description
Reload Schedule	Reloads the schedule and applies any changes.
Recalculate Schedule	Recalculates the tasks and their dependencies for the selected schedule.
Schedule Calendar	Displays and updates the daily defaults for a selected schedule.
Schedule Membership	Displays and assigns resources to a selected schedule.
Schedule Deliverables	Adds or removes deliverables from a selected schedule.
Task Deliverables	Adds or removes deliverables from a selected task.
Scroll Into View	Displays the selected task in the Gantt chart.
Indent task	Changes the selected task to be a sub-task of the task directly above it.
Outdent task	Removes the selected sub-task from its parent task.
Insert Schedule	Adds or removes subschedules in master schedules or schedule templates in master schedule templates.
Task constraints	Adds a task constraint for the selected task.
Baseline Task	Sets a baseline for the selected task and adds it to an existing schedule baseline.
Baseline Schedule	Sets a baseline for the selected schedule.
Manage baselines	Makes a baseline the active baseline, adds a new schedule baseline, modifies a baseline name, or deletes a baseline.
Shift Schedule	Shifts the selected schedule to change the start and finish date of a schedule.
Manage Orphaned Task	Integrates tasks not associated with a schedule back in the schedule or deletes the tasks from the database.
Link→Dependencies	Displays and updates dependencies between tasks in the same schedule.
Link→Create Cross Schedule Dependency	Creates dependencies between tasks in different schedules.
Assignments→Assign to Task	Assigns a resource to a task.
Assignments→Replace Assignment	Replaces the resource assigned to the task with another resource.
Assignments→Designate Discipline	Displays and updates the assigned disciplines and discipline members for the selected task.

Command	Description
Assignments→Revert Assignments to Discipline	Reverts a member of an assigned discipline for a selected task.
WBS→Define Format	Sets the format for the work breakdown structure. For more information, see **Defining the WBS code format**.
WBS→Regenerate	Regenerates saved work breakdown structure codes on the selected tasks. For more information, see **Populate changes to WBS codes within the database**.
WBS→Regenerate All	Automatically generates new work breakdown structure codes based on the format of initial value of the schedule. For more information, see **Populate changes to WBS codes within the database**.
Proxy→Go to Home Task	Displays the schedule for the selected proxy task.
Proxy→Find Proxy Tasks	Displays the schedules that have proxy tasks for a selected task.
Proxy→Mirror as Proxy Task	Creates a proxy task in a subschedule from a task in the parent schedule. For more information, see **Mirror a task (create a proxy task)**.
Deferred Session→Start Session	Starts a deferred session and locks the schedule so you can make multiple updates to the schedule without saving it to the database. For more information about deferred sessions, see **Updating schedules in a deferred session**.
Deferred Session→End Session	Exits a deferred session and gives you the option to save changes you made to the schedule.
Deferred Session→Save Changes	Saves changes you made to the schedule so far in the deferred session.
Deferred Session→Cancel Changes	Cancels changes you made to the schedule so far in the deferred session.
Deferred Session→Release Session	Unlocks a deferred session that has been accidentally locked. Do not use this menu command to end your deferred session. For more information, see **Unlock the schedule**.

Schedule Manager buttons and symbols

Note:

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

Button		Purpose
These standard buttons are located on the main toolbar at the top of the **Schedule Manager** window.		
	Soft abort	Allows you to terminate the current operation without closing Schedule Manager or losing data.
	Cut	Cuts the selected lines from the structure and places them on the clipboard.
	Copy	Copies the selected lines in the structure and places them on the clipboard.
	Paste	Pastes the components from the clipboard as children of the currently selected (assembly) line in the structure.
	Delete	Deletes the selected object from the database.
	Save	Saves the current contents of the schedule to the database.
	Navigation Pane	Displays or hides the navigation pane. For more information about working with the navigation pane, see *Teamcenter Basics*.
	Refresh	Refreshes the display in your rich client window.
	Reload Schedule	Reloads the schedule and applies any changes.
	New Task	Creates a new task.
	New Milestone	Creates a new milestone.
	Task constraints	Adds a task constraint for the selected task.
	Outdent task	Removes the selected sub-task from its parent task.
	Indent task	Changes the selected task to be a sub-task of the task directly above it.
	Assign to Task	Assigns a resource to a task.

Button		Purpose
	Insert Schedule	Adds or removes subschedules in master schedules or schedule templates in master schedule templates.
	Schedule Membership	Displays and assigns resources to a selected schedule.
	Start Deferred Session	Starts a deferred session and locks the schedule so you can make multiple updates to the schedule without saving it to the database. For more information about deferred sessions, see **Updating schedules in a deferred session**.
	End Deferred Session	Exits a deferred session and gives you the option to save changes you made to the schedule.
	Save Deferred Session	Saves changes you made to the schedule so far in the deferred session.
	Print current view	Prints the current schedule.
	Print Preview	Previews your print job and updates the preview options.

The following buttons are located at the bottom left corner of the Schedule Manager navigation tree pane.

	Most recently used (MRU) list	Shows a list of your most recently accessed structures. If you select an entry from the list, Schedule Manager loads the structure into the structure pane. You can configure the number of entries shown in the MRU list by right-clicking the button and moving the slider to the desired number.

The following symbols are displayed at the bottom right corner of the product structure pane and show the current status of the selected line.

> Note:
>
> The buttons and features shown in the product structure pane are not applicable to Schedule Manager.

	Shows if you have write access permissions for the selected line.
	Shows if you have delete access permissions for the selected line.
	Shows if you have access permissions to change the selected line.

Button	Purpose
	Shows if the item revision represented by the line is currently in a workflow process.
	Shows if the item revision represented by the line is currently checked in or checked out.
	Shows if the item revision represented by the line is currently released.
	Shows if the item represented by the line is currently published.
	Shows if the item or revision represented by the line is currently classified.

What are perspectives and views?

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

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

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

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

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

Basic concepts for using Schedule Manager

What are the benefits of using Schedule Manager?

To make the best use of Schedule Manager, it is important to understand how Teamcenter applications work together to provide project tracking and scheduling.

Starting with a reasonable and executable schedule is the first and most important step of keeping your job on track. By learning how to analyze the project schedule and being able to negotiate for the right amount of time to efficiently manage your work, you'll save money throughout the project — from beginning to end.

Using Schedule Manager is key to:

- Managing employees' time.
- Maintaining your budget.
- Leveraging resources.

Creating schedules

You can create schedules in Schedule Manager. You can also create schedules in My Teamcenter, but if you want to view and maintain them, you must send them to Schedule Manager.

For more information, see *Create a schedule using the New Schedule wizard*.

View schedule reports

If your site uses the Reporting and Analytics package, you can generate various reports for Schedule Manager. For example, you can run reports for comparing schedule baselines, viewing the progress of schedule deliverables, showing schedule tasks and the assigned resource, and viewing the progress of workflow tasks in a schedule.

View schedule reports

Schedule Manager reports are contained as XML files in the **data.zip** folder on the Teamcenter software distribution image. To view these files, perform the following steps:

1. On the Teamcenter software distribution image, navigate to the **tc** directory.
2. In the **tc** directory, locate and expand the **data.zip** file into a temporary directory.
3. In the temporary directory, navigate to the **tcra/schmgt** directory.

For more information about the Reporting and Analytics package, see the Report Management Using Report Builder.

Basic tasks using Schedule Manager

You use Schedule Manager to perform the following tasks:

- **Create a schedule using the New Schedule wizard**
- **Baselining schedules**
- **Methods for adding a task**
- **Create a milestone**

- **Set a task baseline**
- **Assigning resources to a schedule**
- **Assign a resource to a task**
- **Defining calendars**

Sites use Schedule Manager to create schedules for a project. Schedules contain tasks that describe work for the project, time constraints, and resources. At various points in the schedule, the schedule coordinator can take a snapshot (baseline) of the schedule and add milestones.

Each schedule has an associated calendar where work days (and hours), holidays, and vacations (on a per-user basis) can be tracked.

2. Configuring Schedule Manager

Setting the site time zone

You must set the **SiteTimeZone** preference before running Schedule Manager.

Schedule Manager uses this preference to determine the default time zone when creating new system calendars. Set it to one of the values defined in the **Timezone** LOV, for example, **Europe/London**.

This preference accepts a single value pair indicating a time zone ID from the zoneinfo database (also known as the Olson database) in the following format:

region/city

For example: **Europe/Paris** or **America/Chicago**.

Warning:

You must set this preference as there is no default value.

The system checks for a valid value and displays an error message when Schedule Manager is launched if either an invalid value or no value is detected.

When creating new calenders, Teamcenter determines the default time zone as follows:

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

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

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

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

Configuring schedules in Schedule Manager

Configuring schedule behavior

You can configure how schedules behave in Schedule Manager with the following preferences:

- **SM_ALLOW_INPROCESS_REMOVAL_OF_SUBSCHEDULE**

  Prevents removal of subschedules that are started and are in progress.

  > Note:
  >
  > The values of the **SM_PREVENT_DELETE_STATES** preference takes precedence over the value of this preference for subschedules.

- **SM_Copy_Schedule_Async**

  Determines the default selection when the user performs the **Save As** or **Create a Schedule** from the **Template** command. (**True** == Asynchronous Copy Schedule)

- **SM_CriticalPath_Color**

  Sets the color for display of the critical path.

- **SM_Delete_Schedule_Async**

  Determines if delete schedule behavior is asynchronous (**True** == Asynchronous Delete Schedule)

- **SM_LIMIT_SINGLE_MASTER_SCHED**

  Limits subschedules to have only one master schedule.

- **SM_SCHEDULE_DATE_LINKED_TO_ACTUAL**

  Default value for linking planned and actual schedule dates. If set to true, all schedules by default have the schedule dates linked to actual.

  > Note:
  >
  > This preference sets the **Are Dates Linked** schedule option for all schedules or leaves it up to the schedule coordinator.

- **SM_PV_FILTER_SHOW_SCHEDULES_ON_EMPTY**

  Determines whether schedule nodes are displayed when no tasks are returned from a filter-only criteria in the Program View.

- **SM_Structure_Partial_Context**

  Specifies the load behavior for loading subschedules in a master schedule context.

- **SM_View_CriticalPath**

Sets the default display of the critical path.

- **SM_SchedulingEngineOptions**

  Manages the deactivation of scheduling and execution validations.

You can also configure how schedules behave in Schedule Manager with the following Business Modeler IDE conditions:

- **Fnd0SMAbortScheduleNotification**

  Returns **true** if the schedule state is **aborted**.

- **Fnd0SMAbortTaskNotification**

  Returns **true** if the task state is **aborted**, the schedule state is not **aborted**, and the task did not start or should have started.

- **Fnd0SMHasTaskStarted**

  Returns **true** if the task state is not **not started**, **closed**, nor **aborted**.

- **Fnd0SMIsCompletePercent100**

  Determines if the task **complete_percent** is **100**.

- **Fnd0SMIsCompletePercentComplete**

  Returns **true** if the task **complete_percent** is **100** and the task state is not **complete**.

- **Fnd0SMIsCompletePercentInProgress**

  Returns **true** if the task **complete_percent** is between **0** and **100** and the state is **not_started** or **complete**.

- **Fnd0SMIsTaskComplete**

  Returns **true** if task **complete_percent** is **100** and the state is **complete**.

- **Fnd0SMIsTaskStatusComplete**

  Returns **true** if task state is **complete** and **complete_percent** is not **100**.

- **Fnd0SMIsWorkCompleteInProgress**

  Returns **true** if the task **work_complete** is greater than **0** and the status is **not_started**.

- **Fnd0SMSendAbortNotifications**

  Determines if notifications are sent when a task or schedule is aborted. The default is **true**.

- **Fnd0SMUseInitActualLogic**

  Determines if the default Teamcenter logic should be used to initialize actual dates. The default is **true**.

- **Fnd0SMUsePCStatusLogic**

  Determines if the default Teamcenter logic should be used to enforce setting **complete_percent** to **100** when the **state** is **complete**. The default is **true**.

- **Fnd0SMUseRollupLogic**

  Determines if the default Teamcenter logic should be used to roll up status changes. The default is **true**.

- **Fnd0SMUseTaskStartedLogic**

  Determines if the default Teamcenter logic should be used to initialize the status when work starts. The default is **true**.

- **Fnd0SMWorkflowAbort**

  Returns **true** if the task state is **aborted**.

- **Fnd0SMIsTaskAssignee**

  Returns **true** if the task type is **standard**, **milestone**, or **gate**.

- **Fnd0SMIscostDba**

  This condition returns **true** if the role of the currently logged in user is **CostDBA**.

- **Fnd0SMCanLoggedInUserModifySchedulingData**

  This condition returns **true** if the currently logged in user is a coordinator on the schedule.

- **Fnd0SMCanLoggedInUserModifyTaskExeData**

  This condition returns **true** if the currently logged in user is a coordinator or participant on the schedule.

Configuring the display of objects, attributes, and properties

You can configure how objects, attributes, and properties are displayed in Schedule Manager with the following preferences:

- **CombinedAvailableAttributes**
- **Fnd0QueryFolder_DefaultChildProperties**
- **ProgramViewFilterProperties**
- **ProgramViewGroupProperties**
- **ScheduleAvailableAttributes**
- **ScheduleColumnShownPref**
- **ScheduleTaskAvailableAttributes**
- **ScheduleTaskAvailableAttributesWithRelations**
- **SM_EXEC_VIEW_PROPERTIES**
- **TaskInbox_DefaultChildProperties**

Setting deferred session length and notifications

You can configure how long Schedule Manager deferred sessions last and notification and display options with the following preferences:

- **SM_DEFERRED_NOTIFICATION_TIME**
- **SM_DEFERRED_SHOW_TIMEOUT**
- **SM_DEFERRED_TIMEOUT**

Setting user permissions

You can configure which users are permitted to perform specified actions within Schedule Manager with the following preference:

- **SM_ALLOW_USER_ABORT**

Preventing updates of schedules or tasks in certain states

You can configure which actions are prohibited when schedules or tasks are in a specified state, such as **in_progress** or **complete**, within Schedule Manager with the following preferences:

- **SM_PREVENT_DELETE_STATES**

  > Note:
  >
  > The values of this preference take precedence over the value of the **SM_ALLOW_INPROCESS_REMOVAL_OF_SUB_SCHEDULE** for subschedules.

- **SM_PREVENT_TASK_START_UPDATE_STATES**
- **SM_PREVENT_UPDATE_STATES**
- **SM_PREVENTION_OVERRIDE**

Configuring schedule importing and exporting

You can configure how schedules are imported and exported with the following preferences:

- **SM_PLMXML_EXPORT_SUB_SCHEDULE**
- **SM_PLMXML_IMPORT_EXISTING_SCHEDULE**

Configuring tasks and milestones

Creating new statuses

Use the Business Modeler IDE to create new statuses and change conditions that determine how statuses are set.

Schedule Manager objects in Business Modeler IDE are provided by the Foundation template. No additional templates are needed.

Configuring the status indicator

There are several ways you can configure the status display. You can:

- Display the status indicator column in Schedule Manager.
- Display the status indicator column in a program view.

- Display the state column in the **My Tasks** tab.
- Customize the display of the status indicator.

Configuring work breakdown structures

You can configure work breakdown structures with the following preferences:

- **SM_WBS_CODE_PREF**
- **SM_WBS_FORMAT_PREF**
- **SM_WBS_INITIAL_PREF**

Enable trace links

To use trace links and the generate traceability reports described in **Managing trace links in Schedule Manager**, perform the following steps:

1. In My Teamcenter, choose **Edit→Options** to display the **Options** dialog box.
2. Select **Systems Engineering**.
3. Select the **Trace Link Mode** check box.
4. Click **OK** to apply the edits and close the dialog box.

This procedure sets the **Tracelink_Edit_enabled**preference to **true**. Setting this option also configures trace link features for Teamcenter applications such as Teamcenter systems engineering and requirements management, My Teamcenter, Structure Manager, and Multi-Structure Manager.

Configuring wizards and dialog boxes in Schedule Manager

You can configure whether to launch the New Milestone wizard when you create a milestone with the following preference:

- **SM_Use_Milestone_Wizard**

You can configure whether the **New Task** dialog box closes or stays open when you click **Finish** with the following preference:

- **SM_NEW_TASK_DIALOG_CLOSE_ON_FINISH**

Use the following preference to configure the Schedule Task object attributes that are displayed in the **Column Chooser** dialog box of the Schedule Manager application when a Program View is opened:

- **ScheduleTaskAvailableAttributes**

> Note:
>
> Interdependent preferences cannot be modified using the **Options** dialog. See Working with preferences in the rich client.

Configuring task assignment criteria

You can choose if Schedule Manager enforces assignment criteria, such as discipline, placeholder, or qualification, when assigning resources to schedule tasks with the following preference:

- **SM_ENFORCE_ASSIGNMENT_CRITERIA**

Configuring costs and deliverables

You can configure costs and deliverables with the following preferences:

- **cost_default_currency**
- **ScheduleDeliverableWSOTypes**

Schedule Manager allows sites to define user rates for calculating both schedule and task costs. These rates are defined with either the Organization application or with Schedule Manager using the rate modifiers function.

- Rates set with the Organization application are global; they are used with Schedule Manager and other applications.
- Rates set with Schedule Manager apply only to Schedule Manager costs and are not reflected back to the Organization application.

To prevent unauthorized users from viewing and changing user rates, Teamcenter defines the **CostDBA** role and establishes the following rules:

- Only users with the **CostDBA** role can read and write the overall user rates as defined by the Organization application.
- Only users with the **CostDBA** role can define rate modifiers (multiplier or custom).
- Schedule coordinators can read and write schedule member rates for both users and disciplines in their schedules.
- Schedule coordinators can create, read, and write fixed costs in their schedules.
- Coordinators can read and write billing codes, billing subcodes, and rate modifiers.

- Participants and observers can read only billing codes, billing subcodes, and rate modifiers.
- When a coordinator adds a user to the schedule, a rate for that user is also added. If the coordinator is logged on as **CostDBA**, the rate added is the rate set for that user in the Organization application. Otherwise, the rate defaults to **$0.00**.
- Users that are permitted to view a dialog box, but are not permitted to view a value in a column, see the value **NA**.

You can configure earned value management calculations with the following preferences:

- **SM_EVM_Calc_Labels**
- **SM_EVM_Calc_Preference**
- **SM_EVM_Export_Units**
- **SM_EVM_Work_Complete**

Setting up work calendars

Defining calendars

Teamcenter uses four types of calendars that allow you to set up work days, work hours, holidays, and vacations used by your organization when creating project schedules.

- *Base calendar*
- *User calendar*
- *Schedule calendar*
- *Schedule user calendar*

Calendars define working times. They do not define *hours* per day.

Schedule, user, and schedule user calendars reference a *parent* base calendar. A calendar inherits all *exceptions* from the parent calendar.

An exception is any deviation from Monday to Friday as working days of a week and 8 a.m. to 5 p.m. as working hours per day. Therefore, any workday considered as a nonworkday, or vice versa, qualifies as an exception.

A calendar can also inherit the default working times from the parent calendar.

> Note:
>
> Only the owning user or users with dba access can edit another user's calendar.

Base calendar

The base calendar, which is installed by Teamcenter, is used as the master calendar when creating schedules. It shows which days are workdays, hours in a workday, holidays and days off. The base calendar is set up and maintained by your system administrator.

For example, if your organization has a four-day work week, you would set **Daily Defaults** for Monday, Tuesday, Wednesday and Thursday to be 10 hours; for Friday, you would set **Daily Defaults** to 0.

A site can have several base calendars.

Teamcenter provides the following three default base calendars:

- **Standard**
- **Night Shift**
- **24 Hour**

When you select the base calendar, you can also select the time zone.

User calendar

The user calendar allows you to set days off, holidays, and working times in a day for an individual resource. It can also be created by the system administrator. Once created, you can access it through My Teamcenter.

User calendars can be created from both My Teamcenter and the Organization application. Nonadministrative users create their own resource calendars from My Teamcenter, while administrative users can create calendars for other users from Organization.

Schedule calendar

The schedule calendar allows you to set days off, holidays, and working times in a day for the current schedule. When you create a schedule, its calendar is the same as the default base calendar specified by the **Default_Base_Calendar_Preference** value. When you change a schedule calendar, the schedule is automatically recalculated.

Schedule user calendar

The schedule user calendar lets you to set days off, holidays, and working times in a day for an individual user. The schedule user calendar for a resource is blank until you create one.

Work time is determined by calendar precedence. For example, when a user is assigned to a task, the user work time is determined as follows:

- If a schedule user calendar exists, it determines user work time.

- If no schedule user calendar is present, but a user calendar exists, the user calendar determines user work time.
- If neither a schedule user calendar nor a user calendar exists, the schedule calendar is used.

Set daily defaults

From the **Daily Defaults** section, you can change workdays and change the number of hours in a day for scheduling purposes. The **Daily Defaults** section allows you to set daily defaults as follows:

- User calendar

  Set daily defaults for the current user.

- Schedule calendar

  Set daily defaults for the current schedule.

- Schedule user calendar

  Set daily defaults for each user in the schedule.

1. Open the calendar to update:

   - User calendar

     From My Teamcenter, choose **Edit** → **Calendar** → **Show Calendar**.

     If the user calendar does not exist, you are prompted to create one.

   - Schedule calendar

     Choose **Schedule** → **Schedule Calendar**.

     > Note:
     >
     > To modify a schedule calendar, the schedule must be unpublished.

   - Schedule user calendar

     Choose **Schedule** → **Schedule Membership**.

     Teamcenter displays the **Schedule Membership** dialog box.

From the **Schedule Membership** dialog box, click the **Calendar** button next to the resource name. If the schedule user calendar does not exist, you are prompted to create one.

> Note:
>
> Schedule user calendars cannot be created for groups, roles, or disciplines.

2. Select each day you want to change.

   To change a workday to a nonworkday, click **Non Working** in **For Selected Date(s)**.

   To change a nonworkday to a workday, click either **Default** or **Working HH:MM** in **For Selected Date(s)**.

3. Click **Details**.

   The system displays the **Daily Defaults Details** dialog box.

   The working times for a day are determined by time ranges with starting and ending times defined from 00:00 to 24:00.

   - The default 8 a.m. to 5 p.m. Working time is defined by two time ranges (08:00-12:00 and 13:00-17:00).
   - You can define up to five time ranges on a given day, but they cannot overlap.
   - Times are entered relative to the time zone selected for the calendar.

     Changing the value of the time zone for a schedule calendar does not change the value of the time zone for a schedule user calendar.

Set times for specific dates

1. Open the calendar to update.

   - Schedule calendar

     Choose **Schedule** → **Schedule Calendar**.

   - Schedule user calendar

     From the **Schedule Membership** dialog box, click the **Calendar** button next to the resource name.

2. Select the day you want to change.

- To change a workday to a holiday, select **Non Working**.
- To change the working times, select **Working HH:MM**.

3. Click **Details** to adjust the working times.
4. Click **OK**.

Update your calendar

When you create a schedule calendar, it inherits its data from the base calendar. When you change the schedule calendar or the base calendar, you must reset the calendar for changes to be seen in the other calendar.

1. Open the schedule calendar in Schedule Manager by choosing **Schedule→Schedule Calendar**.

   The schedule must be unpublished to work with the schedule calendar. To unpublish the schedule, change the **Published** schedule property to **false**.

2. After you make your changes to the schedule calendar, click the **Reset Calendar** button.

   The **Reset Schedule Calendar** dialog box appears.

3. To make all changes in the schedule calendar and base calendar appear in both, click the **Merge with Base Calendar** button and click **OK**.

   Warning:

   If you leave the **Reset to Base Calendar** button selected and click **OK**, any changes you made to the schedule calendar are lost, and the base calendar *replaces* the schedule calendar.

Configuring dates and calendars

You can configure dates and calendars in Schedule Manager with the following preferences:

- **DefaultActualToSystemDate**
- **Default_Base_Calendar_Preference**
- **SM_EnforceActualDatesBeforeNow**
- **SM_SCHEDULING_ENGINE_DATE**
- **SM_TEMPLATE_DATE**

- **SM_Hours_Per_Day_Preference**
- **SM_Hours_Per_Week_Preference**
- **SM_Hours_Per_Year_Preference**

Configuring timesheets

You can configure timesheets with the following preferences:

- **SM_TIMESHEET_APPROVE_WORKFLOW**
- **SM_TIMESHEET_REVISE_WORKFLOW**

Configuring charts and graphs

You can configure Gantt charts in Schedule Manager with the following preferences:

- **SM_DISPLAY_GANTT_SI**
- **SM_GANTT_MONTH_ZM_B_DF**
- **SM_GANTT_MONTH_ZM_T_DF**
- **SM_GANTT_QTR_STRT**
- **SM_GANTT_QTR_ZM_B_DF**
- **SM_GANTT_QTR_ZM_T_DF**
- **SM_GANTT_WEEK_ZM_T_DF**
- **SM_GANTT_YEAR_ZM_T_DF**
- **SM_GANTT_USE_ISO_8601_FOR_DATE**

You can configure resource graphs in Schedule Manager with the following preferences:

- **scheduling_graph_dataSource**
- **scheduling_graph_dataSource_filter**
- **scheduling_graph_date_format**
- **scheduling_graph_date_interval**

- **scheduling_graph_domain_label_vertical**
- **scheduling_graph_font_name**
- **scheduling_graph_font_size**
- **scheduling_graph_font_style**
- **scheduling_graph_histogram_single_color**
- **scheduling_graph_reference_calendar**
- **scheduling_graph_task_legend**
- **scheduling_graph_view**

Configuring workflow with Schedule Manager

You can configure how workflow status rules are mapped between workflow task and schedule task statuses with the following preference:

- **SM_WORKFLOW_STATUS_MAP**

Configuring Schedule Manager interaction with other applications

Display Schedule Manager information in My Teamcenter

You can display Schedule Manager information in My Teamcenter by creating and editing various default child properties and pseudofolder preferences. The following steps are an example; you can configure the preferences to suit your needs.

1. Set the **Schedule_DefaultChildProperties** preference to the following values:
    - **IMAN_reference**
    - **project_list**
    - **schedule_deliverable_list**
    - **schedule_deliverable_taglist**
    - **fnd0SummaryTask**
    - **fnd0Schedulemember_taglist**

2. Set the **ScheduleTask_DefaultChildProperties** preference to the following values:

   - **IMAN_reference**
   - **child_task_taglist**
   - **project_list**
   - **sch_task_deliverable_list**

3. Create the **SchDeliverable_DefaultChildProperties** preference as a user preference and set it to the following value:

   - **deliverable_inst**

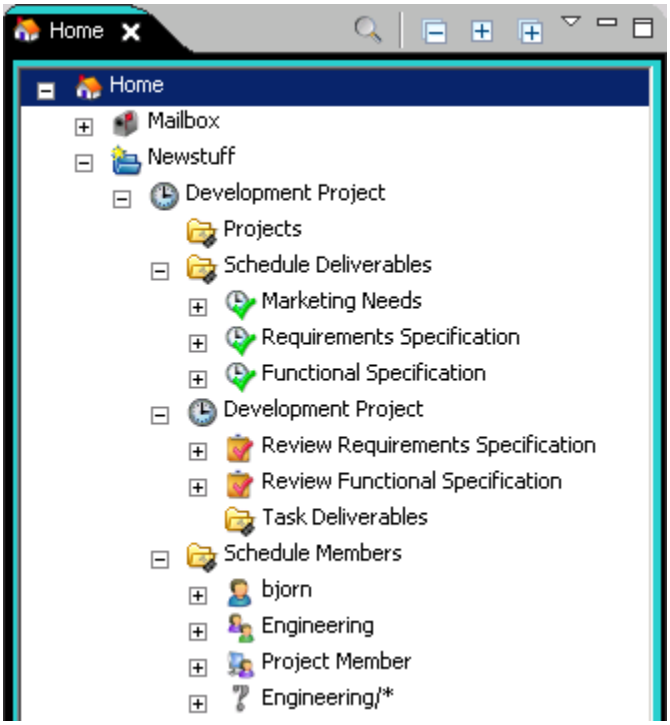
4. Create the **Schedule_PseudoFolder** preference as a user preference and set it to the following values:

   - **schedule_deliverable_list**
   - **project_list**
   - **schedule_deliverable_taglist**
   - **fnd0Schedulemember_taglist**

5. Create the **ScheduleTask_PseudoFolder** preference as a site preference and set it to the following values:

   - **sch_task_deliverable_list**
   - **task_deliverable_taglist**

If you configure your preferences as described, the **Home** folder looks similar to the following.



Configuring Reporting and Analytics parameters

You can configure Reporting and Analytics parameters with the following preference:

- **TC_RA_server_parameters**

You can also specify the source for reports and server parameters used for Reporting and Analytics.

Configuring notifications and subscriptions

What is the difference between notifications and subscriptions?

You use *notifications* to notify individuals, including yourself, of important events associated with selected objects.

You use *subscriptions* to notify *only* yourself of important events associated with selected objects.

> Note:
>
> The transfer of notifications and subscriptions is not supported with PLM XML or site consolidation.

Setting up the mail system for notifications and subscriptions

Notifications and subscriptions utilize Teamcenter mail and the Subscription Manager. To receive notifications and subscriptions, a system administrator must perform the following tasks:

- Set the value of the **Mail_server_name** preference to a name of a valid mail server. This task needs only to be performed once.
- For every user, set the value of the e-mail address in the **Person** object for that user.

Notifying users about schedule and task events

What is a notification?

You create notifications to notify you, fellow team members, and even people outside the team of important events such as finish dates, milestones, and task completions. When you create a notification rule, not only do you specify who should receive it but you can include message text relating to the notification. You can create notifications based on the existing set of notification rules.

You can create notifications for both schedules and tasks.

Notifications can be received by any user in the system, a custom e-mail address, or people meeting the following qualifications:

- Member of a schedule
- Member of a group

Create a notification

Create a notification

> Note:
>
> You can create notifications, but they cannot be initiated from within a schedule template.

1. Select a task, multiple tasks, or schedule.
2. Choose **Edit** → **Notification Rules**.

   Teamcenter displays the **Notification Rules** dialog box.
3. In the **Notification Rules** dialog box, click **New**.

   Teamcenter displays the **Create Notification Rule Wizard** dialog box.

4. Select a rule from the list and click **Next**.

   You can view the list of notification rules for schedules and tasks later in this topic.

5. Select recipients for the message.

   All disciplines in the membership appear in the list.

   When notifying disciplines, members of the discipline who are also members of the schedule are notified. When notifying groups, all group members are notified when an event is initiated.

6. Click **Select** to add other members of the organization who are not currently schedule resources.

   > Note:
   >
   > Notifications are sent to e-mails that appear in the **Check to specify additional email addresses** list.

7. Enter additional e-mail addresses, separated by commas, and click **Next**.

8. Enter a subject and the message text or use the placeholders provided.

   > Note:
   >
   > These placeholders are replaced when the message is sent.
   >
   > - **{ScheduleName}** is filled with the schedule name.
   > - **{TaskName}** is filled with the task name.
   > - **{OldValue}** is used on the change notification. For example, if the notification is when a date changes, **{OldValue}** is the date prior to the change.
   > - **{NewValue}** is used on the change notification. For example, if the notification is when a date changes, **{NewValue}** is the date it was just changed to.
   >
   > These placeholders are not translated.

9. Click **Finish**.

List of notification rules for schedules:

You can create notification rules for schedules when:

- Tasks are added to the schedule.

- Tasks are deleted from the schedule.
- The schedule is near due.
- The schedule is overdue.
- The schedule's start date changes.
- The schedule's finish date changes.
- The schedule's status is changed.
- The schedule's status changes to...
- The schedule's priority is changed.
- The schedule's priority changes to...

List of notification rules for tasks:

You can create notification rules for tasks when:

- The task is deleted.
- The task is near due.
- The task is overdue.
- The task's start date changes.
- The task’s finish date changes.
- The task's status is changed.
- The task's status changes to...
- The task's priority is changed.
- The task's priority changes to...
- The task's work estimate is changed.
- The task's work complete is changed.
- The work is ready.

- The user is assigned to the task.

Modify a notification

1. Select a task or schedule.
2. Choose **Edit** → **Notification Rules**.

   Teamcenter displays the **Notification Rules** dialog box.
3. In the **Notification Rules** dialog box, select the notification and click **Modify**.
4. Using the **Create Notification Rule Wizard** dialog box, change any information you need to update.
5. Click **Finish**.

Delete a notification

1. Select a task or schedule.
2. Choose **Edit** → **Notification Rules**.

   Teamcenter displays the **Notification Rules** dialog box.
3. From the **Notification Rules** dialog box, select the notification and click **Delete**.
4. From the **Confirm** dialog box, click **Yes**.

Deactivate and activate a notification

Activating and deactivating a notification allows you to turn on or off a notification without removing it from the notification rule list.

1. Select a task or schedule.
2. Choose **Edit** → **Notification Rules**.

   Teamcenter displays the **Notification Rules** dialog box.
3. To deactivate a notification, select the notification in the **Notification Rules** dialog box and click **Deactivate**.
4. To activate a notification, select the notification in the **Notification Rules** dialog box and click **Activate**.

Subscribing yourself to schedule and task events

What is a subscription?

You can create a subscription for a task that notifies you when a specified task-related event occurs. Subscriptions are similar to notifications except that you can send a subscription *only* to yourself.

Create subscriptions

Create Subscriptions

The **Subscription Rules** dialog box lets you see a list of existing e-mail subscriptions, create new subscriptions, and modify existing ones.

> Note:
>
> You can create subscriptions, but they cannot be initiated from within a schedule template.

1. Select a task, multiple tasks, or schedule.
2. Choose **Edit** → **Subscription Rules**.

   Teamcenter displays the **Subscription Rules** dialog box.
3. Click **New** in the **Subscription Rules** dialog box.
4. Select one of the rules from the list and click **Next**.

   You can view the list subscription rules for schedules and tasks later in this topic.
5. Enter a subject and the message text or use the placeholders provided.

   > Note:
   >
   > These placeholders are replaced when the message is sent.
   >
   > - **{ScheduleName}** is filled with the schedule name.
   > - **{TaskName}** is filled with the task name.
   > - **{OldValue}** is used on the change notification. For example, if the notification is when a date changes, the **{OldValue}** is the date prior to the change.

- **{NewValue}** is used on the change notification. For example, if the notification is when a date changes, the **{NewValue}** is the date it was just changed to.

These placeholders are not translated.

6. Click **Finish**.

Note:

The symbol for a task that has a notification and one that has a subscription is the same and the only way to tell whether it is a notification of subscription is to display the **Notification Rules** and **Subscription Rules** dialog boxes.

List of subscription rules for schedules:

You can create subscription rules for schedules when:

- Tasks are added to the schedule.
- Tasks are deleted from the schedule.
- The schedule is near due.
- The schedule is overdue.
- The schedule's start date changes.
- The schedule's finish date changes.
- The schedule's status is changed.
- The schedule's status changes to...
- The schedule's priority is changed.
- The schedule's priority changes to...

List of subscription rules for tasks:

You can create subscription rules for tasks when:

- The task is deleted.
- The task is near due.

- The task is overdue.
- The task's start date changes.
- The task’s finish date changes.
- The task's status is changed.
- The task's status changes to...
- The task's priority is changed.
- The task's priority changes to...
- The task's work estimate is changed.
- The task's work complete is changed.
- The work is ready.
- The user is assigned to the task.

Modify a subscription

1. Select a task or schedule.
2. Choose **Edit** → **Subscription Rules**.

   Teamcenter displays the **Subscription Rules** dialog box.
3. In the **Subscription Rules** dialog box, select the subscription and click **Modify**.
4. Using the **Create Subscription Rule Wizard** dialog box, change any information you need to update.
5. Click **Finish**.

Delete a subscription

1. Select a task or schedule.
2. Choose **Edit** → **Subscription Rules**.

   Teamcenter displays the **Subscription Rules** dialog box.

3. In the **Subscription Rules** dialog box, select the subscription and click **Delete**.

4. In the **Confirm** dialog box, click **Yes**.

Deactivate and activate a subscription

Activating and deactivating a subscription allows you to turn on or off a subscription without removing it from the subscription rule list.

1. Select a task or schedule.

2. Choose **Edit** → **Subscription Rules**.

   Teamcenter displays the **Subscription Rules** dialog box.

3. To deactivate a subscription, select the subscription in the **Subscription Rules** dialog box and click **Deactivate**.

4. To activate a subscription, select the subscription in the **Subscription Rules** dialog box and click **Activate**.

Configuring advanced search query in Active Workspace

In Active Workspace, you can search for objects by name, ID, or dataset from the **Quick Search** list in the **Advanced Search** panel. You can configure **Schedules...** as a quick access query by modifying these preferences:

- *Quick_Access_Queries*

  These searches are available by default:

  - Item ID
  - Item Name
  - Dataset Name

  You can add a new value **Schedules...** to this list.

- *Quick_Access_Queries_Attribute*

  By default, there are four values:

- Item ID_SearchAttribute=ItemID
- Item Name_SearchAttribute=ItemName
- Dataset Name_SearchAttribute=DatasetName

You can add a new value **Schedules..._SearchAttribute=Schedule Name** to this list.

> Note:
>
> For this value, you must use a space between **Schedule** and **Name**.

In Active Workspace, verify that the new query, **Schedules...** is listed in the **Quick Search** list in the **Advanced Search** panel.

Disabling scheduling engine logic for data import

A system administrator can set the **SM_SetDefaultScheduleAsExternal** preference to **True** to turn off the scheduling engine logic so that when importing schedule data from an external scheduling application, the data won't conflict with the scheduling engine logic. Scheduling engine logic enforces scheduling constraints, such as ensuring that data doesn't exceed a schedule's date boundaries or preventing conflict when creating schedule task dependencies. Once the schedule data is imported, it is important to set the **SM_SetDefaultScheduleAsExternal** preference to **False** so that schedule data is appropriately constrained.

3. Creating and managing schedules in Schedule Manager

Create a schedule using the New Schedule wizard

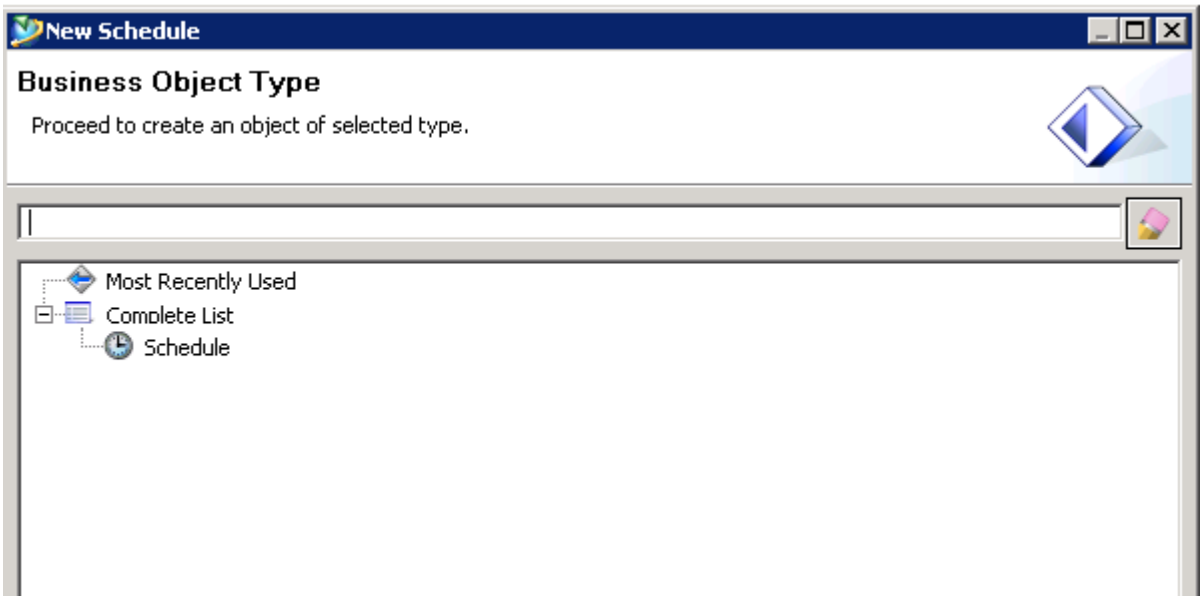
You can create a new schedule either by selecting the default Schedule business object type and defining the schedule using the default properties in Teamcenter or by creating a new business object type specifically designed for your system and defining custom schedules based on this business object type.

1. Open **New Schedule Wizard** using either of these steps:

   - In My Teamcenter, select a folder and choose **File→New→Schedule**. If you do not select anything, Teamcenter creates the schedule in the **Newstuff** folder by default.

   - Launch Schedule Manager and choose **File→New→Schedule**.

   The first page of **New Schedule** appears.



   The listed business object types include a basic definition called **Schedule** and all custom business object types that have been created for your system.

2. Select the desired schedule business object type from the **Most Recently Used** or the **Complete List** list.

Selecting **Schedule** results in the display of the standard Schedule Manager New Schedule wizard pages, while selecting any other business object type opens a customized page that allows you to set custom values.

Schedule Manager creates the new schedule; it appears under the folder that was active when you chose **File→New→Schedule**. You can move the schedule from the current folder to another folder.

> Note:
>
> Schedule Manager does not support cloning of schedules.

3. After selecting a business type object, select one of these options:

   - Click **Next** to specify options for the new schedule.
   - Click **Finish** to finish creating the schedule using the default Teamcenter options. This option is only available if the schedule is named.
   - Click **Close** to end schedule creation.

Create a schedule using the Schedule business object type

When you create a new schedule based on the **Schedule** business object type, Teamcenter displays the options set by default on the **Object Create Information** page. (You can change these settings later using the schedule's **Properties dialog box**).

> Note:
>
> The options for a schedule based on a custom business object type are different from those given here, as are the appearance and order of the items on **Object Create Information**. For information about custom options on your system, contact your manager.

Schedule Manager displays these options:

1. Enter **Name**, which is a required element, and click **Assign** to add a system-generated **Schedule ID**.
2. Add a **Description**, the **Customer** and **Customer Number**.
3. Click **Schedule Options** to review default options. Change as desired.

   - **Is Schedule Template**

     Setting this option to **True** causes Teamcenter to activate **Use an existing Schedule template for this new Schedule** on the **Schedule Information** page.

- **Published**

  Specifies this schedule is published. All users can see any published, public schedule. By default, this option is selected.

  Only the owner of a schedule can publish or unpublish a schedule using the **Schedule Properties** dialog box. To deny access to the schedule to other users, keep it unpublished. Publish it when you are ready for others to view or edit it.

  Publishing a schedule is controlled by the **Published** option in the **Properties** dialog box. Access it by right-clicking a schedule and selecting **Edit→Properties**, selecting **View schedule properties** and **OK**. Unpublish the schedule by deselecting **View schedule properties**.

  > Note:
  >
  > Certain functions, such as the schedule calendar, cannot be changed after a schedule is published. If changes to the schedule are necessary, unpublish the schedule, make changes, and then republish the schedule.

- **Are notifications enabled**

  Specifies that notifications are sent when specific triggers occur within a schedule. By default, this option is selected.

- **Use Finish Date Scheduling**

  Specifies finish-date-based scheduling. The default selection is determined by the **SM_SCHEDULING_ENGINE_DATE** preference.

  If you select this option, Teamcenter uses finish-based scheduling. This means you create your tasks from the finish date backward rather than the start date forward. The following rules apply:

  - As a manager creates tasks and defines dependencies, tasks move earlier in the schedule.
  - The Gantt chart allows changing task duration by dragging the start of a task.

- **Enable Execution Override**

  Allows users to make execution data updates if this check box is selected and the **SM_PREVENTION_OVERRIDE** preference is set to **Schedule Based** (the default setting). If **SM_PREVENTION_OVERRIDE** is set to another value, this check box is ignored and execution data updates follow these rules:

  - If **SM_PREVENTION_OVERRIDE** is set to **ALWAYS_ON**, execution data updates are always allowed even if the **Enable Execution Override** check box is not selected.

- If **SM_PREVENTION_OVERRIDE** is set to **ALWAYS_OFF**, execution data updates are prevented for the states specified by the **SM_PREVENT_UPDATE_STATES** preference even if the **Enable Execution Override** check box is selected. Execution data updates are allowed for the states not specified by the **SM_PREVENT_UPDATE_STATES** preference.

- **Is Schedule Public**

  Specifies the schedule is public. All users, including users who are not assigned to a schedule, can see any public, published schedule.

- **Is Percent Linked**

  If you select this option, the following rules apply:

  - If you change the work completed, the percentage completed changes to equal the percent of scheduled work completed.

  - If you change the percentage completed, the work completed changes to equal the scheduled work multiplied by the percentage completed.

  If this option is not selected, there is no correlation between work completed and percentage completed.

- **Are Dates Linked**

  If you select this option, the planned schedule dates and actual schedule dates are linked as follows:

  - Changing the *actual* start or finish date changes the scheduled start or finish date.

  - Changing the *scheduled* start or finish date does not change the actual start or finish date, respectively.

  - The Gantt chart always reflects the *scheduled* start and finish dates, not the actual start and finish dates.

  If this option is selected, the dates default to the scheduled date regardless of how the system is configured.

  If this option is not selected, the actual start and finish dates are set to the configured default (either today or scheduled) set up by the system administrator.

  You can also set this option with the **SM_SCHEDULE_DATE_LINKED_TO_ACTUAL** preference.

4. After reviewing default options and updating any that need changing, select one of these options:

- Click **Back** to return to **Business Object Type**.
- Click **Next** to specify the use of an existing template.
- Click **Finish** to finish creating this schedule.
- Click **Close** to end schedule creation.

Define schedule information

On the **Schedule Information** page, you can customize details for the use of an existing template for the new schedule.

Complete these settings as needed:

1. Select **Use an existing Schedule template for this new Schedule** to activate the settings here. You also must select this if the new schedule is based on the default **Schedule** but will use an existing **work breakdown structure**.

2. Select **Background Copy** to create the schedule in the background to increase system performance. Teamcenter sends you an email when the system has finished creating the schedule.

   Note:

   The system does not place the schedule in your **Newstuff** folder—you must use **Search** to locate it.

3. Select the schedule template or master schedule template you are basing the new schedule on from the **Schedule Template** list.

   Note:

   In Teamcenter 11.3, the create schedule wizard has been re-architected to show the schedule properties over different pages. The behavior during create from template will be as listed below:

   - All OOTB properties of the schedule template will be carried over to the new schedule in case the user has not specified any specific values.
   - All custom properties of the schedule template will be carried over to the new schedule in case the user has not specified any specific values.
   - If the user has specified a value for an OOTB or a custom property, then the user specified value will be carried over the new schedule being created from the template.

> Note:
>
> A master schedule template is a schedule template that contains one or more subschedule templates. When you create a schedule from a master schedule template, all tasks from the subtemplates are copied into the new schedule; however, no references to the subtemplates or the master template are included.

4. Specify date and time parameters.

   Click the **Start Date** calendar and select the start date and time for the schedule calendar. You can set the date, hour, and minutes. If you base your schedule on the start date, you create your tasks from the start date forward.

   Click the **Finish Date** calendar and select the finish date and time for the schedule calendar. You can set the date, hour, and minutes. If you base your schedule on the finish date, you build your tasks from the finish date backward.

   > Note:
   >
   > All tasks and milestones for the schedule must fall within the start and finish dates. After the schedule is created, you can change the start and finish dates using the **Properties** dialog box.

5. Specify the time zone the schedule uses by default using **Time Zone**. Click the arrow to display a list of values.

6. To proceed, select one of these options:

   - Click **Back** to return to **Object Create Information**.
   - Click **Next** to define the work breakdown structure format.
   - Click **Finish** to finish creating this schedule.
   - Click **Close** to end schedule creation.

Assign project page

Associates this schedule to a security-level project, which are entities that correlate groups of users with the data associated with a given project or subset of a project. Project-level security is defined by your system administrator.

1. Select a project from the **Available Project** list and click **>**.

2. To proceed, select one of these options:

- Click **Back** to return to **Object Create Information**.
- Click **Next** to define the work breakdown structure format.
- Click **Finish** to finish creating this schedule.
- Click **Close** to end schedule creation.

Define the work breakdown schedule on the WBS format page

You can specify the work breakdown structure for the schedule using the settings on this page. The work breakdown structure is a structure of codes applied to a schedule' s tree structure for reference and control purposes. These options are available whenever **Use an existing Schedule template for this new Schedule** is set to **True** on **Schedule Information**.

1. Enter the desired code format in **Format**.
2. Specify the value for the first occurrence of the code in **Initial Value** and click **Define**.
3. Proceed by selecting one of these options:
   - Click **Back** to return to **Schedule Information**.
   - Click **Finish** to finish creating this schedule.
   - Click **Close** to end schedule creation.

Schedule templates

Creating a schedule template

You use schedule templates to simplify the task of creating new schedules. You can create a new schedule template or you can create a schedule template from an existing schedule on which to base the schedule details. When the schedule template is created from an existing template, attributes such as the task actual dates, status, baselines, and work complete, are reset.

Create a new schedule template

1. Using the steps described in *Create a schedule using the New Schedule wizard*, create a schedule.
2. When you get to the **Enter Schedule Options and Details** page in the New Schedule wizard, select **Is Schedule Template**.

Note:

The schedule template symbol is slightly different than that of a regular schedule symbol .

3. Continue creating the template as you would for a non-template schedule.

4. Click **Finish**.

Note:

Teamcenter displays the **Load Schedule** dialog box.

- Click **Yes** if you want to load the schedule in a deferred session.
- Click **No** if you do not want to load the schedule in a deferred session.

For more information about loading a schedule in a deferred session, see **Loading schedules**.

Schedule Manager creates the schedule template which includes the **schedule summary task**.

Create a schedule template from an existing schedule

1. Select the schedule, right-click, and choose **Edit→Properties** in My Teamcenter or Schedule Manager.

Note:

The **Properties** dialog box displays the following options:

- **View schedule summary task properties** (default)

  This option displays the summary task properties. The display is read-only.

- **View schedule properties**

  This option allows you to modify the schedule properties.

2. Click **View schedule properties** and click **OK**.

3. Navigate to the **Is Schedule Template** option and click **True**.

4. Click **OK**.

Add a schedule template to a master schedule template

The master schedule template contains one or more subschedule templates. You can add schedule templates and remove subschedule templates from a master schedule template. You create master schedule templates similar to creating master schedules.

1. Select an existing schedule template in Schedule Manager.

   You can also add subschedule templates to an existing master schedule template.

2. Choose **Schedule→Insert Schedule**.

   Teamcenter displays the **Insert Templates** dialog box containing all available schedule templates. Nontemplate schedules are not displayed.

3. Choose **Reference** or **Copy**.

   If you insert a schedule template as a *reference*, a link to the schedule template is created in the master schedule template. Any changes to the subtemplate from within the context of the master schedule template (for example, updating the finish date of a task in a subschedule from within the master) are identical to performing the update directly in the subschedule. In addition, any other master schedule templates that reference this subtemplate also see the change.

   If you insert a schedule template as a *copy*, a copy of the schedule template is inserted into the master template. Changes made to the copy are *not* reflected to any other master schedules using this template.

   > Note:
   >
   > If a template is inserted as a copy, all of its schedule and task deliverables are lost, that is, they are not included in the master template. If the template is inserted as a reference, its deliverables are retained.

4. Select a schedule template from the **Available Templates** section and click **>** to insert the schedule template in the **Selected Templates** section. Repeat this step to insert additional schedule templates.

5. Click **OK**.

   Schedule Manager creates the master schedule template that includes the **schedule summary task**.

Remove a subschedule template from a master schedule template

1. Open a master schedule template in Schedule Manager.

2. Choose **Schedule→Insert Schedule**.

   Teamcenter displays the **Insert Templates** dialog box containing all schedule templates in the master schedule.

3. To remove a schedule template, choose the schedule template from the **Selected Schedules** section and click **<**. This action removes the schedule template from the master schedule template. To remove all schedule templates, click **<<**.

4. Click **OK**.

Phase gate schedules and tasks

Managing tasks with phase gates

The Teamcenter phase gate process divides a project into a series of phases that define best practice activities. After each phase of the process, there is a gate or quality control checkpoint. The process evaluates the phase at the gate to ensure the action plan and request for resources are sound.

In Schedule Manager, a *phase gate* is a special type of task structure. A *phase* corresponds to a summary task; a *gate* is a special task that provides criteria to determine if the phase is complete. Tasks within phases and gates can be linked to Teamcenter workflow. Phases are not linked to a Teamcenter workflow.

Tasks or task structures in Schedule Manager allow you to submit tasks to Teamcenter workflow. As tasks are worked on and updated in Teamcenter workflow, that information is sent to Schedule Manager where the corresponding information is updated.

Create a phase gate schedule

1. Create a schedule by following the procedures in *Create a schedule using the New Schedule wizard*.

2. Choose **File→New→Task**.

   Schedule Manager displays the **New Task** dialog box.

3. Update task properties in the **New Task** dialog box by following the procedures in *Add a task using the New Task wizard*. Be sure to check the **Create Phase Gate Schedule** box.

After you complete the task, the schedule displays a phase, two milestones, and a gate. The phase appears as hatched lines.

Repeat this process to add additional phases.

Modify the special task dependency

A special phase gate dependency is created between the phase and the gate.

1. Double-click the dependency between the phase and the gate to open the **Edit Dependency** dialog box.

   You can also select the gate in the task table, right-click, and choose **Dependencies** to display the **Dependencies** dialog box. Choose the phase predecessor and click **Edit** to open the **Edit Dependency** dialog box.

2. Change the value of **Lag Time**. This box specifies the number of days between the end of the phase and the start of the gate. The default value is zero.

3. Click **OK**.

   Click **Close** on the **Dependencies** dialog box if open.

Add tasks and milestones to the phase

1. Create tasks for the phase.

2. Assign resources to each task.

3. Arrange dependencies between tasks within the phase.

4. Arrange the dependency between the gate and the first task within the next phase.

Structuring subschedules

Nesting schedules

Schedule Manager allows you to insert an existing *published* schedule into another schedule. This concept is termed *nesting schedules*.

The schedule containing an inserted schedule is termed a *master* **schedule**; the inserted schedule is termed a *subschedule*.

A *normal* schedule is a schedule that is neither a master schedule or subschedule.

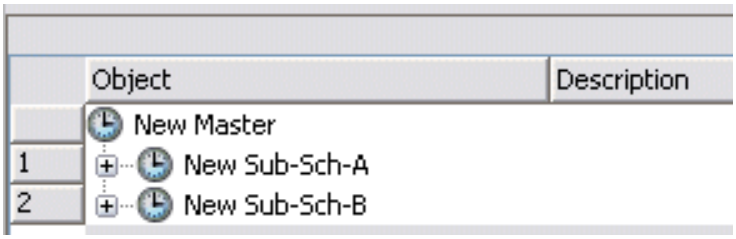
The following rules apply to master schedules, subschedules, and normal schedules:

- You cannot insert a schedule under a subschedule.

- If you remove all subschedules from a master schedule, the master schedule becomes a normal schedule.
- If you remove a subschedule from a master schedule, and if the subschedule is not part of any other master schedules, it becomes a normal schedule.
- A schedule can become a subschedule only if its start and finish dates are within the start and finish dates of the schedule in which it is to be inserted.
- A schedule can become a subschedule in more than one master schedule.
- A subschedule can be a master schedule in another schedule.
- Changing a property in a subschedule is global; that is, the property is changed in every instance that the subschedule is used.
- You can insert a master schedule into another master schedule and the original master schedule becomes a subschedule. All subschedules in the original master schedule are included. Consequently, you can create multiple levels of subschedules.

The following figures contain examples of single, double, and complex schedule nesting.

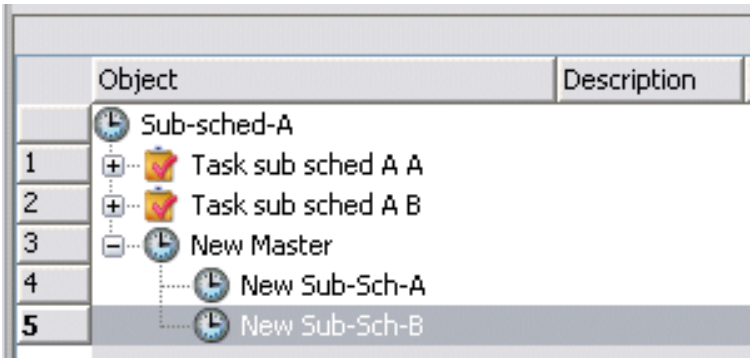
In the following figure, schedule **New Master** is a master schedule and contains subschedules **New Sub-Sch-A** and **New Sub-Sch-B**.



Single-layer nesting

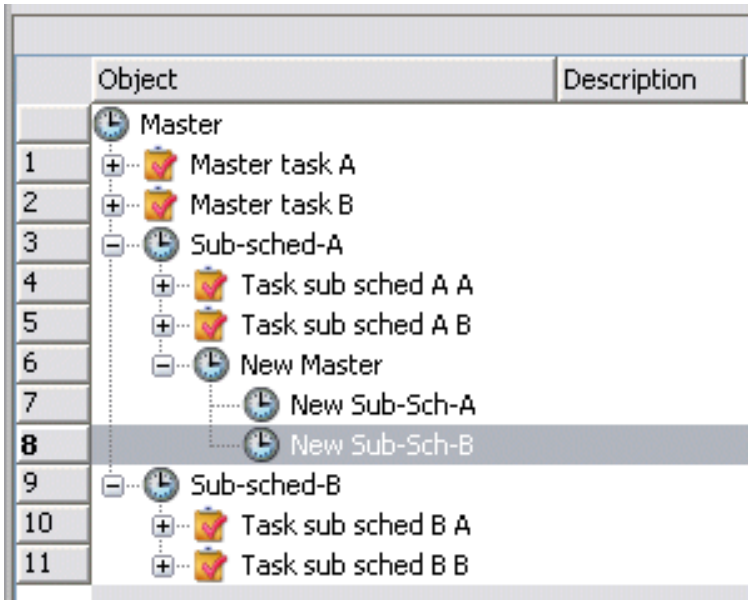
In the following figure, schedule **New Master** is inserted into schedule **Sub-sched-A**. In this instance, **Sub-sched-A** is considered a master schedule.

Schedule **New Master** becomes a subschedule and schedules **New Sub-Sch-A** and **New Sub-Sch-B** are included under schedule **New Master**.



Double-layer nesting

In the following figure, schedule **Sub-sched-A** is inserted in schedule **Master**. Schedule **Sub-sched-A** is now a subschedule in schedule **Master**. Schedule **New Master** is included. This figure illustrates the complexity of nesting schedules.



Complex-layer nesting

Nesting schedule membership

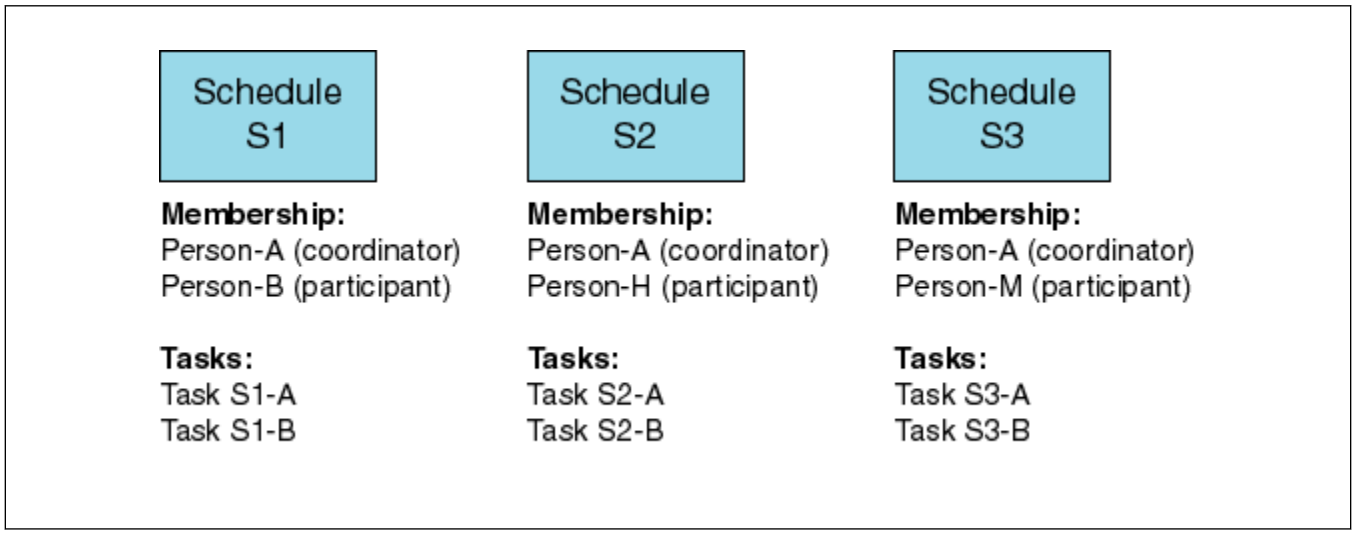
When you create nested schedules, the following rules for schedules, subschedules, and memberships apply:

- The schedule membership (**Schedule→Schedule Membership**) displayed for the master schedule contains only the members added to the master schedule. The membership in the master schedule does *not* include members from subschedules.

- The schedule membership (**Schedule→Schedule Membership**) displayed for a subschedule contains only the members added to that subschedule. Membership in a subschedule does *not* include members from the master schedule or other subschedules.
- If you add members to the master schedule, they are added only as members of the master schedule and can be assigned to tasks only in the master schedule.
- If you add members to a subschedule, they are added only as members of the subschedule and can be assigned tasks only in the subschedule.
- Members added or removed from the master schedule or subschedules do *not* affect the membership in the other schedules.

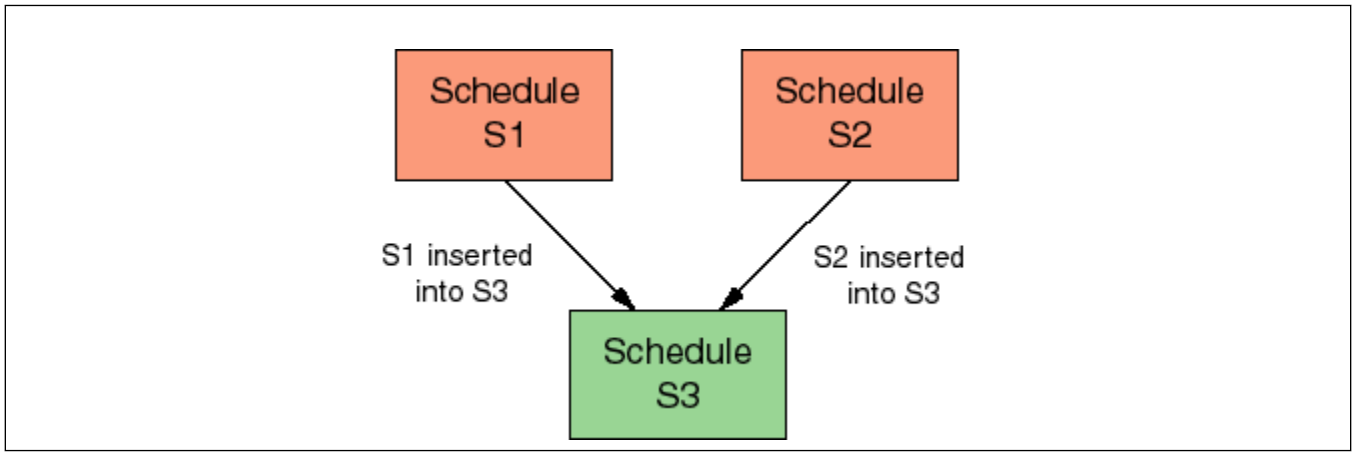
The **Membership in nested schedules** figure shows the membership for schedules **S1**, **S2**, and **S3**.

In the following figure, schedules **S1**, **S2**, and **S3** are normal schedules with membership and tasks.



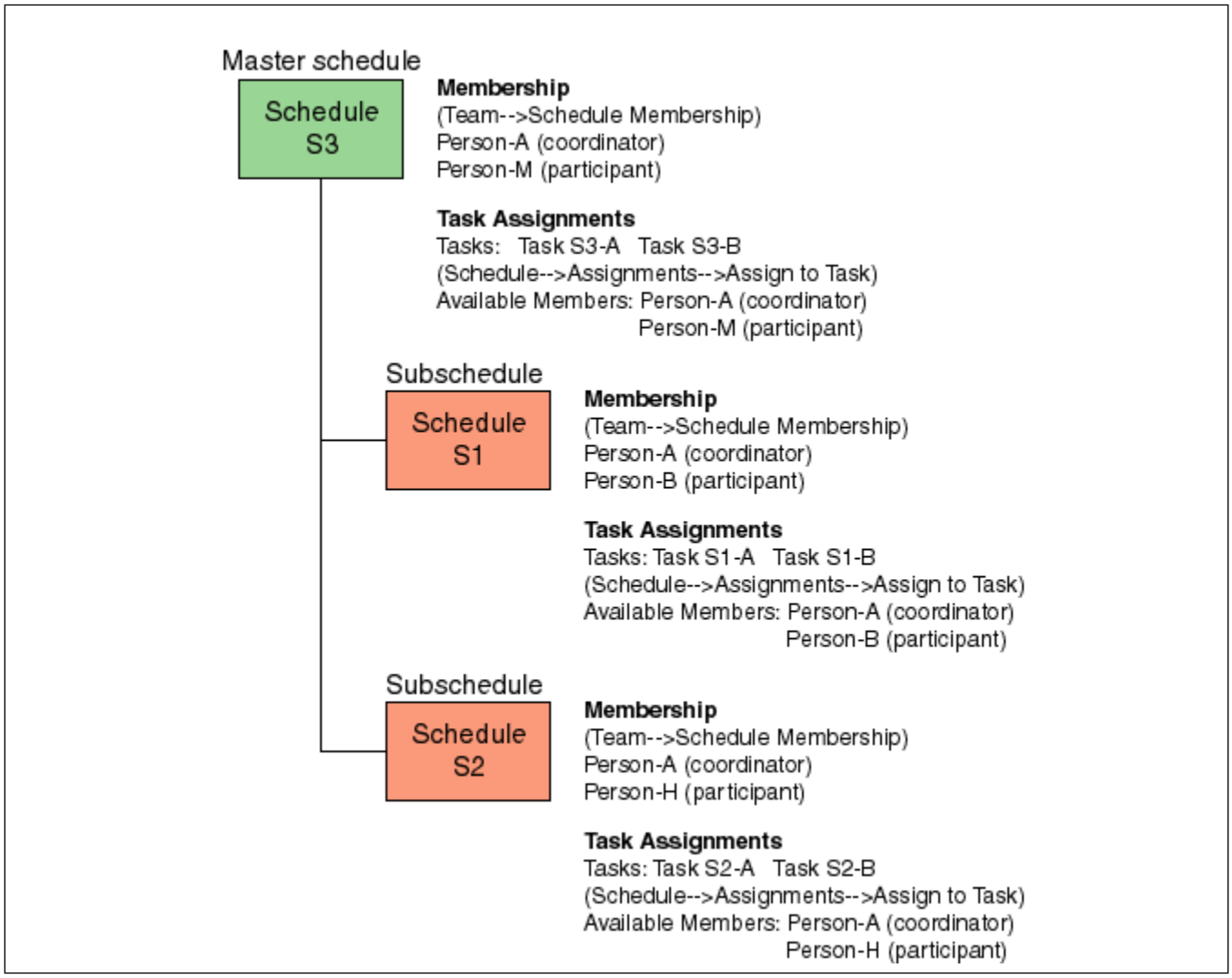
Three normal schedules

In the following figure, schedules **S1** and **S2** are inserted into schedule **S3**. Schedules **S1** and **S2** become subschedules and schedule **S3** becomes the master schedule.



Inserting two schedules into another schedule

The following figure shows the resulting membership and task assignments after inserting schedules **S1** and **S2** into schedule **S3**.



Membership in nested schedules

Nesting schedule templates

Schedule nesting also applies to schedule templates. The following list details the functionality of Schedule Manager as it applies to schedule templates:

- **Creating a master schedule from a master schedule template**

  This process is similar to creating a schedule from a single template. When you create a master schedule from a master schedule template, the created schedule is a normal schedule, not a master schedule. In addition, Schedule Manager creates a list of tasks from the various subschedule templates. After the new master schedule is created, it has no reference to the subschedule templates and master schedule template.

- **Inserting a schedule template into a master schedule template**

This process is similar to inserting schedules into a master schedule. During the process, only schedule templates are displayed in the dialog box and can be inserted. Non-template schedules are not shown.

- Master schedule template membership

  When a schedule template is inserted into a master schedule template, the membership of the master schedule template is added to the subschedule template membership. Master schedule members are automatically given read access to subschedules in context of the master schedule. Master schedule template members do not automatically get write access to the subschedule template.

- Updating a subschedule template

  When a task within a subschedule template is updated such that it causes its roll up task to be updated, the recalculate flag is set indicating a change has occurred. The next time the master schedule template is opened, Schedule Manager recalculates schedule values.

- Changing the template flag

  The template flag in the schedule properties cannot be changed after a schedule template is part of a master schedule template. In addition, the template flag in the master schedule template cannot be changed if there are subschedule templates. To unset the template flag on the master schedule template, you must remove all subschedule templates from the master template.

Managing master schedules

Creating a master schedule

A master schedule contains one or more subschedules. You can add schedules and remove subschedules from the master schedule.

Before you create a master schedule, verify:

- All candidate subschedules have their **Published** attribute set to **True**. Schedules that have their **Published** attribute set to **False** cannot be included in a master schedule.

- The start and finish dates for all candidate subschedules must fall within the start and finish dates of the master schedule.

Add schedules to the master schedule

1. Open a schedule in Schedule Manager. This schedule becomes the master schedule.

   You can also open an existing master schedule and add schedules to it.

2. Choose **Schedule→Insert Schedule**.

Schedule Manager displays the **Insert Schedules** dialog box.

> Note:
>
> All candidate subschedules must have the **Published** attribute set to **True** to appear in the **Insert Schedules** dialog box. Schedules with this attribute set to **False** cannot be inserted into a master schedule.

3. Choose one or more schedules from the **Available Schedules** section and click **>** to insert the schedules into the **Selected Schedules** section. To select all available schedules, click **>>**.

> Note:
>
> Baseline schedules cannot be inserted into a master schedule. Therefore, no baseline schedules are displayed in the **Insert Schedules** dialog box.

4. Click **OK**.

   Schedule Manager inserts the schedules into the master schedule and they are sequenced in the order of their start dates.

Remove subschedules from the master schedule

1. Open a master schedule in Schedule Manager.
2. Choose **Schedule→Insert Schedule**.

   Schedule Manager displays the **Insert Schedules** dialog box.
3. Select one or more subschedules from the **Selected Schedules** section and click **<** to remove the subschedule. To remove all subschedules, click **<<**.
4. Click **OK**.

This action removes only the subschedule from the master schedule. It does not delete the subschedule from the database. If the subschedule is not part of any other master schedule, it becomes a normal schedule.

> Note:
>
> Schedule templates cannot be added or viewed when adding subschedules to a master schedule.

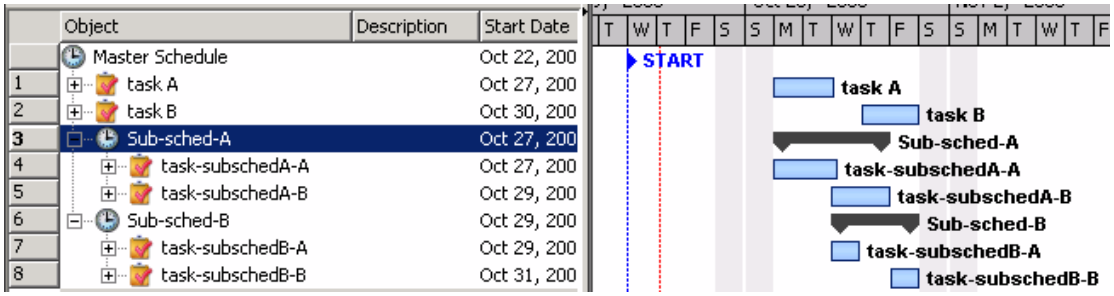
Scheduling a summary task

When you insert a schedule, Schedule Manager shows the *schedule summary task* in the resulting subschedule. This task, the first task in the task table, represents a roll up of the entire subschedule. It

contains rolled-up information from all the tasks in the schedule including: earliest start, latest finish, total estimated work, total work completed, status, and percent complete.

- In the task table, the schedule summary task is displayed as the schedule symbol .
- In the Gantt chart, the schedule summary task is displayed as a black bar .

In the following figure, **Master Schedule** is the master schedule, and **Sub-sched-A** and **Sub-sched-B** are subschedules.



- The schedule summary task applies to both schedules and schedule templates.
- The schedule summary task cannot be updated directly, it cannot contain dependencies, and you cannot assign resources.

> Note:
>
> You cannot edit any summary task from My Teamcenter.

You **view the schedule summary task properties** by using the **Properties** dialog box.

> Note:
>
> When a task within a subtemplate is updated such that it causes its summary task to be updated, the master schedule summary task must also be updated. If the user does not have access to the master template, a flag is set and Schedule Manager updates the master schedule summary task the next time the master schedule is opened.

Edit proxy tasks in master schedules

Proxy tasks create cross-schedule dependencies. You cannot manipulate a proxy task in the schedule in which it is used. You can change only the original task in the original schedule. The proxy task is only a mirror of the original. You can manipulate proxy tasks in the master schedule, however.

Determining the schedule's critical path

Managing a schedule by critical tasks

Schedule Manager lets you see the schedule's critical path. The critical path is the task or tasks that would likely affect the last task in the schedule if they were completed late.

- The critical path is calculated by determining the last task in the project (time wise).
- Any task where a slip would delay the last task in the project is on the critical path.
- Tasks linked by dependencies have a longer critical path (chain of tasks).
- The tasks on the critical path with the longest sequence of dependent tasks merit the most attention to on-time completion in order to avoid delays.

Use the critical path to perform better risk assessment and overall project management.

- View all the tasks on the critical path of a regular schedule, template, or master subschedule in the tree table or the Gantt chart.

  Note:

  The master subschedule displays the critical path from each individual schedule by itself.

- Specify the color of the highlighted tasks on the critical path (the default color is red).
- Query for all critical tasks to display detailed information about the critical path in the tree table, for example, the task owner.
- View the slack time for tasks in the tree table.

  Note:

  Slack time or *float* is the least amount of time a task can be delayed without affecting the dates of the successor task.

  - Slack time is displayed in the **Time Slack** column, but it is not a direct property on the task and cannot be edited.
  - The system calculates slack time each time scheduling data related to a critical task changes.
  - Values for slack time are displayed only for tasks that have a successor.

Display critical path

1. Choose **View** → **Critical Path** → **View Critical Path**.

   The critical path is highlighted in red in both the tree table and the Gantt chart.

2. Choose **View** → **Critical Path** → **View Critical Path** again.

   The normal schedule appears. Highlighting is off in both the tree table and the Gantt chart.

Change the critical path display color

1. Choose **View** → **Critical Path** → **Set Color**.

   A color palette appears.

2. Choose the color in which you want to view the critical path.

   The system stores the value of the selected color.

   > Note:
   >
   > The preference is saved so that the next time you open a schedule, the critical path tasks are automatically highlighted in the specified color.

Updating schedules

Loading schedules

Loading a large schedule with hundreds of tasks, multiple resources, and costs may take a long time. You can load partial schedules for quicker access to your information.

To enable partial schedule load, set the **SM_Structure_Partial_Context** preference.

> Note:
>
> This setting is only applicable to master schedules that contain subschedules. This setting does not have any impact on larger schedules where there are no subschedules.

Loading schedules in a deferred session

Updating schedules in a deferred session

You can enter into a deferred session and lock the schedule in the Schedule Manager application.

While working in a deferred session:

- You can make multiple updates to the schedule without saving it to the database.
- Most changes are not saved to the database until you save or cancel the operation.
- Other users see the schedule is locked by you.
- You can modify the **SM_DEFERRED_SHOW_TIMEOUT** preference to display how much time you have left in the deferred session when time-out functionality is enabled.

These operations can only be performed by the user who put the schedule in a deferred session:

- Add, update, or remove assignments.
- Designate disciplines.
- Add, update, or remove task dependencies.
- Add, update, or remove tasks.

These operations are not allowed in a deferred session:

- Baseline schedules.
- Baseline tasks.
- Insert or remove subschedules and view resource graphs inside the schedule.

  Warning:

  You cannot use the **Schedule→Insert Schedule** menu command while in deferred mode.

- Execution updates (including launching workflows).

  Note:

  Execution updates cannot be run by any user in a schedule while in a deferred session. However, they can be run from the **Schedule Task Execution** view on a schedule that is deferred by another user.

  Execution updates can only be made by the user assigned the task or the schedule coordinator.

Enter a deferred session

You can enter a deferred session in either of the following ways:

- When you are already working in a schedule, choose **Schedule→Deferred Session→Start Session**.
- Use the toolbar button.

Exit a deferred session

To exit a deferred session, do the following:

1. Choose **Schedule→Deferred Session→End Session** or use the toolbar button.

   Teamcenter prompts you to save changes you made during the deferred session.

2. Click **Yes** to save changes you made during the deferred session.

   Click **No** to not save changes you made during the deferred session.

Save changes

Choose **Schedule→Deferred Session→Save Changes**.

Operations outside the scope of the Schedule Manager are not affected by the deferred session. For example:

- trace links
- properties view
- My Teamcenter

Cancel changes

1. Choose **Schedule→Deferred Session→Cancel Changes**.

   Teamcenter displays a warning message about losing changes you made during the deferred session.

2. Click **Yes** to cancel the existing deferred session.

   Click **No** to continue the existing deferred session.

Manage time-outs

While working in a deferred session, you may see the **Session Timeout** dialog box displayed.

- Click **Yes** to reset the session to the maximum allowable time period set in the **SM_DEFERRED_TIMEOUT** preference.
- Click **No** to end the session.
- If you do not respond, the session ends automatically by the default time period.

> Note:
>
> Teamcenter discards unsaved edits.

To specify the notification time in minutes before you are warned that the deferred session is about to expire, set the **SM_DEFERRED_NOTIFICATION_TIME** preference.

> Note:
>
> The value for **SM_DEFERRED_NOTIFICATION_TIME** must be set to a value lower than the value for the **SM_DEFERRED_TIMEOUT** preference. If you need to modify this value, you must restart the rich client for this change to take effect.

To specify the time-out in minutes before the deferred session expires, set the **SM_DEFERRED_TIMEOUT** preference.

> Tip:
>
> Turn on **Show Session Time** to display the time remaining in the deferred session.
>
> Click on the **Session Timeout** button to extend the deferred session.

Create new tasks and manage orphaned tasks in a deferred session

When you create a new task while working in a deferred session, an orphaned task is created in the database. An orphaned task is a schedule task (or customized sub/type) which exists in the database, but is not associated with the structure of the schedule.

- If the deferred session is saved, this task is converted to a regular task (task, summary task, phase task, gate task, or milestone) and integrated with the structure.

> Note:
>
> Orphaned tasks are only created in rare scenarios. For example, in either a deferred or non-deferred session, if you delete the task and save, but for some reason the task deletion fails, that task is converted to orphaned task.

- If the deferred session is canceled, orphaned tasks are discarded from the current schedule. To delete them from the database permanently, use the **Manage Orphaned Task** command from a non-deferred session.

- If the schedule is deleted, all if its orphaned tasks are also deleted.

Use the manage orphaned task dialog box to manually delete orphaned tasks.

1. Choose **Schedule→Manage Orphaned Task**.

   Teamcenter displays the **Manage Orphaned Task** dialog box.

2. Click on **Integrate** to put the selected tasks back in the schedule.

   or

   Click on **Delete** to remove the selected tasks permanently.

   > Note:
   >
   > Orphaned tasks are still schedule task objects and follow the same rules for delete.
   >
   > If you try to delete an orphaned task that is referenced by a proxy task, Teamcenter displays an error message. The orphaned task cannot be deleted. It remains in the database but does not affect your schedule.

Unlock the schedule

When a schedule is being used in the deferred mode, Teamcenter displays a lock icon.

The schedule can be unlocked by the following users:

- The user who has the schedule running in deferred mode.
- The coordinator of the schedule.

To unlock the schedule:

1. Choose **Schedule→Deferred Session→Release Session**.

   Teamcenter displays warning about losing changes made during the deferred session.

   > Caution:
   >
   > This should only be used when a lock got accidentally left; not when a person is working in a deferred mode.

2. Click **Yes** to unlock the existing deferred session.

   Click **No** to continue the existing deferred session.

The schedule is automatically unlocked for any of the following reasons:

- You exit the deferred session.
- You cancel the deferred session.
- The deferred session times out.

Shift a schedule

When the projected timeline of a project changes, you can use the shift schedule feature to change the start and finish date of a schedule.

> Note:
>
> Shifting a schedule on a master schedule shifts the subschedules. This action cannot be undone.

1. Select a schedule in Schedule Manager and choose **Schedule** → **Shift Schedule**.

   Teamcenter displays the **Shift Schedule** dialog box.

2. Click the calendar button  and either select a new schedule start date from the calendar and click **OK** or double-click the new date.

3. Click **OK** again.

Recalculate a schedule's tasks and their dependencies

You can recalculate a schedule's tasks and their dependencies using the **Recalculate Schedule** option.

1. Open the schedule in Schedule Manager and select any task or the schedule summary task.

2. Choose **Schedule** → **Recalculate Schedule**.

   Teamcenter displays the **Recalculate Schedule** dialog box.

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

Delete a schedule

Deleting a schedule deletes all tasks, dependencies, costs, and resource assignments in that schedule. You can delete a schedule as explained below if the schedule does not have any references or tasks assigned to it.

Deleting schedules containing multiple tasks and other references such as workflow jobs assigned to the schedule, can be time consuming and difficult. To delete such schedules, you can either make the schedule obsolete by sending it in a workflow that applies status to revoke read access, or, remove the tasks where they are referenced, and then delete the tasks from the **Manage Orphaned Task** dialog box.

1. In My Teamcenter, select the schedule to delete.

   > Note:
   >
   > You cannot delete the schedule from within Schedule Manager.

2. Choose **Edit→Delete**.

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

Update item display

You can ensure that a displayed schedule contains the most up-to-date list of assignments by refreshing or reloading the display using **Refresh** and **Reload Schedule** on the main toolbar.

You must first select the scheduled summary task to refresh that schedule.

The **Refresh** and **Reload Schedule** options are only available when the user is not in a Schedule Manager Deferred Session.

- **Refresh** updates the schedule by adding all changes made to other parts of the schedule.
- **Reload Schedule** reloads the entire list of assignments. This command recalculates the entire schedule before reloading when:
  - The schedule was exported from Microsoft Project® using the TCUA-MSP plug-in.
  - The schedule is a master schedule in which one or more subschedule tasks was updated independent of the master (for example, if a user made changes to the subschedule).

Abort a schedule

Coordinators can abort a schedule to stop all work in the schedule from that point in time. When a master schedule is aborted, only the master schedule and its tasks are affected. The subschedules and the subschedule tasks are not aborted and they continue to execute. If the subschedules also need to be aborted, that must be done separately.

Note:

This option is unavailable during a deferred session.

Caution:

Once a schedule has been set to **Aborted**, the schedule status cannot be changed or reversed.

1. In Schedule Manager, select the schedule and choose **Schedule→Abort**.

2. In the **Abort** dialog box, select the **Aborted** status from the list and click **Yes**.

The schedule, all of its executing and planned schedule tasks, and its associated executing and planned workflow tasks are aborted. However, they remain in the database in case the data is needed in the future.

Note:

If a schedule is aborted, the coordinator can change only the **Published** and **Is Schedule Public** schedule properties to take the schedule offline. No other schedule or schedule task property can be changed, nor can the schedule or task be deleted.

Search for schedules

You can search for schedules in Teamcenter and the results of the search depend on your relationship to the schedule:

- The person who creates a schedule can always view the schedule.
- A person who is member of the schedule only views the schedule if the **Published** schedule option is set.
- A person who is not a member of the schedule only views the schedule if the **Published** and **Public** schedule options are set.

1. In My Teamcenter, perform an advanced search.

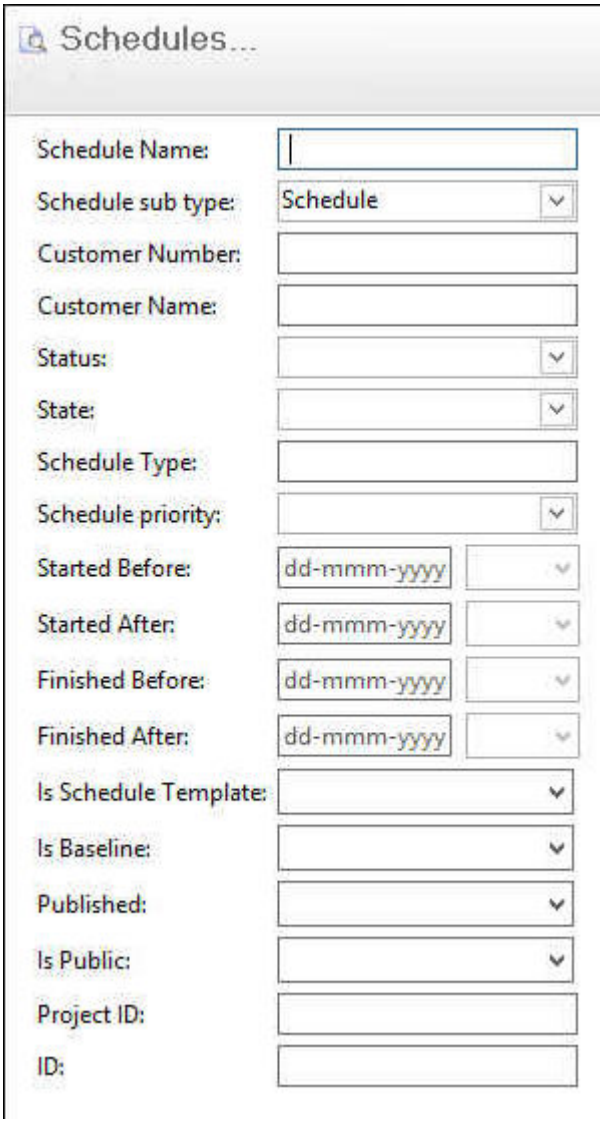
2. Display the **Select a Search** list and choose **More**.

3. In the **Change Search** dialog box, expand **System Defined Searches**.

4. Scroll down and choose **Schedules...**.

5. Click **OK**.

Teamcenter displays the **Schedules...** search.



6. Enter search criteria and execute the search.

   At minimum, you must enter a **Schedule Name**. However, wild cards are permitted. To display all schedules, enter an asterisk (*) in the **Schedule Name** box.

Manage schedule properties

You can change key properties (for example, schedule start and finish dates), publish a schedule, and make a schedule public.

Note:

- You cannot change the **Is Schedule Template** option after a schedule template or nontemplate is part of a master schedule template. To change the **Is Schedule Template** option, you must remove all of the master schedule template/subschedule template and master schedule non-template/subschedule non-template associations.
- You cannot change the **Is Schedule Public** option for a template or a non-template for a master schedule or a subschedule.
- If a schedule is completed or closed, the coordinator can change only the schedule status and the **Published** and **Is Schedule Public** schedule properties if **Schedule Manager preferences are set to prevent changes to schedules and tasks in that state**. No other schedule or schedule task property can be changed.
- If a schedule is aborted, the coordinator can change only the **Published** and **Is Schedule Public** schedule properties to take the schedule offline if **Schedule Manager preferences are set to prevent changes to schedules and tasks in that state**. No other schedule or schedule task property can be changed.
- You cannot change the **Published** option for a template or a nontemplate for a master schedule.

Caution:

The **All** button lists attributes that may not be applicable to schedule management.

You can open and edit the properties from either My Teamcenter or Schedule Manager. To edit the properties in My Teamcenter:

1. In My Teamcenter, navigate to a schedule.
2. Either double-click the schedule in My Teamcenter or right-click the schedule and choose **Send To → Schedule Manager**.

   Teamcenter displays the schedule in Schedule Manager.
3. Select the schedule and choose **View → Properties**.

   Note:

   Schedule Manager displays the **Properties** dialog box with the following options:

   - **View schedule summary task properties** (default)

     This option displays the summary task properties. The display is read-only.

- **View schedule properties**

  This option allows you to modify the schedule properties.

4. Click **View schedule properties** and click **OK**.
5. Modify the properties you want to update.
6. Click **OK**.

Note:

The schedule **Status** list may display duplicate values if your administrator has rendering hints enabled. The schedule state is shown in the list and grayed out to provide context for when the state updates as the status changes.

Assigning resources to schedules and tasks

Assigning resources to a schedule

You can use Schedule Manager to add resources to your schedule. Once this is done, you assign resources to individual schedule tasks.

Resources (*users*, *groups*, *roles*, *resource pools*, and *disciplines*) are assigned to work on the projects. The **Schedule Membership** dialog box allows you to assign resources to a schedule, building a resource team that you can use to assign to individual tasks when you create your project schedule. The advantages of adding resources at this stage of the process are:

- Making sure that the resource pool contains the resources needed to accomplish your task.
- Assigning participation levels for each resource.
- Increasing the accuracy of your schedule.
- Knowing ahead of time whether resources are available for your team.

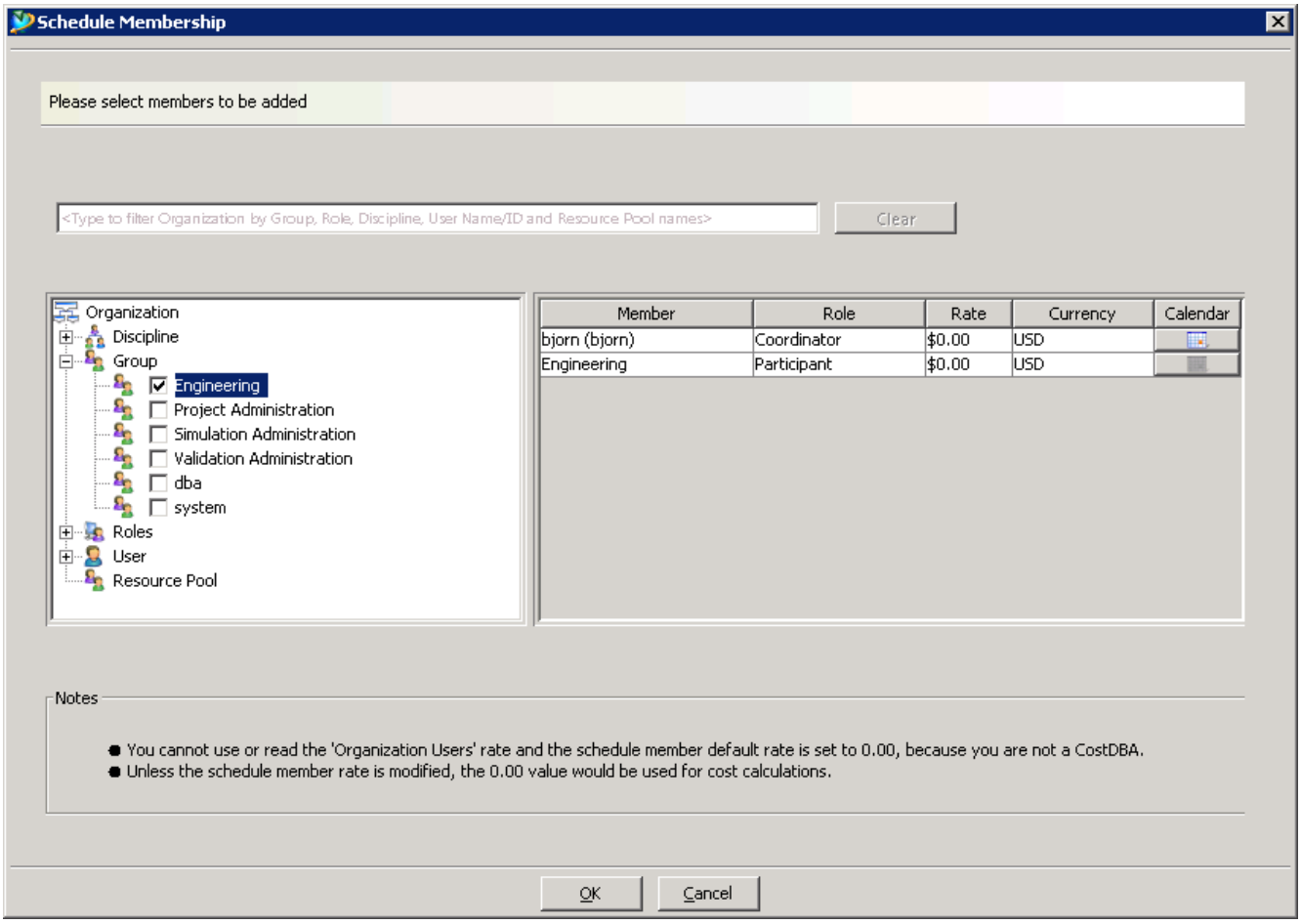
Add resources to a schedule

Note:

Only schedule coordinators can add a resource to, or remove a resource from, a schedule.

1. Open a schedule in Schedule Manager.
2. Choose **Schedule → Schedule Membership**.

Teamcenter displays the **Schedule Membership** dialog box.



3. Select the check box adjacent to the desired disciplines, groups, roles, users, and resource pools. When you select the check box, the schedule member appears in the table.

> Note:
>
> You can specify rates and currency for users, groups, roles, and resource pools.

4. Assign each schedule member a schedule role by clicking the **Role** box next to the name of the resource.

   The standard version of Teamcenter includes the schedule roles of **Coordinator**, **Participant**, and **Observer**. As the schedule creator, you are automatically added as a coordinator.

> Note:
>
> Schedule roles are not the same roles appearing in the Organization application pane.

- **Coordinator**

  A coordinator can read the full schedule information, write the scheduling information, and write the execution information.

  The scheduling information includes schedule dates, milestones, resources, task and schedule baselines, estimated work, and costs.

  The execution information includes the task status, percent complete, work complete, and task start and finish dates.

- **Participant**

  A participant can read the full schedule information and only write the execution information for tasks assigned to them (for example, **Work Complete**). By default, a person added is designated as a participant.

- **Observer**

  An observer can only read the full schedule information.

  > Note:
  >
  > Users inside a discipline that is a schedule member will not get the read access to the schedule. The user of the discipline that is a member of the schedule will get read access to the schedule only if that user is designated through a discipline to a schedule task.

5. If you assign a user, the **Schedule Membership** dialog box displays values in the **Rate** and **Currency** boxes.

   If an hourly rate for the user is set using the Organization application, and you have **CostDBA** privileges, that value is displayed. You can either accept the value or double-click the **Rate** box and overwrite the value.

   > Note:
   >
   > To set the hourly rate using the Organization application, launch the Organization application, expand **Users**, locate the desired user, right-click, and choose **Rates**. Enter an hourly value and, optionally, select a value for **Currency**.

   Double-click the **Currency** box and select a value from the list. The default currency in Teamcenter is **USD** (United States dollars). Schedule Manager supports only one currency but it can be changed by updating the **CostCurrency** LOV using the Business Modeler IDE. If you change the **CostCurrency** LOV, you must also change the **cost_default_currency** preference.

6. (Optional) Assign each user a **schedule user calendar** by clicking the **Calendar** box next to the name of the resource. If a schedule user calendar is not defined, you are prompted to create one.

> Note:
>
> You cannot assign calendars to groups or disciplines.

7. Click **OK**.

> Note:
>
> There are some tasks a schedule owner can do that a coordinator cannot do; for example, open an unpublished schedule and unpublish a schedule.
>
> Only the schedule owner can change the schedule owner. They can also change the original schedule coordinator.
>
> To change the ownership (owning user, owning group) and replace the original schedule coordinator:
>
> 1. The current owner adds the new owner as a schedule coordinator.
> 2. The current owner changes the ownership.
> 3. The new owner removes the old owner from membership (if necessary).

Assign a resource to a task

As the project manager responsible for creating a schedule, you define the resources for the project. As the project scope becomes more defined and you fill in the schedule by adding tasks and milestones, you are likely to refine your resource needs.

You can start adding the names of resources who will be working on this project as you acquire them. These may be the names of actual people, or they may be disciplines that act as placeholders until you are ready to assign actual tasks.

1. Right-click the task and choose **Assignments** → **Assign to Task**.

2. Click the **Organization**, **Project Teams**, **Disciplines**, or **Search** tab and select a user, role/group, or discipline to assign to the task. You can assign a combination role/group and discipline.

   a. If you click the **Organization** or **Project Teams** tab, select users from the tree and click **Add**.

      - In the **Organization** tab, you can filter the tree by group, role, user name, or user ID in the box above the tree.

- In the **Project Teams** tab, select the project from the **Projects** list. You can filter the tree by name in the box above the tree.

Alternatively, you can use **Resource Pool Options/Placeholder Options** to assign a set of group or role members as participants instead of individual users. When a group or role is selected, additional options become available.

If you select	You can
A group	• Click **Any Member** so any member of the group can be assigned to the task • Or **All Members** to assign the entire group membership to the task.
A group and the **Placeholder Assignment** check box	Assign members from that group later.
A role under a group	• Click **Any Member** and choose **Specific Group** to assign any member of the combined group and role to the task • Or choose **Any Group** to assign any member of any group and the selected role to the task.
A role and the **Placeholder Assignment** check box	• Choose **Specific Group** to use the combined group and role as a placeholder • Or choose **Any Group** to use the selected role with any group as a placeholder.

b. If you click the **Disciplines** tab, select either a discipline or users from the disciplines tree and click **Add**.

You can filter the tree by name, user name, or user ID in the box above the tree. No resource pool options are available.

c. If you click the **Search** tab, select a discipline, placeholder, or qualification to match a user that you can assign.

To search for users	Select	And then
In a discipline	The discipline underneath the task and	Select one of the users in the **Results** list and click **Add**. The user is assigned in place of the discipline.

To search for users	Select	And then
	click the **Find Resources** button.	
To replace the placeholder	The placeholder role/ group or role underneath the task and click the **Find Resources** button.	Select one of the users in the **Results** list and click **Add**. The user is assigned in place of the placeholder.
Who meet the qualification required by the task	The task, select the qualification/level, and click the **Find Resources** button.	Select one or more of the users in the **Results** list and click **Add**. The users are assigned to the task.
With a higher qualification level than required by the task or with out-of-date qualification	The **Show Alternates** check box.	Select one or more of the users in the **Results** list and click **Add**. The users are assigned to the task.

If you select a combination placeholder and discipline and attempt to assign a user that does not match both requirements, the user is assigned as an additional resource instead of replacing the combination.

You can see the load of the user selected in the **Results** list by clicking the **Show Resource Graph** button.

Qualifications, discipline, and group/role requirements are enforced if the **SM_ENFORCE_ASSIGNMENT_CRITERIA** preference is set to **true**.

3. Click **Add**.

4. Change the **Load** value if needed.

5. Click **OK**.

Tasks assigned to a user or a resource pool that the user is a member of appears in the **Schedule Tasks** folder in their **Worklist**.

Set a privileged user

Privileged users only exist on workflow tasks. On a workflow task, work is performed after the workflow starts and the privileged user must control where the workflow goes upon launch. You assign a privileged user only for schedule tasks that have associated workflow templates.

A *process owner* is the user who initiated the workflow process. The process owner is also known as the process initiator. When the workflow process is initiated, the process owner becomes the responsible party for the workflow process; the root task of the workflow process is placed in the process owner's worklist. Whenever any task in the workflow process is not explicitly assigned to another user, person or resource pool, the responsible party for the task defaults to the process owner.

1. Right-click the task and choose **Workflow Task**.
2. To set the privileged user for a workflow task, click the **Add Privileged User** button in the **Workflow Rule Configuration** dialog box.

   To change the privileged user, click the **Edit Privileged User** button.
3. Select the user from the **User or Resource Pool Selection** dialog box and click **OK**.
4. To remove a user from being the privileged user, click the **Remove User** button in the **Workflow Rule Configuration** dialog box.
5. Click **OK** in the **Workflow Rule Configuration** dialog box.

Remove a resource from a task

1. Right-click the task and choose **Assignments** → **Assign to Task**.
2. Click the resource you want to remove.
3. Click the **Remove** button.
4. Click **OK**.

Shifting resources, duration, or work within a schedule

Effort-driven scheduling automatically adjusts your schedule if you change a task's duration, the number of resources assigned to a task, or the amount of work a task requires. Effort-driven scheduling uses the following formula, with one of the factors fixed:

*Work = Duration * Resources*

In Schedule Manager, effort-driven scheduling is enabled for all tasks by default. You use the **Fixed Type** property of the task to control which of the three factors remains fixed and which change to accommodate changes to the schedule.

The **Fixed Type** property is set to **Fixed Work** by default. However, you can set the task type to be **Fixed Resources** or **Fixed Duration** instead.

The following table shows what happens when you fix one of the factors, and then change one of the other factors.

Fixed Type	When you change Resources, Schedule Manager changes	When you change Duration, Schedule Manager changes	When you change Work, Schedule Manager changes
Fixed Resources	Duration	Work	Duration
Fixed Duration	Work	Resources	Resources
Fixed Work	Duration	Resources	Duration

For example, if you add resources and the **Fixed Type** property is set to:

- **Fixed Resources** or **Fixed Work**—the duration decreases.
- **Fixed Duration**—the total work increases.

When you assign resources to a **Fixed Duration** task, Schedule Manager initially sets the work level for each resource to 100% for the entire duration of the task. However, you can adjust the work percentage level while assigning resources. If you add another resource, their work level is added to the total work, instead of reducing the work of the other resources.

Use **Fixed Duration** tasks when the duration should not change regardless of changes to the number of resources. For example, you may have a project plan review task where you have assigned five reviewers one week to review the project plan. Your manager asks to be added as another reviewer. When you add the manager to the task, you do not want the amount of work to be reduced and you still want all your reviewers to have one week to review the document. In this case, you set the **Fixed Type** property to **Fixed Duration**. The previously assigned reviewers will have the same amount of time and work to perform, and the work required for the newly assigned reviewer is added to the total work for the same duration.

On the other hand, for **Fixed Resources** or **Fixed Work** tasks, after the first time resources are assigned, any change in resources equally divides 100% of the work percentage among all assigned resources. The total work value does not change.

If you applied constraints or dependencies to your task, Schedule Manager might prevent changes you want to make or ask you to remove the constraint. For example:

- If a task has the **Fixed** constraint applied, you cannot make a change that changes either the task duration or the start and end dates. If you attempt to add resources to a **Fixed Work** task with a **Fixed** constraint, Schedule Manager displays an error and prevents the change.
- If you attempt to change the start date of a dependent task with the **As Soon As Possible** constraint to start before its predecessor task, Schedule Manager warns you that it violates the task constraint

and asks if you want to remove the constraint and continue. If you remove the constraint, the start date is changed. If you keep the constraint, the task is moved back to its original start date.

If you use Finish Date Scheduling, you adjust the finish date instead of the start date of the task, subject to constraints.

> Note:
>
> Shifting resources, duration, and work totals may cause other parts of the schedule to change, especially if you have many tasks that have constraints and dependencies. After updating your tasks, be sure to review the entire schedule to note all of the changes.

> Note:
>
> - When the Schedule Task has no resource assignment, the values for duration and work estimate are same.
> - When the Schedule Task has resource assignment with 0% load, the work estimate is the same as the duration.

Replace assignments

> Note:
>
> This is an asynchronous process which requires dispatcher services to be running in the background. Your system administrator can find information about configuring asynchronous service in Installing and Configuring Dispatcher in the Teamcenter help collection.

1. Select a task or tasks from the task table.
2. Right-click the task or tasks and choose **Assignments** → **Replace Assignment**.

   > Note:
   >
   > When you replace a resource, you change the task assignment to the new resource. This has the potential to change the schedule.

3. Under **Select Member to replace** select a current schedule resource.
4. Under **Replace With**, select a new resource.

   If both the old and new resources were assigned to tasks, the new resource receives the sum of all assignments.

If the new resource is assigned to a discipline and is not a member of the discipline, he or she is added as a red entry similar to a non-member of a schedule.

5. Click **Done**.

Designate discipline

When you designate a discipline, you are assigning a single member of each discipline required for a task. If you want to assign more than one member of a discipline to a task, use the **Assignments → Assign to Task menu command**.

> Note:
>
> You cannot designate a discipline if there are qualifications assigned to a task.

1. Select the task or tasks.

2. Right-click the task or tasks and choose **Assignments → Designate Discipline**.

   - If there are multiple disciplines assigned to the task or tasks, the **Designate Disciplines** dialog box appears. This dialog box shows disciplines that are common to all selected tasks.

     Select a discipline and click **Next**. The **Discipline Members** dialog box appears.

   - If there is only one discipline assigned to the task or tasks, the **Discipline Members** dialog box appears. This dialog box shows the users in the schedule belonging to the discipline assigned to the selected task.

3. In the **Discipline Members** dialog box, select a member of the discipline to assign to the task.

   If the member does not appear in the list, click the **Expand** button to open a list of members who are outside of your schedule and select one.

4. Click **OK**.

   The member is assigned to the task. If there are multiple disciplines assigned to the task or tasks, repeat the selection of discipline and member.

The group/role and discipline requirements for the task are kept.

Revert assignments

You can remove the specified discipline member from a task assignment and revert the assignment back to the discipline. There are two methods—one directly in the task tree and one in the **Task Assignment** dialog box.

- In the task tree:

  1. In the task tree, right-click the task or tasks and choose **Assignments → Revert Assignments to Discipline**. The dialog box that appears shows members of disciplines assigned to the selected task. It also shows the discipline of which they are a member.

  2. Select a member from the **Revert Assignments** list.

  3. Click **OK**.

  4.

- In the **Task Assignment** dialog box:

  1. Right-click the task or tasks and choose **Assignments → Assign to Task**.

  2. In the **Task Assignment** dialog box, right-click the discipline member assigned to the task and choose **Revert Assignment to Discipline**.

The group/role and discipline requirements for the task are kept.

Determining resource availability with resource graphs

What are resource graphs?

A resource graph displays a bar chart showing a user's workload or tasks between specific start and end dates. When you place the mouse cursor over a bar in the resource graph, a tooltip displays the task name and schedule name, the work complete and the work estimate, the percent complete, and the date for that bar.

You can view a resource graph from either the Organization application or from the Schedule Manager application. In the Organization application, you can also change the start and end dates to customize the resource graph view.

> Note:
>
> Changes to the task assignments while in a deferred session affect the resource graph, even though the resource graph is not available for schedules opened in a deferred session. The resource graph calculations must include the deferred changes made in the current session. The resource graph when viewed from the Organization application does *not* reflect any changes current to the deferred session as the user is outside the context of the Schedule Manager application.

Configure resource graphs

To view resource graphs using the default **Resource Graph Viewers** functionality, the following conditions must be set:

- The **Resource Graph Viewers** role must be included in a group.
- You must be a member of the **Resource Graph Viewers** role, and it must be your current role.

  You can specify the **Resource Graph Viewers** role as your current role when logging in or change your role to **Resource Graph Viewers** by choosing **Edit → User Settings** and selecting **Resource Graph Viewers** from the role list.

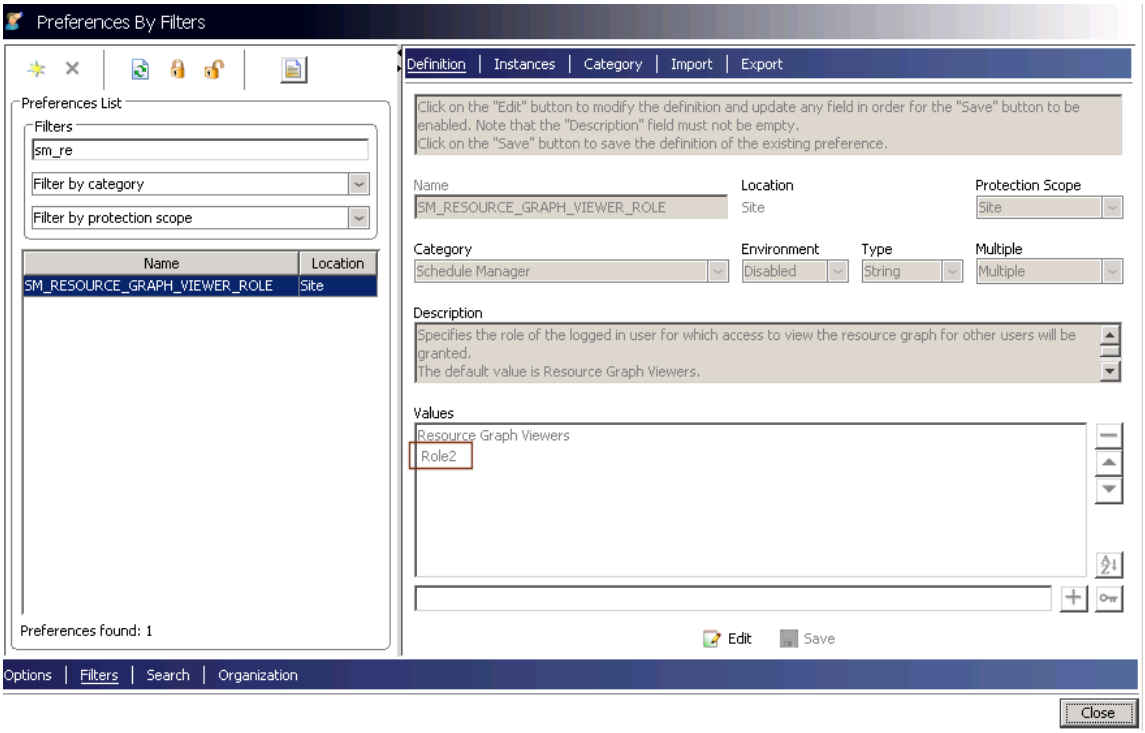
Note:

- If the **TC_current_role** preference is set to **false**, members of the **Resource Graph Viewers** role also have read access to all schedules, even when the **Resource Graph Viewers** role is not the user's current role. This is the default value.
- If the **TC_current_role** preference is set to **true**, members of the **Resource Graph Viewers** role have read access to all schedules only when the **Resource Graph Viewers** role is that user's current role.

Changing the **TC_current_role** preference has an impact outside of Schedule Manager because it alters how the core access rules are evaluated.

To provide access to the Resource Graph Viewer for custom roles (for example, the Manager or Supervisor role), the following conditions must be set:

- As an administrator, navigate to the **SM_RESOURCE_GRAPH_VIEWER_ROLE** preference and add the custom role to the preference.



- You must be a member of the custom role, and it must be your current role.

View a resource graph from Schedule Manager

The following steps apply to the Schedule Manager application:

> Note:
>
> You must either be a member of the **Resource Graph Viewers** role, or a member of a custom role that has been added to the **SM_RESOURCE_GRAPH_VIEWER_ROLE** preference, to open resource graphs; otherwise, the **Show Resource Graph** button is disabled and the resource graph symbol does not appear.

1. Right-click a task in the tree view or in the Gantt chart.
2. Choose **Assignments → Assign to Task**.
3. To open a resource graph:

From	Do this
The **Schedule Tasks** list	Select a user, role/group, or discipline and click its symbol in the **Graph** column.
In the **Organization**, **Project Teams**, or **Disciplines** tab	Right-click a user, role/group, or discipline and choose **Resource Graph**.
In the **Search** tab	Select one or more users from the **Results** list and click the **Show Resource Graph** button.

The resource graph displays a stacked bar chart with daily task workload for your selection.

If the graph shows the load for a set of users, such as a discipline or role/group, you can see an individual's resource graph by selecting their name from the **User Load** list.

Note:

The resource graph shows information relative to the client's time zone. When viewing the graph for a resource assigned to schedules in other time zones (especially those more than 8 hours away), it is important to understand how time is displayed in the resource graph. For example, an 8-hour task is assigned on a Monday to a user in India (GMT+5:30), and you are in Los Angeles (GMT-8). The resource in India, who works 8 a.m. to 12 p.m. and 1 p.m. to 5 p.m. on Monday, shows work on Sunday and Monday in the resource graph, when viewed in Los Angeles. This is because 8 a.m. Monday in India is 6:30 p.m. Sunday in Los Angeles. The resource graph shows the user working for 5.5 hours on Sunday and 2.5 hours on Monday. If you open the schedule, you see the task starting at 6:30 p.m. Sunday because all dates are also shown in the client's time zone.

View a resource graph from Organization

1. In the lower-left pane of the Organization application, right-click **Users** and choose **View Resource Graph** .

   Note:

   You must either be a member of the **Resource Graph Viewers** role, or a member of a custom role that has been added to the **SM_RESOURCE_GRAPH_VIEWER_ROLE** preference, to open resource graphs; otherwise, the **Show Resource Graph** command is disabled.

2. Double-click **Users** to expand the list and click a user.

   The resource graph displays a stacked bar chart with that user's daily task workload.

   The default resource graph starts one week prior to the schedule start date and spans 15 weeks (ending one week prior to the schedule end date).

3. To view another user's resource graph, click that user.

   Enabling a resource graph for one user displays resource graphs for all users.

4. To hide the resource graph, right-click **Users** and choose **View Resource Graph**.

Change how the resource graph displays

You can change how the resource graph is displayed by right-clicking the graph and selecting one of the following:

- **Properties**

  Displays the **Chart Properties** dialog box.

  - Change the graph title text, font, and color on the **Title** tab.
  - Change the axes appearance, title label, font, and color as well as tick label and marks on the **Plot** tab.
  - Change the background and series color on the **Other** tab.

- **Preferences**

  Display and change the scheduling graph preferences defined in Teamcenter.

- **Print**

  Prints the resource graph.

- **Save As**

  Saves the resource graph in graphical format, such as **.png**.

- **Zoom In, Zoom Out, Auto Range**

  Zooms in and out of the resource graph to display the range of data you desire. The **Domain Axis** is the X axis and **Range Axis** is the Y axis.

Print resource graphs

1. View the resource graph for a specific member in the schedule.

2. Right-click the graph and choose **Print**.

3. Change any options you want in the **Page Setup** dialog box and click **OK**.

4. Select the printer in the **Print** dialog box and click **OK**.

View and edit resource graph preferences

Resource graph display characteristics are controlled by a set of site preferences. Only users with sufficient access privileges can change site preferences.

To view or edit the following preferences, right-click the resource graph and choose **Preferences**.

Preference	Description
scheduling_graph_dataSource	Specifies data source for resource graph. When set to **randomSample**, the system uses a random sample generator. When set to **TeamcenterDB** (default), the system uses the Teamcenter database. Warning: This preference must be set to **TeamcenterDB** in a production environment.
scheduling_graph_dataSource_filter	Specifies the filtering method used when creating resource graphs. • **none** No filter applied (default) • **selection** Filter for selected schedules • **current** Filter for the current schedule
scheduling_graph_date_format	Specifies data format in resource graph. Valid values can be any patterns that describe date and time format. The default value for this preference is **EEE, MMM d**.

Preference	Description
scheduling_graph_domain_interval	Specifies the marked intervals on the domain axis. Valid values are any segmented time line value such as **day** (default), **week**, or integer values such as **1** for a day or **7** for a week. Valid values include **day**, **week**, **month**, **1440**, and **10080**.
scheduling_graph_domain_label_vertical	Specifies the orientation of the domain labels. When set to **true** (default), the label orientation is vertical. When set to **false**, the orientation is horizontal.
scheduling_graph_font_name	Specifies a font name. Valid values can be a font name or font family name. The default varies by system type (Windows or Linux).
scheduling_graph_font_size	Specifies the point size of the font in resource graph. Valid values can be any appropriate integer number. The default value is **8**.This is a site preference.
scheduling_graph_font_style	Specifies font style. Valid values are **0** (default) for normal style, **1** for bold text, **2** for italic text, and **3** for bold and italic text.
scheduling_graph_histogram_single_color	Specifies single or multiple color bars in the graph. When set to **true** (default) a single color is used. When set to **false**, multiple colors are used.
scheduling_graph_reference_calendar	Specifies the calendar type to use for domain (x) and range (y) axis in the resource graph. Valid values can be one of the following calendar types: 'resource_calendar_type', 'system_calendar_type'. The default value is **'resource_calendar_type'**. This is a site preference.
scheduling_graph_task_legend	Enables legend display. When set to **true**, the system displays legends for stacked bars. When set to false

Preference	Description
	(default), no legends are displayed for stacked bars. Note: If this preference is set to **true**, tooltips do not include schedule and load information.
scheduling_graph_view	Specifies whether to use scroll bars in the view. Valid values are **classic**, to view the graph with scroll bars, and **native** (default), to view the graph without scroll bars.

Note:

- You can also view and edit these preferences in My Teamcenter by choosing **Edit → Options** and using the ***scheduling*** search term.
- The **TC_current_role** preference specifies if members of the **Resource Graph Viewers** role have read access to all schedules, among other impacts. You can view or edit this preference by choosing **Edit → Options** in My Teamcenter and searching for it specifically (TC_current_role) — the ***scheduling*** search term does not show it.

  However, changing the **TC_current_role** preference has an impact outside of Schedule Manager because it alters how the core access rules are evaluated.

Analyzing costs

Managing scheduled costs

Schedule Manager allows sites to define and track costs as they relate to both schedules and tasks.

You track costs by defining:

- *Rate modifiers*

  Rate modifiers are used with resource costing information to calculate schedule and task costs and are defined by billing types, rates and currency.

- *Resource costs*

  Resource costs are determined by using the hourly rate of the resource and the billing rate.

- *Fixed costs*

  In addition to the costs associated with resources, you can include fixed costs on a schedule or task basis.

What are rate modifiers?

Rate modifiers are used with resource costing information to calculate schedule and task costs and are defined by billing types, rates and currency.

- **Types**

  Types are either a **multiplier** or a **custom rate**.

- **Rates**

  Rates depend on the type.

  If the type is a multiplier, the rate is calculated by multiplying the time used by the resource *by* the hourly rate of the resource *by* the value of the **rate** box in the **Manage Rate Modifiers** dialog box. Rates are decimal values, for example, **1.0** or **1.5**.

  If the type is a custom rate, the rate is calculated by multiplying the hourly rate of the resource *by* the value of the **rate** box in the **Manage Rate Modifiers** dialog box. Rates are decimal values of the specified currency.

- **Currency**

  Currency is the currency used in the calculation of the schedule or task cost.

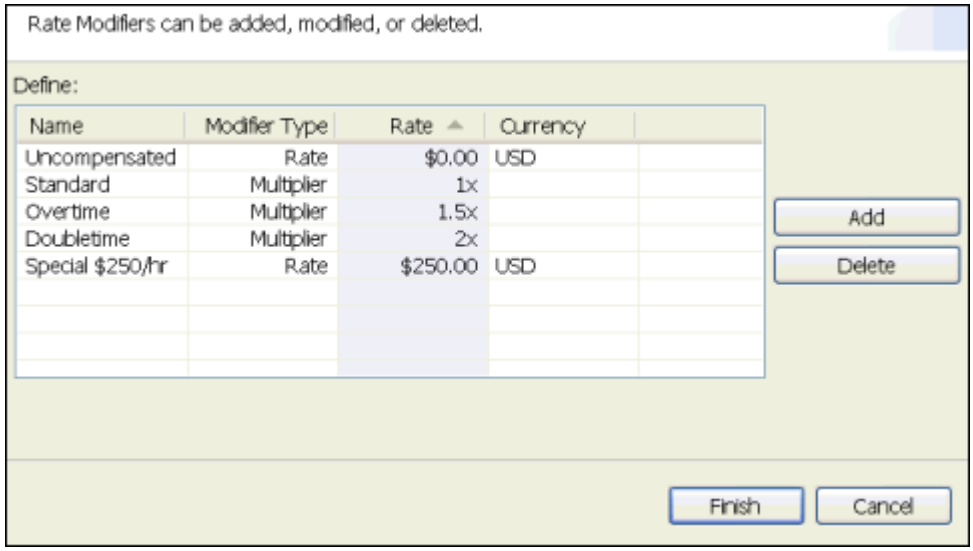
Manage rate modifiers

Note:

- You must have **CostDBA** privileges to manage rate modifiers.
- You cannot delete a rate modifier that is currently being used.

1. In Schedule Manager, choose **Schedule** → **Rate Modifiers**.

   Teamcenter displays the **Manage Rate Modifiers** dialog box.



2. Click **Add** to add a new line.

   Schedule Manager creates an entry in the **Manage Rate Modifiers** dialog box and displays the default value of **Multiplier** in the **Modifier Type** box.

3. Enter a name for the billing rate in the **Name** box. The name must be unique. The billing rate name is used in the **Costs** dialog box.

4. Click **Multiplier** in the **Modifier Type** box to display a list of types. Teamcenter provides values of **Multiplier** and **Rate**.

5. In the **Rate** box, enter either the multiplier rate, for example, **2.0**, or a custom rate, for example, **100.00**.

   If you specify **Rate** in the **Type** box, Schedule Manager displays the default currency in the **Currency** box. The default currency in Teamcenter is **USD** (United States dollars).

   > Note:
   >
   > Using the Business Modeler IDE, you can change the **Currency** list by modifying the **CostCurrency** LOV.

6. To modify a billing rate, select the billing name, update the entry and click **Finish**.

7. To remove a billing rate, select the billing name and click **Delete**.

What are resource costs?

Resource costs are determined by using the hourly rate of the resource and the billing rate. Resource hourly rates are set by the Organization application and Schedule Manager.

Using the **Cost** dialog box, you create, modify, and display cost information regarding resource costs. It also allows you to define fixed costs associated for both schedules and tasks.

Display task cost information

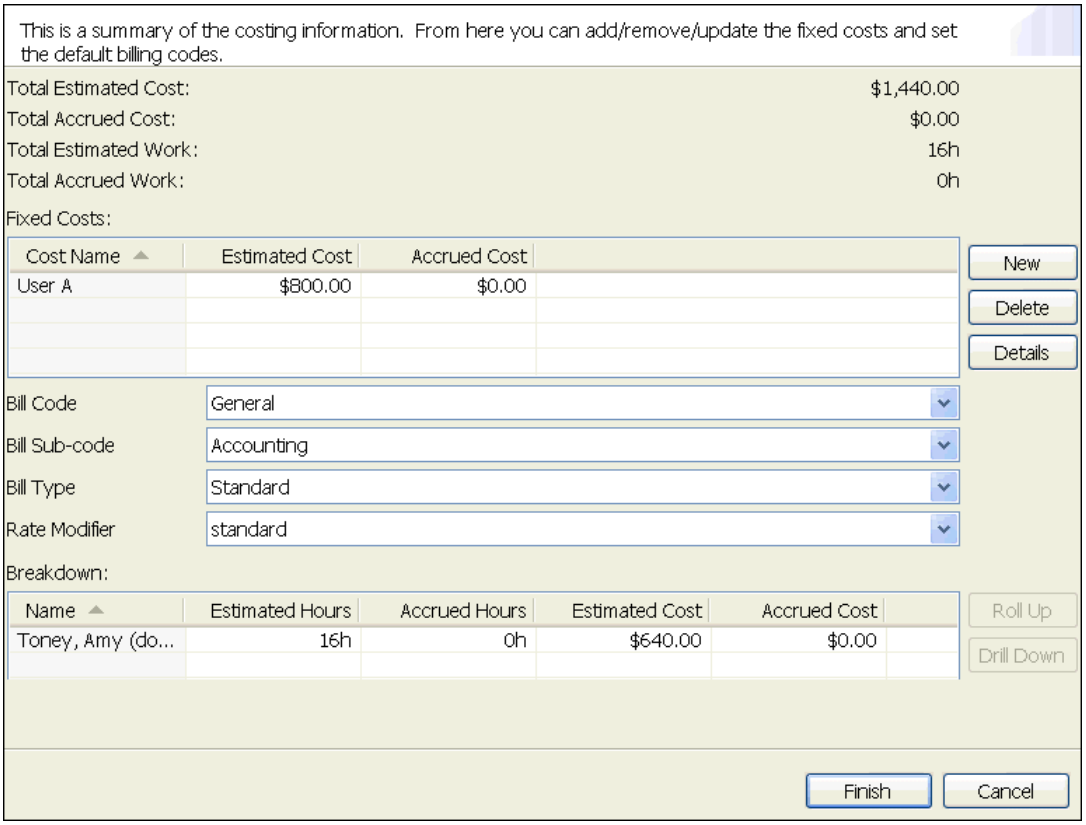
1. To display cost information for an individual task and, optionally, change the billing codes, select the task in the task tree, and choose **Schedule** → **Costs**.

   > Note:
   >
   > You can also set values for fixed costs for the task.

   Schedule Manager displays the **Costs** dialog box for the selected task.

   For example, the following figure shows the costs for **task-A** based on the following parameters.

Parameter	Value
Resource hourly rate (**User A**)	$100.00
Total duration of task	16 hours
Time accrued	8 hours



2. The default **Rate Modifier** is always **None**, but **Bill Code**, **Bill Sub-code**, and **Bill Type** use the defaults when the task is created. If the top level has **General**, **Accounting**, and **Standard** values, the tasks (when created) default to **General**, **Accounting**, and **Standard**.

   You can change these values using the **Costs** dialog box. The values for **Rate Modifier** are those created using the **Manage Rate Modifiers** dialog box.

   > Note:
   >
   > The value for **Rate Modifier** is applied to all resources assigned to the task. For example, if the rate modifier is a multiplier with a value of **1**, *all* resources assigned to the task use a rate modifier of **1**. Different tasks can use different rate modifiers.

3. Click **Finish**.

Schedule cost information

1. To display cost information for the schedule and, optionally, change the billing codes, select the schedule in the task tree, and choose **Schedule** → **Costs**.

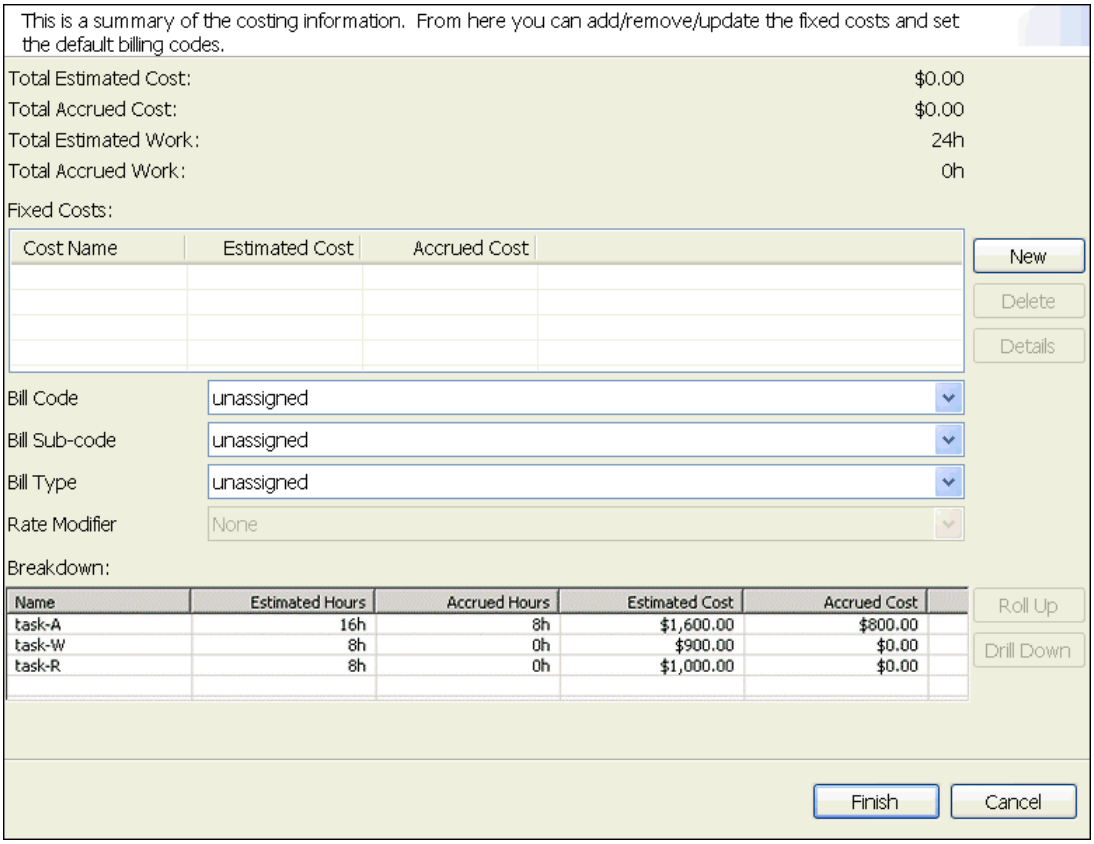
   > Note:
   >
   > You can also set values for fixed costs for the schedule.

   Schedule Manager displays the **Costs** dialog box for the selected schedule.

   As an example, the following shows the costs for **Normal Schedule** based on the following parameters.

Parameter (task-A)	**Value**
Resource hourly rate (**User A**)	$100.00
Total duration of task	16 hours
Time accrued	8 hours

Parameter (task-R)	**Value**
Resource hourly rate (**User B**)	$125.00
Total duration of task	8 hours
Time accrued	0 hours



Parameter (task-W)	Value
Resource hourly rate (**User A** and **User B**)	$100.00 for resource **User A** and $125.00 for resource **User B**.
Total duration of task	8 hours 4 hours for resource **User A** and 4 hours for resource **User B**.
Time accrued	0 hours

2. The default values for **Bill Code**, **Bill Sub-code**, and **Bill Type** are **unassigned**.

   You can change these values using the **Fixed Costs** dialog box.

3. Click **Finish**.

What are fixed costs?

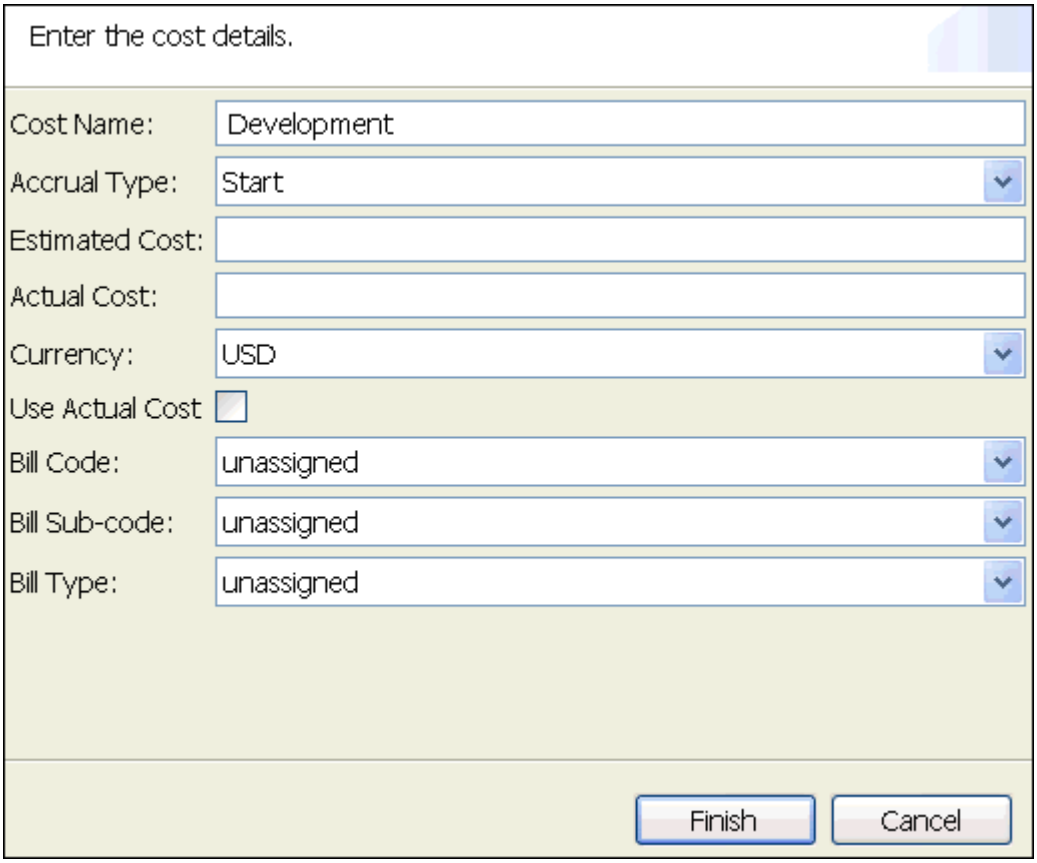
In addition to the costs associated with resources, you can include fixed costs on a schedule or task basis. Examples of fixed costs are rental of hardware or licensing of software during the development or manufacture of the product.

Manage fixed costs

1. Open a **Costs** dialog box for either a schedule or task.

2. Click **New** to add a new fixed cost or select a fixed cost and click **Details** to view/modify a fixed cost.

   Schedule Manager displays the **Fixed Cost** dialog box.



Fixed Cost dialog box

3. Enter values as described in the following table.

> Note:
>
> The default **Bill Code**, **Bill Sub-code**, and **Bill Type** are the current codes set on the task where the fixed cost is being added.

Column	Description
Name	Specifies the name of the fixed cost.
Accrual Type	Specifies accrual type. Valid values are **Start**, **Prorated**, and **Finish**. Accrual types determine when the cost is scheduled to be accrued.
Estimated Cost	Specifies the estimated cost.
Actual Cost	Specifies the actual cost.
Currency	Specifies the currency. Values are defined by the **CostCurrency** LOV.
Use Actual Cost	Specifies that the value of the **Actual Cost** box is used for the cost summary. If this box is not checked, the value of the **Estimated Cost** box and the **Accrual Type** box are used to determine the accrued cost.
Bill Code	Specifies the billing code. Values are defined by the **BillCodes** LOV.
Bill Sub-code	Specifies the billing subcode. Values are defined by the **BillCodes** LOV.
Bill Type	Specifies the billing type. Values are defined by the **Bill Types** LOV.

4. Click **Finish**.

> Note:
>
> Using the Business Modeler IDE, you can add other values to the **Bill Code**, **Bill Sub-code**, and **Bill Type** list by updating the LOV specified above.

Managing schedules based on earned value management

What is earned value management?

Earned value management (EVM) is a project management technique for measuring project progress in an objective manner.

You can:

- Calculate the EVM values for the entire schedule or selected tasks.

  Teamcenter displays the EVM results for the level selected.

- Quantify progress using the PV (Planned Value) calculations and the EV (Earned Value) calculations.
- Compute earned values based on the costs and hours entered against scheduled tasks and the fixed costs.

Set options for the earned value management calculation

1. In the Schedule Manager application, select the root node in the tree.
2. Choose **View→EVM→EVM Options**.

   The **Earned Value Calculation** dialog box is displayed.
3. Select **Cost** or **Hours** for the basis of the calculation.
4. Choose one of the following from the **Calculate Work Complete By** list.

   a. **Percent Complete**

   b. **Actual Hours**
5. Select one of the following labels:

   a. **Earned value based management based labels**

   b. **Cost/Schedule control systems criteria**

      Select **Help Me Choose** for label definitions.
6. Click **Calculate**.

   The **EVM Results** dialog box is displayed.

Reviewing the earned value management results

The following are earned value management (EVM) calculations:

- Planned Value (PV) = Budgeted Cost of Work Scheduled (BCWS) (Planned Effort) to be done by now.
- Earned Value (EV) = Planned Value (PV) multiplied by percent of work complete (or actual work) until now.
- Actual Cost (AC) or Actual Cost of Work Performed (ACWP) (Actual Effort) = actual hours of work performed on the task multiplied by the resource rate.

- Cost Variance (CV) = Earned Value – Actual Value ((EV-AC) (in hours or cost) greater than zero is considered good (under budget).
- Budget at Completion (BAC) = the total budget or planned value (PV or BCWS) at the end of the project.
- Forecast at Completion (FAC) = Actual Cost + (BAC - EV).
- Estimate at Completion (EAC) = projection of total cost of the project at completion (AC + (BAC - EV)/CPI).
- Schedule Variance (SV) = Earned Value – Planned Value (EV – PV) (in hours or cost) greater than 0 is considered good (ahead of schedule).
- Schedule Performance Index (SPI) = Earned Value/Planned Value (EV/PV) (ratio or %) greater than 1 is considered good (ahead of schedule).
- Cost Performance Index (CPI) = Earned Value/Actual Value (EV/AC) (ratio or %) greater than 1 is considered good (under budget).

Based on the results, management can decide which projects should go forward.

> Note:
>
> No baseline is considered.

Exporting earned value management results to Microsoft Excel

Exporting the results to Microsoft Excel provides you with more details, including task breakdown information for each of the EVM values. It also contains the time at which the report was exported.

To display units for the results in Excel, set the **SM_EVM_Export_Units** preference.

To export the results, click **Export** In the **EVM Results** dialog box and save as a CSV file.

Requiring qualified users to perform tasks

Defining qualifications

Qualifications define the skills, certificates, training, or other aspects of a user's capability to perform the task. You can require the task be performed by a user with a specific set of qualifications.

Qualifications can have different levels, such as novice, intermediate, or expert. You can allow someone with a higher level, who is more qualified, than the one you specify to perform the task. Qualifications can also have effective dates (when the qualification started) and expiration dates (when the qualification ended).

By default, only those in the **dba** role can add or modify the qualifications and qualification levels.

Create qualifications

1. Open the **Qualifications** view by choosing **Window** → **Show View** → **Other**. In the **Show View** dialog box, search for **Qualifications**, select it, and click **OK**.

2. On the **Manage Qualifications** tab, select **Qualification** in the list on the left.

3. Type the new name in the **Qualification Name** box and more information about it in the **Description** box.

4. If you want the qualification to have a beginning and end date, select the **Require Effective and Expiration Dates** check box. If not, clear the check box.

5. Create a level for your qualification by typing the level name in the box next to the **Add** button in the **Qualification Levels** section of the tab and click **Add**.

   You must create at least one level. Continue to create levels as needed.

6. If you created more than one level, order them from the highest level at the top of the list to the lowest at the bottom with the **Up** ▲ and **Down** ▼ buttons.

7. Click the **Create** button.

Modify or delete qualifications

1. Open the **Qualifications** view by choosing **Window** → **Show View** → **Other**. In the **Show View** dialog box, search for **Qualifications**, select it, and click **OK**.

2. On the **Manage Qualifications** tab, select one of the qualifications in the list on the left.

3. You can change the qualification details, such as levels, description, or if effective and expiration dates are required, and click **Modify**.

4. You can delete the entire qualification by clicking **Delete**.

   You cannot delete a qualification that is assigned to a user, job card, or job task.

Assign qualifications to users

1. Open the **Qualifications** view by choosing **Window** → **Show View** → **Other**. In the **Show View** dialog box, search for **Qualifications**, select it, and click **OK**.

2. On the **Manage User Qualifications** tab, select a user in the **Organization** list on the left.

3. Select a qualification and qualification level from the lists on the right.

   If the **Effective Date** and **Expiration Date** boxes are enabled, select the dates for when the user's qualifications begin and end.

4. Click the **Assign** button.

5. If a user no longer holds a qualification, select it from the list in the **User Qualifications** section and click **Remove**.

6. If a user has a different qualification or level or new effective or expiration dates, select the qualification from the list in the **User Qualifications** section and click **Modify** to change it.

Defining tasks, milestones, and work breakdowns in the schedule

Understanding schedule task types

Schedule task types are displayed in the following manner in Teamcenter:

- Within the schedule object tree, schedule task types are displayed using the full task-type name, for example, Task, Milestone, or Summary.
- In the **Properties** dialog box, schedule task types are associated with a numerical value.

The following table identifies the task type name and associated number.

Task Type Name	Task Type Number
Standard	0
Milestone	1
Summary	2
Phase	3
Gate	4
Schedule Summary	6

Scheduling and managing tasks

Once you create a schedule, you can add tasks and milestones and baseline tasks. You can also set and change schedule and task properties as necessary.

Consider the following when creating a task:

- If the new task is created when keeping the schedule summary task selected in the **Schedule Manager** view, the new task is created following the last task in the schedule.
- If the new task is created when keeping a task or milestone selected in the **Schedule Manager** view, the new task is created following the selected task or milestone.
- If the new task is created when keeping a summary task selected in the **Schedule Manager** view, the new task is created next to the summary task.
- If nothing is selected, you can create a task only by using the **Task** box in the **Schedule Manager** view. The new task is created following the last task in the schedule.
- Use the **ScheduleTaskClassNameToCreate** preference to specify the type of schedule task that is created through the quick create option in the rich client.

Adding tasks to a schedule

Methods for adding a task

You can add a task to a schedule using any of the following procedures.

If the schedule is a master schedule and contains subschedules, you can add a task to either the master schedule or any of the subschedules by selecting a task in the desired schedule and performing one of the following procedures.

- Using the **Task** box by following the procedure in Add a task using the task box.
- Using the **File** menu.

  To use the **File** menu, choose **File→New→Task**.

  Schedule Manager displays the New Task wizard. Follow the procedure in Add a task using the task box.
- Using the task table.

  To use the task table, select the schedule or task in the schedule and either right-click and choose **New→Task** or click the **New Task** button on the toolbar.

  Schedule Manager displays the New Task wizard. To add information, follow the procedure in Add a task using the task box.

Add a task using the Task box

1. Open a schedule in Schedule Manager.

2. Select an existing task. The new task is inserted directly below (at the same level of) the currently selected task.

3. Enter the task name in the **Task** box at the top of the task table.

> Note:
>
> You cannot restrict the task name length to 32 characters with the **TC_Allow_Longer_ID_Name** preference.

4. In the **Work** box, enter the task work. You can specify the task work in weeks, days, or hours by adding the **w**, **d**, or **h** suffix to the value. You can also enter decimal values for task work, for example, **12.5h**.

   The default task work is displayed in **h** (hours) and the default value is **8**. Regardless of the suffix specified, Schedule Manager converts and displays the task work in hours.

5. Click **Create**.

   The task defaults as starting on the current day and lasting for the same duration as the specified task work.

   For example, **40h** entered in step 4 is used for **40h** work and the **40h** duration.

Add a task using the New Task wizard

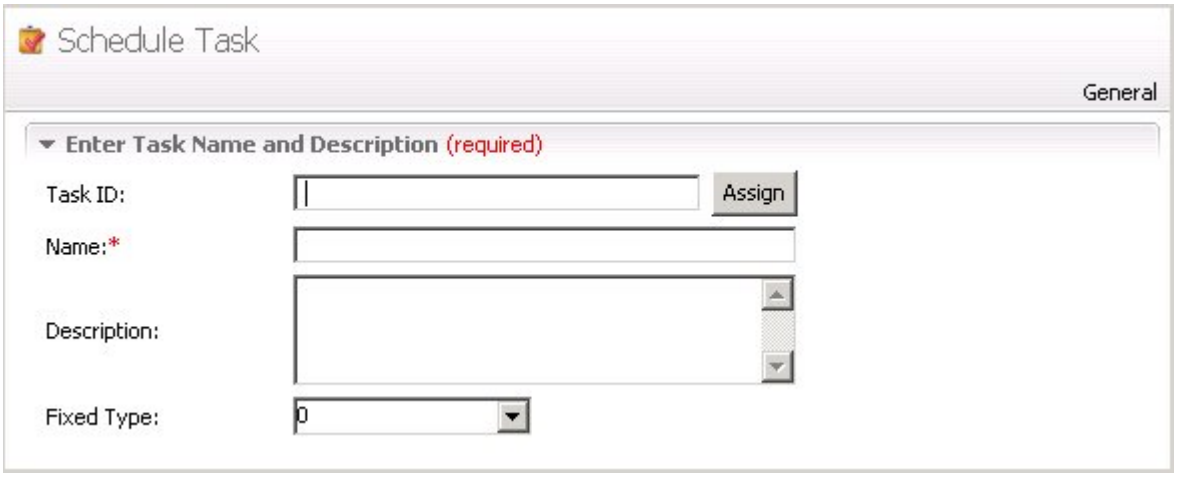
Schedule Manager displays the New Task wizard when creating tasks from the **File** menu or the task table.

1. Select a schedule and choose **File→New→Task**.

2. Select **Schedule Task** and click **Next**.

> Note:
>
> You must select exactly where in the structure you want the task created. For example, if you want it to be the third task in the list, the new task becomes the fourth task and the previous task ending as the fourth ends up as the fifth task. However, if the top schedule is selected, the new task is added at the end.

   Schedule Manager displays the **Object Create Information** dialog box.



a. In the **Name** box, type a name for this task.

> Note:
>
> You cannot restrict the task name length to 32 characters with the **TC_Allow_Longer_ID_Name** preference.

b. (Optional) Click **Assign** to have Schedule Manager enter a value for the **Task ID**

c. (Optional) Enter a description of the schedule task in the **Description** box.

d. Set **Fixed Type** to whatever type you desire.

- **Fixed Work**

  (Default) Keeps the hours constant while duration or resource to task is modified.

- **Fixed Duration**

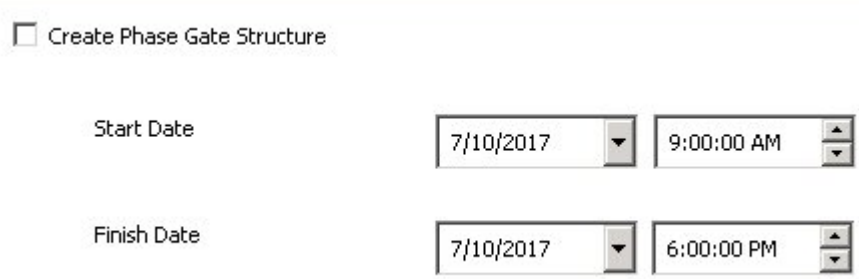
  Keeps the length of time constant while the work or resource is modified.

- **Fixed Resource**

  Keeps the resource constant while the work or duration is modified.

3. Click **Next**.

Schedule Manager displays the **Task Information** dialog box.



a. Select the **Create Phase Gate Structure** checkbox to create a **phase gate structure**.

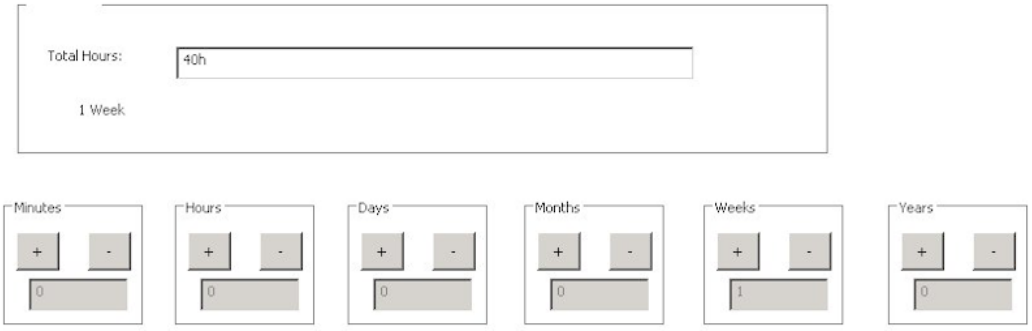
b. Click the **Start Date** and **Finish Date** drop down buttons to display a calendar to select start dates and finish dates.

> Note:
>
> Unless the schedule is based on the **Finish Date**, **Finish Date** must occur after **Start Date**. **Finish Date** defaults to the value of **Start Date**.

c. Click the time buttons to set the schedule task start and finish times.

4. Click **Next**.

Schedule Manager displays the **Define Work Estimate** dialog box.



a. Enter the work estimate values in one of the following ways:

- Enter the value in the **Total Hours** box.
- Click the **+** or **–** to set the work estimate in minutes, hours, days, weeks, months, and years.

5. Click **Next**.

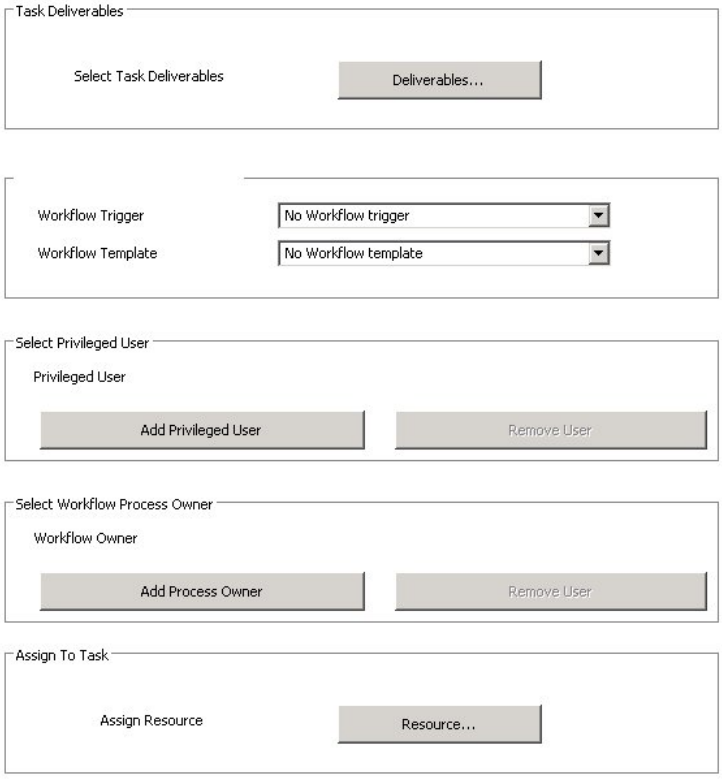
Schedule Manager displays the **Define Work Complete** dialog box.

Enter work complete values in one of the following ways:

- Enter the work complete values in the **Total Hours** box.
- Click **+** or **–** to set the work completed in minutes, hours, days, weeks, months, and years.

6. Click **Next**.

Schedule Manager displays the **Define Task Assignments, Workflow and Deliverable** dialog box.



a. Click the **Deliverables...** button to assign deliverables to the task.

b. Click the **Workflow Trigger** drop down button to select the desired task trigger.

c. Click the **Workflow Template** drop down button to select the desired template for this workflow.

d. Click the **Add Privileged User** button to add a privileged user to the workflow. Privileged users control where the workflow goes upon launch.

   You can search for a group, role, or user.

   Use **Resource Pool Options/Placeholder Options** to assign a set of group or role members as participants instead of individual users.

e. Click the **Add Process Owner** button to assign an owner to the workflow process. The process owner is the user who initiated the workflow process.

   You can search for a group, role, or user.

f. Click the **Resource...** button to assign a resource to this task.

   Click either the **Organization**, **Project Teams**, or **Disciplines** tab and select a user to assign to the task.

   You can search for a group, role, or user in the box below the tabs.

   Use **Resource Pool Options** to assign a set of group or role members as participants instead of individual users.

   - If you select a group, you can click **Any Member** so any member of the group can be assigned to the task.
   - If you select a role under a group, you can click **Any Member** and select **Specific Group** to assign any member of the combined group and role to the task or select **Any Group** to assign any member of any group and the selected role to the task.
   - If you select a discipline, no resource pool options are available.
   - If you assign a task to a resource pool, a member of the pool can **claim the task** and move it to their user inbox.

7. Click **Finish**.

Set localized values for task names

To set task name values so that they are localized when another user imports them to the Business Modeler IDE, the administrator must set all task names as translatable or as not translatable.

For example, if you expect some coworkers in France to import your schedule, you must:

1. Make sure the administrator has set task names as translatable.
2. Provide the value for the task names in French.

When the coworkers in France import the schedule, the task names automatically appear localized.

If you expect some coworkers in Spain to import your schedule, you must:

1. Make sure the administrator has set task names as translatable.
2. Provide the value for the task names in Spanish.

When the coworkers in Spain import the schedule, the task names automatically appear localized.

Likewise, you can provide values for German and English.

Claim a task from a resource pool

You can claim a schedule task from a resource pool inbox and move it to your personal inbox under the following conditions:

- The resource pool is a schedule member.
- You are a member of the resource pool and have subscribed to it.

  For more information about subscribing to a resource pool, see the *Getting Started With Workflow*.
- The task is assigned to any member of a resource pool.

  If the task is assigned to all members, you cannot claim it.

  > Note:
  >
  > If the task is assigned to all members, it does not appear in the resource pool inbox because it cannot be claimed.

- If the schedule task is attached to a workflow process, claiming the task has no effect on workflow assignments.

1. Click the **My Worklist** link, open the resource pool inbox, and then open the **Schedule Tasks** folder under it.
2. Select the task you want to claim, and then choose **Actions→Claim Task**.
3. In the **Claim Task** dialog box, click **Yes**.

4. In the confirmation dialog box, click **OK**.

The task is moved from the resource pool inbox to your user inbox, and you are assigned the task.

Sending schedule tasks through workflows

Managing schedule tasks using workflows

Teamcenter workflow and Schedule Manager work together to manage your schedule tasks. When schedule tasks are assigned to a resource pool and a privileged user assigned, that information is passed to the workflow process when it starts.

- During the workflow process for the schedule task, when a workflow process state changes to **Started**, **Complete**, or **Aborted**, the schedule task state in Schedule Manager is updated to **In Progress**, **Complete**, or **Aborted**, respectively.
- You can change the mapping of the workflow process and schedule task states with the **SM_WORKFLOW_STATUS_MAP** preference.
- When a task is completed in a workflow, Teamcenter marks the schedule task as complete.
- Teamcenter creates a workflow as a remote workflow when the privileged user (or, in the absence of a privileged user, the workflow owner) is a remote user. When the system creates the remote workflow, it links the schedule task to that workflow and attaches all task attachments using GRM relations. It also replicates the attachments. You can configure the workflow to either check them out remotely or transfer ownership to the remote site.

For information about propagating related items to plan items using workflow, see the *Change Management — Deployment and Rich Client Usage*.

Configure a schedule task to be a workflow task

You can configure a Teamcenter schedule task so that when certain conditions are met, the associated workflow can be initiated. The triggering rules or conditions create a workflow process. If there are updates to the workflow process tasks, a notification is sent to the Teamcenter schedule task so that the schedule task can be updated.

> Note:
>
> The workflow trigger and workflow template can also be set in the tree table.

1. Select one or more tasks from the task table.
2. Right-click and choose **Workflow Task**.

The **Workflow Rule Configuration** dialog box appears and displays the **Workflow Trigger** and **Workflow Template** boxes.

The default workflow trigger is **No workflow trigger** and the default workflow template is **No workflow template**.

3. From **Workflow Trigger**, choose one of the following triggers:

   - **Predecessors complete** (when all direct and indirect predecessor tasks are complete)
   - **Scheduled start date** (when the start date and time of the schedule task have arrived)
   - **Both scheduled start date and predecessors complete**
   - **Either scheduled start date or predecessors complete**

4. Select a workflow in the **Workflow Template** dialog box.

   Note:

   - If the selected workflow template contains an interactive task, for example, **Do Task**, **Review Task**, or **Signoff Task**, the task to be performed appears in the user's inbox. If no interactive task is present in the workflow template, no workflow notification is displayed.
   - The first workflow task can be assigned to anyone, not only the privileged user.

5. Click the **Add Privileged User** button, select the user from the **Privileged User** dialog box, and click **OK**.

   You can remove the privileged user and add a new one if someone else needs to perform various administrative actions with the workflow process.

6. Click **OK**.

If a schedule is unpublished or is a template, workflow triggers are not processed, the workflows are not processed, and the workflows do not appear in the user's inbox. Only schedules that are published and not templates start workflows.

Note:

If you change the finish date of a workflow, the schedule task finish date is no longer changed. Instead, the workflow sends an e-mail to the schedule owner about the workflow slipping. The owner can then decide if the schedule should be changed. The **In Progress** and **Complete** status updates are still automatically updated.

Initiate a workflow

1. In the task table, select a workflow task.
2. Choose **Schedule→Launch Workflow Now** or right-click and choose **Launch Workflow Now**.

   Schedule Manager displays the **Confirm Launch Workflow** dialog box.
3. Click **Yes** to launch the workflow.

> Note:
>
> You cannot delete workflow processes initiated by a schedule task.

Updating task properties

Update task properties (task table)

1. Select a task that you want to edit in the task table. You can use the horizontal scroll bar to display task properties.
2. Double-click the cell corresponding to the task property you want to edit.
3. Enter a new value.

Update task properties (Properties dialog box)

1. Select the task in the task table and perform one of the following to display the **Properties** dialog box:

   > Note:
   >
   > Use the Shift or Ctrl key to select multiple tasks. If you select multiple tasks and display the **Properties** dialog box, any values you enter in the dialog box apply to all selected tasks.

   - Choose **File → Properties**.
   - Right-click the task and choose **Properties**.
   - Double-click the task.

> Note:
>
> The **General** tab displays the out-of-the-box properties. The **All** tab does not display the task properties in the same way as the **General** tab. Siemens Digital Industries Software recommends you use the **General** tab to modify the task properties.

2. Modify the properties you want to update.

> Note:
>
> You may not be able to modify certain properties for *summary* tasks in the **Properties** dialog box. You can update those properties in the task table instead.

3. Click **OK** to save your changes.

Update task properties (Schedule Task Execution view)

1. In either My Teamcenter, **My Worklist**, or the Schedule Manager application, select a schedule task.

> Note:
>
> Only the user assigned the task or the schedule coordinator can make execution updates.

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

   The **Show View** dialog box is displayed.

3. Select **Schedule Task Execution** view from the list.

   Click **OK**.

   The **Schedule Task Execution** view shows the contents of the selected schedule task.

4. Update the task attributes, as desired.

   You can include the state attribute as read-only.

   State values are set relative to the status values, as follows:

State values	Status values
Not started	Not started
In Progress	In progress
In Progress	Late

State values	Status values
In Progress	Needs attention
Complete	Complete
Closed	Abandoned
Aborted	Aborted

Note:

You can only update execution data from this view. You can use this view anywhere in the rich client where you can select a schedule task.

Set the **SM_EXEC_VIEW_PROPERTIES** preference to specify the properties displayed in the execution view and the order in which they are displayed.

Require a task be performed by someone with specified qualifications

1. Right-click the task and choose **Assignments** → **Assign to Task**.

   The **Task Assignment** dialog box is displayed.

2. Select a task from the **Schedule Tasks** list.

3. Click the **Qualifications** tab and select a qualification and a level.

4. Click **Assign**.

   The assigned qualification appears in the **Qualification** column of the **Task Assignment** dialog box and the **Summary** view of the task.

5. To remove the required qualification for the task, select the task in the **Task Assignment** dialog box, click the **Qualifications** tab, select the qualification, and click **Remove**.

   If a user is assigned to the task, you cannot remove the qualification. You must first remove the assigned user from the task.

6. Click **OK**.

If a task has a qualification assigned to it, a user with the same or higher qualification must be assigned to it if the **SM_ENFORCE_ASSIGNMENT_CRITERIA** preference is set to **true**.

Abort a schedule or summary task

> Caution:
>
> Once a schedule or summary task has been set to **Abort**, the status cannot be changed or reversed.

The schedule coordinator can abort a task or a collection of tasks within a schedule. If tasks are aborted, the schedule itself is not aborted and any tasks not aborted execute as scheduled. If there is a workflow or remote workflow in execution for the aborted schedule task,Teamcenter aborts the workflow or remote workflow. If the workflow has completed or is not executing, Teamcenter does not abort it.

If the schedule coordinator aborts a summary task, all of its **In Progress** and **Not Started** subtasks are aborted too. If a subtask is another summary task, all of its subtasks are aborted as well.

1. In Schedule Manager, select the task and choose **Schedule→Abort**.

2. In the **Abort** dialog box, select the **Aborted** status from the list and click **Yes**.

Teamcenter aborts the task and associated subtasks and updates the scheduled task in the workflow or remote workflow. It sends an email to all coordinators and assigned users of the tasks. However, the tasks remain in the database in case the data is needed in the future.

> Note:
>
> Aborted tasks and schedules with aborted tasks cannot be deleted.

Abort a task workflow and its associated task

> Caution:
>
> Once a task workflow has been set to **Abort**, the status cannot be changed or reversed.

The schedule coordinator or an authorized schedule participant can abort a workflow, which aborts its root task. This cancels all workflow processes currently executing. If a schedule task is associated to the root task of the workflow, the schedule task is also aborted, unless the participant who aborted the workflow does not have permission to abort schedule tasks.

1. In **My Worklist**, select the task and choose **Actions→Abort**.

2. (Optional) Type any comments you want to appear in the audit file.

3. Click **OK**.

If a workflow is aborted, the schedule task in the workflow is marked as aborted. If the system is configured to support this task in workflow, the system sends an e-mail to the assigned users. The task remains in the database in case the data is needed in the future

Defining work breakdown

Using work breakdown structure codes

A work breakdown structure (WBS) is a way for managers to provide a quick reference to a task in the breakdown structure. This makes it easy for all those working on the project to find their assigned tasks and indicate the completion status of each.

The WBS code follows the schedule's tree structure, which shows the subdivision of effort required to achieve an objective. For example, a task with code **AA/b.3** belonging to a schedule having format **2A/a.N.a** and initial value **AA**, could have three subtasks with codes **AA/b.3.a**, **AA/b.3.b**, and **AA/b.3.c**.

Usually, large companies use an outline letter or number scheme for a WBS to plan and schedule the changes to a product. The format may even be company-wide.

Typically, the work breakdown structure format is set once and remains for the schedule's lifetime. However, the format can be changed for the existing schedule.

The codes for the schedule summary tasks are always generated. They can neither be edited nor saved. To start a subschedule at a code other than **1, a,** or **A**, set the initial value in the WBS format.

> Note:
>
> You must have **Coordinator** privileges to define the format of the schedule or set the codes for tasks.
>
> This functionality is available only in the rich client.

Defining the WBS code format

Whether you are creating, changing, or updating a new schedule, you can:

- Define the WBS codes manually, using the columns at the top of the **Define WBS Format** dialog box.
- Define the WBS codes using the table in the middle of the **Define WBS Format** dialog box.

Rules for setting the WBS code format

Whether you define the WBS codes manually or use the table in the **Define WBS Format** dialog box, the codes must comply with these rules:

- The format must be defined with at least a minimum of 2 levels and a maximum of 10 levels.

- The last character in the format defines what is used for all remaining levels in the schedule tree structure.
- The format must be defined in both master schedules and subschedules. The format is not supported across schedules.
- The overall initial value cannot exceed 32 characters.
- The maximum size for an individual level set in the initial value is 12 characters.

> Note:
>
> Teamcenter displays an error message if these rules are violated.

Define the WBS code format manually

1. In Schedule Manager, select the schedule.
2. Choose **Schedule→WBS→Define Format**.

   Teamcenter displays the **Define WBS Format** dialog box.
3. In the **Format** box, enter a combination of numbers, uppercase and lowercase letters, and symbols for the format.

   The format should be in the form *[N,A,a][.,-,/,+][N,A,a]*. See the guidelines that follow.
4. Enter an initial value at the top of the form to set the starting value.

   > Note:
   >
   > The initial value used by the individual schedules can be changed at the schedule level.
   >
   > The overall initial value cannot exceed 32 characters.
   >
   > The maximum size for an individual level set in the initial value is 12 characters.
   >
   > The initial value must comply with the format.
5. Click **Verify** to verify the new format and the initial value in the **Define** table.
6. Click **Finish** to save the format and the initial value.

You must follow this format:

*[?N,?A,?a]{[.,-,/,+][?N,?A,?a]}**

?	Whole number representing the minimum character length of a given section. If no number is provided, then 1 is assumed.
N	Whole number (there is no support for fractions).
A	Uppercase English alphabet character (A–Z).
a	Lowercase English alphabet character (a–z).
.	Valid separation character.
–	Valid separation character.
/	Valid separation character.
+	Valid separation character.

Note:

The format used by the individual schedules can be changed at the schedule level.

The following are examples of valid preferences and WBS codes that can be generated by the format:

- **N.N – 1.2.3**
- **N,3a/A – 12,aar/A/A**
- **3N+2a-4A – 010+aw-ACDB-AAAB**

Define the WBS code format using the table

1. In Schedule Manager, select the schedule.
2. Choose **Schedule→WBS→Define Format**.

   Teamcenter displays the **Define WBS Format** dialog box.
3. Use the **Define** table in the middle of the dialog box to help you define the format.

Level	Sequence	Length	Separator
1	Number	1	.
2	Number	1	.

4. Define the **Sequence** for each level.
   - Select **Number** to display a numeric WBS code.

There is no support for fractions.

- Select **Uppercase** to show uppercase alphabetical WBS codes.
- Select **Lowercase** to show lowercase alphabetical WBS codes.

5. Define the length for each level of the WBS code.

   For example, to show four uppercase characters in the first level of the WBS code, enter **4** in the **Length** column. The total length of a WBS code can be from 1 to 9 characters.

6. Define the separator to separate the WBS code for one level from the WBS code for the next level.

   - + (plus)
   - – (minus)
   - / (forward slash)
   - . (period)

7. Click **Add** to define another level of tasks.

   Click **Delete** to delete one row level for tasks.

> Note:
>
> The **Example** area displays the code based on the levels in the format. It provides a preview of the WBS codes that can be applied to the schedule tree structure.

Define the default WBS code and initial value for new schedules

1. Go to the My Teamcenter perspective.
2. Choose **Edit→Options**.
3. Select **WBS** from the list of options.
4. Click **Define WBS Format**.

   The **Define WBS Format** dialog box is displayed.

5. Follow the steps outlined in *Define the WBS code format using the table*.

Note:

This modifies the **SM_WBS_FORMAT_PREF** and **SM_WBS_INITIAL_PREF** preferences.

Define the WBS code format for a new schedule

When you create a new schedule:

1. Select **Define Format** on the **Enter Schedule Options and Details** page in the New Schedule wizard.

   The **Define WBS Format** dialog box is displayed.

2. Follow the steps outlined in *Define the WBS code format using the table*.

Change the WBS code format for an existing schedule

1. Select the schedule in Schedule Manager.
2. Choose **Schedule→WBS→Define Format**.

   The **Define WBS Format** dialog box is displayed.

3. Follow the steps outlined in *Define the WBS code format using the table*.

Viewing WBS codes

To view WBS codes in the schedule tree structure, you add the **WBS Code** column in the schedule tree view.

Copied schedule tasks receive new WBS codes. These codes depend on the level, format, and initial value of the schedule.

Note:

The codes displayed in **bold** are saved in the database and available for query. Codes not populated within the database are displayed in *italic*.

Rules for setting WBS codes

- Codes must be unique and match the specified format.
- Codes must comply with the location in the schedule.

  For example, a task with code 3.2.1 must be under a task with code 3.2.

- When manually editing a task's WBS code, the following rules apply:
  - After you manually edit a code, that single code is automatically saved and displayed in bold.
  - Changing one entry may cause others around it to change.
  - If you want to regenerate a single task, you can simply delete the existing code and click outside the cell.

    Use this feature if you are upgrading from a prior version to version 11.2. In 11.2 and all subsequent versions, if a parent or previous task does not have a WBS code, the system does not generate a code for a newly created task. To prevent this problem, you must generate WBS codes for schedules that did not have WBS codes before the upgrade. Manually enter the WBS code for tasks whose previous task cannot be modified, for example, if the previous task was aborted.

> Note:
>
> Teamcenter displays an error message if these rules are violated.

Populate changes to WBS codes within the database

- Changes to the task codes in the schedule are automatically saved as you make them. You do not need to save them yourself.
- To regenerate saved codes on certain tasks in the schedule, instead of editing each task code, select the tasks on the schedule and choose **Schedule→WBS→Regenerate**.

  When you choose **Schedule→WBS→Regenerate All**, all the previously saved codes are cleared and the new codes are generated automatically, based on the format and initial value of the schedule.

> Note:
>
> If you are upgrading from a version prior to 11.2, you must generate the WBS codes for any schedule that did not contain WBS codes, using **Schedule→WBS→Regenerate**. In version 11.2 and later, Schedule Manager can set the WBS code on a newly created task only if there is a generated code for the schedule.

Create a milestone

Milestones are defined to be tasks with zero duration. You use a milestone to identify a key date or key deliverable.

1. Position the cursor in the task table on the task directly above where you want to place the milestone.
2. Choose **File → New → Milestone**.

The milestone is added to the task table and is labeled **Milestone**.

You can also convert an existing task to a milestone by setting its **Task Duration** value to zero hours.

You can also convert an existing milestone to a task by setting its **Task Duration** value to greater than zero hours.

Modify a milestone

1. Either double-click the milestone in the task table or right-click it and choose **Properties**.
2. To change the name of the milestone, enter a new name in the **Name** box.
3. To change the date of the milestone, enter a new date in the **Start Date** box.
4. To automatically change the milestone's status to **Complete** when its predecessor is complete, set **Auto Complete** to **True**.

Scroll to a task

If the task is not displayed in the Gantt chart, follow these steps:

1. Select a task from the display list.
2. Right-click and choose **Scroll into View**.

   The task appears in the Gantt chart.

> Note:
>
> You can also scroll the Gantt chart manually.

Set a task baseline

You can set baselines for schedules and tasks. When you create a baseline for a task, you add it to an existing schedule baseline.

> Note:
>
> You must create a baseline for the entire schedule before you can baseline a single task.
>
> Baselines do not include proxy tasks or cross schedule dependencies.

1. Select the task or tasks.
2. Choose **Schedule→Baseline Task**.

3. From **Choose baseline**, select a schedule baseline under which the task baselines are to be added or updated.

Delete a task

1. Click to highlight the task to be deleted.

2. Select **Edit→Delete**.

> Note:
>
> When you delete a task from a schedule, the system also deletes any task proxy at a remote site, but the system does not automatically delete the workflow. Delete the workflow manually if it is not needed.

Sequencing tasks

Cut or copy tasks

1. Select the task or tasks from the task table.

2. Choose **Edit → Copy** or **Edit → Cut**. You can also right-click and choose **Copy** or **Cut**.

Paste tasks

> Note:
>
> You cannot paste a task before the first task in the schedule.

1. Select the task in the task table directly above where you want to paste the new task.

2. Choose **Edit → Paste**. You can also right-click and choose **Paste**.

Position tasks

- **From the task table**

  Change the value in the **Start Date** column.

  This shifts the task in time, changing the task's start and finish date, while keeping its overall working duration. If a two-day task beginning on Monday and ending on Tuesday (two calendar days, two working days) is moved to Friday, it now ends on Monday (four calendar days, two working days).

- **From the Gantt chart**

Click the center of the task bar and drag it to a new position. Your mouse cursor changes to a four-headed arrow, indicating you can click and drag the entire task.

Change task duration

- **From the task table**
  - Changing the value in the **Task Duration** column changes the duration and updates the task finish date.
  - Changing the value in the **Finish date** column changes the finish date and updates the task duration.
- **From the Gantt chart**

  Click and drag the right edge of the task bar either backward or forward in time. Your mouse cursor changes to a two-headed arrow, indicating that you can click and drag the finish-date of the task.

Change work complete or percentage complete

- **From the task table**

  Change the value in the **Work Complete** or **Work Complete Percent** column.

  > Note:
  >
  > When changing the value of **Work Complete** to a nonzero value, the task status is automatically changed from **Not Started** to **In Progress**.

- **From the Gantt chart**

  Click and drag the left inside edge of the task bar and drag the dark blue duration bar to the right within the task bar. Your mouse cursor changes to a hand pointer. Dragging changes work.

Create summary tasks and subtasks

A *summary*, or top-level task, has one or more subtasks associated with it. A summary task appears as a black summary bar in the Gantt chart.

- Its start date is defined as the earliest start date of its subtasks.
- Its end date is defined as the latest finish date of its subtasks.

Note:

The top of every schedule contains a schedule summary task. The summary bar may not match up exactly with its last subtask if the last task is less than a working day. Summary tasks use the end date of the last task for calculation. The subtasks calculate and display exact hours.

1. Select one or more tasks from the task table.
2. Choose **Schedule→Indent task**.

   To indent multiple tasks, they must be consecutive tasks.

   The selected tasks become a subtask of the task directly above it, the summary task, in the task table. The summary task and each of its subtasks have a parent/child relationship.
3. Choose **Schedule→Outdent task** to remove a subtask from its parent summary task.

   To outdent multiple tasks, they must be consecutive tasks.

Note:

Do not assign resources to summary or top-level tasks. Instead, assign resources to subtasks for distributed progress-reporting to work correctly.

Setting task trace links

Schedule Manager allows you to link a requirement in Systems Engineering and Requirements Management to a task in Schedule Manager. This linking feature is termed *trace links*.

When the task completes in Schedule Manager, a workflow is initiated to obtain approval from a signoff team.

Add a task constraint

You can use constraints to force a shift in the schedule honoring the constraint type. The constraint type is indicated by a red marker on the Gantt chart task bar.

1. Select a task in the task table.
2. Choose **Schedule → Task Constraints**.
3. From the **Task Constraints** dialog box, choose a constraint type:

   - **No Constraint**

The task in the Gantt chart shows no red arrows.

- **As Soon As Possible**

  Works with task dependencies to schedule a task as soon as the task dependency and other scheduling considerations allow.

  The task in the Gantt chart shows a red arrow pointing to the left.

- **As Late As Possible**

  Works with task dependencies to schedule a task as late as the task dependency and other scheduling considerations allow.

  The task in the Gantt chart shows a red arrow pointing to the right.

- **Fixed**

  Fixes the task duration. Schedule dates cannot be changed.

  The task in the Gantt chart shows a red arrow pointing to the left and a red arrow pointing to the right.

4. Click **OK**.

Creating dependencies between tasks

What are task dependencies?

A *dependency* between two tasks links their required order of completion. If two tasks must occur in a certain order, you can create start-to-start, start-to-finish, finish-to-start, and finish-to-finish dependencies between them to ensure their correct sequencing.

Example:

In the following figure, the **Develop preliminary BOM** task is dependent on the completion of the prior **Develop preliminary parts lists** task. The first task must be completed before the start of the second, therefore, this is a finish-to-start dependency.

Summary tasks can participate in dependencies just like normal tasks, despite being represented differently in the Gantt chart.

There are two ways to create, edit, and delete task dependencies.

- Using the task table.
- Using the Gantt chart.

Create task dependencies (task table)

1. Select a task in the task table.
2. Define the task dependency information.
   - If the selected task is dependent on another task, double-click the **Predecessor** cell.
   - If another task is dependent on the selected task, double-click the **Successor** cell.
3. Enter a task number, type of dependency, and lag time in the following format:

   ```
   task-number[type][+/- lag]
   ```

   - *type*

     Specifies one of the following lag types:

     - **SS:** Start-to-start
     - **FS:** Finish-to-start
     - **SF:** Start-to-finish
     - **FF:** Finish-to-finish

     The default value is **FS**.

   - *+/–*

     Specifies whether the lag time occurs after (**+**) or before (**-**) the lag type.

   - *lag*

     Specifies the lag time. You can specify the lag time in weeks, days, or hours by adding the **w**, **d**, or **h** suffix to the value. You can also enter decimal values for lag time.

     The default lag time is in **d** (days) and the default value is **0**. Regardless of the suffix specified, Schedule Manager converts and displays the lag time in days.

     The following table contains examples of lag time for task number **1** and a lag type of **FS**.

Note:

In the following examples, it is assumed 1 work week = 5 days and 1 work day = 8 hours.

Lag time is based on an 8 hour work day and the calculations will not be valid if your working time per day is more than 8 hours.

To set the lag time to	Enter	Schedule Manager displays
2 weeks	1FS+2w	1FS+10d
1 and one-half weeks	1FS+1.5w	1FS+7d4h
4 days	1FS+4d or 1FS+4	1FS+4d
3 days and 4 hours	1FS+3d4h or 1FS+3.5d	1FS+3d4h
10 hours	1FS+10 or 1FS+1.25d	1FS+1d2h
6 hours and 30 minutes	1FS+6.5h	1FS+0d6.5h

You are also able to create more than one dependency by using commas (for example, **5, 6SS-1, 7FS+4**).

If you reorder tasks, the **Predecessor** and **Successor** boxes are automatically updated with new task numbers.

Note:

Proxy tasks mirror real tasks. If you change the dependencies on the real task, the dependencies on the proxy task change as well.

Create task dependencies (Gantt chart)

1. Click the first task bar to display a four-headed arrow and drag the cursor straight up or straight down.

2. Position the cursor over the second task and release.

   While dragging the mouse, a yellow status popup appears displaying the task dependency information. After the dependency is created, a blue dependency line appears on the Gantt chart between the two dependent tasks.

Note:

- A **Finish to Start** dependency is created when you release the mouse button. To create a different dependency type, hold down the Control key when you release the mouse; this allows you to edit the type and lag before you create the dependency.
- You cannot create **Master/Sub** environment task dependencies between tasks in different schedules.
- Proxy tasks mirror real tasks. If you change the dependencies on the real task, the dependencies on the proxy task change as well.

Edit task dependencies (task table)

Perform either of the following procedures:

- Using the **Dependencies** dialog box:

  1. Select the task in the task table.
  2. Right-click and choose **Dependencies**.

     Teamcenter displays the **Dependencies** dialog box.
  3. Select the dependency to be edited from either the **Predecessors** or **Successors** boxes and click **Edit** to display the **Edit Dependency** dialog box.
  4. From the **Type** list, select the dependency type you wish to use.

     - **SS:** Start-to-start
     - **FS:** Finish-to-start
     - **SF:** Start-to-finish
     - **FF:** Finish-to-finish
  5. In the **Lag Time** box, enter the lag time, adding + or - values as needed. Lag time is the built-in time delay between tasks.

     Lead and lag times are useful when you have two dependent tasks, but the time between them must remain constant. For example, you may have a task that is called **paint walls**. You cannot schedule the **hanging pictures** task until two days after the **paint walls** task completes because the walls need to dry. Rather than creating a new task called **drying walls**, you can add a lag time of **2d** to the **hanging pictures** task.

     Learn more about the **values you can specify** in the **Lag Time** box.

> Note:
>
> Lag time is based on working time. In the example above, if the **paint walls** task finishes on Friday, Schedule Manager does not start the next task, **hanging pictures**, until Wednesday (four calendar days).
>
> Lag time is based on an 8 hour work day and the calculations will not be valid if your working time per day is more than 8 hours.

6. Click **OK**.

- Using the **Predecessor** or **Successor** columns:

  1. Select the task in the task table.
  2. Double-click either the **Predecessor** or **Successor** cell.
  3. Change the dependency information in the box.
  4. Press **Enter**.

> Note:
>
> Proxy tasks mirror real tasks. If you edit the dependencies on the real task, the dependencies on the proxy task change as well.

Edit task dependencies (Gantt chart)

1. Position the cursor over the task bar to display a four-headed arrow.
2. Right-click and choose **Dependencies**.

   Teamcenter displays the **Dependencies** dialog box.
3. Select the dependency from either the **Predecessor** or **Successor** boxes and click **Edit** to display the **Edit Dependency** dialog box.
4. Update the dependency, using **this information** about the **Edit Dependency** dialog box.
5. Click **OK**.

> Note:
>
> Proxy tasks mirror real tasks. If you edit the dependencies on the real task, the dependencies on the proxy task change as well.

Delete task dependencies (task table)

Perform either of the following procedures:

- Using the **Dependencies** dialog box:

  1. Select the task in the task table.
  2. Right-click and choose **Dependencies**.

     Teamcenter displays the **Dependencies** dialog box.
  3. Select the dependency from either the **Predecessor** or **Successor** boxes and click **Delete** to display the **Confirm** dialog box.
  4. Click **Yes**.

- Using the **Predecessor** or **Successor** columns:

  1. Select the task in the task table.
  2. Double-click either the **Predecessor** or **Successor** cell.
  3. Remove the entries for the dependencies you want to delete. Removing all the information from the box will delete all successors or predecessors of that task.
  4. Press Enter to display the **Confirm** dialog box.
  5. Click **Yes**.

- Using the **Edit** dialog box, choose **NONE** as the dependency type.

> Note:
>
> Proxy tasks mirror real tasks. If you delete the dependencies on the real task, the dependencies on the proxy task are deleted as well.

Delete task dependencies (Gantt chart)

1. Position the cursor over the task bar to display a four-headed arrow.
2. Right-click and choose **Dependencies**.

   Teamcenter displays the **Dependencies** dialog box.

3. Select the dependency from either the **Predecessor** or **Successor** boxes and click **Delete** to display the **Confirm** dialog box.

4. Click **Yes**.

Creating dependencies between tasks in different schedules

Create cross-schedule dependency

You can create dependencies between tasks in different schedules, including the top-level summary tasks in the Schedule Manager application. The schedule may be part of the same master schedule or in entirely separate schedules.

> Note:
>
> You cannot create a cross-schedule dependency between a schedule template and a non-template schedule.

> Note:
>
> You cannot create a dependency between a published schedule and an unpublished schedule, even if you are the creator and owner of both the schedules.

1. Select a task in an original schedule you created.

2. Choose **Schedule → Link → Create Cross Schedule Dependency**.

   Teamcenter displays the **Select a Schedule** page in the Create Cross Schedule Dependency wizard.

3. Select the schedule on which to depend.

4. Click **Next**.

   Teamcenter displays the **Select a Task** page in the Create Cross Schedule Dependency wizard.

5. Select the task on which to depend.

6. Click **Next**.

   Teamcenter displays the **Create a dependency** page in the Create Cross Schedule Dependency wizard.

   a. Select **Successor** or **Predecessor** from the list.

   b. Select a dependency type from the **Dependency Type** list.

c. Select a value from the **Lag** list.

7. Click **Finish**.

   The proxy task appears grayed out.

You can also create this dependency by creating a **proxy task** first, and then linking it to another task.

Delete cross-schedule dependency

1. Select the dependency to delete.
2. Choose **Edit** → **Delete**.
3. In the confirmation dialog box, click **Yes**.

   If the **proxy** does not have any other dependencies, Teamcenter displays the **Delete Proxy Tasks** dialog box.

4. Click **Yes**.

Using proxy tasks

A proxy task represents a real task in a different schedule and is used in cross-schedule dependencies. If the real task is deleted from the original schedule, that task is orphaned and no longer displayed in its schedule. The proxy is still displayed in the schedule in which it is used but listed as orphaned type instead of milestone, summary, and so on.

- You cannot modify proxy tasks. Modify the original task and the proxy task mirrors the change.
- You cannot create a proxy task for a task that exists in the same schedule.
- Proxy tasks are ignored when a schedule is imported to Microsoft Project.
- Template schedules can have proxies from other template schedules.
- Nontemplate schedules can have proxies from other nontemplate schedules.

Add a proxy task

1. Open an original schedule you've created within the Schedule Manager application.
2. Choose **File** → **New** → **Proxy Task**.

   Teamcenter displays the **Select a Schedule** page in the New Proxy Task wizard.

3. Select the schedule on which to depend.

4. Click **Next**.

   Teamcenter displays the **Select a Task** page in the New Proxy Task wizard.

5. Select the task on which to depend.

6. Click **Finish**.

   The proxy task appears grayed out in the schedule.

Mirror a task (create a proxy task)

Mirroring a task in a schedule creates a proxy of that task in its subschedules.

> Note:
> This is unavailable during a deferred session.

1. Select the task to mirror.

2. Choose **Schedule→Proxy→Mirror as Proxy Task**.

   Teamcenter displays the **Mirror Proxy Task** dialog box.

3. Select either **1st Level of Sub-Schedules** or **All Sub-Schedules**.

4. Click **OK**.

Drag a proxy task

You can place the proxy task anywhere in the structure by simply dragging it up or down in the tree table.

- Proxy tasks are shown in the hierarchy based on a reference task.
  - The reference task is the task which was selected when first creating the proxy.
  - In the case of **cross-schedule dependencies**, the proxy typically references the task on which it depends.
- The proxy is placed above or below its reference task based on the start date.
  - If the proxy starts before or at the same time as its reference task, it displays above the reference task.

- If the proxy starts after the reference task, it displays below the reference task.

> Note:
>
> Data in a proxy task does not roll up to any summary task.

Delete a proxy task

You can delete a proxy task if cross-schedule dependencies have been removed.

1. Select the proxy task.
2. Choose **Edit** → **Delete**.
3. In the confirmation dialog box, click **Yes**.

> Note:
>
> If you delete a proxy task that is part of a cross-schedule dependency, the dependency is also deleted.

Because proxy tasks can exist without dependencies, you can keep the proxy task when deleting the dependency.

Comparing the planned schedule with the current schedule

Baselining schedules

You can create a schedule baseline, which represents a snapshot of the schedule at a given time. This allows you to view how the actual schedule compares with the originally planned schedule, assessing which tasks have slipped and which tasks have been completed ahead of schedule. It also allows you to compare estimated duration against actual duration.

You can also create multiple baselines for a schedule and assign one baseline to be the *active* baseline.

If you are using a *master schedules and subschedules*, all baseline operations applied to either the master schedule or any subschedule are also applied to the other schedules.

You can also baseline tasks.

Create a schedule baseline

1. Open a schedule in Schedule Manager.
2. Select the schedule and choose **Schedule→Baseline Schedule**.

Teamcenter displays the **Schedule Baseline** dialog box.

3. Enter a unique name for the baseline in the **Baseline Name** box.

   > Note:
   >
   > If you are copying a baseline from an existing baseline, and you use the same name, the older baseline is overwritten with the new baseline options.

4. Click **Active** to make this baseline the active baseline. The active baseline information is shown for the baseline columns when not viewing a specific baseline.

   > Note:
   >
   > If this is the first baseline, this option is not available. Teamcenter automatically sets this baseline as active.

5. Click **Copy Baseline** to copy information from an existing baseline.

6. In the **Copy Settings** box, set the following options:

   - **Choose Baseline**

     Choose a baseline to copy.

   - **Baseline new tasks**

     Baseline all tasks not currently baselined.

7. In the **Task baseline updates** section, set the following options:

   - **Do not update baselines**

     Existing tasks baselines are not updated.

   - **Not started tasks**

     Update the baseline of all tasks that have not started.

   - **Update incomplete tasks**

     Update the baseline of all tasks that are not complete.

8. Click **OK**.

Manage schedule baselines

1. Select the schedule and choose **Schedule→Manage baselines**.

   Teamcenter displays the **Manage Baselines** dialog box.

2. To make a baseline the active baseline:

   a. Select a baseline from the list.

   b. Click **Set Active**.

3. To add a new schedule baseline, click **Add Baseline**.

4. To modify a baseline name:

   a. Select a baseline from the list.

   b. Under **Baseline name** column, enter a new name for the baseline.

5. To delete a baseline:

   a. Select a baseline from the list.

   b. Click **Delete Baseline**.

   c. In the **Confirmation** dialog box, click **Yes**.

6. Click **Close**.

Assigning deliverables to schedules and tasks

Schedule and task deliverables

You can associate deliverables with schedules and with the tasks within a phase. For example, a design document can be associated with a development design document task.

You must create schedule deliverables before you can assign them to tasks.

Assign deliverables to a schedule

You can associate deliverables with schedules and with the tasks within a phase. For example, a design document can be associated with a development design document task.

You must create schedule deliverables first. After you create schedule deliverables, you assign the deliverables to tasks by performing the steps in **Assign deliverables to a task**.

> Note:
>
> If you are using a master schedule and subschedules, all deliverable operations such as create and delete are available but are relative to the schedule. Schedule deliverables cannot be shared between the master and subschedules.

1. Select the schedule in the task tree.
2. Choose **Schedule→Schedule Deliverables**.

   The **Schedule Deliverables** dialog box appears.
3. Click **Add** to create a line in the **Schedule Deliverables** dialog box.

   You can remove a deliverable from the **Schedule Deliverables** dialog box by selecting the deliverable and clicking **Remove**.
4. Click the **Deliverable Name** column and enter a name.
5. Double-click **Deliverable Type** and select a type from the list.

   The **Deliverable Link/URL** box displays the real instance of the deliverable, if one exists.

   For example, if a schedule deliverable of type MSWord is referenced by a task deliverable, when the workflow is launched, the system displays the existing MSWord document name in the **Deliverable Link/URL** box.
6. (Optional) Click the search symbol to the right of the **Deliverable Link/URL** box to display a search dialog box and enter search criteria. If the deliverable is found, double-click to copy its value into the **Deliverable Link/URL** box.
7. Repeat steps 3 through 6 to add another schedule deliverable.
8. Click **OK**.

Assign deliverables to a task

You can associate deliverables with schedules and with the tasks within a phase. For example, a design document can be associated with a development design document task.

You must create schedule deliverables first by performing the steps in **Assign deliverables to a schedule** before assigning the deliverables to tasks.

1. Select the task in the task tree.
2. Choose either **Schedule→Task Deliverables** or right-click and choose **Task Deliverables**.

   The **Task Deliverables** dialog box appears.

   > Note:
   >
   > You must have a schedule deliverable defined to create a task deliverable.

3. Click **Add** to add a schedule deliverable in the **Task Deliverables** dialog box.

   Subsequent clicking of **Add** inserts another schedule deliverable.

   You can remove a deliverable from the **Task Deliverables** dialog box by selecting the deliverable and clicking **Remove**.
4. Click the **Schedule Deliverable** column and select a deliverable from the list.
5. Click the **Submit Type** column and select a type from the list.
6. Click the real instance of the deliverable in the **Deliverable Link/URL** column.
7. Click **OK**.

Importing schedules

Use the **ScheduleManagerFoundationImport** transfer mode to import a schedule and its related data, including properties, for all schedules created in the previous versions of Teamcenter 11.2.

> Note:
>
> To import the custom properties on a schedule or schedule task using PLM XML, the exported schedule must have a custom **PropertySet** object attached to the **ScheduleManagerFoundationExport** transfer mode, as described in *Exporting schedules*.

Use the **ScheduleManagerFndImportLegacy** transfer mode to import a schedule and its related data, including properties, for all schedules created in the current version of Teamcenter 11.2 and later.

> Note:
>
> If you create a subclass with custom properties, these properties can be attached to the out-of-the-box transfer modes.

- Orphaned tasks are ignored during import.

- If the workflow template is not present upon import, workflow tasks ignore the template and the scheduling attribute is set to **NULLTAG**.
- When importing resource assignments, if the user, discipline, or group is not present, the resource assignment fails.
- When importing schedule member, if the user, discipline, or group is not present, the schedule member fails.
- Re-importing an already imported schedule into the system will not update or overwrite the existing schedule-related data.
  - The system deletes all schedule-related data like tasks, proxy tasks, assignments, dependencies, deliverables, and calendars.

    Note:

    If deletion of any of the schedule-related data fails, the system rolls back any changes made and the import operation fails. An error message is displayed.

  - The system re-imports everything from the PLM XML file.

  Set the **SM_PLMXML_IMPORT_EXISTING_ SCHEDULE** preference to **True** to re-import a schedule that is already in the system. Set this preference to **False** to block the import of the schedule that is already in the system.

Exporting schedules

Use the **ScheduleManagerFoundationExport** transfer mode to export an out-of-the-box schedule and its related data, including properties.

Use the **SM_PLMXML_EXPORT_SUB_SCHEDULE** preference to export subschedules when exporting a master schedule.

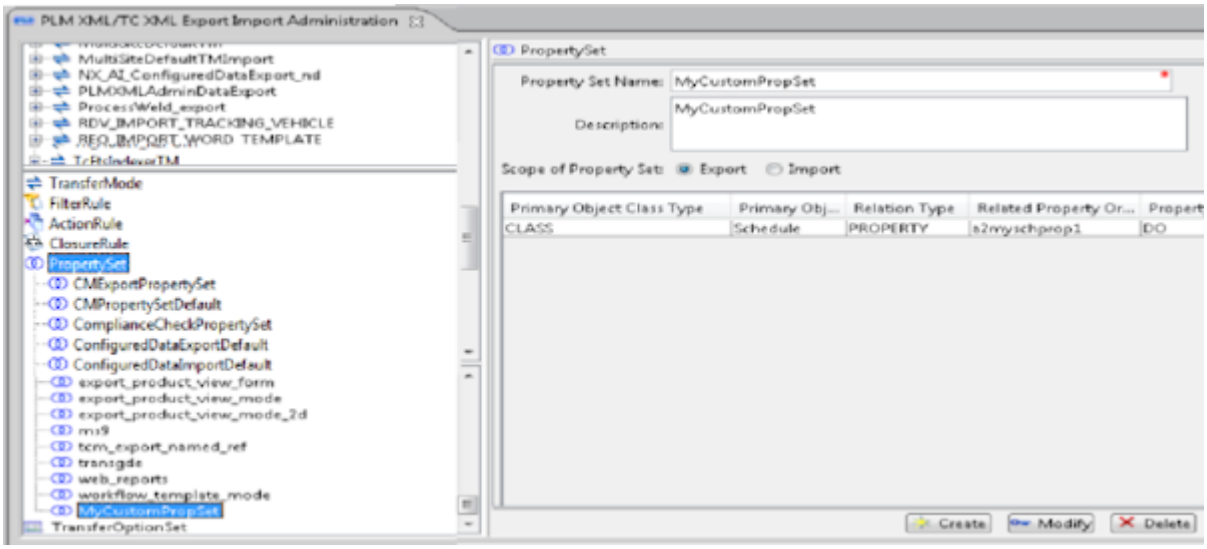
Note:

If you create a subclass with custom properties, these properties can be attached to the out-of-the-box transfer modes.

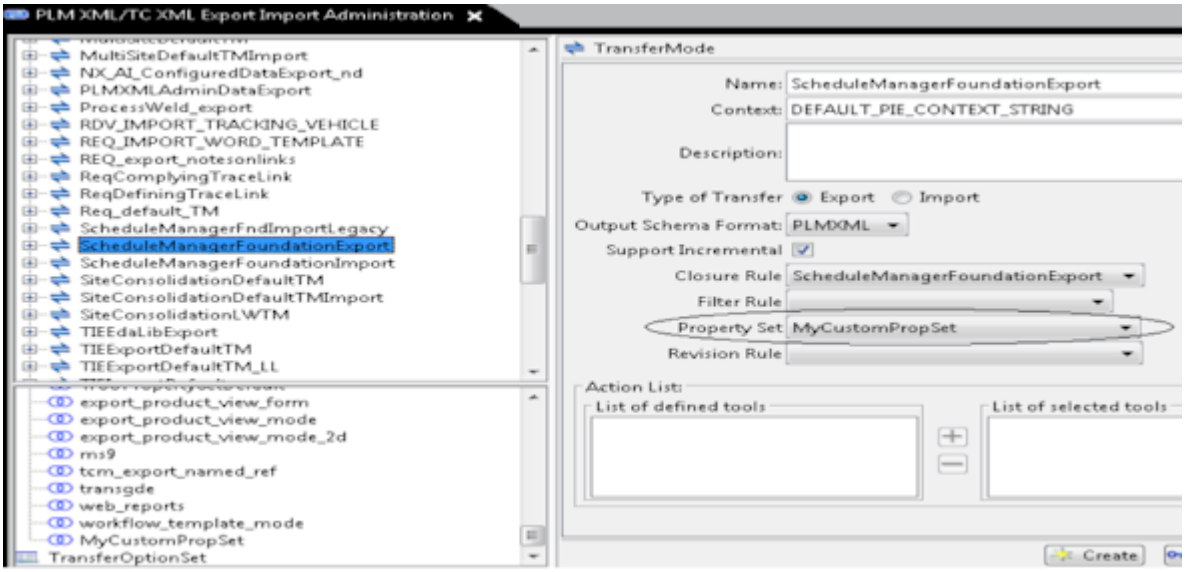
- Orphaned tasks are ignored during export.
- The system exports all schedule-related data like schedule tasks, proxy tasks, assignments, dependencies, deliverables, calendars, and so on along with schedules.

To export the custom properties on a schedule or schedule task using PLM XML, you must use PLM XML/TC XML Export Import Administration to:

1. Create a new **PropertySet** object for the custom property.



2. Attach the property set to the **ScheduleManagerFoundationExport** transfer mode.



Note:

If you create custom properties on a schedule or schedule task and modify the **ScheduleManagerFoundationExport** transfer mode, you must manually modify the transfer mode after any Teamcenter upgrade to retain the custom attributes.

Change the zoom factor

You can zoom in or out on the Gantt chart. Your zoom options are week, month, quarter, and year. To change the zoom factor, choose **View → Zoom Factor**, then select the view you want from the list.

4. Performing and tracking your tasks

Viewing and updating your task information

You can see the tasks you are assigned across all schedules in the **Schedule Tasks** folder in **My Worklist** in the rich client.

From the **My Tasks** tab, you can:

- Mark tasks as complete.
- Display the **State** column, which groups status.
- Edit and update execution column data, such as the actual finish date, actual start date, work complete percent, task status, and work complete.
- Reorder column headers by clicking and dragging the header to the desired position.
- Sort the task list by clicking the column header of the column you want to sort.
- Limit the number of tasks displayed per window.
- Filter the tasks by a specific duration such as week, month, or year.
- Update the task execution information by adding values in the appropriate fields, and then clicking **Update Tasks**.
- Save any changes to the column configuration settings, like the number of tasks shown on a page by clicking **Save Configuration**.

5. Reviewing schedules and tasks

Configuring a program view

A program view provides a read-only view of tasks across multiple schedules. Information can be filtered and grouped to provide an exact view of key data. A program view allows you to view multiple schedules at the same time.

The tree view on the left includes schedules and tasks and their predefined attributes that can be manipulated (filtered and grouped) to provide critical information.

A Gantt chart view on the right shows scheduling information for the selected schedules and tasks. Each *group node* in the Gantt chart is represented as a summary task. All summary tasks are filtered out when a *group by* condition is created. If all the schedules you select have the same schedule calendar; weekends are shown in the Gantt chart in gray.

You can easily resize these views by dragging the border between the two views or by clicking the expand/collapse button on the split bar.

1. Create a program view.

2. Choose schedules to view.

3. Filter data based on attribute values.

4. Group task data and attributes into *group by nodes*.

A program view is represented in Teamcenter as a dataset.

Create a program view

1. In My Teamcenter, select a folder in which to create the new program view, and then choose **File→New→Program View**.

   Teamcenter displays the **New Program View** dialog box.

   a. Enter a name for the program view.

   b. (Optional) Enter a description of the program view.

   c. (Optional) Import an existing program view XML file.

   d. (Optional) Select **Choose Column** and specify the columns to display in the program view.

A. Select **Schedule**, **Schedule Task**, or **Combined** in the **Category and Type** list.

> Note:
>
> When you specify **Schedule Task** as the **Category and Type**, **State** is an available column you can display.

B. Select columns in the **Available Columns** list and click **>** to copy them to the **Displayed Columns** list.

C. To remove columns in the **Displayed Columns** list, select the columns and click **<**. To remove all columns, select all columns and click **<**.

D. Click **OK** after you specify the columns to display in the program view.

To specify available schedule task attributes in the column chooser of the program view, set the **ScheduleTaskAvailableAttributes** preference.

e. Click **Next**.

2. Choose schedules for the program view.

In the New Program View wizard **Choose Schedules** dialog box:

a. Select schedules from the **Available Schedules** list and click **>** to copy them to the **Selected Schedules** pane. To select all available schedules on the current page, click **>>**.

> Note:
>
> You cannot select schedule templates for program view.

To remove schedules from the **Selected Schedules** list, select the schedules and click **<**. To remove all schedules, click **<<**.

You can also use the **Search** box to search for a particular schedule.

b. Click **Next**.

3. Set filters for the program view.

In the New Program View wizard **Filter** dialog box:

a. Select a value from the **And/Or** box to specify whether the next filter condition is in addition to (**And**) the previous condition or instead of (**Or**) the previous condition.

b. Select a value from the **Field Name** box.

c. Select a value from the **Condition** box, for example, **Less than, Greater Than, Equal To, Between**.

> Note:
>
> The type of field being filtered changes the display of filtering conditions.

d. Click the **...** button to the right of **Value** and select a value.

> Note:
>
> The allowed values differ based on the type being filtered.

e. Click **OK**.

Set the **ProgramViewFilterProperties** preference to specify the list of attributes for schedule and schedule task objects displayed in the New Program View wizard **Filter** dialog box in Schedule Manager.

f. Click **Next**.

4. Set the group attributes for the program view.

In the New Program View wizard **Group Attributes** dialog box:

a. In the **Group By** row under **Field Name**, select an option by which you want to group information.

This is the only time you can select the **Schedules** option. Because of the system hierarchy, it must be selected as the highest grouping or not at all. If you select a grouping condition, summary tasks are removed from the Gantt chart.

b. To group date, time, and numerical columns by range, click the **Range** button to the right of the corresponding **Field Name** box.

The **Select Range** dialog box appears. The **From** and **To** input boxes for this dialog box vary depending on the type of box selected.

A. Enter values in the **From** and **To** boxes.

For dates, use the **Calendar** boxes to select **From** and **To** dates.

B. Repeat the process to add additional ranges.

C. Click **Done**.

> Note:
>
> If a task lies in two ranges, it is grouped in the lower range. For example, if a numerical column has the following ranges specified: 0–1, 1–2, 2–3, a task having value 1 could be in both the 0–1 and 1–2 ranges, but the **Program** view always places it under 0–1.

c. Under **Order**, select a sort order of ascending, descending, or none.

d. Under **Cell background**, select a background color for this grouping level.

   A. Click the **Cell background** button that corresponds to the group.

   B. When the **Pick A Color** dialog box appears, select a display color that you want to represent for this group node in the program view.

   C. Click **OK**.

e. Under **Rollup**, set up rollup information for this node.

   A. Click the **Rollup** button next to the group.

   B. Under **Field Name**, select the attribute you want rolled up.

      If you select an attribute that you have not selected with the attribute chooser, it is automatically added to the program view.

   C. Under **Rollup**, select a rollup condition. For example, if you set **Field Name** to **xyz**, you can select **sum** to add the values of this attribute for each task in the group.

   D. Repeat the process to add additional rollup conditions.

   > Note:
   >
   > If you delete a rollup condition, all rollup conditions under the one you delete are also deleted.

   E. Click **Done**.

f. In the first **Then By** row under **Field Name**, select another attribute by which you want to group information.

   Select an order, cell background, and rollup information as necessary.

g. Repeat the process for the remaining attributes you want to group.

> Note:
>
> To delete a group by selection, select the blank from the list. If you delete a group by selection, all groups under the one you delete are also deleted.

Set the **ProgramViewGroupProperties** preference to specify the list of attributes for schedule and schedule task objects displayed in the New Program View wizard **Group Attributes** dialog box in Schedule Manager.

5. Click **Finish**.

   Teamcenter creates the new program view.

6. Either select the program view and double-click to send to Schedule Manager, or right-click the program view and choose **Send To→Schedule Manager**.

   > Note:
   >
   > You may not have to complete this step if the **Open on Create** check box is selected.

Save, print, or export a program view

- To save the program view, choose either **Program→Save Program View** or **File→Save as Program View**.
- You can print a program view and use the **Print Preview** feature to set print options.
- To export the program view, choose **File→Export Program View**.

Task status display in the task table

Task status is displayed in the task table by a colored indicator that appears next to the task name. Once the task starts, the indicator shows the current state of the task.

During the life of the schedule, task status can be updated by Schedule Manager. For example, if a task has a status of **Not Started** and a value for **Work Complete** or **Work Complete Percent** is entered, Schedule Manager changes the status to **In Progress**. If the value for **Work Complete Percent** is entered as 100%, Schedule Manager changes the task status to **Complete**.

The following table describes each task status and the color assigned to the indicator.

> Note:
>
> You can customize the status indicator display.

Task status	Color	Symbol	Description
Not Started	None	None	Generally indicates that no work has been performed on the task. For example, the **Task Work Estimate** is set to 8 hours but the **Work Complete** is 0 hours and the **Work Complete Percent** is 0%. This is the default status of tasks when tasks are initially created. Note: Setting the status to **Not Started** does not reset **Percent Work Complete** or **Work Complete**.
In Progress	**Green**		Indicates the task work is in progress. This task status is the result of the **Work Complete** value less than the **Task Work Estimate** value. Initial change to **Work Complete** or **Percent Work Complete** triggers Schedule Manager to set the status to **In Progress** from **Not Started**.
Needs Attention	**Red**		Indicates the schedule coordinator needs to review the task and resolve any issues. Schedule Manager does not automatically change the task status to **Needs Attention**.
Complete	**Blue**		Indicates that work on a task is complete. This task status is the result of one of the following: • The **Task Work Estimate** value equals the **Work Complete** value. Schedule Manager sets the status to **Complete** if the **Percent Work Complete** attribute is linked to **Work Complete** (schedule option). Schedule Manager also sets the status to **Complete** if you drag the work complete bar on the Gantt chart to the end of the task. This action sets the **Work Complete** value to the **Task Work Estimate** value. • The task status is changed to **Complete** regardless of **Work Complete** or **Percent Work Complete**.

Task status	Color	Symbol	Description
			Note: When the task status is changed to **Complete**, the **Percent Work Complete** is changed to 100%. Likewise, when the **Percent Work Complete** is set to 100%, Schedule Manager changes the status to **Complete**.
Abandoned	**Gray**		Indicates no further work is being done on the task. The value of **Work Complete** does not change. Schedule Manager does not automatically change the task status to **Abandoned**.
Late	**Yellow**		Indicates the **Finish** date for the task has occurred but the **Work Complete Percent** is not 100%. Schedule Manager does not automatically change the task status to **Late**.
Aborted	**White**		Indicates that the task has been aborted.

Note:

To quickly identify tasks needing attention, scan the task table for red task status indicators.

Search for tasks in the task table

1. Right click any of the column headers in the task table and choose **Filter**.
2. In the **Filter Tree** dialog box, select the column header in the **Attribute name** list you want to search.
3. Type the text you want to search the specified attribute for in the **Filter text** box.

   The tasks and milestones that match the attribute name and filter text are the only ones listed in the task table.
4. Click the **Close** button to restore the entire task table.

Note:

The fields **Filter text** and **Attribute name** are case sensitive and wildcard characters are not supported.

Customize the status indicator display

1. Choose **Edit** → **Options**.
2. Select **Status Indicators**.
3. In the **Status Indicators** dialog box, select the row from the **State** column you want to customize.
4. Click the **...** button on the right side of the **Indicator** column.
5. In the **Select Object** dialog box, do the following:
   a. Enter a file name or choose the graphic file to associate with the status.
   b. Click **Select**.

   Note:

   The graphic file must be 16x16 pixels or less. Otherwise, the users receive an error when trying to select their own customized graphic image.
6. (Optional) Click **Delete** to delete a status indicator.

Auditing schedules

You can view the audit log of many schedule events. For example, Create schedule, Modify schedule, and Delete schedule. Find all schedule manager events in Business Modeler IDE.

Note:

The **TC_audit_manager** preference must be set to **ON**.

The **TC_audit_manager_version** preference enables or disables different auditing functionality types and must be set to **2** to enable the functionality described in this procedure.

1. In Audit Manager, add the object type, event type, and object properties to be logged. If you do not have permission to use Audit Manager, see your administrator.
2. In My Teamcenter, select the schedule or task that you want to audit.

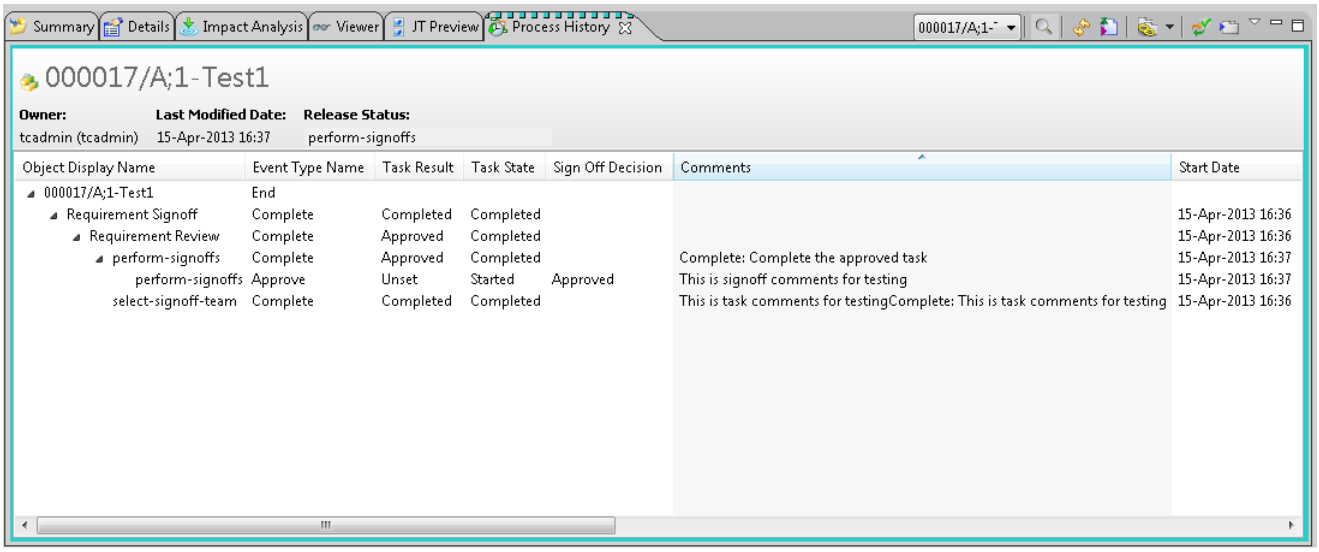
3. Choose **View→Audit→View Audit Logs**.

4. Select or type the criteria you want to use to narrow the audit information and click **Find**.

   The **Search Results** table lists the objects that match your criteria.

Reviewing workflow and schedule progress by viewing the process history

The **Process History** view displays the Workflow or Schedule Manager process of the business object selected in the **Home**, **My Worklist**, or **Search Results** view in My Teamcenter.



- If there is no audit data for the business object, the view displays a `No process history data available for selected object.` message.

- If the selected object has passed through more than one workflow process, you can choose which process to display from the list to the right of the tab.

In the **Process History** view, you can review the progress of a workflow or schedule and do the following:

- Determine the progress of an object in a schedule or workflow and who has responsibility for the object.

- Review comments by other workflow participants.

- Verify that the appropriate participants completed the required reviews.

- Debug a workflow that proceeded down an unexpected path.

- Identify workflows that require attention to continue processing.
- Review user activity to verify the appropriate users signed off.

> Note:
>
> If you migrate from Audit Manager version 2 to version 3, workflow-related events are migrated and are displayed in the **Audit Logs** tab. However, the events are not displayed in the **Process History** view.

> Tip:
>
> Administrators can configure display of the **Target Release Status** values in the **Process History** view.
>
> - **Target Release Status** values are only shown by the **Process History** view for a selected object.
> - **Target Release Status** is not shown in the **Process History** view for a workflow or task.

Customize the process history display

1. In the **Process History** view, click the **View Menu** button and then choose **Column** from the view menu.

   The **Column Management** dialog box appears.

2. Add or remove columns from the **Process History** view table.

   - To add a column, select a property from the **Available Properties** list and click the **Add to Displayed Columns** button .
   - To remove a column, select a property in the **Displayed Columns** list and click the **Remove from Displayed Columns** button .

3. (Optional) Click the **Move Up** and **Move Down** buttons, to the right of the **Displayed Columns** list, to adjust the order of the displayed columns.

4. Click **Apply** to apply the configuration to the current view, or click **Save** to save the configuration for later use.

   > Note:
   >
   > You can use the **Apply Column Configuration** command on the view menu to:

- Apply a saved configuration.
- Restore the default configuration. This is the only way to restore columns removed using the right-click **Remove this column** command.

You can use the **Save Column Configuration** command on the view menu to save the current configuration of the table display.

5. Click **Close** to close the **Column Management** dialog box.

View and print process reports

On My Teamcenter, choose **Tools→Reports→Report Builder Reports**, and then choose one of the following audit reports:

- **Audit - Workflow Attachment Report**

  Displays all attachment object details for the specified workflow process.

- **Audit - Workflow Detailed Report**

  Displays all actions and their statuses for the specified workflow process.

- **Audit - Workflow Signoff Report**

  Displays the signoff results and comments for the specified object in a workflow process.

- **Audit - Workflow Summary Report**

  Displays the start, complete, approve, rejected, assign status, demote, promote, fail, and update actions for the specified workflow process.

- **WF - Items In Process**

  Displays the *items* currently in a workflow process and where they are in their respective processes.

- **WF - Objects In Process**

  Displays the *objects* currently in a workflow process and where they are in their respective processes.

To print a process history report:

1. Export the audit report to Excel.
2. Use the Excel print function to print the report.

Print the process history report

1. Export the audit report to Excel.

2. Use the Excel print function to print the report.

Export audit logs or process history to Microsoft Excel

Teamcenter contains Extensions for Microsoft Office (also known as live Excel) which allows you to manage Teamcenter objects and properties from Microsoft Excel.

1. Display the **Process History** view and choose the rows you want to export.

   OR

   Run a saved query and select the audit logs you want to export from the **Details** tab.

   > Note:
   >
   > You can only run a saved query from My Teamcenter. The saved query functionality is meant to be executed only when the **Schedule tasks** folder is expanded in **My Worklist**. You cannot run this query from anywhere else in the system.

2. Choose **Tools→Export→Objects To Excel**.

   Teamcenter displays the **Export To Excel** dialog box.

3. Under **Object Selection**, select one of the following:

   - Select **Export Selected Objects** to export the rows you selected in the view.
   - Select **Export All Objects in View** to export all rows.

4. Under **Output Template**, select one of the following:

   - Select **Export All Visible Columns** to export all the columns in the view.
   - Select **Use Excel Template** to activate the template list.

     In the list, select the template that specifies the data that you want to export.

5. Under **Output**, select one of the following:

   - For a standard Excel file that is not connected to Teamcenter, select **Static Snapshot**.

- For an interactive live Excel file that is connected to Teamcenter, select **Live integration with Excel (Interactive)**.
- For a live Excel file that is not connected to Teamcenter, select **Live integration with Excel (Bulk Mode)**.

  You can accumulate changes and later connect the file to Teamcenter.
- To export the data to an Excel file that also contains import processing information on a separate sheet, select **Work Offline and Import**.
- To check out objects while exporting to live Excel, select **Check out objects before export**.

  Note:

  The checkout applies to all objects being exported. Use this option carefully if you are exporting a large number of rows.

6. (Optional) Click **Copy URL**.

   Note:

   - **Copy URL** is unavailable if you select more than one object to export.
   - **Copy URL** is unavailable if you select any of the following dialog box options:
     - **Work Offline and Import**
     - **Export All Visible Columns**
     - **Export All Objects in View**

   The export file is generated and the `URL Generated` message is displayed, confirming that the URL is in your Windows Clipboard and showing the URL details.

7. Click **OK** to generate the export Excel file.

   Excel opens a temporary file. You can create a permanent file by choosing **File→Save As** in Excel to display the **Save As** dialog box.

   If you save a live Excel file, you can open it later in My Teamcenter to reconnect it to the database.

   Note:

   Values that you cannot change in Teamcenter are unavailable in the cells of the live Excel file.

Communicating with the assigned user

If you work in a collaborative environment where several users are assigned schedules or tasks, you may want to communicate with the user who is assigned to a particular schedule or task. If the Microsoft Office Communicator integration is installed on your system, you can right-click the schedule or task, and then choose **Send an Instant Message to Assigned User**. Teamcenter displays a Communicator window, allowing you to begin an instant message conversation with the user.

6. Exchanging data between Microsoft Project and Schedule Manager

Using Microsoft Project Integration

Teamcenter – Microsoft Project Plugin requires:

- Teamcenter Client for Microsoft Office and Microsoft Project
- Microsoft Windows desktop operating system
- Teamcenter rich client and/or Active Workspace

> Note:
>
> You must have a Teamcenter four-tier server configured to exchange data between Microsoft Project and Teamcenter.

> Note:
>
> You must install Microsoft Office and Project before installing the Teamcenter – Microsoft Project plug-in.

> Note:
>
> The Microsoft Project plug-in does not support Teamcenter's master/subschedule relationship. If a master schedule with subschedules is imported, the subschedules are imported as summary tasks and do not retain linkages to Teamcenter.
>
> When exporting schedules back to Teamcenter with the **Update** option, only tasks inside the master schedule are supported. If you want to update subschedule tasks, you must separately import the subschedule and then export its tasks.

Run the Teamcenter – Microsoft Project plug-in

1. Open Microsoft Project.
2. Click the **Teamcenter Integration** button.

   Teamcenter displays a logon dialog box.
3. Type your Teamcenter user name and password to connect to Teamcenter. If prompted for the Teamcenter URL, type the URL to the Teamcenter web tier (**http://***host*:*port***/tc/**).

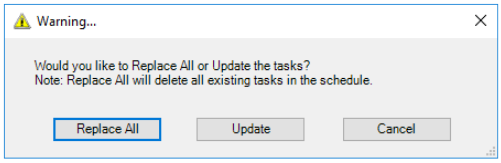
The logon dialog box will vary depending on whether you use Security Services.

4. Select an option by clicking the appropriate button:

- **Export**

  Exports a Microsoft Project to Schedule Manager.

  You can select whether you want to update the schedule tasks with the updated content from Microsoft Project, or replace the entire schedule. If you select **Replace All**, the current schedule data in Schedule Manager will be deleted and replaced with the content from the schedule you are exporting. If you select **Update**, the schedule task Planning properties (**Work Effort**, **Start Date**, **Duration**, **Priority**, **Fixed Type**, and **Constraint**) and Execution properties (**Work % Complete**, **Task State**, **Actual Start Date**, and **Actual Finish Date**) are updated. Teamcenter does not update schedule tasks with a **State** value equal to **Complete**, **Closed**, **Aborted**, or those values identified in the **SM_PREVENT_UPDATE _STATES** preference.

  Select a schedule in the **Schedule Selector** dialog box. When using **Export**, you can map any Microsoft Project resources to members in the selected schedule.

  > Note:
  >
  > You cannot map two Microsoft Project resources to the same Teamcenter resource.
  >
  > Before an export operation, create a schedule in Teamcenter with the correct time zone, dates which include the tasks to be exported, and the resources you want to use.
  >
  > If WBS formats are not similar, codes transfer incorrectly and appear in red in Schedule Manager. Regenerate the WBS codes for that schedule.
  >
  > The Warning dialog does not display if the schedule you are exporting to Active Workspace was not first imported from Active Workspace. In this situation the process defaults to **Replace All**.

- **Import**

  Imports a Schedule Manager project to Microsoft Project.

  Select a schedule in the **Schedule Selector** dialog box.

> Note:
>
> If WBS formats are not similar, the code is ignored.

- **Clear**

  Remove the linking information between Microsoft Project and Schedule Manager.

  When the project is imported after being imported or exported, the Microsoft Project data is overwritten with the latest Teamcenter data. Similarly, if you export again after either importing or exporting, the Teamcenter data is overwritten with the Microsoft Project data. If you do not want to overwrite the project, click the **Clear** button to remove the Schedule Manager linking information from the current project. You are then able to import/export the project to the end of Schedule Manager/Microsoft Project.

- **About**

  Provides information about Schedule Manager Integration.

5. After clicking **Import** or **Export**, you are asked to log on to Teamcenter. Enter your Teamcenter user name and password.

6. Click **Close** to close the dialog box and return to Microsoft Project.

> Note:
>
> If an environment variable (TEMP) is set, the TcProjectAddin.log file will be created in the Windows Temp folder, else the log file will be saved in the *<install dir>\log* folder.

Transferring special items

Although many items in Microsoft Project transfer seamlessly to a schedule, some do not. The following list describes those special items that do not transfer:

- Microsoft Project supports a number-based priorities system, while Schedule Manager supports level-based priorities.

  Mapping on Export

When Microsoft Project priority is	Schedule Manager priority is
0–141	Lowest
142–283	Low

When Microsoft Project priority is	Schedule Manager priority is
284–425	Medium low
426–567	Medium
568–709	High
710–851	Very high
852–1000	Highest

Mapping on Import

When Schedule Manager priority is	Microsoft Project priority is
Highest	1000
Very high	800
High	650
Medium	500
Medium low	400
Low	250
Lowest	100

- Microsoft Project does not support state types:

Mapping on Export

When Microsoft Project Task percent complete is	Schedule Manager state is
100	**COMPLETE**
0	**NOT STARTED**
> 0 and < 100	**IN PROGRESS**

> Note:
>
> The default status of the equivalent state is automatically set.

- Calendars cannot be imported or exported.

- Schedule Manager does not support split tasks. This is an option found in Microsoft Project plug-in and not Schedule Manager. To work around this problem, select **Options** from the **Tools** menu and clear the **Split in-progress tasks** option.

- Schedule Manager does not support all Microsoft Project constraints and Microsoft Project does not support all Schedule Manager constraints:

Microsoft Project	Schedule Manager
ASAP	ASAP
ALAP	ALAP
Must start on	Fixed
Must finish on	Fixed
Start no earlier than	None
Start no later than	None
Finish no earlier than	None
Finish no later than	None

- Microsoft Project does not have the option of unlinking a task's Percent Complete to Work Complete.

  To work around this problem, before importing or exporting, make sure to check the **Is Percent Linked** option in the Schedule Manager. To select this option, open the **Properties** dialog box for a schedule. From the **General** tab, click **Is Percent Linked**.

- The Microsoft Project plug-in does not support integrated projects, that is, multiple Microsoft Project projects in the same project.

- Baselines do not transfer for import/export operations.

- When you import from Teamcenter to Microsoft Project, phase gates and proxy tasks are treated as normal tasks without any special attributes. Only the basic scheduling data is imported. No relationships with other Teamcenter objects are imported. This includes trace links, deliverables, workflow information, and so on.

Importing and exporting data with translated values using Microsoft Project

When the Teamcenter system is configured with tasks having localized names, the data you import or export is locale-specific.

- When you import data from Teamcenter, you receive the localized version of the data based on your locale.
- When you export data, you send the localized version, which then becomes the standard version.

> Note:
>
> When you import from Teamcenter to Microsoft Project, phase gates and proxy tasks are treated as normal tasks without any special attributes. Only the basic scheduling data is imported. No relationships with other Teamcenter objects are imported. This includes trace links, deliverables, workflow information, and so on.
>
> The locale of the Teamcenter – Microsoft Project plug-in reflects the locale of the operating system.

Map custom schedule task properties between Microsoft Project and Teamcenter Schedule Manager

Use this procedure to map custom schedule task properties between Microsoft Project and Teamcenter Schedule Manager. This ensures that when a Microsoft Project schedule is imported into Schedule Manager, custom property data is transferred and does not have to be manually reentered.

Teamcenter uses two Schedule Manager preferences to manage the import of schedule task properties. **SM_MPP_OOTB_MAP** is a system preference that identifies the OOTB schedule task properties that are included during the import process. These values cannot be modified.

As a system administrator, you will use the **SM_MPP_CUSTOM_MAP** site preference to identify any custom properties of schedule tasks. Teamcenter Schedule Manager supports the following custom property types: Boolean, Character, Date, Double, Integer, String, and Long String.

> Note:
>
> Only custom properties for out-of-the-box schedule tasks are supported.

1. If your custom task properties don't already exist, create them using the Business Modeler IDE and then deploy your template.
2. Use the **SM_MPP_CUSTOM_MAP** preference to map the custom properties of schedule tasks with the Microsoft Project task fields.

   You can view the preference syntax in the **Edit →Options** dialog box.

   Use the following to match Microsoft fields to Teamcenter Schedule Manager property types:

Microsoft Project task field	Type
Date1-10	Date
Flag1-20	Boolean
Number1-20	Integer, Double
Text1-30	String, Character, Long String

3. Add the custom properties to the tcmspaddin.xml policy file.

   This file is typically located in TC_DATA\soa\policies.

4. (Optional) If you want to display the properties in Teamcenter Schedule Manager, add the custom schedule task properties to the stylesheet.

5. Restart the server.

7. Allocating requirements to Schedule Manager tasks

Managing trace links in Schedule Manager

You can allocate requirements to tasks in Schedule Manager using *trace links*.

A trace link is a directional relationship conveyed by the terms *defining* and *complying*. A defining object specifies a condition that a product or a component must fulfill. A complying object must partially or completely fulfill a condition specified by a defining object. Such a relationship establishes a traceable path in which one object precedes another.

For more information about trace links, see *Systems Engineering — Deployment and Rich Client Usage*.

Several trace link tools are available in Schedule Manager. You can:

- Start a trace link on a requirements object in Systems Engineering or Requirements Manager, and end the trace link on a task object in Schedule Manager.
- Start a trace link on a task object in Schedule Manager and end the trace link on a requirements object in Systems Engineering or Requirements Manager.
- Verify requirements by electronic approval process using a workflow template.
- Generate and view traceability reports.

You can use the following process to allocate requirements to schedule tasks using trace links, and then manage and track the requirements review process and approval in Schedule Manager.

Step	User action
1	Create a trace link between a requirement in Systems Engineering or Requirements Manager, and a task in Schedule Manager. See **Create trace links**.
2	Create a workflow task in Schedule Manager using the **Requirement Signoff** workflow template. See **Configure a schedule task to be a workflow task**.
3	Create predecessor tasks to the workflow task. See **What are task dependencies?**.
4	Complete the predecessor tasks in Schedule Manager. This action triggers the workflow specified in step 2. See **Updating task properties**.
5	Execute the sign-off process by the sign-off team to verify the requirements are complete.
6	Check the status of the target requirements sign-off in the **Summary** view, **Audit Logs** tab.

Integration workflow handlers

Schedule Manager includes the **RM-attach-SM-tracelink-requirement** and **RM-attach-tracelink-requirement** workflow handlers.

- **RM-attach-SM-tracelink-requirement**

  This workflow handler is specific to Schedule Manager and only retrieves trace link requirements for schedule tasks. It contains input attributes that allow a user to:

  - Specify the workflow target or reference folder (**target_folder** attribute).
  - Specify whether to pass the defining or complying requirement (**defining_complying_type** attribute).
  - Specify whether to pass only a particular subtype of trace link (**tracelink_subtype** attribute).

  Teamcenter contains the **Requirement Signoff** workflow template for the Schedule Manager and Systems Engineering and Requirements Management electronic sign-off process. This template is preconfigured with the **RM-attach-SM-tracelink-requirement** workflow handler and is used when creating a workflow task linking requirements.

- **RM-attach-tracelink-requirement**

  This is a generic workflow handler that allows sites to retrieve trace link requirements for different types of Teamcenter components.

  There is no released version of a workflow template for the generic handler. To use the generic handler, an administrator must create a workflow that includes the handler.

Create an integration workflow handler

1. Launch the Workflow Designer application.
2. In the **Process Template** box, select the **Requirement Signoff** workflow template from the list.
3. Click **Edit Mode**  located on toolbar to allow modification to this template.
4. Click **Yes** to take the template offline.
5. Select **Requirements Signoff** from the **Process Template** drop-down list.
6. Select **perform-signoffs**.

7. Click the **Display the Task Handlers Panel** tab located in the lower left corner.

8. In the **Task Handlers** pane, select the **Task Action** box.

9. Select the **RM-attach-SM-tracelink-requirement** handler from the **perform-signoffs** tree.

10. Add the following pairs of arguments and values for the handler. Click **Add** to add each new pair.

Argument	Values
defining_complying_type	Specify either **defining** or **complying**.
target_folder	Specify either **target** or **reference**.
tracelink_subtype	Specify the trace link subtype.

11. After entering all arguments, click **Modify** at the bottom of the pane.

12. Click **X** in the upper right to close the pane.

Create trace links

Because trace link options are available in both Schedule Manager and Systems Engineering, you can start a trace link in either application and end it in either application.

> Note:
>
> To enable trace links, choose **Edit→Options**, select the **Systems Engineering** option, and select the **Trace Link Mode ON** check box.

- To start a trace link in Systems Engineering and end it in Schedule Manager, perform the following steps:

  1. Select a requirements object in Systems Engineering.

  2. From the Systems Engineering menu, either choose **Tools→Trace Link→Start Trace Link** or click the start trace link button.

  3. Select a task in Schedule Manager.

  4. From the Schedule Manager menu, either choose **Tools→Trace Link→End Trace Link** or click the end trace link button.

- To start a trace link in Schedule Manager and end it in Systems Engineering, perform the following steps:

1. Select a task in Schedule Manager.
2. From the Schedule Manager menu, either choose **Tools→Trace Link→Start Trace Link** or click the start trace link button  .
3. Select a requirements object in Systems Engineering.
4. From the Systems Engineering menu, either choose **Tools→Trace Link→End Trace Link** or click the end trace link button  .

In either case, the trace link button  appears on the requirements object in Systems Engineering and on the task in Schedule Manager.

Generate a traceability report

The traceability report shows information about defining and complying objects related to the trace link.

Using the traceability report, you an also manage trace links including, delete a trace link, view trace link properties, and navigate to the trace linked object.

1. Select a task in Schedule Manager on which a trace link exists.
2. Choose **Tools→Trace Link→Traceability Report**, and then choose either **Defining** or **Complying**.

> Tip:
>
> The signoff status on target requirements is indicated by:
>
> - A workflow completed symbol next to the target requirement in the schedule task structure.
> - Information in the workflow logs shown on the **Audit Logs** tab in the **Summary** view.