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Administrator's Guide

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Welcome to This Guide

Welcome to HP Quality Center, the HP Web-based test management tool. Quality Center helps you organize and manage all phases of the application testing process, including specifying testing requirements, planning tests, executing tests, and tracking defects.

Throughout the testing process, Quality Center projects are accessed by many users—including developers, testers, and quality assurance managers. In order to protect, maintain, and control information in a testing project, users are assigned to groups with different access privileges. Only a Quality Center project administrator (belonging to the TDAdmin user group) has full privileges in a Quality Center project.

As a Quality Center site administrator, you use **Site Administration** to create and maintain Quality Center domains and projects; manage Quality Center users, connections, and licenses; define database servers; and modify Quality Center configurations.

As a Quality Center project administrator, you use **Project Customization** to customize project entities and lists, set up user groups and permissions, configure mail, set alert rules, and configure the workflow in the Quality Center modules.

Quality Center is shipped without any passwords defined. To protect your testing data from unauthorized access, it is highly recommended that you set passwords early in the Quality Center process.

How This Guide is Organized

The Quality Center Administrator's Guide provides information regarding the administration, maintenance, and customization of Quality Center.

It contains the following parts:

Part I Site Administration

Describes how the site administrator uses Site Administration to manage Quality Center projects. This includes maintaining projects, users, connections, licenses, servers, configuration parameters, and site analysis.

Part II Project Customization

Describes how the project administrator uses the Project Customization window to control access to a project by defining the project users and their privileges. It also describes how to customize a project to meet the specific needs of the project users.

Part III Workflow Customization

Describes how to create workflow scripts to customize the Quality Center user interface and to control the actions that users can perform.

Part IV Appendixes

Describes how to use Quality Center Checker, a diagnostic tool that tests many of the Quality Center server components that Quality Center uses; the methodology for upgrading and migrating from previous versions of TestDirector or Quality Center; and storing project data in the project's database as an alternative to storage on the application server's file system.

Documentation Library

The Documentation Library is an online help system that describes how to use Quality Center. You can access the Documentation Library in the following ways:

- Click **Documentation Library** in the Quality Center Help menu to open the Documentation Library home page. The home page provides quick links to the main help topics.
- Click **Help on this page** in the Quality Center Help menu to open the Documentation Library to the topic that describes the current page.

Documentation Library Guides

The Documentation Library consists of the following guides and references, available online, in PDF format, or both. PDFs can be read and printed using Adobe Reader, which can be downloaded from the Adobe Web site *(*http://www.adobe.com*)*.

Getting Started explains how to use the Documentation Library and how it is organized. (Available online.)

What's New? describes the newest features in the latest versions of Quality Center. (Available online and in PDF format.)

You can also access **What's New?** from the Quality Center **Help** menu. In addition, you can choose **Help** > **Product Feature Movies** to view short movies that demonstrate the main product features.

Readme provides last-minute news and information about Quality Center.

Quality Center Guides:

HP Quality Center User's Guide explains how to use Quality Center to organize and execute all phases of the testing process. It describes how to define requirements, plan tests, run tests, and track defects. (Available online and in PDF format.)

HP Quality Center Administrator's Guide explains how to create and maintain projects using Site Administration, and how to customize projects using Project Customization. (Available online and in PDF format.)

HP Quality Center Tutorial is a self-paced guide teaching you how to use Quality Center to manage the software testing process. (Available in PDF format.)

HP Quality Center Installation Guide explains how to install Quality Center on a server machine in a cluster environment or as a stand-alone application. (Available in PDF format.)

Business Process Testing Guides:

HP Business Process Testing User's Guide explains how to use Business Process Testing to create business process tests. (Available online and in PDF format.)

HP Business Process Testing Tutorial provides a self-paced guide that teaches you the basics of Business Process Testing in the Quality Center application. (Available in PDF format.)

API References:

HP Quality Center Database Reference provides a complete online reference for the project database tables and fields. (Available online.)

HP Quality Center Open Test Architecture API Reference provides a complete online reference for the Quality Center COM-based API. You can use the Quality Center open test architecture to integrate your own configuration management, defect tracking, and home-grown testing tools with a Quality Center project. (Available online.)

HP Quality Center Site Administration API Reference provides a complete online reference for the Site Administration COM-based API. You can use the Site Administration API to enable your application to organize, manage, and maintain Quality Center users, projects, domains, connections, and site configuration parameters. (Available online.)

HP Quality Center Custom Test Type Guide provides a complete online guide for creating your own testing tool and integrating it into the Quality Center environment. (Available online.)

Additional Online Resources

The following additional online resources are available from the Quality Center **Help** menu:

Knowledge Base uses your default Web browser to open the Mercury Customer Support Web Site directly to the Knowledge Base landing page.

Customer Support Web Site uses your default Web browser to open the Mercury Customer Support Web site. This site enables you to browse the Mercury Support Knowledge Base and add your own articles. You can also post to and search user discussion forums, submit support requests, download patches and updated documentation, and more. The URL for this Web site is http://support.mercury.com.

HP Software Web site uses your default Web browser to access the HP Software Web site. This site provides you with the most up-to-date information on HP Software products. This includes new software releases, seminars and trade shows, customer support, and more. The URL for this Web site is http://www.hp.com/managementsoftware.

Add-ins Page opens the HP Quality Center Add-ins Page, which offers integrations with HP testing tools, as well as third-party, synchronization, and version control tools. For more information, refer to the *HP Quality Center Installation Guide*.

Typographical Conventions

This guide uses the following typographical conventions:

UI Elements and **Function Names**	This style indicates the names of interface elements on which you perform actions, file names or paths, and other items that require emphasis. For example, “Click the **Save** button.” It also indicates method or function names. For example, "The **wait_window** statement has the following parameters:"
Arguments	This style indicates method, property, or function arguments and book titles. For example, “Refer to the *HP User’s Guide*.”
<**Replace Value**>	Angle brackets enclose a part of a file path or URL address that should be replaced with an actual value. For example, <**MyProduct installation folder**>**bin**.
Example	This style is used for examples and text that is to be typed literally. For example, “Type Hello in the edit box.”
CTRL+C	This style indicates keyboard keys. For example, “Press ENTER.”
[ ]	Square brackets enclose optional arguments.
{ }	Curly brackets indicate that one of the enclosed values must be assigned to the current argument.
...	In a line of syntax, an ellipsis indicates that more items of the same format may be included. In a programming example, an ellipsis is used to indicate lines of a program that were intentionally omitted.
|	A vertical bar indicates that one of the options separated by the bar should be selected.

Part I

Site Administration

1

Site Administration at a Glance

Using Site Administration, you create and maintain Quality Center projects, users, servers, site connections, license usage, and parameters. You can also define site administrators and change site administrator passwords.

This chapter describes:	On page:
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Starting Site Administration

Using Site Administration, you create and maintain your Quality Center projects.

To start Site Administration:

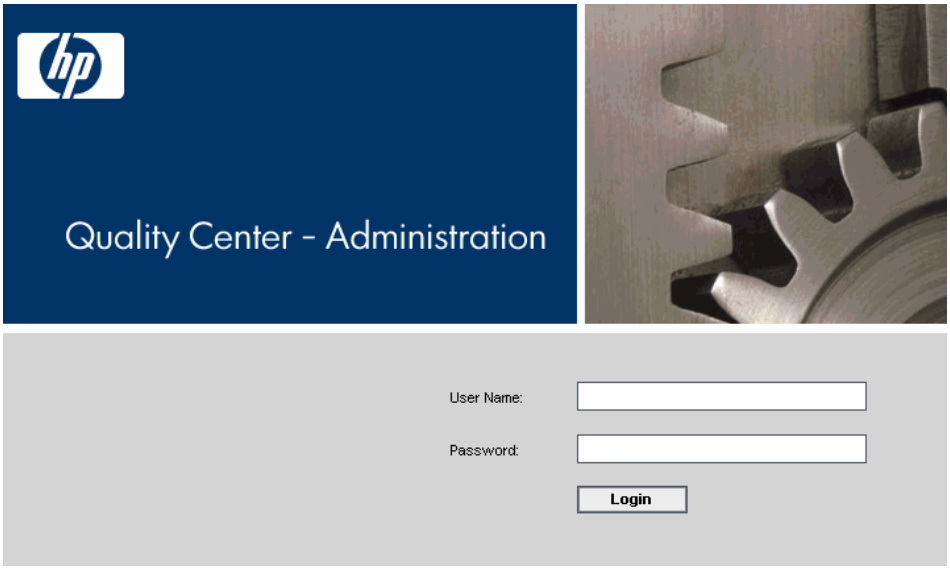
1 To start Site Administration, you can:

- Open your Web browser and type your Quality Center URL: http://<Quality Center server name>[<:port number>]/qcbin. The Quality Center Options window opens. Click the **Site Administration** link.
- Alternatively, open your Web browser and type your Site Administration URL: http://<Quality Center server name>[<:port number>]/sabin.

The first time you run Site Administration, files are downloaded to your workstation. Subsequently, Quality Center carries out a version check on the client files installed on your workstation. If there is a newer version on the server, updated files are downloaded to your workstation.

Note: To download files to your computer, you must log in with administrator privileges. This applies if you are running Quality Center for the first time, upgrading to a newer version, or applying a service pack. For more information on the minimum permissions required to install client components, refer to the *HP Quality Center Installation Guide*.

After the Quality Center version has been checked and updated if necessary, the Quality Center Site Administration Login window opens.



2 In the **User Name** box, type the name of a user who is defined as a site administrator. The first time you log in to Site Administration, you must use the site administrator name that you specified during the installation of Quality Center. After you log in to Site Administration, you can define additional site administrators. For more information, see "Defining Site Administrators" on page 23.

3 In the **Password** box, type your site administrator password. The first time you log in to Site Administration, you must use the site administrator password that you specified during the installation of Quality Center.

To define or change the site administrator password, see "Changing Passwords" on page 97.

4 Click **Login**. Site Administration opens.

Understanding Site Administration

As a Quality Center site administrator, you create and maintain Quality Center projects, users, and servers using Site Administration.

➤ Click the **Site Projects** tab to manage your Quality Center projects. This includes adding new domains and projects, enabling extensions for projects, querying project data, restoring projects, renaming projects, and activating or deactivating projects. For more information, see Chapter 2, "Managing Quality Center Projects."

You can also upgrade projects from a previous Quality Center version to the current version. For more information, see Chapter 3, "Upgrading and Migrating Projects."

➤ Click the **Site Users** tab to add new users and define user properties, including changing passwords. For more information, see Chapter 4, "Managing Quality Center Users."

➤ Click the **Site Connections** tab to monitor the users currently connected to a Quality Center server. For more information, see Chapter 5, "Managing User Connections and Licenses."

➤ Click the **Licenses** tab to monitor the total number of Quality Center licenses in use and to modify the license key. For more information, see Chapter 5, "Managing User Connections and Licenses."

- Click the **Servers** tab to modify Quality Center server information, such as the log file and mail protocol. For more information, see Chapter 6, "Configuring Servers and Parameters."
- Click the **DB Servers** tab to manage your database servers. This includes adding a new database server, editing a database's connection string, and changing a database's default administrator user name and password. For more information, see Chapter 6, "Configuring Servers and Parameters."
- Click the **Site Configuration** tab to modify Quality Center configuration parameters. For more information, see Chapter 6, "Configuring Servers and Parameters."
- Click the **Site Analysis** tab to monitor the number of licensed Quality Center users connected to your projects at specific points over a period of time. For more information, see Chapter 7, "Analyzing Site Usage."

- Click the **Tools** button on the upper-right corner of the Site Administration window, and choose **Migration Tool** to migrate any projects you created in TestDirector to Quality Center. For more information, see Chapter 3, "Upgrading and Migrating Projects."

Defining Site Administrators

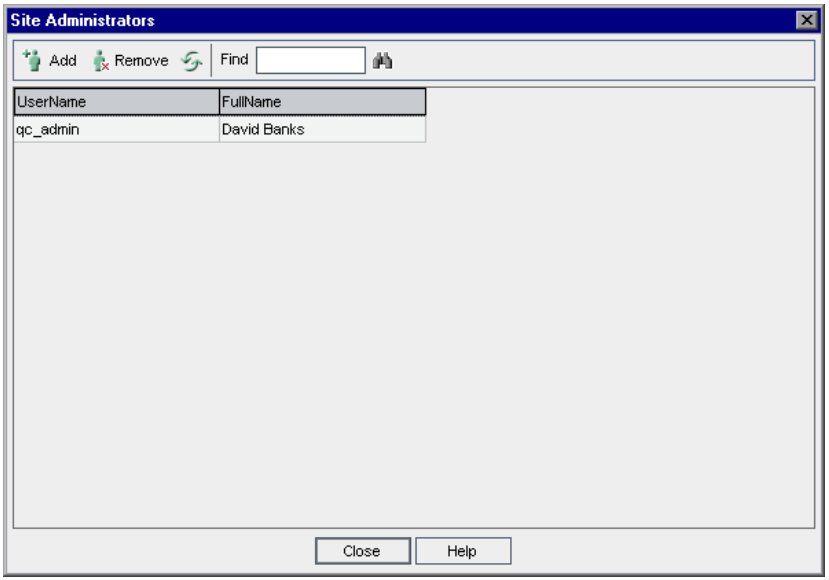
You can define Quality Center users as site administrators. Only users defined as site administrators can access Site Administration.

To secure the information in Site Administration, ensure that each user you add as a site administrator has a password defined. For more information, see "Changing Passwords" on page 97.

To define site administrators:

1 In Site Administration, click the **Site Users** tab.

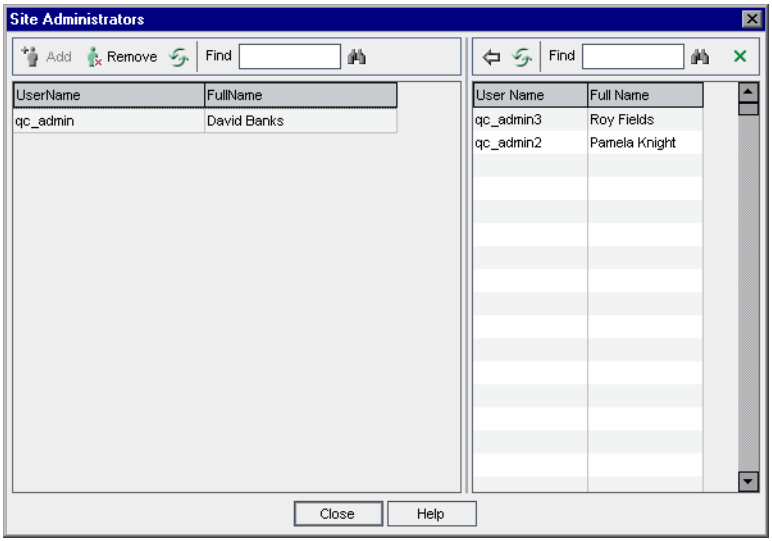
2 Click the **Site Administrators** button. The Site Administrators dialog box opens displaying the Site Administrators list.



To change the sort order of the Site Administrators list from ascending to descending, click the **UserName** or **FullName** column heading. Click the column heading again to reverse the sort order.

You can search for a user in the Site Administrators list by typing the name of a user in the **Find** box, and clicking the **Find** button.

3 Click the **Add Site Administrators** button. The Quality Center Users list is displayed in the right pane.



4 Select the users that you want to assign as site administrators. You can search for users by typing a search string in the **Find** box above the Users list, and clicking the **Find** button.

5 Click the **Add Selected Users** button. Alternatively, double-click a user. The selected users are moved to the Site Administrators list in the left pane.

6 To remove a site administrator from the Site Administrators list, select the user and click the **Remove Selected Site Administrators** button. Click **OK** to confirm. The user is removed from the Site Administrators list.

7 To refresh the Site Administrators list or Users list, click the **Refresh** button above the appropriate list.

2

Managing Quality Center Projects

Site Administration enables you to manage and maintain Quality Center domains and projects.

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About Managing Quality Center Projects

Before you start working in Quality Center, you need to create a Quality Center **project**. A Quality Center project collects and stores data relevant to a testing process. You can create a Quality Center project that works on Oracle, Microsoft SQL, or Microsoft Desktop Engine (MSDE). You can either create an empty Quality Center project, or copy the contents of an existing project to a new project. You can also restore access to an existing project.

After you create a project, you can add and remove users from the project, enable extensions for the project, query the contents of the project by defining and running SQL statements, and deactivate/activate access to the project. You can also migrate a project from TestDirector to the current version of Quality Center.

Quality Center projects are grouped by **domain**. A domain contains a group of related Quality Center projects and assists you in organizing and managing a large number of projects.

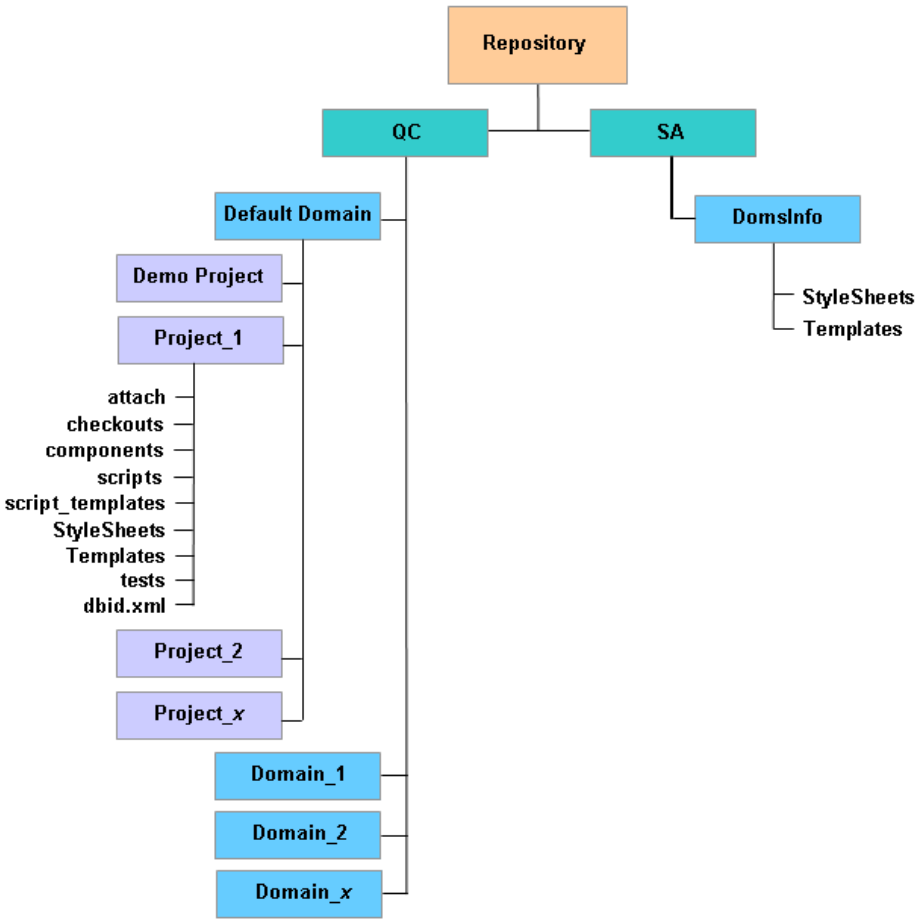
Understanding the Quality Center Project Structure

When you install Quality Center, the installation program creates a *base repository* on the application server's file system. The Site Administration and Quality Center directories are subfolders of this repository.

The Site Administration directory is located in **C:\Program Files\Mercury\Quality Center\repository\sa**, by default. This directory stores global XML files, style sheets, templates, and reports to be used by all projects in the base repository.

The Quality Center directory is located in **C:\Program Files\Mercury\Quality Center\repository\qc**, by default. It is a working area for a group of domains that are shared by multiple users. Each domain stores Quality Center projects. If you chose to install the Quality Center demo project during installation, the QC directory includes a default domain that stores the QualityCenter_Demo project. When you create a new project, you can add it to the default domain or to a user-defined domain.

The following diagram shows the structure of the repository.



For each project, you can store data such as test scripts, reports, and attachments in the QC directory.

A project directory contains the following subdirectories:

- **attach.** A subdirectory for storing attachments.
- **checkouts.** A subdirectory for version control integration.
- **components.** A subdirectory for storing business component scripts.

- **scripts.** A subdirectory for storing workflow scripts.
- **script_templates.** A subdirectory for storing template workflow scripts.
- **StyleSheets.** A subdirectory for storing style sheets that are used when mailing defects, requirements, or tests.
- **Templates.** A subdirectory for storing report templates (if empty, the report template from the SA subdirectory is used).
- **tests.** A subdirectory for storing automated tests.
- **dbid.xml.** An initialization file that stores project information required for restoring a connection to a project. For more information on restoring a connection to a project, see "Restoring Access to Quality Center Projects" on page 58.

Under the **SA** directory, the **DomsInfo** subdirectory contains the following information:

- **StyleSheets.** A subdirectory for storing global style sheets.
- **Templates.** A subdirectory for storing database templates used when creating new projects.

Note: Project data can also be stored in the project's database. For more information, see "Storing Project Data in the Project's Database" on page 363.

Creating Quality Center Domains

You can add new domains to Site Administration. Quality Center organizes projects in the Projects list by domain.

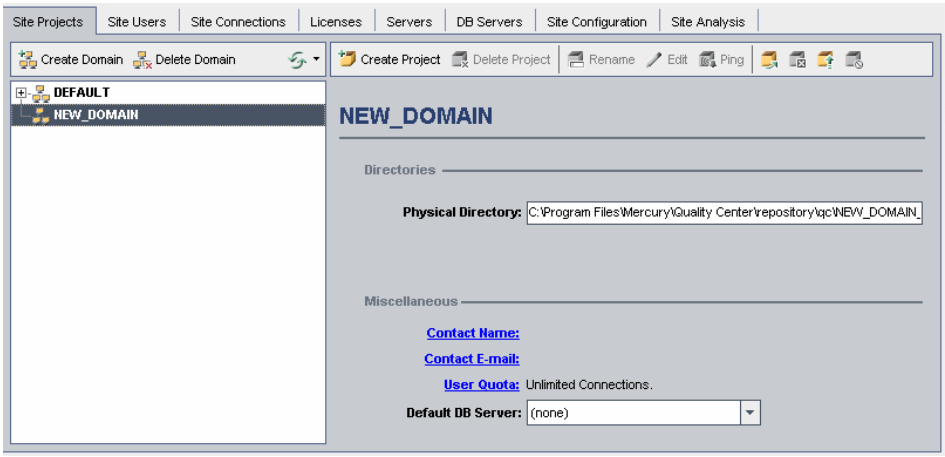
To create a domain:

1 In Site Administration, click the **Site Projects** tab.

2 Click the **Create Domain** button. The Create Domain dialog box opens.

3 Type a **Domain Name** and click **OK**.

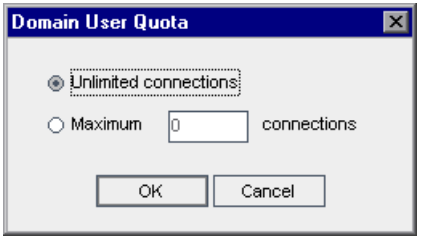
The new domain is added to the Projects list in alphabetical order. In the right pane, under **Directories**, you can view the location of the domain.



4 To add a person's name as a contact when there are questions or problems with the domain and/or its projects, click the **Contact Name** link. In the Set Contact Name dialog box, type the name of the contact person and click **OK**.

5 To add the e-mail address of the contact person for the domain, click the **Contact E-mail** link. In the Set Contact E-mail dialog box, type the e-mail address and click **OK**.

6 To change the number of users allowed to connect concurrently to the domain, click the **User Quota** link. The Domain User Quota dialog box opens.



Choose **Maximum Connections** and type the maximum number of concurrent connections allowed. Click **OK**.

Note: In addition to changing the number of users allowed to connect concurrently to a domain, you can also change the number of users allowed to connect concurrently to a project. For more information, see "Updating Project Details" on page 42.

---

7 To select a default database server when creating projects in the domain, select a default database server from the **Default DB Server** list.

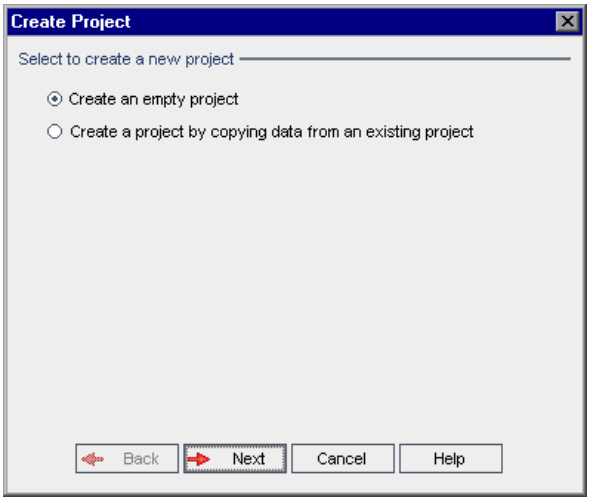
Creating Quality Center Projects

You can create Quality Center projects in Oracle, Microsoft SQL, or MSDE. When you create a new project, you can create an empty project or copy the contents of an existing project. For more information on copying projects, see "Copying Quality Center Projects" on page 38.

Note: For information on the Oracle or Microsoft SQL permissions required by Quality Center, refer to the *HP Quality Center Installation Guide*.

To create a project:

1. In Site Administration, click the **Site Projects** tab.
2. Select the domain where you want to create the project.
3. Click the **Create Project** button. The Create Project dialog box opens.



Note: If the **SHOW_REPOSITORY_OVER_DB** parameter exists and is set to "Y" in the **Site Configuration** tab, the **Create a project by importing data from an exported Quality Center project** option is also available. For more information on importing data, see "Importing a Project" on page 368.

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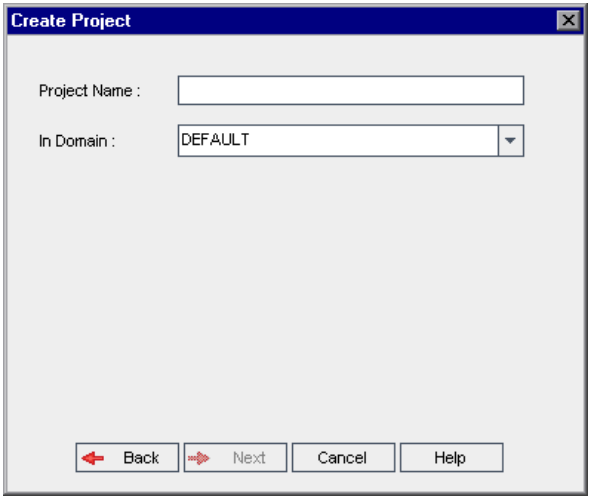
4 Choose the **Create an empty project** option and click **Next**. The following dialog box opens.



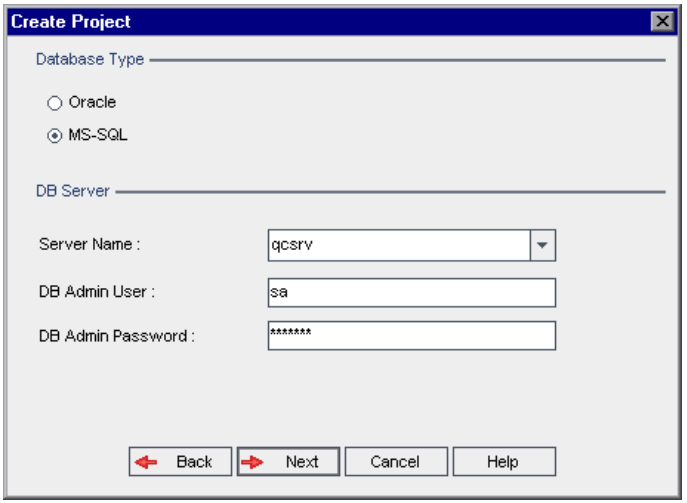
5 In the **Project Name** box, type a name for your Quality Center project.

6 In the **In Domain** box, select a domain.

Tip: After the project has been created, you can move it to a different domain in the Projects list using a drag-and-drop operation.

---

7 Click **Next**. The following dialog box opens.



8 Under **Database Type**, select **Oracle** or **MS-SQL**. If you are working in MSDE, select **MS-SQL**.

9 By default, the default values defined for the domain are displayed for **Server Name**, **DB Admin User**, and **DB Admin Password**. If additional database servers are defined, you can select another name from the **Server Name** list.

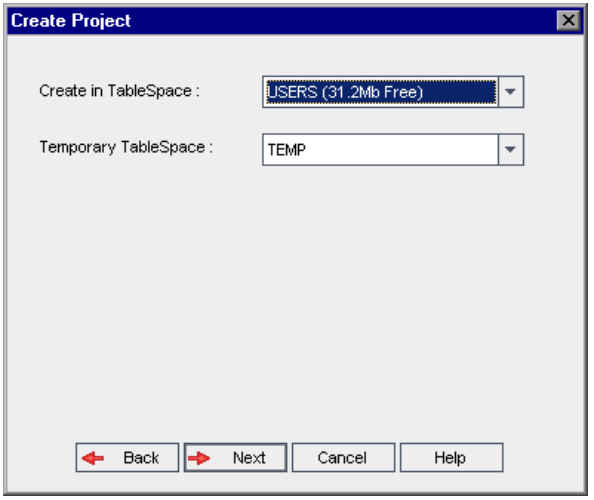
Note: For more information on defining database servers, see “Defining New Database Servers” on page 115.

---

10 Click **Next**.

If your selected database server does not have the text search feature enabled, a message box opens. It indicates that after this process completes, you can enable the text search feature. For more information on enabling the text search feature, see "Configuring Text Search" on page 120.

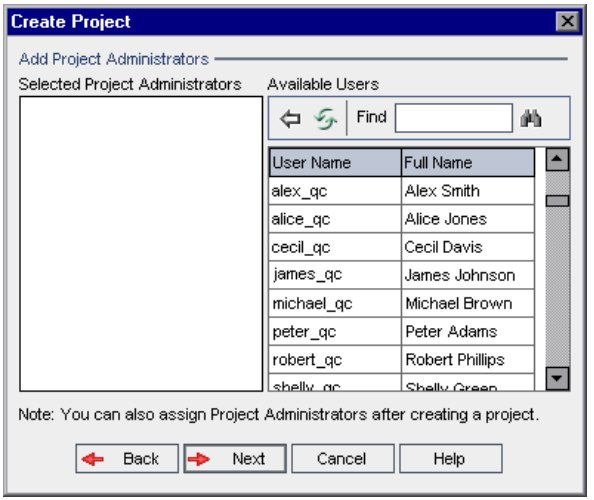
11 If you are creating a Microsoft SQL project, proceed to step 12. For an Oracle project, the following dialog box opens.



In the **Create in TableSpace** box, select a storage location that has sufficient space to store the new project. You should not use **UNDO** as the storage location.

In the **Temporary TableSpace** box, select a temporary storage location that has sufficient space to store the new project.

12 Click **Next**. The Add Project Administrators dialog box opens.



Selected Project Administrators lists Quality Center users that are assigned as project administrators. **Available Users** lists Quality Center users available in the project. When you assign project administrators, they are moved from the Available Users list to the Selected Project Administrators list. Project administrator users can add and administer other users in the project.

➤ **Refresh.** Click the **Refresh** button to refresh the list of available users.

➤ **Find.** Type the name of a user in the **Find** box, and click the **Find** button to search the Available Users list.

➤ **Add Selected Users.** Select the users you want to assign as project administrators, and click the **Add Selected Users** button. Alternatively, double-click a user. The selected users are moved to the Selected Project Administrators list.

➤ **Delete.** To remove a user from the Selected Project Administrators list, right-click the user and click **Delete**.

Note: You can also assign project administrators after you have created the project. For more information, see "Assigning Project Administrators" on page 48.

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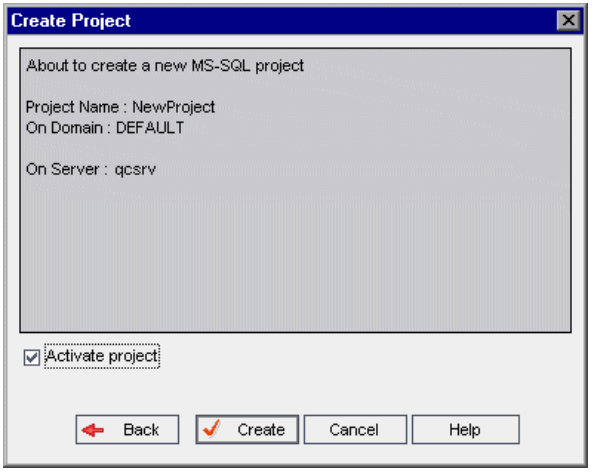
13 Click **Next**. The following dialog box opens.



Verify the project details. To change any of the details, click **Back**.

14 You can select **Activate Project** to instruct Quality Center to activate the new project. Only activated projects are available to users in the Quality Center Login window when they log in to a project. For more information, see "Deactivating and Activating Projects" on page 53.

15 If the **SHOW_REPOSITORY_OVER_DB** parameter exists and is set to "Y" in the **Site Configuration** tab, the **Store project's repository in the database** check box is available. You can select the check box to store project data in the project's database instead of in the file system. For more information on storing project data in the database, see "Storing Project Data in the Project's Database" on page 363. For more information on setting parameters, see "Setting Quality Center Configuration Parameters" on page 126.

16 Click **Create**. The new project is added to the Projects list.

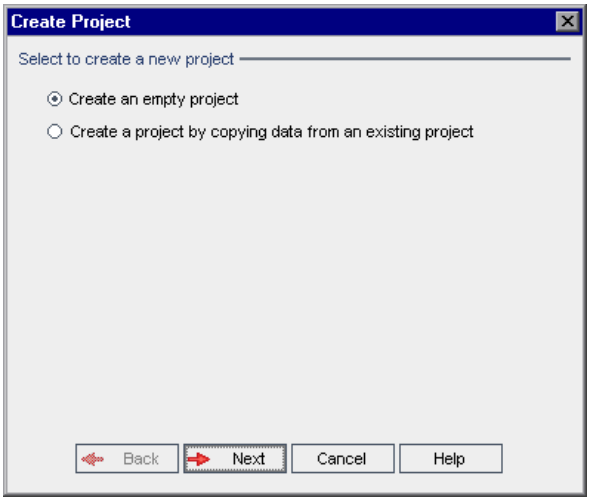
Copying Quality Center Projects

When you create a new Quality Center project, you can copy the contents of an existing project to the new project.

Note: If your Quality Center server becomes unavailable while copying, you can resume the copying process at a later stage. To resume copying, reopen Site Administration and select the project from the Projects list. In the right pane, click the **Click Here** link.

To copy a Quality Center Project:

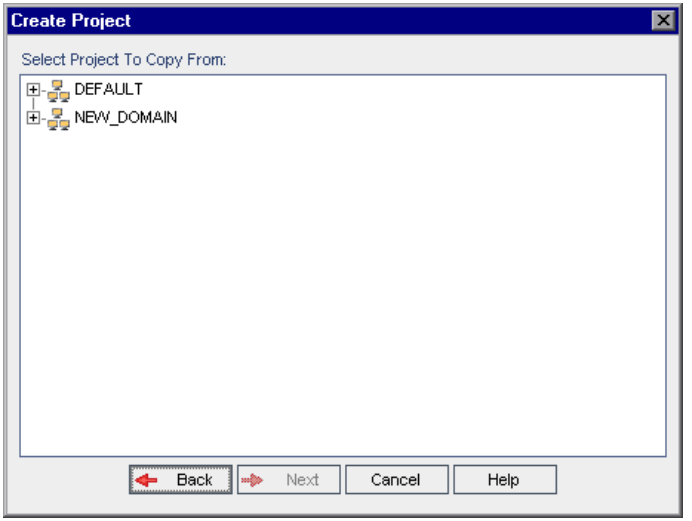
1. Deactivate the project you want to copy. For more information, see "Deactivating and Activating Projects" on page 53.
2. In Site Administration, click the **Site Projects** tab.
3. Select the domain where you want to create the project.
4. Click the **Create Project** button. The Create Project dialog box opens.



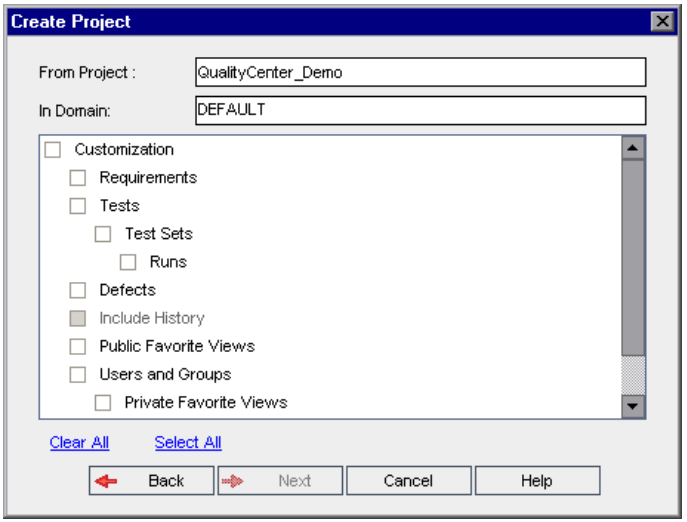
Note: If the **SHOW_REPOSITORY_OVER_DB** parameter exists and is set to "Y" in the **Site Configuration** tab, the **Create a project by importing data from an exported Quality Center project** option is also available. For more information on importing data, see "Importing a Project" on page 368.

---

5 Choose the **Create a project by copying data from an existing project** option and click **Next**. The following dialog box opens:



6 Under **Select Project To Copy From**, select the domain and project you want to copy and click **Next**. The following dialog box opens.



7 Select **Customization** to copy project lists, host data, system and user-defined fields, workflow, and transition rules to the new project. If this option is selected, you can also choose to copy any of the following:

Option	Description
Requirements	Copies requirement data from the project. Selecting this option enables you to choose **Include History**.
Tests	Copies test data from the project. If this option is selected, you can also choose to copy the following option: ➤ **Test Sets.** Copies test set data from the project. If this option is selected, you can also choose to copy the following option: ➤ **Runs.** Copies test run data from the project. Selecting this option enables you to choose **Include History**.
Defects	Copies defect data from the project. Selecting this option enables you to choose **Include History**.
Include History	Copies history data for the options that are selected.

Option	Description
Public Favorite Views	Copies public favorite view data and Excel report definitions from the project. For more information, refer to the *HP Quality Center User's Guide*.
Users and Groups	Copies user and group information and permission settings. If this option is selected, you can also choose to copy the following options: ➤ **Private Favorite Views.** Copies private favorite view data and Excel report definitions from the project. For more information, refer to the *HP Quality Center User's Guide*. ➤ **Mail Conditions.** Copies the mailing configuration data. For more information, see "Configuring Automail" on page 217. ➤ **Alerts and Follow up Flags.** Copies alerts and follow up flags. For more information, refer to the *HP Quality Center User's Guide*.

Note: If the project from which you are copying has extensions enabled, Quality Center automatically copies the extensions and their associated data to the new project.

8 To clear all options, click **Clear All**.

9 To select all options, click **Select All**.

10 Click **Next** to continue, and perform steps 5 - 16 in "Creating Quality Center Projects" on page 32.

After you successfully complete these steps, the contents of the existing project is copied to a new project, and the new project is added to the Projects list.

Updating Project Details

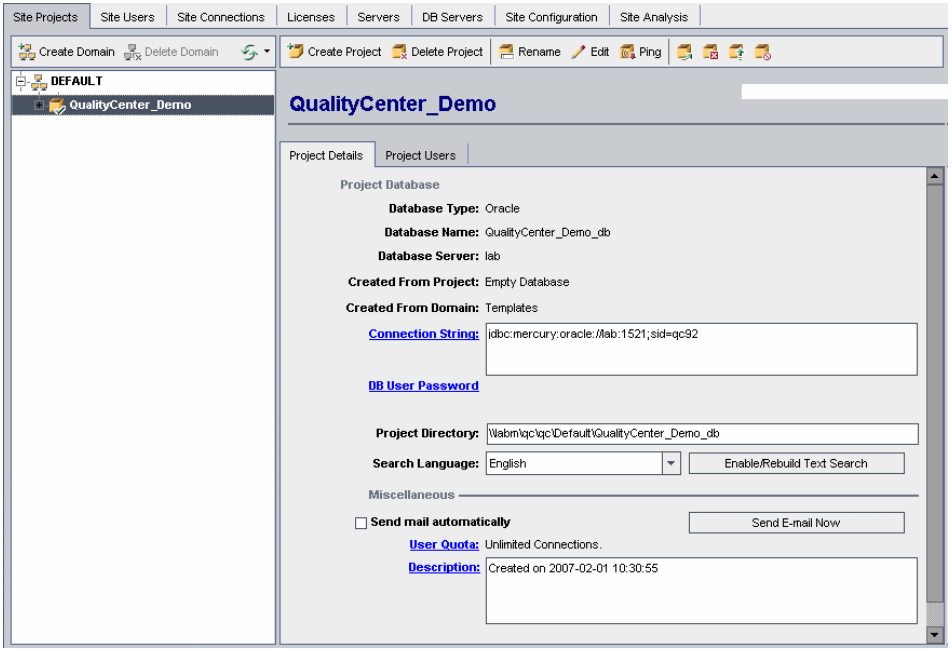
You can update project details such as database type and project directory from the Project Details tab. You can also enable the automatic sending of defect e-mail. Updated project details are written to the **dbid.xml** file, so that if a project is restored, the updated project data is used. For more information, see "Restoring Access to Quality Center Projects" on page 58.

Tip: You can move a project to a different domain in the Projects list using a drag-and-drop operation. This does not change the physical location of the project.

To update project details:

1 In Site Administration, click the **Site Projects** tab.

2 In the Projects list, select a project. In the right pane, select the **Project Details** tab. The project's details are displayed.



Note: If a project is inactive, the project icon is displayed in red. To activate, see "Deactivating and Activating Projects" on page 53.

3 Under **Project Database**, view the following project details:

Field	Description
Database Type	The database type can be MS-SQL or Oracle.
Database Name	The project name, as defined in the database.
Database Server	The name of the database server on which the database is located.
Created From Project	The project was copied from this project. An **Empty Database** value indicates that the project was not copied. For more information, see "Copying Quality Center Projects" on page 38.
Restored From Project	The project was restored from this project. For more information, see "Restoring Access to Quality Center Projects" on page 58. **Note:** This field is displayed instead of **Created From Project**.
Created From Domain	The project was copied from this domain.
Restored From Domain	The project was restored from this domain. For more information, see "Restoring Access to Quality Center Projects" on page 58. **Note:** This field is displayed instead of **Created From Domain**.
Connection String	The connection string. To modify the connection string, see "Editing the Connection String" on page 57.
DB User Password	The user password for the Oracle server on which the database is located. To modify this password, see "Modifying Database Server Properties" on page 117.

Field	Description
Repository in DB	Indicates where the project repository is stored. If **Yes**, the project repository is stored in the database. If **No**, the project repository is stored in the file system. **Note:** This field is displayed only if the repository is stored in the database, or if the **SHOW_REPOSITORY_OVER_DB** parameter exists and is set to "Y" in the **Site Configuration** tab. For more information on storing the project repository in the database, see Appendix C, "Storing Project Data in the Project's Database."
Project Directory	The location of the project repository in the file system.
Search Language	Indicates the search languages for performing a text search. For more information, see "Selecting a Text Search Language for a Project" on page 123.

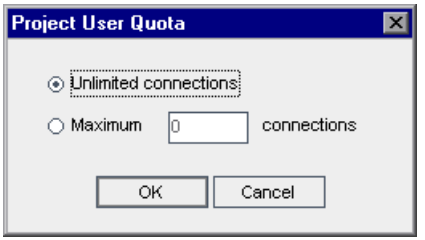
4 If you enable the **Text Search** link in the **DB Servers** tab after you have added a project to the Projects list in the Site Projects tab (for example, after creating, upgrading, or migrating a project), you must also click the **Enable/Rebuild Text Search** button. For more information, see "Enabling Text Search in Quality Center" on page 122.

5 Select **Send mail automatically** to enable the mail configuration settings for a project. This instructs Quality Center to send e-mail to specified users every time set defect fields are updated. If this check box is not selected, mail configuration settings for the project have no effect and e-mail is not sent. For more information on configuring mail, see Chapter 12, "Configuring Automail."

Quality Center sends the defect messages automatically, at specified time intervals. You can edit the time interval using the MAIL_INTERVAL parameter in the **Site Configuration** tab. You can also specify if you want the e-mail to include attachments and/or history. For more information, see "Setting Quality Center Configuration Parameters" on page 126.

To manually send the defect messages that have accumulated during the current time interval, click the **Send E-mail Now** button. If the **Send mail automatically** check box is not selected, defect messages do not accumulate, so this button has no effect.

6 To change the number of users allowed to connect concurrently to the project, click the **User Quota** link. The Project User Quota dialog box opens.



Choose **Maximum connections** and type the maximum number of concurrent connections allowed. Click **OK**.

Note: The maximum number of users allowed to connect concurrently to the project should not exceed the number of users allowed to connect to its domain. For more information, see "Creating Quality Center Domains" on page 30.

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7 To add a description for the project, click the **Description** link. In the Edit Project Description dialog box, type your description and click **OK**.

8 Click the **Refresh Projects List** button to refresh the projects in the selected domain. To refresh projects in all domains, click the **Refresh Projects List** arrow and choose **Refresh All Domains**.

9 To assign users to a project, see "Assigning Users to Projects" on page 46.

Assigning Users to Projects

As a site administrator, you can control access to Quality Center projects by defining the users that can log on to the project. You can assign users to projects from the Quality Center Users list, or copy users from existing Quality Center projects. You can also assign users as project administrators. For more information on assigning project administrators, see "Assigning Project Administrators" on page 48.

When a user is no longer working on a project, remove the user from the project to ensure project security. Removing a user from a project does not delete the user from the Quality Center Users list. To remove the user from Quality Center, you must delete the user from the Site Users tab, as described in "Deleting Users" on page 104.

Notes:

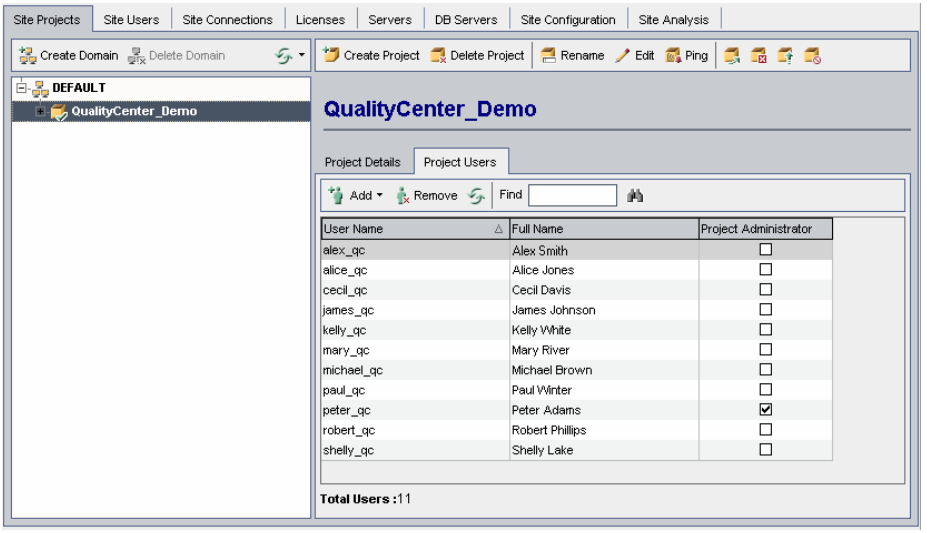
- As a Quality Center project administrator, you can assign and remove users from projects, and change user privileges from the Project Customization window. For more information, see Chapter 9, "Managing Users in a Project".
- You can assign projects to users from the Site Users tab. For more information, see "Assigning Projects to Users" on page 101.
- Quality Center sends automatic e-mail notification to project administrators when users are assigned or removed from a project in Site Administration. You can make automatic notification unavailable by adding the **AUTO_MAIL_USER_ NOTIFICATION** parameter in the Site Configuration tab. For more information, see "AUTO_MAIL_USER_ NOTIFICATION" on page 131.

To assign users to a project:

1 In Site Administration, click the **Site Projects** tab.

2 In the Projects list, select a project. In the right pane, select the **Project Users** tab.

The users for the selected project are displayed.



You can click the **User Name** or **Full Name** column to change the sort order of user names or full names in the Project Users list from ascending to descending. You can also click the **Project Administrator** column to group users by project administrators.

3 Click the **Add** button, and choose one of the following options:

- **Add From The Users List.** The Users list is displayed to the right of the Project Users tab. Select the users that you want to assign to the project. You can search for users by typing a search string in the **Find** box above the Users list, and clicking the **Find** button.
- **Copy From Another Project.** The Projects list is displayed to the right of the Project Users tab. To copy a user, click a project to expand the project directory, and select the user name check box. To copy all users from a project, select the project's check box. To clear all selected users, click **Clear All**.

4 Select users from the Users list or Projects list, and click the **Add Selected Users** button. Alternatively, double-click a user. The selected users are displayed in the Project Users list.

5 To remove a user from a project, select the user in the Project Users list and click the **Remove** button. Click **Yes** to confirm. The user is removed from the Project Users list.

6 To refresh the Project Users list or Users list, click the **Refresh** button above the appropriate list.

Assigning Project Administrators

After you add users to projects you can assign users as project administrators (belonging to the TDAdmin user group). Project administrators have full privileges in the Quality Center project from the Project Customization window. For more information, see Chapter 10, "Managing User Groups and Permissions."

When you copy users from other projects, they are added with the same user group privileges they had in the project from which they were copied, provided the user group exists in this project. If the user group does not exist in this project, the users are added with Viewer group privileges. If you copy a user from another project in which the user is a project administrator, the user is automatically assigned as a project administrator in this project.

When you add users to the project from the Users list, those users are added with Viewer group privileges (read-only privileges).

Note: You can also assign project administrators when you create a new project. For more information, see "Creating Quality Center Projects" on page 32.

To assign Project Administrator privileges to a user:

1. In Site Administration, click the **Site Projects** tab.
2. In the Projects list, select a project. In the right pane, select the **Project Users** tab.
3. In the Project Users list, select the **Project Administrator** check box for each user you want to assign as a project administrator.
4. To remove a user from the Project Administrator group, clear the **Project Administrator** check box, and confirm you want to remove the user from the group.

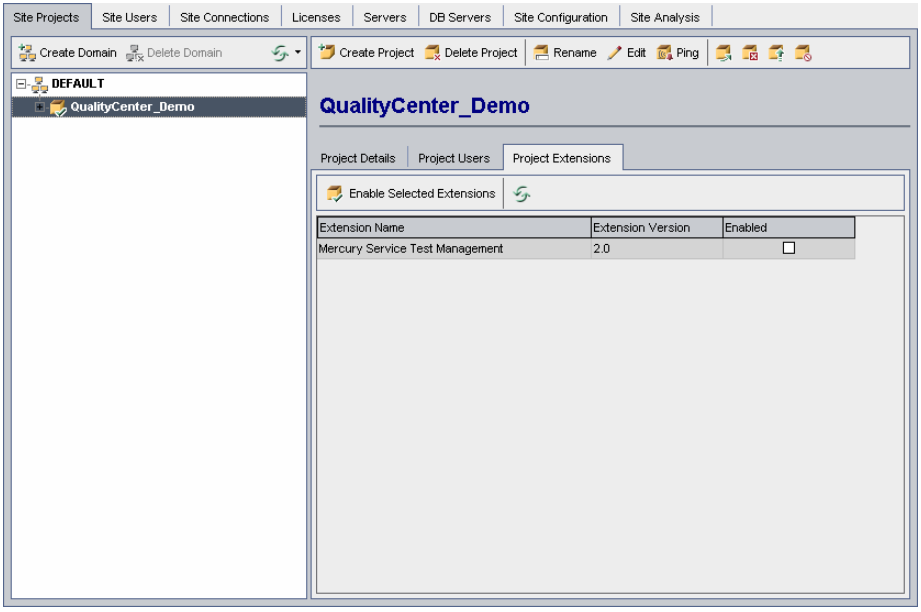
Enabling Extensions for a Project

If you have a license for a Quality Center extension and the extension is installed on your Quality Center server, you must enable the extension for a project before you can use it with the project. Extensions add extra functionality to Quality Center. Note that you cannot disable an extension for a project after you enable it.

To enable Quality Center extensions for a project:

1 In Site Administration, click the **Site Projects** tab.

2 In the Projects list, select a project. In the right pane, click the **Project Extensions** tab. This tab is available only if you have a license for at least one extension and the extension is installed on the Quality Center server. The Extensions list is displayed, listing extensions installed on the Quality Center server.



3 To enable a single extension for the project, in the Extensions list, select the **Enabled** check box for the extension you want to enable.

4 To enable more than one extension for the project, select the extensions you want to enable and click the **Enable Selected Extensions** button. Click **Yes** to confirm. The selected extensions are enabled for the project.

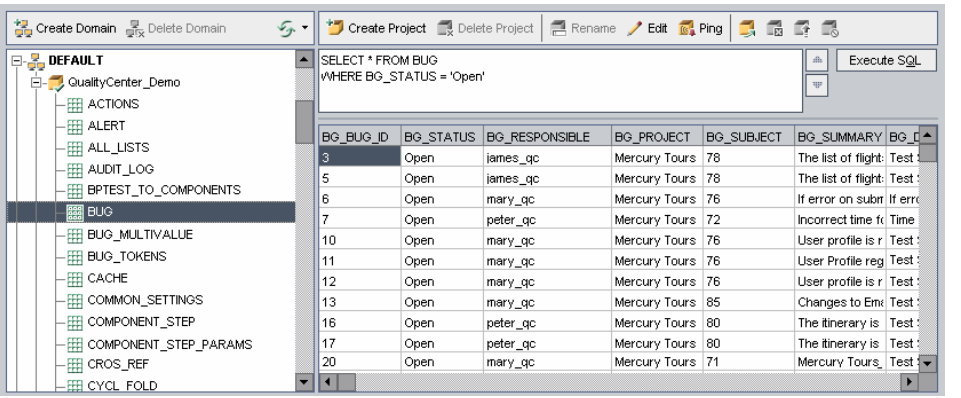
5 To refresh the Extensions list, click the **Refresh** button.

Querying Project Tables

You can query specific data that is stored in your project. You query a project by defining and running SQL statements. The following examples show SQL queries and the results that they return.

Query	Results
select * from BUG where BG_STATUS = 'Open'	All defects that are open.
select * from BUG where BG_RESPONSIBLE = 'james_qc' or BG_RESPONSIBLE = 'mary_qc'	All defects assigned to either James or Mary.
select count (*) from BUG where BG_RESPONSIBLE = 'mary_qc'	The number of defects assigned to Mary.
select * from BUG where BG_RESPONSIBLE='james_qc' and BG_STATUS='open'	All open defects assigned to James.

Using the first query example, the SQL query returns the following:



To query a project:

1. In Site Administration, click the **Site Projects** tab.
2. In the Projects list, double-click a project.
3. Select a table. Quality Center automatically runs the “SELECT *” query for this table and displays all the data for the table in the SQL Query Results grid.
4. Define a query by typing an SQL statement in the SQL pane.
5. Click the **Execute SQL** button. The data returned by the query appears in the SQL Query Results grid.

   To export query results, your database administrator can run the same queries on the project database and export the results for you.

Deactivating and Activating Projects

You can deactivate or activate a Quality Center project. When you deactivate a project, the project name is removed from the **Projects** box in the Quality Center Login window. The project is not deleted from the server. Any users currently connected to the project are forced to log out when you deactivate.

Note: It is recommended that you deactivate a project before you change any data that may cause inconsistency for a connected user.

To deactivate a project:

1. In Site Administration, click the **Site Projects** tab.
2. In the Projects list, select a project.
3.  Click the **Deactivate Project** button. A message box indicates that all connected users will be disconnected.
4. Click **OK** to confirm. The project is deactivated and the project icon is changed in the Projects list.

To activate a project:

1. In Site Administration, click the **Site Projects** tab.
2. In the Projects list, select a project.
3.  Click the **Activate Project** button. The project is activated and the project icon is changed in the Projects list.

Pinging Projects

You can check whether a project database is accessible from Site Administration.

To ping a project:

1. In Site Administration, click the **Site Projects** tab.
2. In the Projects list, select a project.
3. 

Click the **Ping Project** button.
4. Click **OK** when prompted with a message that the ping was successful.

Renaming Projects

You can rename a project in the Projects list.

To rename a project:

1. In Site Administration, click the **Site Projects** tab.
2. In the Projects list, select a project.
3. 

Click the **Rename Project** button. If the project is active, you are prompted to deactivate it. For more information, see "Deactivating and Activating Projects" on page 53.
4. In the Rename Project dialog box, enter the new name for the project and click **OK**. The project is renamed in the Projects list.

Removing Projects

You can remove a project from the Projects list in Site Administration. This does not delete the project from the server and you can restore the project if necessary. For more information on restoring access to a project, see "Restoring Access to Quality Center Projects" on page 58.

To remove a project from the Projects list:

1. In Site Administration, click the **Site Projects** tab.
2. In the Projects list, select a project.
3.  Click the **Remove Project** button.
4. Click **OK** to confirm. If the project is still active, you are prompted to deactivate it. For more information, see "Deactivating and Activating Projects" on page 53.
5. Click **OK**.

Deleting Projects

You can delete a project from the Projects list in Site Administration. This deletes the contents of the project from the server and you cannot restore the project.

To delete a project:

1. In Site Administration, click the **Site Projects** tab.
2. In the Projects list, select a project.
3. 

Click the **Delete Project** button.
4. Click **OK** to confirm. If there are active users connected to the project, you are prompted to disconnected them.

   The Database Admin Password dialog box opens. If you did not specify a database administrator user name or password, enter the database administrator's user name and password and click **OK**. If you previously specified a database administrator user name or password, these credentials are already entered in the dialog box.
5. Click **OK**.

Deleting Domains

You can delete a domain. It is removed from the Projects list, and its contents are deleted from the server.

Note: You cannot delete a domain if it contains projects. To delete the domain, you must first delete the projects. For more information, see "Deleting Projects" on page 55.

To delete a domain:

1. In Site Administration, click the **Site Projects** tab.
2. In the Projects list, select a domain.
3. Click the **Delete Domain** button.

4. Click **Yes** to confirm.

Editing the Connection String

You can edit a project's connection string. For more information on connection strings, see "Defining New Database Servers" on page 115.

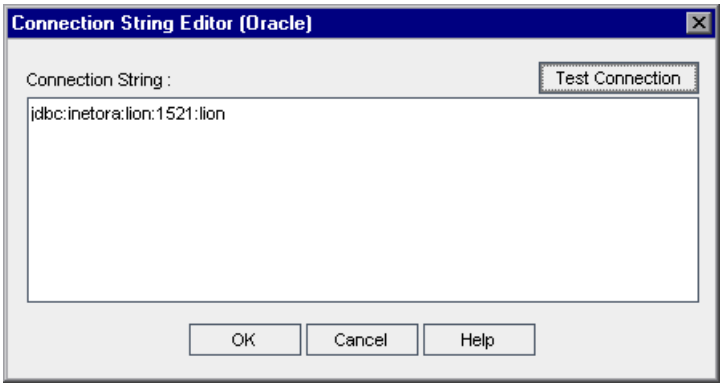
To edit the connection string:

1 In Site Administration, click the **Site Projects** tab.

2 In the Projects list, select a project.

3 Click the **Edit Connection String** button or the **Connection String** link. If the project is still active, you are prompted to deactivate it. For more information, see "Deactivating and Activating Projects" on page 53.

The Connection String Editor dialog box opens.



4 In the **Connection String** box, modify the attributes of the connection string.

5 To test the connection string, click **Test Connection**.

6 Click **OK** to save your connection string modification and close the Connection String Editor.

Restoring Access to Quality Center Projects

You can restore access to a Quality Center project that is not in your current Projects list in Site Administration. For example, you may want to access a project from another server. After you restore access to a project, it is added to the Projects list in Site Administration.

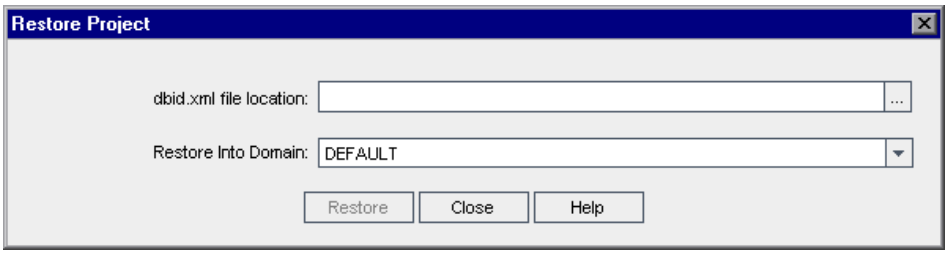
Notes:

- To restore a TestDirector 7.6 or 8.0 project, you must migrate the project to Quality Center 9.2. Before restoring the project, make sure that the database where the project resides exists in the **DB Servers** tab in Site Administration on your Quality Center server, since the Quality Center server needs to access the contents of the restored project from the project's database. For more information, see Chapter 3, "Upgrading and Migrating Projects."
- If a project has extensions installed, the server to which you restore it must also have the same extensions installed.

To restore access to a Quality Center project:

1 In Site Administration, click the **Site Projects** tab.

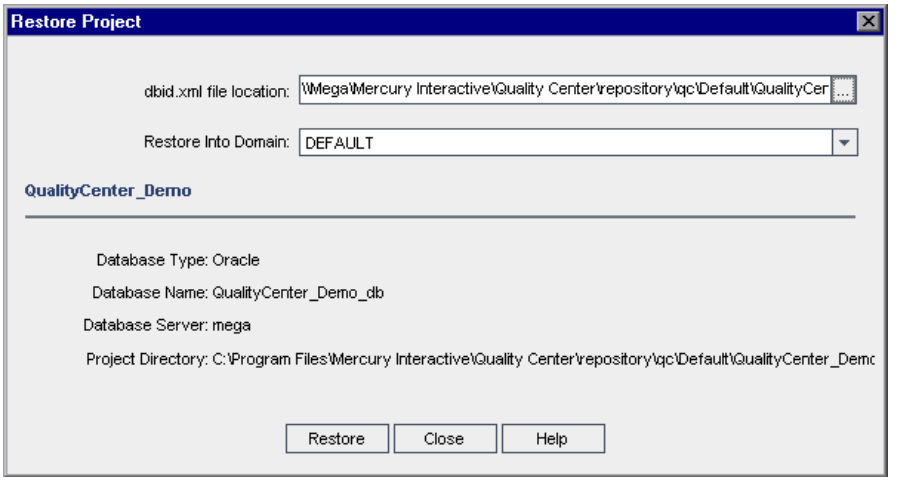
2 Click the **Restore Project** button. The Restore Project dialog box opens.



3 To locate the file that includes the project that you want to restore, click the browse button to the right of the **dbid.xml file location** box. The Open File dialog box opens.

4 Locate the file. For information on the location of the **dbid.xml** file, see "Understanding the Quality Center Project Structure" on page 27.

5 Select the **dbid.xml** file and click **Open**. The Restore Project dialog box opens and displays the database type, name, server, and the directory path of the project.



6 In the **Restore Into Domain** box, select the domain in which you want the restored project to be located.

7 Click **Restore**.

8 If your database server does not have the text search feature enabled, a message box opens. You can enable the text search feature before or after this process completes.

- Click **Yes** to continue this process. After the process completes, you can enable the text search feature.
- Click **No** to stop this process. Enable the text search feature and then restart the process.

For more information on enabling the text search feature, see "Configuring Text Search" on page 120.

9 When the restore process completes, click **OK**.

10 Click **Close** to close the Restore Project dialog box and view the restored project in the Projects list.

Renaming the Defects Module for a Project

You can rename the Defects module for a specific project. For example, you can change the name of the Defects module from **Defects** to **Bugs**. You rename the Defects module by adding a parameter to the **DATACONST** table of the project. For more information on modifying project tables, see "Querying Project Tables" on page 51.

Note: You can rename any Quality Center module for all your projects by adding the **REPLACE_TITLE** parameter in the **Site Configuration** tab. For more information, see "REPLACE_TITLE" on page 136.

To rename the Defects module for a project:

1. In Site Administration, click the **Site Projects** tab.
2. In the Projects list, double-click the project for which you want to rename the Defects module.
3. Select the **DATACONST** table.
4. In the SQL pane, type an SQL INSERT statement to insert a row into the table with the following values:
   - In the **DC_CONST_NAME** column, insert the parameter name REPLACE_TITLE.
   - In the **DC_VALUE** column, insert a string that defines the new name for the Defects module, in the following format:

     original title [singular];new title [singular];original title [plural];new title [plural]

   For example, to change the name of the module from **Defects** to **Bugs**, type the following SQL statement into the SQL pane:

   ```
   insert into dataconst values ('REPLACE_TITLE', 'Defect;Bug;Defects;Bugs')
   ```

5. Click the **Execute SQL** button. The new row is added to the **DATACONST** table. The Quality Center project displays the new Defects module name.

3

Upgrading and Migrating Projects

To work with previously created projects, you must upgrade or migrate them to your current version of Quality Center.

This chapter describes:	On page:
About Upgrading and Migrating Projects	62
Upgrading Quality Center Projects	63
Migrating TestDirector Projects to Quality Center	70
Backing Up Quality Center and TestDirector Projects	81
Restoring Quality Center and TestDirector Projects	83

Tip: To enable you to upgrade and migrate from a previous TestDirector or Quality Center version to Quality Center 9.2 with the minimum possible interruption to your system operations, you should be familiar with the considerations and recommendations involved in the migration process. For more information, see Appendix B, "Guidelines for Upgrading and Migrating to Quality Center."

About Upgrading and Migrating Projects

To work with a project from a previous version, you must either upgrade or migrate your project to Quality Center. The following table describes the process required for working with a previously created project.

From Quality Center or TestDirector:	To Quality Center 9.2:
Quality Center 8.*x* or 9.0	You must upgrade the project to Quality Center 9.2 using Quality Center 9.2 Site Administration. For more information, see "Upgrading Quality Center Projects" on page 63.
TestDirector 7.6 or 8.0	You must migrate the project to Quality Center 9.2 using the Quality Center 9.2 Migration Tool. For more information, see "Migrating TestDirector Projects to Quality Center" on page 70.

Before you upgrade or migrate from a previous version, protect data stored in your databases by backing up your projects. You can back up projects stored on a database or in the file system. For more information on backing up projects, see "Backing Up Quality Center and TestDirector Projects" on page 81.

In the event that the upgrade or migration fails, you can restore the data from the back ups. You must restore backed up projects before trying the upgrade or migration process again. For more information on restoring projects, see "Restoring Quality Center and TestDirector Projects" on page 83.

Upgrading Quality Center Projects

This section describes how to upgrade projects from Quality Center 8.*x* or 9.0 to Quality Center 9.2. You can choose to upgrade one project at a time, or several projects in a domain consecutively. After you have upgraded, you can no longer use your projects with a previous Quality Center version.

If you are upgrading projects on an Oracle database server earlier than Oracle 10g, it is recommended that you collect statistics both before and after you perform the upgrade. For more information, see "Collecting Oracle Database Statistics" on page 67.

Note: When upgrading a project to Quality Center 9.2, all requirements are assigned a requirement type of **Undefined** in the **Requirement Type** field.

To upgrade a single project:

1. Before commencing the upgrade process, back up your Quality Center project. For more information, see "Backing Up Quality Center and TestDirector Projects" on page 81.
2. In Site Administration, click the **Site Projects** tab.
3. In the Projects list, select a project.
4.  Click the **Upgrade Project** button.
5. If your database server does not have the text search feature enabled, a message box opens. You can enable the text search feature before or after this process completes.
   - ➤ Click **Yes** to continue this process. After the process completes, you can enable the text search feature.
   - ➤ Click **No** to stop this process. Enable the text search feature and then restart the process.

   For more information on enabling the text search feature, see "Configuring Text Search" on page 120.
6. If the project is active, you are prompted to deactivate it. For more information, see "Deactivating and Activating Projects" on page 53.

7 If the option to store project data on the database is available, you are prompted to move the project repository to the database.

➤ Click **Yes** to confirm that you want to move the repository to the database.

➤ Click **No** to confirm that you want to keep the repository in the file system.

For more information on storing project data on the database, see Appendix C, "Storing Project Data in the Project's Database."

8 Click **Yes** to confirm that you want to upgrade your project. The upgrading process starts.

If the upgrade fails, Quality Center displays an error message with reasons for the failure and refers you to the log file. You must restore the backed up project before you try to upgrade again. For more information, see "Restoring Quality Center and TestDirector Projects" on page 83.

9 When the upgrade process completes, you are prompted to activate the project. Click **Yes**.

Tip: If the upgrade process completes with warning messages, you should fix the problems and then upgrade the project again.

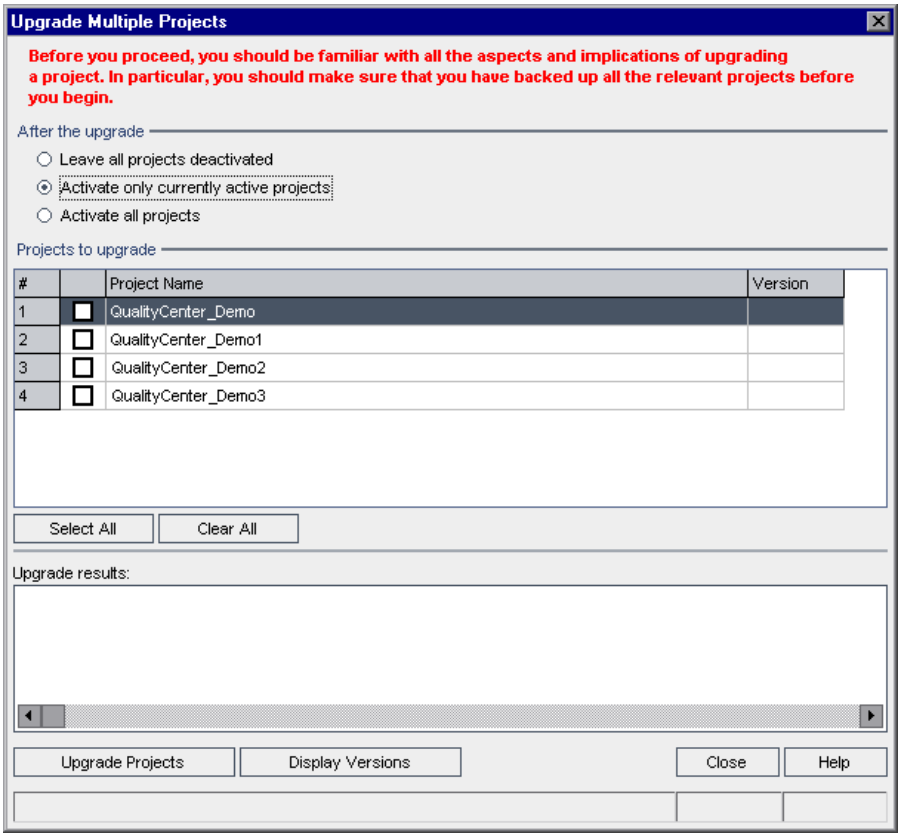
To upgrade several projects in a domain consecutively:

1 Before commencing the upgrade process, back up your Quality Center projects. For more information, see "Backing Up Quality Center and TestDirector Projects" on page 81.

2 In Site Administration, click the **Site Projects** tab.

3 In the Projects list, select a domain.

4 Click the **Upgrade Multiple Projects** button. The Upgrade Multiple Projects dialog box opens.



5 Under **After the upgrade**, choose whether you want Quality Center to leave all projects deactivated after the upgrade, activate only the previously active projects, or activate all projects. By default, only the currently active projects are activated after the upgrade is performed.

6 If the option to store project data on the database is available, the **Project Repository** section is displayed. If any of the projects that you are about to upgrade contain project repositories in the file system, you can select **Move project's repository from the file system to the database** to move the repositories to the project databases. For more information on storing project data on the database, see Appendix C, "Storing Project Data in the Project's Database."

7 You can view the current version numbers of your projects. You can view the version numbers for all the projects in the domain, or select specific projects for which you want to view the version numbers:

- ➤ To view the version numbers for all projects, click **Select All** and then click the **Display Versions** button.
- ➤ To view the version numbers for specific projects only, select the boxes beside the project names ☑ and click the **Display Versions** button.

The project version number appears in the **Version** column.

8 You can upgrade all projects in the domain, or select specific projects to upgrade:

- ➤ To upgrade all projects, click **Select All** and then click the **Upgrade Projects** button.
- ➤ To upgrade specific projects only, select the boxes beside the project names ☑ and click the **Upgrade Projects** button.

9 If your database server does not have the text search feature enabled, a message box opens. You can enable the text search feature before or after this process completes.

- ➤ Click **Yes** to continue this process. After the process completes, you can enable the text search feature.
- ➤ Click **No** to stop this process. Enable the text search feature and then restart the process.

For more information on enabling the text search feature, see "Configuring Text Search" on page 120.

10 If any of the selected projects are active, you are prompted to deactivate them. For more information, see "Deactivating and Activating Projects" on page 53.

11 The upgrading process and results are displayed in the **Upgrade Results** box. Click **Close** to close the Upgrade Multiple Projects dialog box.

If the upgrade fails, Quality Center displays an error message with reasons for the failure and refers you to the log file. You must restore the backed up projects before you try to upgrade again. For more information, see "Restoring Quality Center and TestDirector Projects" on page 83.

Collecting Oracle Database Statistics

Quality Center uses Oracle's cost-based SQL optimizer to determine the most efficient way to carry out a SQL statement. For the optimizer to work properly, it requires up-to-date statistical information on the data being accessed. In Oracle 10g, collecting statistics is an automatic task. In earlier versions of Oracle, you must collect statistics for all Quality Center project schema tables on a periodic basis. In particular, database statistics must be collected before and after upgrading a Quality Center project.

Collecting Statistics on a Periodic Basis

During the initial phase of Quality Center deployment, it is recommended that you collect statistics for all Quality Center project schemas (tables and indexes). After your Quality Center system is stable, you can collect statistics on a weekly basis.

When working with large Quality Center environments, it is recommended that you collect statistics only for objects for which the amount of data changes significantly during the day, or for new objects that are created (such as new tables and indexes created by the upgrade process).

Note: Collecting statistics is a resource-consuming operation that can take a long time. It is therefore recommended that you collect statistics during special maintenance hours.

To collect statistics for a specific project schema:

1. Log in to the Quality Center database schema using SQL*Plus.
2. Run the following command:

```
Exec DBMS_STATS.GATHER_SCHEMA_STATS (ownname => '<name of Oracle schema>', estimate_percent => 20, cascade => TRUE);
```

To collect statistics for a specific project schema table and its indexes:

1. Log in to the project schema using SQL*Plus.
2. For each table, collect statistics by running the following command:

   Exec DBMS_STATS.GATHER_TABLE_STATS (ownname => '<name of Oracle Schema>', tabname => '<Name of table for which you want to collect statistics>', estimate_percent => 5, cascade => TRUE);

   (Cascade => True instructs the Oracle database to analyze all the indexes in the table.)

Collecting Statistics Before Upgrading Quality Center Projects

When you upgrade a Quality Center project, Quality Center performs numerous changes to the installed version including applying database schema changes and data modifications. These changes may require some time to complete like any other set of SQL statements performed by the database server. To reduce the time spent by the upgrade process on changing the database schema or data to the minimum necessary, it is mandatory that the database statistics are updated.

Quality Center's project upgrade process checks if the database statistics were collected recently. If they were not collected recently, it performs statistics collection for the project's user schema prior to starting the upgrade. The database keeps this information for each user schema in a view called USER_TABLES.

Since collecting statistics can take a long time, it is recommended that you collect statistics before you perform the upgrade. You should collect statistics when there is less demand on the database server. For more information on collecting statistics, see "Collecting Statistics on a Periodic Basis" on page 67.

To check when the database statistics were last collected for a specific table:

1. Login to the project schema using Oracle SQL*Plus.
2. Run the following query:

   SELECT TO_CHAR(LAST_ANALYZED,'DD/MM/YYYY HH24:MI:SS') FROM USER_TABLES WHERE TABLE_NAME LIKE '<table name>';

To check when the database statistics were last collected for any table in the project user schema:

1. Login to the project schema using Oracle SQL*Plus.
2. Run the following query:

   SELECT TO_CHAR(MIN(LAST_ANALYZED),'DD/MM/YYYY HH24:MI:SS') FROM USER_TABLES;

Collecting Statistics After Upgrading Quality Center Projects

After the upgrade process is complete, it is recommended that you collect database statistics again to enhance database performance. This is because Quality Center performs significant database schema changes and data modifications during the upgrade. For more information on collecting statistics, see "Collecting Statistics on a Periodic Basis" on page 67.

Migrating TestDirector Projects to Quality Center

To work with TestDirector 7.6 or 8.0 projects, you must migrate the projects to Quality Center 9.2. Projects are migrated to Quality Center using the Migration Tool. You must specify the **source** and **target** servers. The source server is the TestDirector server from which you want to migrate the project. The target server is the Quality Center server to which you want to migrate the project. When migrating from TestDirector, you can use the same repository used in TestDirector, or you can copy the repository to Quality Center.

This section describes the migration prerequisites, the migration workflow, the repository migration options, and the migration process.

Tip: To enable you to migrate from TestDirector 7.6 or 8.0 to Quality Center 9.2 with the minimum possible interruption to your system operations, you should be familiar with the considerations and recommendations involved in the migration process. For more information, see Appendix B, "Guidelines for Upgrading and Migrating to Quality Center."

Migration Prerequisites

Before you start the migration process, make sure that you consider the following issues:

- The user account that is running the Quality Center (target) server must have the same read and write permissions as the user account used to run the TestDirector (source) server.
- To specify the maximum number of projects that can be migrated from TestDirector to Quality Center at one time, set the **MIGRATION_MAX_NUMBER_OF_PROJECTS** parameter. By default, you can migrate up to 50 projects at a time. For more information, see "MIGRATION_MAX_NUMBER_OF_PROJECTS" on page 135.

Migration Workflow

When you migrate projects from TestDirector to Quality Center, the following events occur:

- The TestDirector project is upgraded to Quality Center.
- The project is removed from the TestDirector server but it remains on the database server. The project can now be accessed only from the Quality Center server.
- The users are imported from TestDirector to Quality Center.
- The Site Configuration parameters are imported from TestDirector to Quality Center.
- One of the following migration options is performed:
  - If you choose the **Use the current repository** option, the repository path is updated so that it can be accessed by Quality Center.
  - If you choose the **Create a copy of all repository data on the target server file system** option, the repository is copied to Quality Center and is stored in the file system.

For more information on migration options, see "Choosing a Repository Migration Option" on page 72.

Choosing a Repository Migration Option

The Migration Tool provides the following options for migrating the repository:

- **Use the current repository.** Uses the same repository used in TestDirector. You need to define the path to be accessed by Quality Center.
- **Create a copy of all repository data on the target server file system.** Copies the repository to Quality Center and stores it in the file system.

Note: When migrating Microsoft SQL Server or Oracle-based TestDirector projects, the databases of these projects are not copied to Quality Center.

The following table compares the migration options:

Use the current repository	**Create a copy of all repository data on the target server file system**
The repository is unchanged.	The repository is copied to Quality Center and stored in the file system.
Additional configurations may be required on the TestDirector and Quality Center servers. See table below.	No additional configurations are required.
This option is faster than the **Create a copy of all repository data on the target server file system** option.	This option is slower than the **Use the current repository** option.

To work with the **Use the current repository** option, the following additional configurations may be required:

	Configure the repository for Quality Center on Windows	**Configure the repository for Quality Center on UNIX or Linux**
Repository is on the same computer as the TestDirector server	On the TestDirector server, share the repository directory so that it can be accessed from Quality Center by a UNC path by the user running Quality Center.	Configure the repository and the Quality Center computer settings so that the repository on the TestDirector computer can be accessed from the Quality Center computer by a UNIX/Linux-based path.
Repository is on a different computer than the TestDirector server	No need to modify the UNC path. The same path can be used by Quality Center. Note that the user running Quality Center must have permissions to this shared path.	Configure the repository and the Quality Center computer settings so that the repository on a computer other than TestDirector can be accessed from the Quality Center computer by a UNIX/Linux-based path.

When choosing the **Create a copy of all repository data on the target server file system** option, the Migration Tool uses the HTTP protocol to copy the repository from the TestDirector server to the Quality Center server. If the TestDirector repository is larger than 3 GB or if it contains over 200 projects, the migration process may take a long time to complete.

To improve performance, instead of using the **Create a copy of all repository data on the target server** option, you can copy the repository at the operating system level. For more information on copying from the operating system level, refer to the Mercury Support Knowledge Base (http://support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp), select **TestDirector for Quality Center**, and search for Article Number 38780.

Migrating Projects

This section describes how to migrate a project from TestDirector to Quality Center. Before you start the migration process, it is recommended that you review "Migration Prerequisites" on page 71, and "Choosing a Repository Migration Option" on page 72.

To migrate a project:

1 Before you start the migration process, back up your TestDirector project. For information on backing up projects, see "Backing Up Quality Center and TestDirector Projects" on page 81.

2 On the TestDirector machine, insert the HP Quality Center installation DVD into the DVD drive. Install the **MercuryQualityCenter_MigrationTool.exe** file.

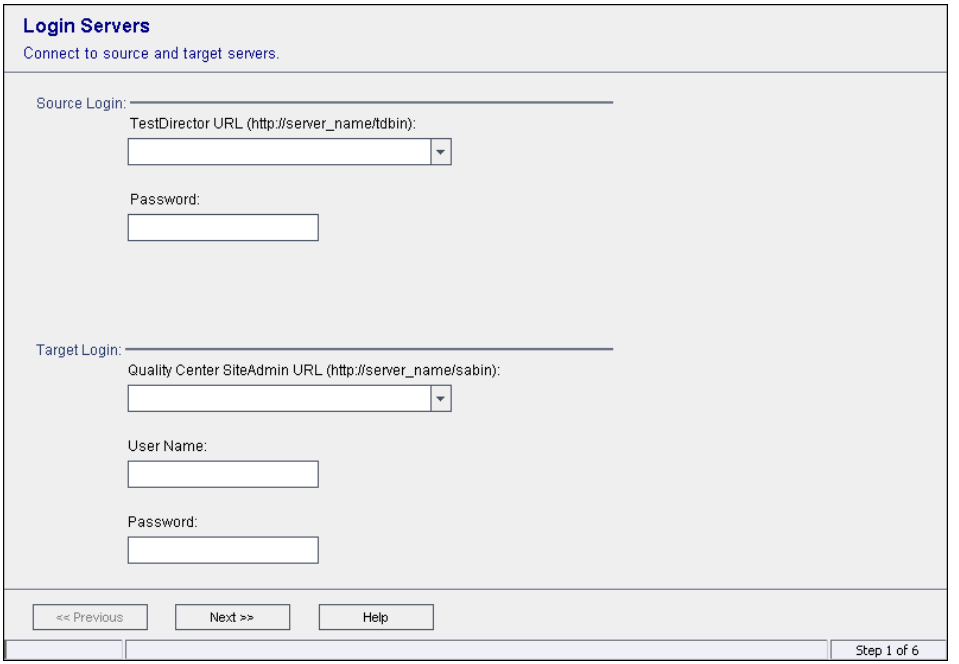
Note: Make sure that the executable is installed using the same user account that is used for running the TestDirector server.

---

3 On a separate machine, open the Quality Center Site Administration (http://<Quality Center server name>[<:port number>]/sabin), and log in. Site Administration opens.

TOOLS

4 Click the **Tools** button on the upper-right corner of the Site Administration window and choose **Migration Tool**. The Login Servers page opens.



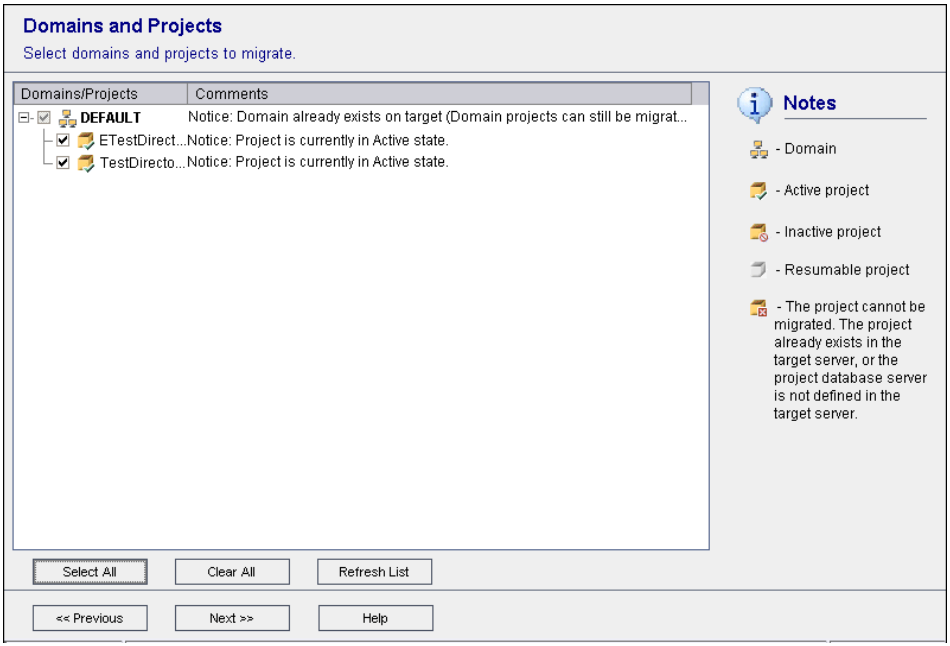
5 Under **Source Login**, specify the following:

- In **TestDirector URL**, specify the TestDirector URL from which you want to migrate the project (http://<TestDirector server name>/tdbin).
- In the **Password** box, type the TestDirector password for logging in to the Site Administrator.

6 Under **Target Login**, specify the following:

- In **Quality Center Site Admin URL**, specify the Quality Center Site Administration URL to which you want to migrate the project (http://<Quality Center server name>[<:port number>]/sabin).
- In the **User Name** box, type the Quality Center site administrator user name.
- In the **Password** box, type the Quality Center site administrator password.

7 Click **Next**. The Domains and Projects page opens.



8 Select the projects to be migrated. To select all projects, click **Select All**.

You cannot migrate a project in the following situations:

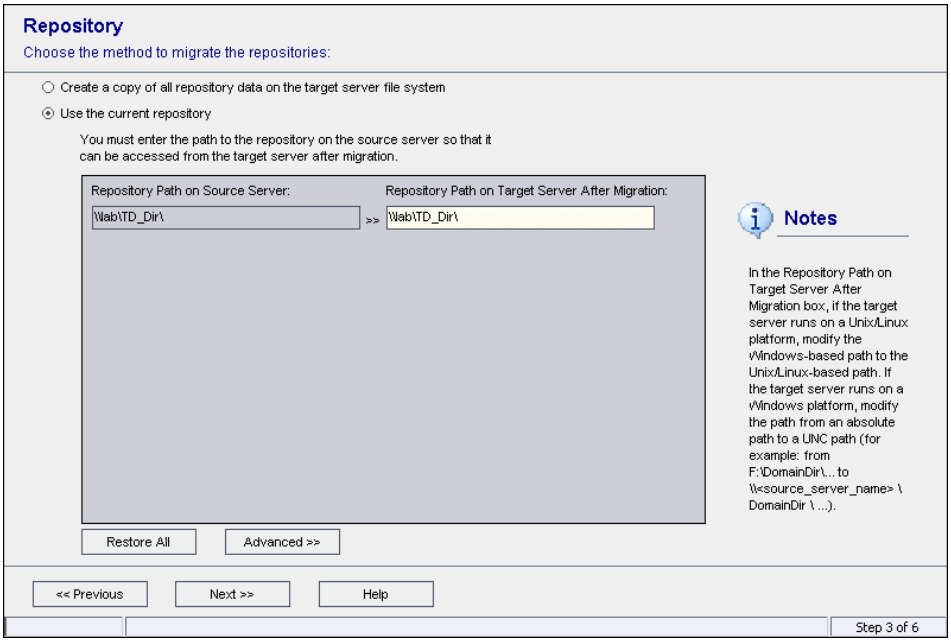
- A project of that name already exists on the Quality Center server.
- The project database server is not defined on the Quality Center server. On the Quality Center target server, define the database server configuration to be identical to that defined on the TestDirector source server. For more information on defining a database server, see “Defining New Database Servers” on page 115.

9 To clear all selected projects, click **Clear All**.

10 To refresh the projects list, click **Refresh List**.

11 If the migration process was previously interrupted before completion, you can resume the process. To resume, select a resumable project from the projects list or click **Select All Resumable** to select all resumable projects. Click **Resume** to continue the migration process. These buttons are available only if you have resumable projects.

12 Click **Next**. The Repository page opens.



13 Choose a repository migration option. For more information on the repository migration options, see “Choosing a Repository Migration Option” on page 72.

14 If you chose **Create a copy of all repository data on the target server file system**, proceed to step 16 on page 80.

If you chose **Use the current repository**, modify the target repository path in the **Repository Path on Target Server After Migration** box, as follows:

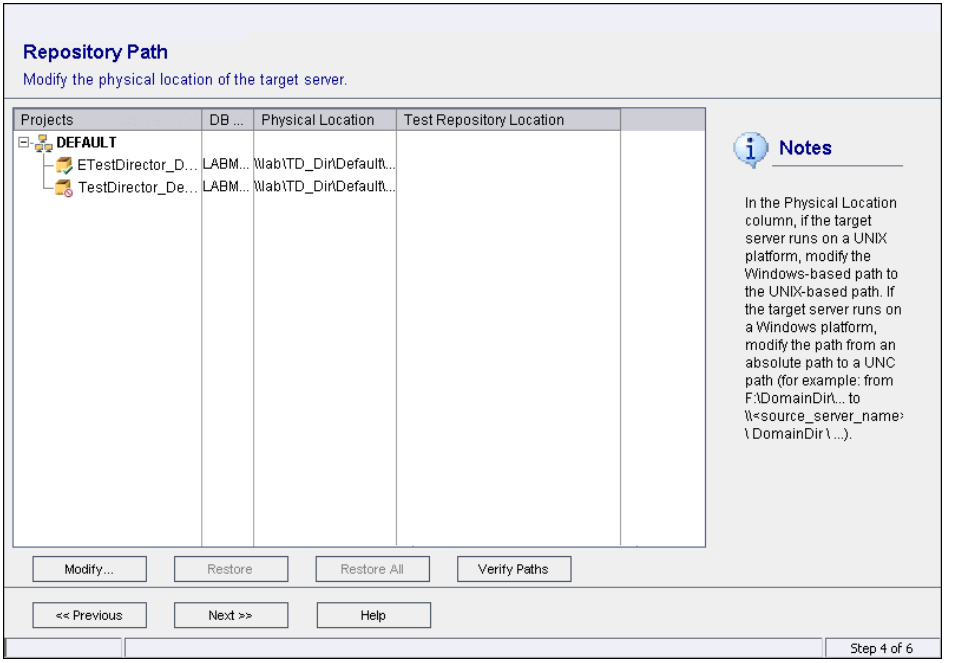
- If the target server runs on a Windows platform, modify the path from an absolute path to a UNC path. For example, change the target path from F:\Td_dir to \\<source_server>\Td_dir.
- If the target server runs on a UNIX or a Linux platform, modify the Windows-based path to the UNIX-based path. For example, to modify an absolute path to a UNIX/Linux-based path, change the target path from F:\Td_dir to /net/<source_server>/td_dir.

To undo all changes, click **Restore All** and then click **Yes** to confirm.

15 To modify or verify the physical path of a project on the Quality Center server, click **Advanced**.

If your database server does not have the text search feature enabled, a message box opens. After this process completes, you can enable the text search feature. For more information, see "Configuring Text Search" on page 120.

The Repository Path page opens.



The following columns are available:

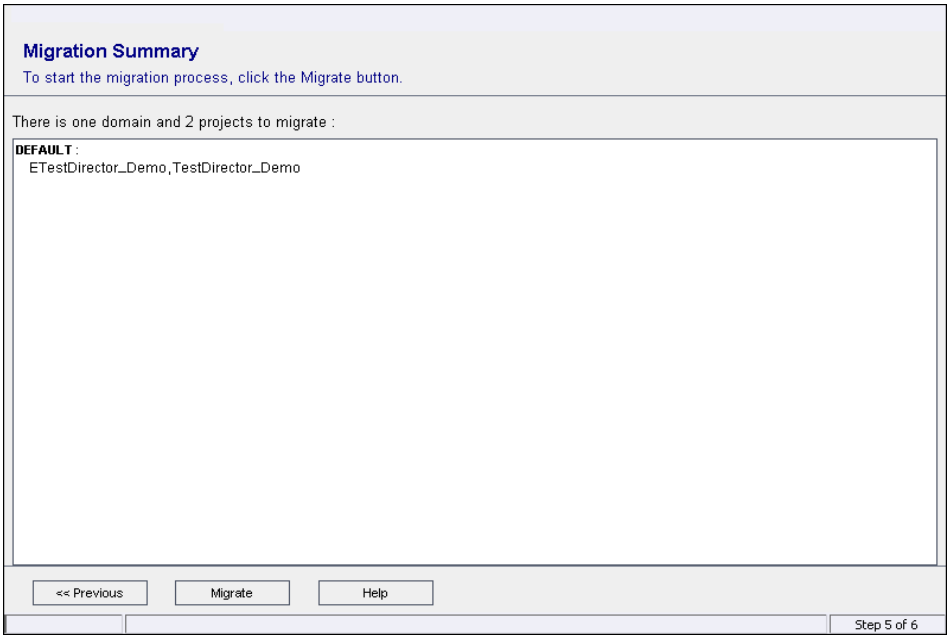
Column Name	Description
Projects	Indicates the project name.
DB Server Name	Indicates the name of the database server used for the project. The database server name used on the Quality Center machine must be the same as the name on the TestDirector machine.

Column Name	Description
Physical Location	Indicates the physical path of the project on the Quality Center server. To modify, double-click a physical location path or click **Modify**, and edit the path. If the Quality Center server runs on a UNIX or a Linux platform, modify the Windows-based path to the UNIX-based path. If the Quality Center server runs on a Windows platform, modify the path from an absolute path to a UNC path. ➤ To verify the availability of the paths, click **Verify Paths**. ➤ To undo a change, click **Restore** and then click **Yes** to confirm. ➤ To undo all changes, click **Restore All** and then click **Yes** to confirm.
Test Repository Location	The path is displayed if the test folder is not stored in the project repository. To modify, double-click a repository location path or click **Modify**, and edit the path. If the Quality Center server runs on a UNIX or a Linux platform, modify the Windows-based path to the UNIX-based path. If the Quality Center server runs on a Windows platform, modify the path from an absolute path to a UNC path. ➤ To verify the availability of the paths, click **Verify Paths**. ➤ To undo a change, click **Restore** and then click **Yes** to confirm. To undo all changes, click **Restore All** and then click **Yes** to confirm.

16 Click **Next**.

If your database server does not have the text search feature enabled, a message box opens. After this process completes, you can enable the text search feature. For more information, see "Configuring Text Search" on page 120.

The Migration Summary page opens.



17 Click **Migrate** to start the migration process. An information box opens.

18 Click **OK** to confirm.

19 When the migration process ends, an information box opens. Click **OK**.

If the migration fails, you must restore the backed up project before trying the migration process again. For more information, see "Restoring Quality Center and TestDirector Projects" on page 83.

20 To save the log file of the migration process as an HTML file, click **Save to File**.

21 Click **Close** to exit the Migration Tool.

Backing Up Quality Center and TestDirector Projects

You can protect data stored in your databases by backing up your Quality Center and TestDirector projects. It is recommended that you back up your projects before you upgrade or migrate from a previous version. You can back up projects stored on a database or in the file system.

Note:

- For information on where Quality Center 8.x stores its data, refer to the Mercury Support Knowledge Base (http://support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp), select **TestDirector for Quality Center**, and search for Article Number 36165.
- For information on where TestDirector stores its data, refer to the Mercury Support Knowledge Base (http://support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp), select **TestDirector for Quality Center**, and search for Article Number 18859. You can also refer to the *TestDirector 8.0 Administrator's Guide*.

Backing Up Projects Stored on the Database

You can back up Quality Center and TestDirector projects stored on an Oracle, Microsoft SQL, or MSDE database. In addition, you can back up TestDirector projects stored on an Access or Sybase database.

To back up projects stored on the database:

- **For Oracle:** Use the **exp** command. For more information on backing up a project on an Oracle database, refer to the Mercury Support Knowledge Base (http://support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp), select **TestDirector for Quality Center**, and search for Article Number 6760.
- **For Microsoft SQL and MSDE:** From the SQL Server Enterprise Manager, choose **Tools** > **Backup Database**. For more information on backing up a project on a Microsoft SQL or MSDE database, refer to the Mercury Support Knowledge Base (http://support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp), select **TestDirector for Quality Center**, and search for Article Number 10657.

- **For Access:** Navigate to the TestDirector Domain Physical directory on the file system. Under each project folder, make a copy of the **TestDir.mdb** file and store it elsewhere.
- **For Sybase:** Open **Sybase Central**, select your server, and click **Databases**. Right-click the TestDirector SQL database you want to back up, and select **Backup Database**.

Backing Up Projects Stored in the File System

If the project repository is stored in the file system, ensure that all data, including automated tests scripts and results, and attachments, is saved in the project directory under the repository defined during the installation of Quality Center. Make a copy of this common directory including all subdirectories and files.

If your automated tests are stored outside the project directory, make a copy of them. To find out whether your tests are outside the project directory, log in to the Site Administrator. In the **Projects** tab, click the **DATACONST** table for the project you want to back up. Check the value of the **DC_VALUE** field for the record with the **DC_CONST_NAME** tests directory. If it is not set as **tests** but is set instead to some other location, then your tests are outside of the project folder.

Restoring Quality Center and TestDirector Projects

If the upgrade or migration process fails, you must restore the backed up projects before trying the process again. You can restore Quality Center and TestDirector projects that were backed up on an Oracle, Microsoft SQL or MSDE database server, or in the file system.

To restore a project backed up on a Microsoft SQL or MSDE database server:

1. From the Site Administrator, create a new empty project using the same name and database location as the project you want to restore.
2. From the SQL Server Enterprise Manager, navigate to the database and select **Tools** > **Restore Database**.
3. Navigate to the backup file, and follow the restore procedure to complete the data restore process.
4. In the Site Administrator, restore the project. If you are restoring your project from a different directory, or if you renamed your schema, you must update the **dbid.xml** file accordingly. For more information on restoring projects, see "Restoring Access to Quality Center Projects" on page 58.

Note: For more information on restoring a project backed up on a Microsoft SQL or MSDE database, refer to the Mercury Support Knowledge Base (http://support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp), select **TestDirector for Quality Center**, and search for Article Number 10657.

To restore a project backed up on an Oracle database server:

1. Copy the backup file to the Oracle server machine.
2. Using the SQL*Plus utility, log in to the Oracle server using the **system** account.

3 Create a user for the Quality Center or TestDirector project. Make sure you create it with the same name as the Quality Center or TestDirector project name (or the Oracle user name) when the project was exported.

Use these SQL statements:

```
CREATE USER [<project name>] IDENTIFIED BY tdtdtd DEFAULT
TABLESPACE TD_data TEMPORARY TABLESPACE TD_TEMP;

GRANT CONNECT,RESOURCE TO [<project name>];
```

4 Using the command line, type imp to run the import utility.

5 Follow the prompt, and log in to the Oracle server using the **system** account. Make sure you import all the dump files.

After all tables have been successfully imported, a confirmation message displays.

6 In Site Administrator, restore the project. If you are restoring your project from a different directory, or if you renamed your schema, you must update the **dbid.xml** file accordingly. For more information on restoring projects, see "Restoring Access to Quality Center Projects" on page 58.

Note: For more information on restoring a project backed up on an Oracle database, refer to the Mercury Support Knowledge Base (http://support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp), select **TestDirector for Quality Center**, and search for Article Number 6760.

To restore a project backed up in the file system:

1 Copy the backed up repository to the Quality Center or TestDirector repository.

2 In the Site Administrator, restore the project. If you are restoring your project from a different directory, or if you renamed your schema, you must update the **dbid.xml** file accordingly. For more information on restoring projects, see "Restoring Access to Quality Center Projects" on page 58.

4

Managing Quality Center Users

You manage Quality Center users in Site Administration. You can add new Quality Center users, define user details, change user passwords, and define site administrators. You can also import users from LDAP and enable LDAP authentication for users. After you add users, you can assign projects to users.

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Updating User Details	96
Changing Passwords	97
Enabling LDAP Authentication for Users	99
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About Managing Users

You use Site Administration to manage the users connected to your Quality Center projects. You begin by adding or importing new users to the Users list in Site Administration. You can then define user details and change or override a user's password. You can also enable users to log in to Quality Center using their LDAP passwords.

For each Quality Center user, you can select projects that the user can access. You can also define Quality Center users as site administrators. For more information, see "Defining Site Administrators" on page 23.

Note: You can monitor the users currently connected to a Quality Center server. For more information, see Chapter 5, "Managing User Connections and Licenses."

Adding a New User

You can add new users to the Users list in Site Administration. After the user is added, you can view users and define user details. For more information on updating user details, see "Updating User Details" on page 96.

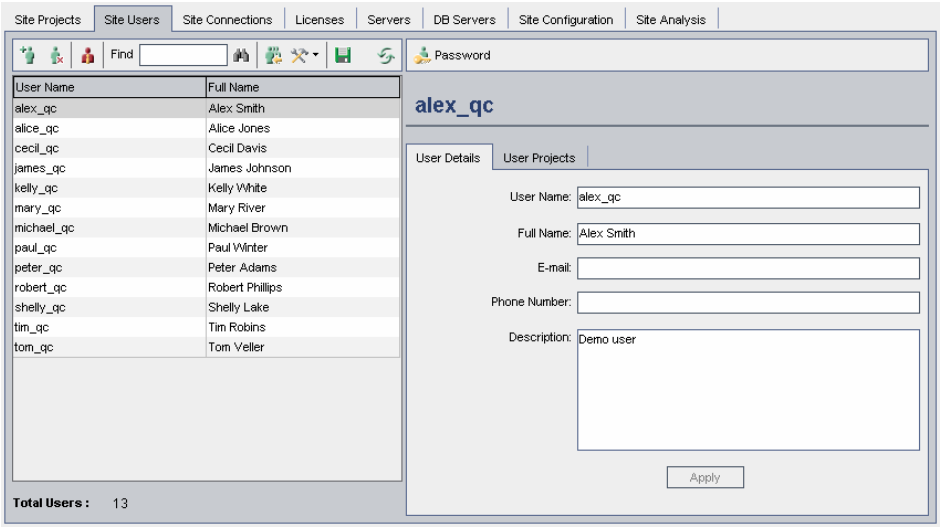
You can also import new users from LDAP directories. For more information, see "Importing Users from LDAP" on page 88.

Note: Creating a new user for a Quality Center project consists of two steps:

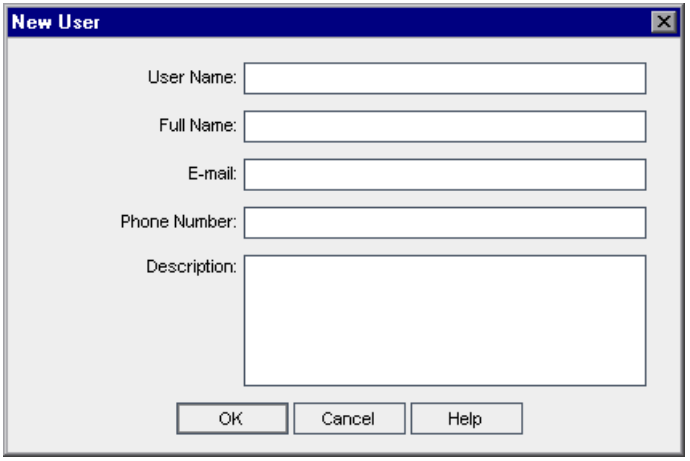
- Adding the user to the Users list in Site Administration (as described in this section).
- Assigning the user to a user group using Project Customization. Each user group has access to certain Quality Center tasks. For more information, see Chapter 9, "Managing Users in a Project," and Chapter 10, "Managing User Groups and Permissions."

To add a new user:

1 In Site Administration, click the **Site Users** tab.



2 Click the **New User** button. The New User dialog box opens.



3 Type a **User Name** (maximum length 60 characters) and **Full Name**.

4 Type additional user information: **E-mail**, **Phone Number**, and a **Description**. The e-mail information is important, as it enables users to receive project information directly to their mailboxes.

Note: You can update user information in the User Details tab. For more information, see "Updating User Details" on page 96.

---

5 Click **OK**. The new user is added to the Users list.

Importing Users from LDAP

You can import users from an LDAP directory to the Users list in Site Administration.

Notes:

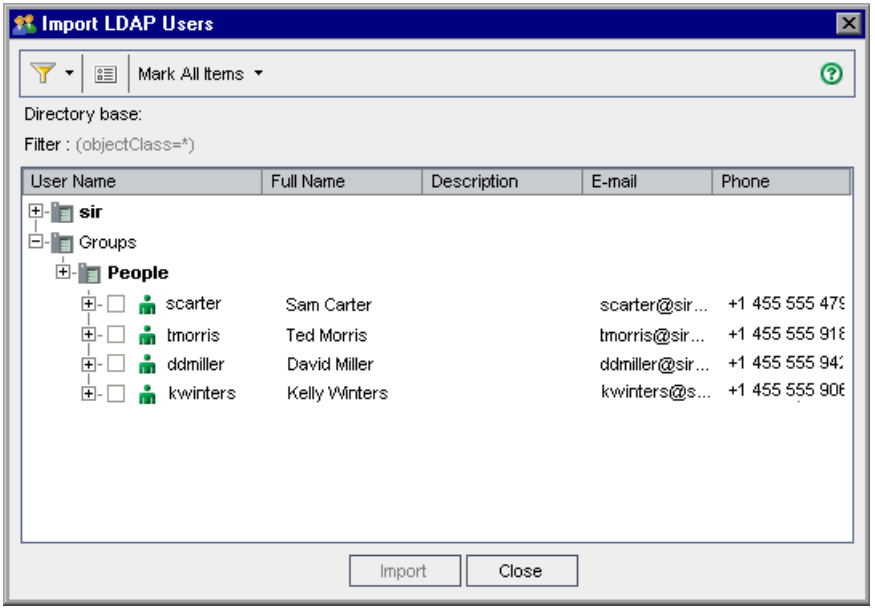
- To work with LDAP through SSL requires that you perform additional steps. For more information, refer to the Mercury Support Knowledge Base (http://support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp), select **TestDirector for Quality Center**, and search for Article Number 34793.
- The **LDAP_TIMEOUT** parameter enables you to define a connection time-out between Quality Center and an LDAP server. By default, the value is set to 10 minutes. For more information, see "LDAP_TIMEOUT" on page 134.

To import a user from LDAP:

1 In Site Administration, click the **Site Users** tab.

2 Ensure that the LDAP import settings are defined. For more information, see "Defining LDAP Settings for Importing Users" on page 90.

3 Click the **Import LDAP Users** button. The Import LDAP Users dialog box opens.



4 To filter the LDAP directory base, click the **Filter All** button. If you have preselected users, a warning message box opens. Click **OK** to clear all selections and continue. The Filter dialog box opens. Type a filter condition to display specific records from your LDAP directory base and click **OK**.

5 To view LDAP details for a user, select an item and click the **Show LDAP Details** button. The LDAP User Details dialog box opens and displays the user attributes.

6 You can use the following options to import users:

- To import a user, expand a directory and mark the user name by selecting the check box.
- To import a group of users, use **Ctrl** or **Shift** to highlight users to include. Click the **Mark All Items** arrow and choose **Mark Selected Items** to select the check boxes of the highlighted users.
- To import all users, click **Mark All Items**.

7 To clear the check boxes of highlighted users, click the **Mark All Items** arrow and choose **Clear Selected Items**. To clear all check boxes, click the **Mark All Items** arrow and choose **Clear All**.

8 Click **Import**. A confirm message box opens. Click **Yes** to continue.

- If the users were imported successfully, a message box opens. Click **OK**. Proceed to step 9.
- If the same user names exist in the Users list, the Handle Conflict dialog box opens. For more information, see "Handling User Name Conflicts" on page 94.

9 Click **Close** to close the Import LDAP Users dialog box.

Defining LDAP Settings for Importing Users

To enable you to import users from an LDAP directory to the Users list in Site Administration, you must define your LDAP import settings.

When you import users from an LDAP directory, Quality Center copies attribute values from an LDAP directory into Quality Center. For each imported user, the following attribute values are copied:

- **Distinguished name (DN).** A unique name that is made up of a sequence of relative distinguished names (RDN) separated by commas.

  For example: CN=John Smith, OU=QA, O=Mercury

  where CN is the common name; OU is the organizational unit; and O is the organization.

- **Userid (UID).** The name that identifies a user as an authorized user. The UID attribute value is mapped to the **User Name** field in Quality Center.

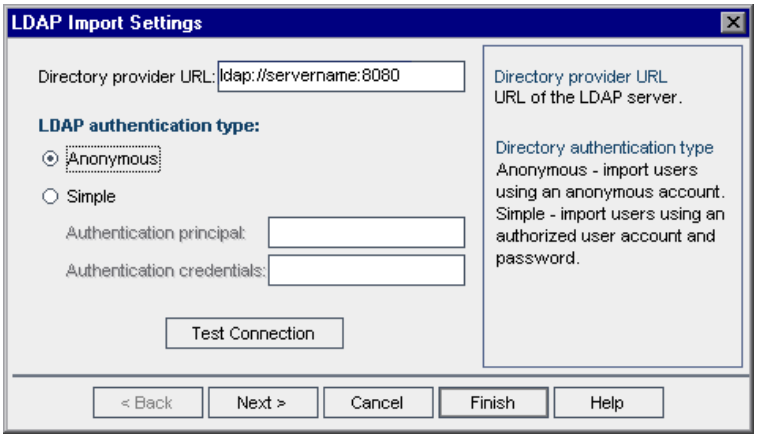
- **Full Name, Description, E-mail and Phone.** Optional attributes that are used to populate the Full Name, Description, E-mail, and Phone Number fields for each user imported from an LDAP directory.

Note: The optional **LDAP_IMPORT_ATTRIBUTE_MASK** parameter enables you to define a regular expression that can be used to distinguish between different values for an LDAP attribute. For more information, see "Setting Quality Center Configuration Parameters" on page 126.

To define LDAP settings for importing users:

1 In Site Administration, click the **Site Users** tab.

2 Click the **User Settings** button and choose **LDAP Import Settings**. The LDAP Import Settings dialog box opens.



3 In the **Directory provider URL** box, type the URL of the LDAP server (ldap://<server name>:<port number>).

4 Under **LDAP authentication type**:

- Select **Anonymous** to enable you to import users from the LDAP server using an anonymous account.
- Select **Simple** to enable you to import users from the LDAP server using an authorized user account and password.

5 If you select **Simple**, the following options are enabled:

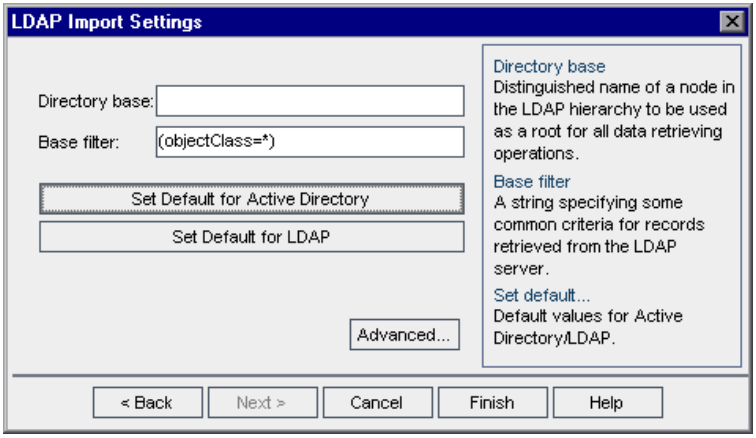
- In the **Authentication principal** box, type the authorized user name.
- In the **Authentication credentials** box, type the password.

6 Click the **Test Connection** button to test the URL of the LDAP server.

7 Choose one of the following options:

- To define additional LDAP settings, proceed to step 8.
- To close the LDAP Import Settings dialog box, click **Finish**.

8 To define additional LDAP settings, click **Next**. The following dialog box opens.



9 In the **Directory base** box, type the LDAP directory name.

10 In the **Base filter** box, define filter criteria.

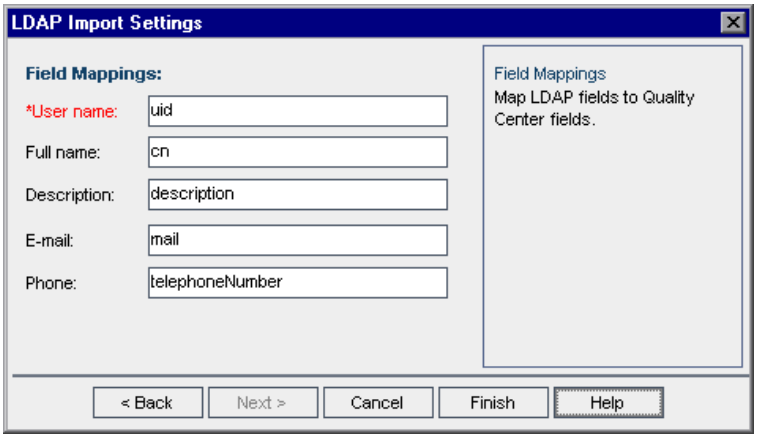
11 To set the default values for the Active Directory, click the **Set Default for Active Directory** button.

12 To set the default values for LDAP, click the **Set Default for LDAP** button.

13 Choose one of the following options:

- To populate optional attributes in Quality Center for each user imported from an LDAP directory, proceed to step 14.
- To close the LDAP Import Settings dialog box, click **Finish**.

14 To populate optional attributes in Quality Center for each user imported from an LDAP directory, click **Advanced**. The following dialog box opens.



15 Define the corresponding LDAP field names. Note that **User Name** is a required field.

16 Click **Finish** to close the LDAP Import Settings dialog box.

Handling User Name Conflicts

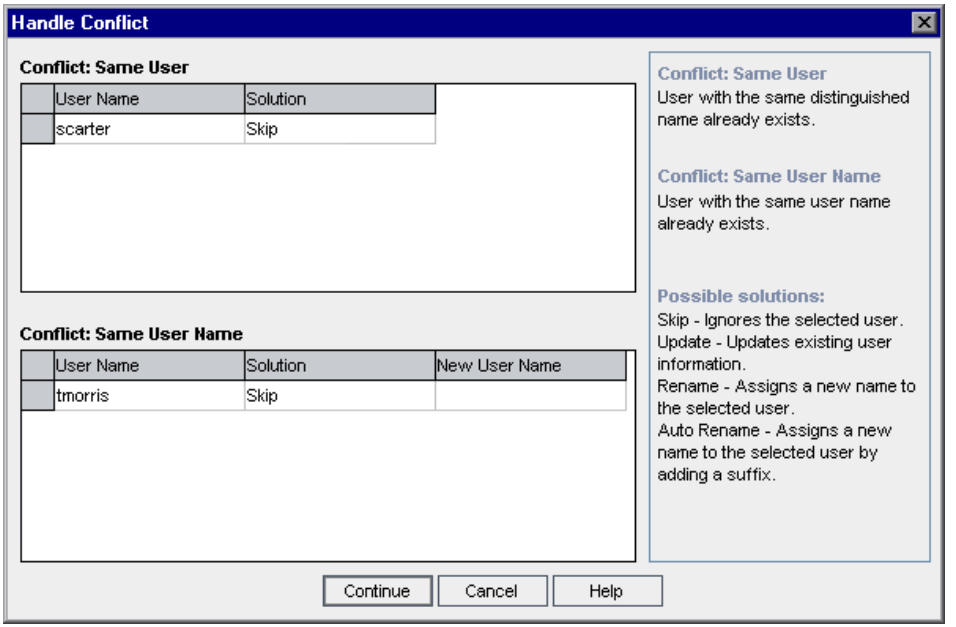
When importing users from an LDAP directory to the Users list in Site Administration, you may encounter the following conflicts:

- **Same user.** A user with the same LDAP distinguished name already exists.
- **Same user name.** A user with the same user name already exists.

To resume the process of importing users, you can choose to ignore the user, rename a user name, or update user information.

To handle user name conflicts:

1 Import users (see step 8 in "Importing Users from LDAP"). If conflicts occur, the Handle Conflict dialog box opens.



2 If the conflict is listed under **Conflict: Same User**, you can choose one of the following options to resume the process:

Option	Description
Update	Updates existing user information. Click the corresponding **Solution** box. Click the browse button and choose **Update**.
Skip	Does not import the selected user (default).

3 If the conflict is listed under **Conflict: Same User Name**, you can choose one of the following options to resume the process:

Option	Description
Rename	Assigns a new name to the selected user. Click the corresponding **Solution** box. Click the browse button and choose **Rename**. In the **New User Name** box, type the new name.
Auto Rename	Assigns a new name to the selected user by adding a suffix. Click the corresponding **Solution** box. Click the browse button and choose **Auto Rename**. The new name is displayed in the **New User Name** box.
Update	Updates existing user information. Click the corresponding **Solution** box. Click the browse button and choose **Update**.
Skip	Does not import the selected user (default).

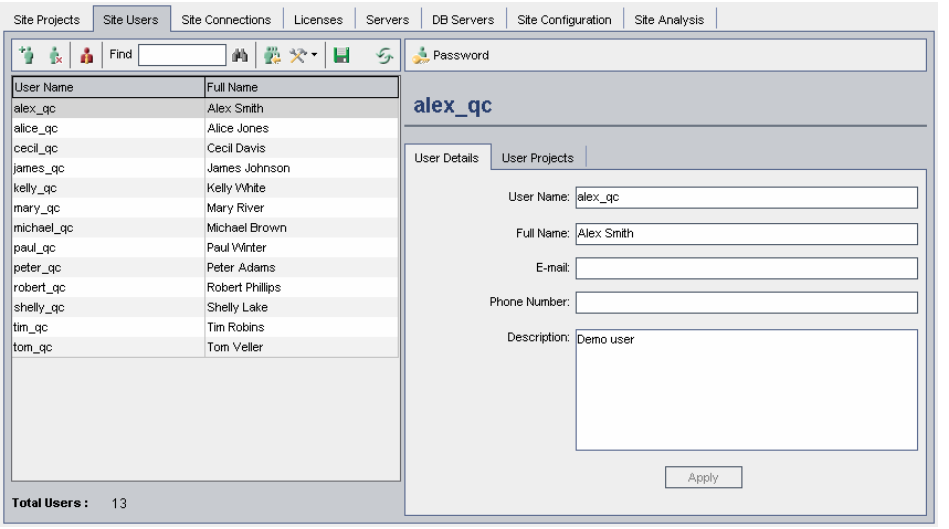
4 Click **Continue**.

Updating User Details

After you add a user, you can update user details. For example, you may need to update a user's full name or contact details. You can also define Quality Center users as site administrators. For more information, see "Defining Site Administrators" on page 23.

To update user details:

1 In Site Administration, click the **Site Users** tab. In the right pane, click the **User Details** tab.



2 Select a user from the Users list.

You can search for a user in the Users list by typing the name of a user in the **Find** box, and clicking the **Find** button. The first user that matches the searched text is highlighted. Click the button again to search for other users containing the searched text.

3 Edit the user detail fields.

Note: If the user was imported from an LDAP directory to Site Administration, the **Domain Authentication** box displays the LDAP authentication properties of the imported user. If the user was not imported, the **Domain Authentication** box is not displayed. For more information, see "Importing Users from LDAP" on page 88.

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4 To assign projects to a user, click the **User Projects** tab. For more information, see "Assigning Projects to Users" on page 101.

5 Click **Apply** to save your changes.

Changing Passwords

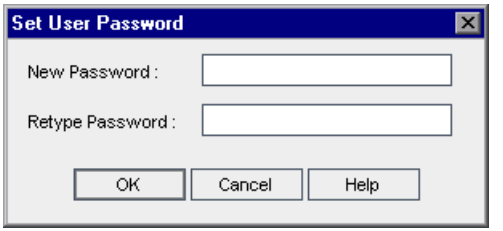
The site administrator can change or override a user's password.

Notes:

- You can only change passwords for users that are set to log in to Quality Center using their Quality Center passwords. If LDAP passwords are in use, this option is unavailable. For more information on LDAP authentication, see "Defining LDAP Settings for Importing Users" on page 90.
- Non-administrators can change their passwords using the **User Properties** link in the Project Customization window. For more information, refer to the *HP Quality Center User's Guide*.

To change a password:

1. In Site Administration, click the **Site Users** tab.
2. Select a user from the Users list.
3. Click the **Password** button. The Set User Password dialog box opens.



4. In the **New Password** box, type a new password (maximum length 20 characters).
5. In the **Retype Password** box, retype the user's new password.
6. Click **OK**.

Enabling LDAP Authentication for Users

You can allow users to log in to Quality Center using their LDAP passwords, instead of Quality Center passwords.

Working with LDAP through SSL requires that you perform additional steps. For more information, refer to the for Mercury Support Knowledge Base (http://support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp), select **TestDirector for Quality Center**, and search for Article Number 34793.

Note: When users attempt to log in to Quality Center, they are authenticated against LDAP using the distinguished names (DN) that are stored in the Domain Authentication property in the Quality Center database. When the user attempts to log in, and the DN information in Quality Center is invalid, the user is unable to log in to Quality Center.

You can enhance the search so that when the DN information is invalid, Quality Center also searches on the LDAP server, using the LDAP import settings defined in Site Administration. If the user is found, the DN is updated in Quality Center, and an automatic login attempt is performed.

To set this extended search, define a comma-separated list for the **LDAP_SEARCH_USER_CRITERIA** Site Configuration parameter. The possible values are **username**, **email**, **fullname**, **phone**, **description**. The order of the properties defines their priority if multiple results are found.

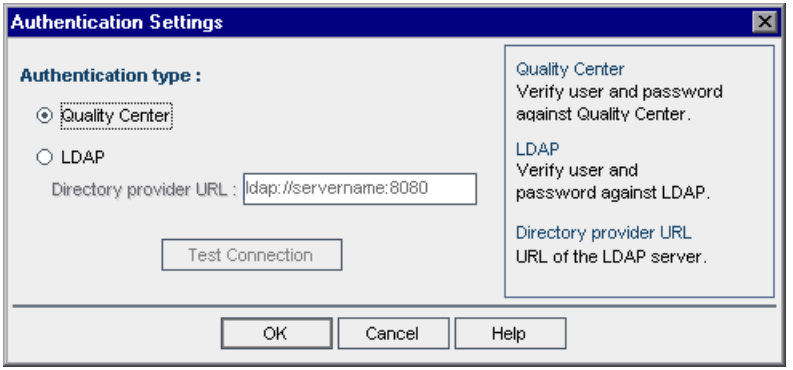
For example, if the parameter is set to username and email, and two users are found with the same user name on the LDAP server, their e-mail addresses are checked. If more than one user is found answering the set properties, an error message is returned. If the search for the user succeeds, the user is logged in to Quality Center.

For more information, see “Setting Quality Center Configuration Parameters” on page 126.

To enable LDAP authentication for users:

1 In Site Administration, click the **Site Users** tab.

2 Click the **User Settings** button and choose **Authentication Settings**. The Authentication Settings dialog box opens.



3 Under **Authentication type**, select **LDAP** to set the authentication type as LDAP for all users.

4 In the **Directory provider URL** box, type the URL of the LDAP server (ldap://<server name>:<port number>).

5 Click the **Test Connection** button to test the URL of the LDAP server.

6 Click **OK**.

Note: Once LDAP authentication is enabled, authentication will be performed against the LDAP server. Make sure that the site administrator is set up as an LDAP user before switching to LDAP authentication, otherwise the site administrator will not be able to log in after the authentication type is switched.

Assigning Projects to Users

As a Quality Center site administrator, you can control user access to Quality Center projects by defining the projects to which a user can log on. When a user is no longer working on a project, remove the user from the User Projects list.

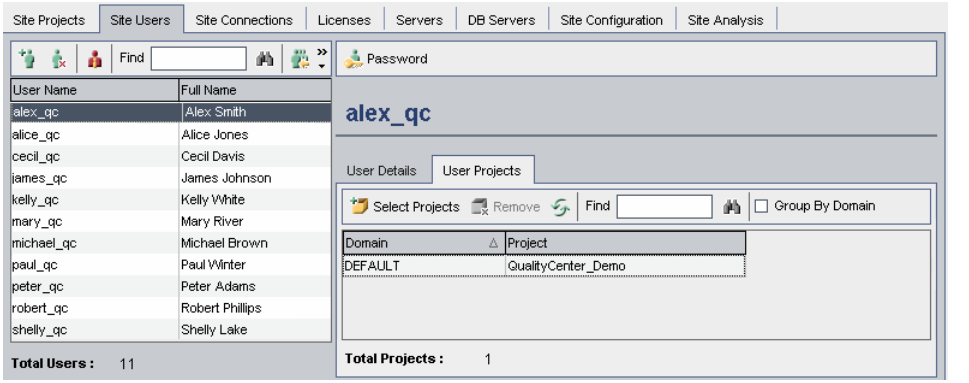
When you add a user to a project, the user is automatically assigned to the project with Viewer privileges. For more information on user groups and group privileges, see Chapter 9, "Managing Users in a Project," and Chapter 10, "Managing User Groups and Permissions."

Notes:

- You can assign users to projects from the Site Projects tab. For more information, see "Assigning Users to Projects" on page 46.
- Quality Center sends automatic e-mail notification to project administrators when users are assigned or removed from a project in Site Administration. You can make automatic notification unavailable by adding the **AUTO_MAIL_USER_ NOTIFICATION** parameter in the Site Configuration tab. For more information, see "AUTO_MAIL_USER_ NOTIFICATION" on page 131.

To assign projects to a user:

1 In Site Administration, click the **Site Users** tab. In the right pane, select the **User Projects** tab. The Projects list for the selected user is displayed.



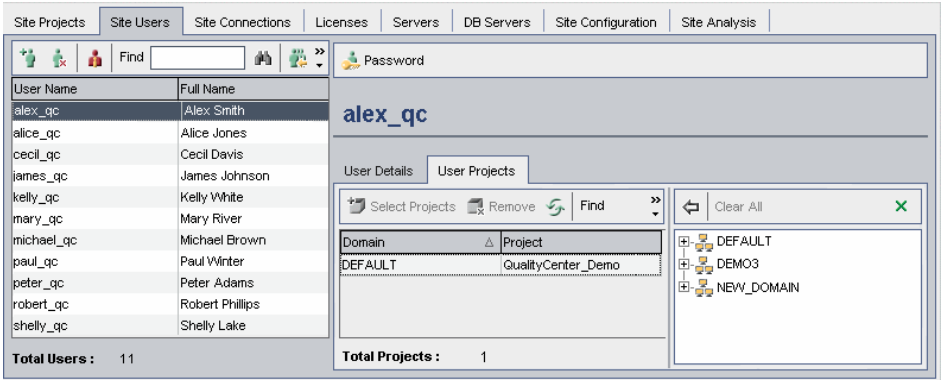
You can click the **Domain** column to change the sort order from ascending to descending domain names. You can also click the **Project** column to sort according to project instead of domain name.

2 In the Users list in the left pane, select a user. You can search for a user by typing the name of a user in the **Find** box, and clicking the **Find** button.

The selected user's projects are displayed in the User Projects list.

To group user projects by domain, select **Group By Domain**. Clear the check box to remove the group by settings.

3 In the User Projects tab, click the **Select Projects** button. The Quality Center Projects list is displayed in a new pane to the right of the User Projects tab.



4 To select projects from the Projects list, expand the directory, and select the projects that you want to assign to the user.

To clear all selected projects, click **Clear All**.

5 Click the **Add current user to the selected projects** button. The selected projects are added to the User Projects list.

6 To remove a project from the User Projects list, select the project and click the **Remove** button. Click **OK** to confirm. The project is removed from the User Projects list. Note that this does not delete the project from the server.

7 To refresh the User Projects list, click the **Refresh Users List** button.

Exporting User Data

You can export the user name and full name of all site users from the Users list to a text file.

To export user data:

1 In Site Administration, click the **Site Users** tab.

2 Click the **Export User Data To File** button. The Export Data To File dialog box opens.

3 Select the directory where you want to save the parameters, and enter a name for the file in the **File name** box.

4 Click **Save** to export the data to a text file.

Deleting Users

You can delete a user from the Users list.

To delete a user:

1 In Site Administration, click the **Site Users** tab.

2 Select a user from the Users list.

3 Click the **Delete User** button.

4 Click **Yes** to confirm.

5

Managing User Connections and Licenses

In Site Administration, you can monitor user connections and modify license information.

This chapter describes:	On page:
About Managing User Connections and Licenses	105
Monitoring User Connections	106
Managing Quality Center Licenses	109

About Managing User Connections and Licenses

You use the **Site Connections** tab in Site Administration to monitor and manage the users connected to your Quality Center projects. For more information, see "Monitoring User Connections" on page 106.

You use the **Licenses** tab in Site Administration to view Quality Center license information and to modify the license key, if needed. For more information, see "Managing Quality Center Licenses" on page 109.

Monitoring User Connections

You can use the Site Connections tab to perform the following:

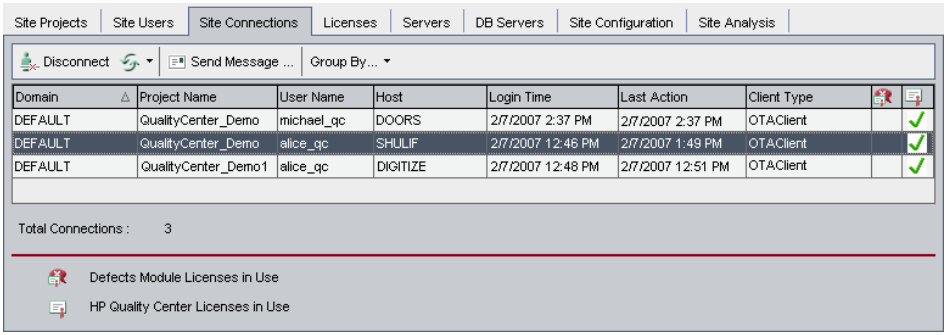
- Monitor the users currently connected to a Quality Center server. For each user, you can view the domain and project being used, the user's machine name, the time the user first logged in to the project, and the time the most recent action was performed. You can also view the client type connection to the Quality Center server.
- View the licenses that are currently being used by each user. The **HP Quality Center license**  indicates that the user can access all modules in a specific project. The **Defects Module license**  indicates that the user can access only the Defects module.
- Send messages to users connected to your Quality Center projects. You can also disconnect users from projects.
- Modify access to a Quality Center project using the **Module Access** link. For more information, see "Customizing Module Access for User Groups" on page 194.

Notes:

- To view the total number of licenses that are in use for each Quality Center module, click the **Licenses** tab. For more information, see "Managing Quality Center Licenses" on page 109.
- To view and analyze the number of licensed Quality Center users connected to your projects at specific points over a period of time, click the **Site Analysis** tab. For more information, see "Monitoring Site Usage" on page 144.

To monitor user connections:

1 In Site Administration, click the **Site Connections** tab.



You can click any column heading to change the sort order of the column from ascending to descending.

2 To refresh the Connections list, click the **Refresh Connections List** button.

To instruct Quality Center to automatically refresh the Connections list, click the **Refresh Connections List** arrow and choose **Automatic Refresh**. By default, the Connections list is automatically refreshed every 60 seconds. To change the automatic refresh rate, click the **Refresh Connections List** arrow and choose **Set Refresh Rate**. In the Set Refresh Rate dialog box, specify a new refresh rate in seconds.

3 You can group connected users by clicking the **Group By** arrow, and choosing a Group By option. To group connected users by project, choose **Group By Project**. To group connected users by user, choose **Group By User**. To clear the Group By settings, click the **Group By** arrow and choose **Clear Group By**.

4 You can send a message to a connected user or group of users by clicking the **Send Message** button. For more information on sending messages, see “Sending Messages to Connected Users” on page 108.

5 To disconnect a user or group of users from a project, select the row of the user or group and click the **Disconnect Users** button. Click **Yes** to confirm.

Sending Messages to Connected Users

You can send messages to users connected to your Quality Center projects. This enables you to routinely inform connected users about important maintenance activities. For example, disconnecting a project, or restarting a Quality Center server.

When you send a message, a pop-up window automatically opens on the user's machine displaying the message text. The message box is displayed until the user closes it or disconnects from Quality Center. For more information, refer to the *HP Quality Center User's Guide*.

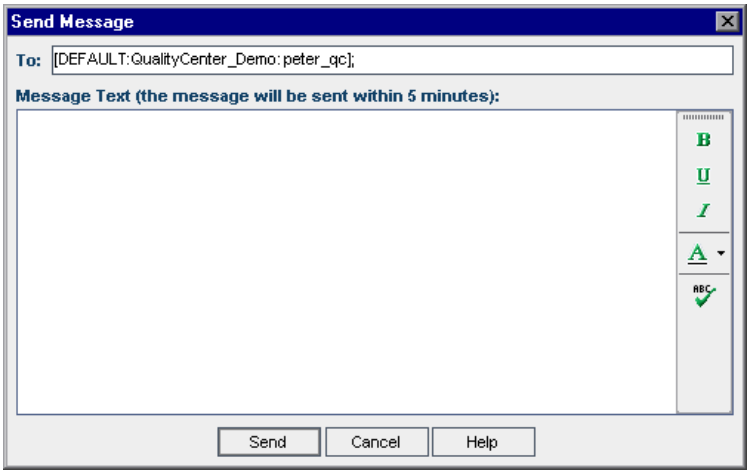
To send messages to connected users:

1 In Site Administration, click the **Site Connections** tab.

2 Select the users to whom you want to send a message:

- To send a message to a user or group of users, select the row of the user or group.
- To send a message to multiple users, use **Ctrl** or **Shift** to highlight users to include.

3 Click the **Send Message** button. The Send Message dialog box opens.



The **To** box displays the intended recipients of the message in the format [DOMAIN:Project Name:User Name].

4 In the **Message Text** box, type a message.

5 Click **Send**. Quality Center sends the message to user machines within five minutes.

Managing Quality Center Licenses

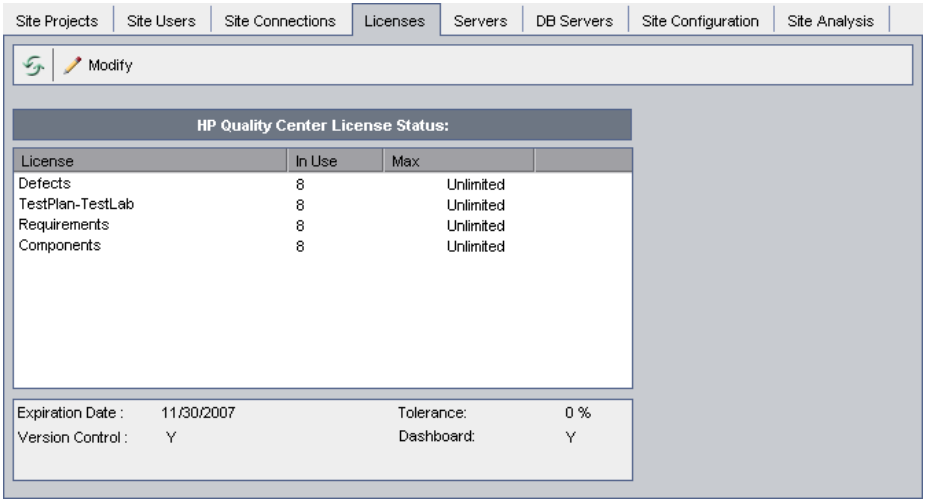
You can view the total number of licenses in use and the maximum number of licenses that you have for each Quality Center module. When other HP tools, such as QuickTest Professional, are connected to a Quality Center project, you can view the total number of licenses in use for these tools. You can also modify your license file.

Notes:

- To view the Quality Center licenses that are currently being used by each user, click the **Site Connections** tab. For more information, see "Monitoring User Connections" on page 106.
- To view and analyze the number of licensed Quality Center users connected to your projects at specific points over a period of time, click the **Site Analysis** tab. For more information, see "Monitoring Site Usage" on page 144.

To manage Quality Center licenses:

1 In Site Administration, click the **Licenses** tab.



2 To refresh the license information displayed in the Licenses tab, click the **Refresh Licenses List** button.

3 To modify the license, click the **Modify License** button. The License Edit dialog box opens. To load the license file, click **Load License** and select the file. Alternatively, copy the license file and click **Paste License**. Click **OK**.

6

Configuring Servers and Parameters

You use Site Administration to configure Quality Center and Site Administration servers, define and modify database servers, configure the text search, set configuration parameters, and define the Quality Center mail protocol.

This chapter describes:	On page:
About Configuring Servers and Parameters	112
Configuring Server Information	113
Defining New Database Servers	115
Modifying Database Server Properties	117
Configuring Text Search	120
Setting Quality Center Configuration Parameters	126
Setting the Quality Center Mail Protocol	142

About Configuring Servers and Parameters

You use the **Servers** tab to configure Quality Center and Site Administration server information. You can set the server log file and maximum number of database handles. For more information, see "Configuring Server Information" on page 113.

You use the **DB Servers** tab to define database servers that were not defined during installation. For each database server, you enter the database type, database name, default connection string, and administrator user and password. For more information, see "Defining New Database Servers" on page 115.

You also use the **DB Servers** tab to modify existing database server definitions. For more information, see "Modifying Database Server Properties" on page 117. In addition, you can configure the text search option for a specified database server that has the text search feature installed and configured. For more information, see "Configuring Text Search" on page 120.

You use the **Site Configuration** tab to add and modify Quality Center configuration parameters. For more information, see "Setting Quality Center Configuration Parameters" on page 126. In addition, you can set the mail protocol to be used by all the server nodes in your Quality Center site. For more information, see "Setting the Quality Center Mail Protocol" on page 142.

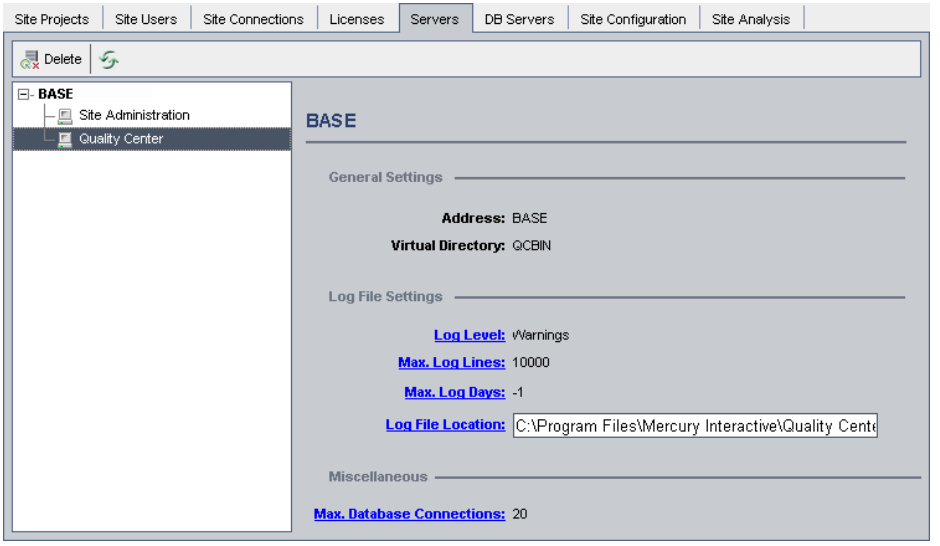
Configuring Server Information

You can configure Quality Center and Site Administration server information. This includes:

- **Setting the Quality Center server log file.** The Quality Center server can write all Quality Center events—API functions that send requests to a Quality Center project—to a log file. The log file displays the date and time a function was run. This enables Customer Support to trace where errors occur, if necessary. By default, the Quality Center server does not automatically record events.
- **Setting the maximum number of database connections.** The Quality Center server can open a number of connections for each project on a database server. You can set the maximum number of concurrent connections that can be opened by the Quality Center server for each project.

To configure Quality Center server information:

1 In Site Administration, click the **Servers** tab.



2 In the Server list, expand a server.

3 To set Site Administration server information, select **Site Administration**. To set Quality Center server information, select **Quality Center**.

The **General Settings** area displays the server address and virtual directory name. For the Site Administration server, the virtual directory name is **sabin**. For the Quality Center server, the virtual directory name is **qcbin**.

4 Under **Log File Settings**, click the **Log Level** link to configure the type of log file you want the server to create. Select one of the following options in the Log Level dialog box:

- **None.** Does not create a log file.
- **Errors.** Records error events.
- **Warnings.** Records potentially harmful situations.
- **Flow.** Records informational messages that highlight the application flow.
- **Debug.** Records events that are most useful for debugging.

5 Click the **Max. Log Lines** link to open the Maximum Log Lines dialog box and configure the maximum number of lines that the Quality Center server can write to the log file. Quality Center creates a new log file after the log file reaches the maximum number of lines. The default value is 10,000.

6 Click the **Max. Log Days** link to open the Maximum Log Days dialog box and configure the maximum number of days that the Quality Center server keeps the log file. Quality Center automatically deletes the log files once the maximum number of days has been reached. The default value is **Unlimited**, which is displayed as **-1**.

7 Click the **Log File Location** link to change the directory path of the log file. In the Log File Location dialog box, type the new location for the log file.

8 If you are setting the Quality Center server information, you can also set the maximum number of concurrent connections that can be opened by the Quality Center server for each project. Click the **Max. Database Connections** link to open the Maximum Database Connections dialog box and set the maximum number of concurrent connections.

9 To delete a Quality Center server from the Server list, select it and click the **Delete QC Server** button. Click **Yes** to confirm.

10 Click the **Refresh QC Servers List** button to refresh the servers list.

Defining New Database Servers

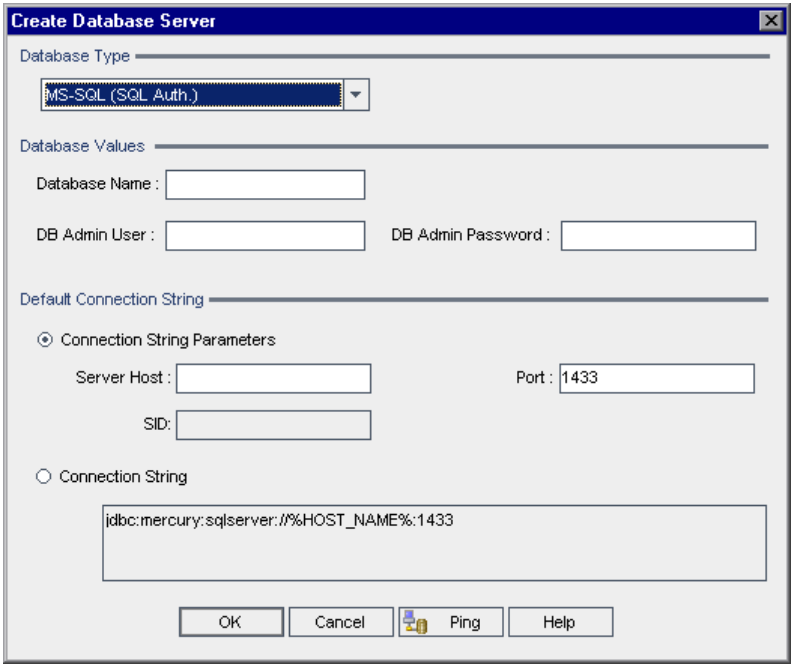
You can define additional database servers that were not defined during the installation process.

Note: For information on the Oracle or Microsoft SQL permissions required by Quality Center, refer to the *HP Quality Center Installation Guide*.

To define a new database server:

1 In Site Administration, click the **DB Servers** tab.

2 Click the **New Database Server** button. The Create Database Server dialog box opens.



3 Under **Database Type**, select the type of database server you want to define:

- **MS-SQL (SQL Auth.).** Uses SQL authentication.
- **MS-SQL (Win Auth.).** Uses Microsoft Windows authentication.
- **Oracle**

4 Under **Database Values**, in the **Database Name** box, type the database name.

5 In the **DB Admin User** box, type the login name of the database administrator.

- For Oracle database type, the default administrator user account enabling you to create Quality Center projects is **system**.
- For MS-SQL (SQL Auth.) database type, the default administrator user account enabling you to create Quality Center projects is **sa**.
- For MS-SQL (Win Auth.) database type, the **DB Admin User** box is unavailable. The login name of the database administrator is the Windows user that is set to run Quality Center as a service.

6 In the **DB Admin Password** box, type the password of the database administrator. This field is unavailable if you selected the **MS-SQL (Win Auth.)** database type.

7 Under **Default Connection String**, you can edit the default connection string parameters or the connection string, as follows:

- To edit the default connection string parameters, choose **Connection String Parameters** and define the following parameters:

Parameter	Description
Server Host	The server name.
Port	The port number of the database server.
SID	The service ID for an Oracle database server.

- To edit the connection string, choose **Connection String** and edit the connection string.

8 To check whether you can connect to the database server, click the **Ping Database Server** button. The DB admin user and password you entered are displayed in the Ping Database Server dialog box. Click **OK**.

9 Click **OK** to close the Create Database Server dialog box. The new database server you defined appears in the Database Servers list.

10 Click the **Refresh Database Servers List** button to refresh the database servers list.

Modifying Database Server Properties

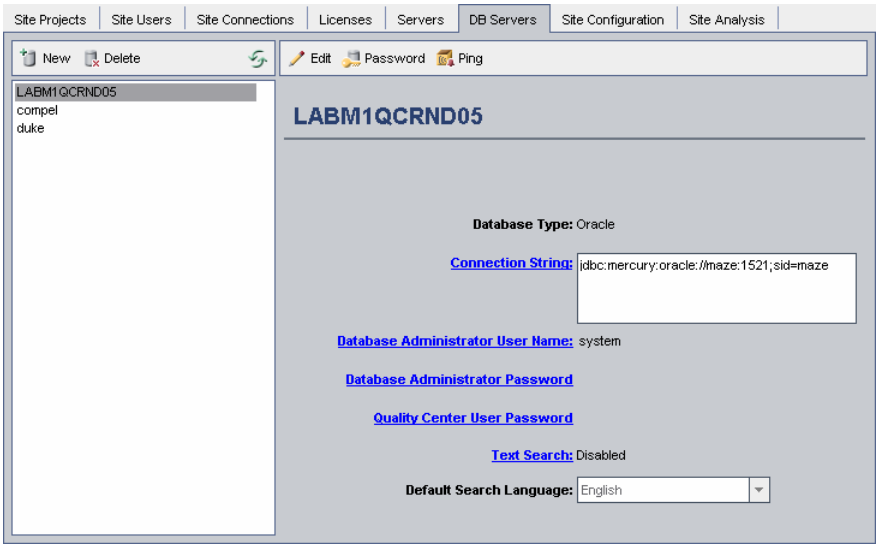
You can modify the database server properties.

Note: For information on the Oracle or Microsoft SQL permissions required by Quality Center, refer to the *HP Quality Center Installation Guide*.

To modify database server properties:

1 In Site Administration, click the **DB Servers** tab.

2 Select a database server in the Database Servers list.



3 To modify the connection string, click the **Edit Connection String** button, or click the **Connection String** link. Edit the connection string in the Connection String Editor and click **OK**. For more information on connection strings, see “Defining New Database Servers” on page 115.

4 To modify the database administrator’s login name, click the **Database Administrator User Name** link. In the Database Administrator User Name dialog box, type the new login name and click **OK**.

For more information on defining a new login name for a database administrator, see “Defining New Database Servers” (step 5) on page 116.

5 To modify the database administrator’s password, click the **Database Administrator Password** button, or click the **Database Administrator Password** link. In the Database Administrator Password dialog box, type the new password and then retype it. Click **OK**.

6 To modify the default Quality Center user password for accessing the database schema, click the **Quality Center User Password** link. In the Quality Center User Password dialog box, type the new password and retype it. Click **OK**.

Note: If you have existing Quality Center projects on your MS-SQL server, after you change the Quality Center user password, you must also update the password for each project.

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7 To enable text search capabilities in Quality Center, click the **Text Search** link.

If the text search is enabled, you can set the default text search language for the database server in the **Default Search Language** list.

For more information on text search, see "Configuring Text Search" on page 120.

8 To check whether you can connect to the database server, click the **Ping Database Server** button. The DB admin user and password you entered are displayed in the Ping Database Server dialog box. Click **OK**.

9 To delete a database server from the Database Servers list, select it and click the **Delete Database Server** button. Click **Yes** to confirm.

10 Click the **Refresh Database Servers List** button to refresh the database servers list.

Configuring Text Search

Text search allows users to enter keywords and search specific project fields in the Requirements, Test Plan and Defects modules. For information on working with the text search feature, refer to the *HP Quality Center User's Guide*.

Note: The **Text Search** link is available only if you install and configure the Oracle or SQL text searching feature. For Microsoft SQL 2005 SP1 and Oracle 10g, the text search feature is installed by default. For Oracle 9i, you must install and configure the text searching feature on your Oracle database server. Quality Center does not support the text search feature for Microsoft SQL 2000.

To configure text search, perform the following steps:

- Install and enable the text search feature on the database server. For more information, see "Enabling Text Search on the Database Server" on page 121.
- In Site Administration, enable text search and define the default search language for a specified database server in the DB Servers tab. For more information, see "Enabling Text Search in Quality Center" on page 122.
- To specify a different search language for a specific project, change the search language from the Site Projects tab. For more information, see "Selecting a Text Search Language for a Project" on page 123.
- For a specific project, define the project fields to be included in the search from Project Customization. For more information, see "Defining Searchable Fields" on page 124.

Enabling Text Search on the Database Server

Text search is available only if the text searching feature has been installed and configured on an Oracle or SQL database server. For Microsoft SQL 2005 SP1 and Oracle 10g, the text search feature is installed by default, and no configuration is required.

For Oracle 9i, you must install the text search feature on your Oracle database server, and configure it using a predefined Quality Center package (QC_CTX_DDL) that is created in the CTXSYS user schema. You can create the QC_CTX_DDL package either by:

- Supplying the CTXSYS password in Site Administration when you enable the text search, as described in step 3 of "Enabling Text Search in Quality Center" on page 122. Contact your database administrator for the CTXSYS password.
- Having your database administrator manually create the QC_CTX_DDL package, and then enable the text search. For more information on creating the QC_CTX_DDL package, see the procedure that follows.

Note: For information on installing the text search feature, refer to the documentation provided with your database server.

To create the QC_CTX_DDL package on an Oracle 9i server:

1. Navigate to the **qc_ctxsys9i_db___oracle.sql** script located in the **\utilities\databases\scripts** folder on the Quality Center installation DVD.
2. Log in to the CTXSYS user account using Oracle SQL*Plus.
3. Run the following command to execute the package creation script: @qc_ctxsys9i_db___oracle.sql.
4. Open the **qc_ctxsys9i_db___oracle.log** file that is created by the package, and check that no errors are specified in it.
5. Perform steps 1-3 in "Enabling Text Search in Quality Center" on page 122.

Enabling Text Search in Quality Center

In Site Administration, you can enable text search for a specified database server that has the text search feature installed and configured. You can enable text search on a database server before or after you add any projects to your Projects list.

When you enable text search on a database server before you add projects, the projects that you add afterwards are text search enabled. When you enable text search on a database server after you have added projects, you must manually enable text search for each existing project.

After you have enabled the text search for a specified database server, you set the default search language for the database server. You can change the default search language for a specific project from the Site Projects tab. For more information, see "Selecting a Text Search Language for a Project" on page 123.

To enable text search on a database server before adding projects:

1. In Site Administration, click the **DB Servers** tab.
2. In the Database Servers list, select a database server.
3. Click the **Text Search** link and click **Yes** to confirm.

   If you are using an Oracle 9i database server and you are prompted for the **CTXSYS** user password, type the password in the Set CTXSYS Password dialog box and click **OK**. A password is not required if the QC_CTX_DDL package was manually created (see "Enabling Text Search on the Database Server" on page 121).

   The **Text Search** value changes from **Disabled** to **Enabled**. You cannot disable the text search after you have enabled it.
4. In the **Default Search Language** list, set the default text search language for the database server.

To enable text search on a database server after adding projects:

1 In Site Administration, click the **DB Servers** tab.

2 In the Database Servers list, select a database server.

3 Click the **Text Search** link and click **Yes** to confirm.

If you are using an Oracle 9i database server and you are prompted for the **CTXSYS** user password, type the password in the Set CTXSYS Password dialog box and click **OK**. A password is not required if the QC_CTX_DDL package was manually created (see "Enabling Text Search on the Database Server" on page 121).

The **Text Search** value changes from **Disabled** to **Enabled**. You cannot disable the text search after you have enabled it.

4 In the **Default Search Language** list, set the default text search language for the database server.

5 Click the **Site Projects** tab, and in the right pane click the **Project Details** tab.

6 For each project that you want to enable text search, click the **Enable/Rebuild Text Search** button. Click **Yes** to confirm.

Selecting a Text Search Language for a Project

For each project, you can specify a search language other than the default search language you set for the database server. For more information on enabling the text search and setting the default search language, see "Enabling Text Search in Quality Center" on page 122.

Note: Search languages are not available for a project created on a database server that does not have the text search feature enabled.

To select a search language for a project:

1 In Site Administration, click the **Site Projects** tab.

2 In the Projects list, select a project. In the right pane, click the **Project Details** tab.

3 In the **Search Language** field, select a language for the project. For more information on updating project details in the Project Details tab, see "Updating Project Details" on page 42.

Defining Searchable Fields

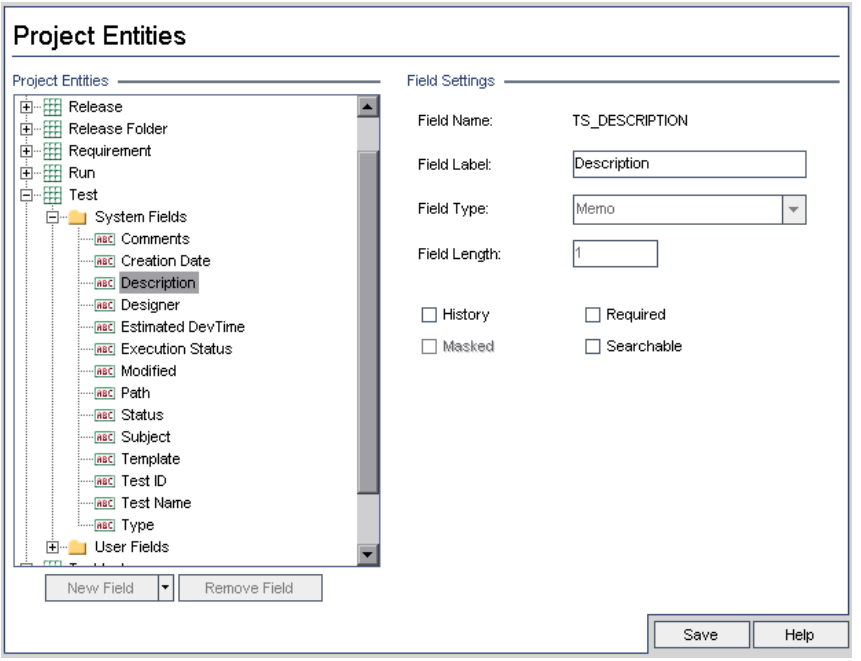
For each project, you must define the fields to be included in the search. The searchable option is only available in the Requirement, Test, Test Step (for design steps only), and Defect entities. Note that only user-defined fields with field type **Memo** or **String**, or the following system fields are available as searchable fields:

Entity	Searchable Fields
Defect	➤ Comments ➤ Description ➤ Detected in Cycle ➤ Detected in Release ➤ Reproducible ➤ Summary ➤ Target Cycle ➤ Target Release
Requirement	➤ Comments ➤ Creation Time ➤ Description ➤ Name ➤ Target Cycle ➤ Target Release
Test	➤ Comments ➤ Description ➤ Path ➤ Template ➤ Test Name
Test Step (Design steps only)	➤ Description ➤ Expected ➤ Step Name

To define a searchable field:

1 In the Project Customization window, click the **Project Entities** link. The Project Entities page opens. For more information on customizing project entities, see "Customizing Project Entities" on page 199.

2 Under **Project Entities**, expand an entity, and select a system or user-defined field that can be made searchable.



3 Select the **Searchable** check box.

4 Click **Save** to save your changes to the Project Entities page.

Setting Quality Center Configuration Parameters

You can set the default Quality Center configuration parameters and add optional ones.

This section includes:

- Default Quality Center Parameters
- Optional Quality Center Parameters
- Setting Quality Center Parameters

Default Quality Center Parameters

You can set the following default Quality Center configuration parameters:

Parameter	Description
ADD_NEW_USERS_FROM_PROJECT **(formerly CUSTOM_ENABLE_USER_ADMIN)**	If this parameter is set to "N", you can add new Quality Center users from Site Administration (**Site Users** tab) only. If this parameter is set to "Y" (default), new Quality Center users can also be added from Project Customization. In the Project Users page, click **Add User**. The Add User to Project dialog box opens. If this parameter is set to "Y", a **New** button is available for adding new Quality Center users. For more information, see "Adding a User to a Project" on page 160.
ATTACH_MAX_SIZE	The maximum size (in kilobytes) of an attachment that can be sent with e-mail from Quality Center. If the attachment size is greater than the specified value, the e-mail is sent without the attachment. By default, the maximum e-mail attachment size is 3,000 KB.

Parameter	Description
AUTO_MAIL_WITH_ ATTACHMENT **(formerly SAQ_MAIL_ WITH_ATTACHMENT)**	If this parameter is set to "Y" (default), defect e-mail is sent with attachments. This applies only if you select **Send defect e-mail messages automatically** in the **Site Projects** tab. For more information, see Chapter 12, "Configuring Automail". **Note:** The former parameter name is supported for purposes of backward compatibility.
AUTO_MAIL_WITH_ HISTORY **(formerly SAQ_MAIL_ WITH_HISTORY)**	If this parameter is set to "Y" (default), defect e-mail is sent with the history. This applies only if you select **Send defect e-mail messages automatically** in the **Site Projects** tab. For more information, see Chapter 12, "Configuring Automail". **Note:** The former parameter name is supported for purposes of backward compatibility.
BASE_REPOSITORY_PATH	The base repository path. The Quality Center and Site Administration repositories are subfolders of this repository. If you change this parameter value, you must copy the repository to its new location and then restart all servers in the cluster.
CREATE_HTTP_SESSION	You can use this parameter if you are working with load balancing over a cluster of application servers. If the parameter is set to "Y", Quality Center creates an HTTP session. This causes the load balancer to operate in sticky mode, meaning that after a request sent by a client is directed to a particular node in the cluster, all subsequent requests sent by that client are directed to the same node. By default, this parameter is set to "N".

Parameter	Description
LDAP_SEARCH_USER_ CRITERIA	A comma-separated list of Quality Center user properties to be used as LDAP search criteria, if the Domain Authentication property does not contain the user's distinguished name (DN). The order of the properties defines their priority if multiple results are found. The following are the possible values: **username**, **email**, **fullname**, **phone**, **description**. For more information on LDAP, see "Enabling LDAP Authentication for Users" on page 99.
LICENSE_ARCHIVE_ PERIOD	The time interval in days during which license usage is archived. License usage information before this period is removed from the archive. By default, the value is set to **365** days. If you set the value to **-1**, the license archive period is unlimited.
LOCK_TIMEOUT	The maximum number of hours that Quality Center objects can remain locked. After this time, the lock is removed. By default, the value is set to **10** hours.
MAIL_FORMAT	The format Quality Center uses to send e-mail. By default, the format is set to "HTML". To instruct Quality Center to send e-mail as plain text, change the value to "Text". Quality Center uses e-mail to send defects, requirements, tests, and test set notifications to Quality Center users.
MAIL_INTERVAL	The time interval in minutes for sending defect e-mail according to your mail configuration settings. By default, the value is set to 10 minutes. Note that this applies only if you select **Send defect e-mail messages automatically** in the **Site Projects** tab. For more information, see Chapter 12, "Configuring Automail".
MAIL_MESSAGE_ CHARSET	The character set used by Quality Center to send e-mail to users. By default, the value is set to **UTF-8**.

Parameter	Description
REPORT_QUERY_ RECORDS_LIMIT	The maximum number of records that can be retrieved from the database for an Excel report. If you set the value to **-1**, the number is unlimited.
REPORT_QUERY_ TIMEOUT	The maximum length of time in seconds that the Quality Center server waits for an SQL query for an Excel report to be executed. If the query takes longer than this time to be executed, the query is cancelled.
SITE_ANALYSIS	If this parameter is set to "Y" (default), you can track Quality Center license usage over time from the **Site Analysis** tab. If this parameter is set to "N", the Site Analysis tab is unavailable. For more information, see Chapter 7, “Analyzing Site Usage”.
VC	If this parameter is set to “Y”, version control is enabled. If you enable version control, you can create a version control database for any project. If it is set to “N” (default), version control is disabled. **Note:** To work with version control, you must install a supported version control tool and the Quality Center Version Control Add-in on your Quality Center server. For more information on Quality Center add-ins, refer to the *HP Quality Center Installation Guide*.
WAIT_BEFORE_ DISCONNECT	The time interval in minutes that the Quality Center client can be inactive before it is disconnected from the Quality Center server. Disconnecting the client enables the license to be used by another Quality Center user. By default, the value is set to **600** minutes. For performance reasons, it is recommended to set a value of at least 60 minutes. If you set the value to **-1**, Quality Center is not disconnected, regardless of how long the client is inactive.

Optional Quality Center Parameters

You can add the following optional Quality Center configuration parameters:

Parameter	Description
ALLOW_MULTIPLE_ VALUES	This parameter determines whether the **Allow Multiple Values** check box is visible in the Project Entities page in Project Customization. If this parameter is set to "N", then the **Allow Multiple Values** check box is unavailable. If this parameter does not exist or is set to "Y", then the **Allow Multiple Values** check box is available. For more information on the **Allow Multiple Values** check box, see "Allow Multiple Values" on page 203.
ALLOW_REQ_COVERAGE_ BY_TEST_INSTANCE	This parameter determines whether the option to create coverage between requirements and test instances is available. If the parameter does not exist, is empty, or is set to "N", then this option is unavailable. If the parameter is set to "Y", you can create and view coverage between requirements and test instances from the following locations: ➤ In the Requirements module, in the Requirement Details view, in the Test Coverage tab ➤ In the Test Plan module, in the Test Instance Properties dialog box, in the Linkage and Coverage view

Parameter	Description
AUTO_MAIL_SUBJECT_ FORMAT **(formerly SAQFORMAT)**	This parameter enables you to customize the subject line of defect e-mail sent automatically to users. For example, you can define a subject line such as Defect no. 4321 has changed by providing the value Defect no. ?BG_BUG_ID has changed, where Defect no. and has changed are strings, and **BG_BUG_ID** is a Quality Center field name. To customize the subject line for a specific project, see "Customizing the Subject of Defect Mail" on page 222. **Note:** The former parameter name is supported for purposes of backward compatibility.
AUTO_MAIL_USER_ NOTIFICATION	This parameter enables you to prevent Quality Center sending automatic e-mail notification to project administrators when users are assigned or removed from a project in Site Administration. If this parameter is set to "N", then automatic notification is not sent to project administrators. If this parameter does not exist, is empty, or is set to "Y", then automatic notification is sent. For more information on assigning users to projects, see "Assigning Users to Projects" on page 46.
BACKWARD_SUPPORT_ ALL_DOMAINS_PROJECTS	This parameter enables the use of DomainsList and ProjectsList properties for the purposes of backward compatibility. If this parameter is set to "Y", then the DomainsList and ProjectsList properties are supported. If the parameter does not exist or is empty, the default value is "N", and these properties are not supported.

Parameter	Description
BACKWARD_SUPPORT_ SA_DEFAULT_USER	This parameter enables the use of the old connection method to Site Administration for the purposes of backward compatibility. To work with scripts that use the old connection method (where the site administrator only required a password to log in), a user should be defined, and this user's password is used during login. The value of this parameter is a user name, whose password is used. If the parameter does not exist or is empty, an empty string is used.
COPY_CHANGES_ USER_FIELDS **(formerly COPY_PASTE_ CHANGES_OWNER)**	This parameter enables you to specify that the user who copies a record is listed in the specified User List fields of the copy. For more information on fields that have User List as their Field Type, see "Customizing Project Entities" on page 199. The value of this parameter is a comma-separated list of User List fields. For example, set the value of the parameter to BG_DETECTED_BY. Assume defect 10 is detected by user Cecil_qc, and user Shelly_qc copies defect 10. Quality Center creates a copy of the defect with Shelly_qc as the user who detected the defect, not Cecil_qc.
CREATE_DB_ REPOSITORY_VISIBILITY	This parameter enables you to hide the option to store project data in the database when creating a new project. If this parameter is set to "N", the **Store project's repository in the database** check box is not displayed in the Create Project dialog box. If this parameter does not exist, is empty, or is set to "Y", the check box is displayed. **Note:** The option to store project data in the database is available only if the **SHOW_REPOSITORY_OVER_DB** parameter is set to "Y". For more information, see "SHOW_REPOSITORY_ OVER_DB" on page 138.

Parameter	Description
DISABLE_COMMAND_ INTERFACE	If this parameter is set to “Y” (default), only users belonging to the TDAdmin group can use the OTA **Command** object. If it is set to “N”, any user can use it. For more information, refer to the *HP Quality Center Open Test Architecture API Reference*.
DISABLE_CONSOLE_ DEBUG_INFO	This parameter enables you to disable access to the Quality Center or Site Administration debug info console page (access to it is enabled by default). If this parameter exists and is set to “Y”, the debug info console page cannot be accessed. Note that the Quality Center server must be restarted to activate the parameter, since the parameter is read at startup.
DISABLE_EXTENDED_ STORAGE	This parameter controls user access to the OTA **ExtendedStorage** object. This is a security feature that can be used to limit access to the file system of the project. If this parameter is set to "Y" (default), the ExtendedStorage object cannot be accessed from TDConnection. Users can access the object from a specific entity for read-only, but no changes can be made. If it is set to "N", the ExtendedStorage object can be accessed by all users, from a specific entity or from TDConnection. For more information about the ExtendedStorage object, refer to the *HP Quality Center Open Test Architecture API Reference*.
FAVORITES_DEPTH	Defines the number of most recently used favorite views displayed on the **Favorites** menu. By default, Quality Center displays the four most recently used views on the menu. To hide the list of recently used views completely, set the parameter to “0”. For more information on favorite views, refer to the *HP Quality Center User’s Guide*.

Parameter	Description
HEBREW	If this parameter is set to "Y", it indicates that the Quality Center server is Hebrew-enabled. On a per project basis, you can then enable Hebrew by selecting **Allow Hebrew language** in the **Site Projects** tab. When users work in a Hebrew-enabled project, they can toggle between English and Hebrew by choosing **Tools** > **Reading Order** > **Right to Left**.
LDAP_IMPORT_ ATTRIBUTE_MASK	This parameter enables you to define a regular expression that can be used to distinguish between different values for an LDAP attribute when importing users from an LDAP directory. When importing users, Quality Center chooses a value for the attribute that matches the regular expression. The parameter should be of the format: **<LDAP attribute name> = <regular expression>**, where **<LDAP attribute name>** is the name of the LDAP attribute whose value you want to choose, and **<regular expression>** is a regular expression. This regular expression should conform to the standard Java syntax for regular expressions. For example, a parameter value `uid=^\D\w+$` would choose values for the LDAP attribute `uid` consisting of a non-digit followed by any number of word characters (letters, numerals or the underscore character). For more information on importing users from an LDAP directory, see "Importing Users from LDAP" on page 88.
LDAP_TIMEOUT **(formerly DIRECTORY_TIME_LIMIT_ CONSTRAINT)**	The length of time, in seconds, that Quality Center waits before canceling an LDAP operation. The time limit on LDAP operations prevents a situation where LDAP encounters a problem and causes Quality Center to wait indefinitely. The default timeout value is 10 minutes (600 seconds). For more information about using LDAP, see Chapter 4, "Managing Quality Center Users".

Parameter	Description
LR DIRECTFILEACCESS	This parameter applies if you are integrating with HP LoadRunner. If set to "Y", it enables the direct accessing of scripts located within the same LAN as your Quality Center client/server. **Note:** In a UNIX or Linux environment, you must also set the UNIX_SERVER parameter.
MIGRATION_MAX_ NUMBER_OF_PROJECTS	The maximum number of projects that can be migrated from TestDirector to Quality Center at one time. By default, you can migrate up to 50 projects at a time. For more information on migration, see "Migrating TestDirector Projects to Quality Center" on page 70.
NEWREQTYPE	This parameter determines whether the Create New Requirement dialog box is displayed when adding a requirement. If the parameter does not exist, is empty, or is set to "Y", then the Create New Requirement dialog box is displayed when adding a requirement. If the parameter is set to "N", the Create New Requirement dialog box is unavailable and the New Requirements dialog box is opened directly.
NLS_SEARCH_LOCALE	The language used by the **Find Similar Defects** command to tokenize the defect summary. This parameter is needed only if the default locale on the server does not match the language in which the defect summary is written, in terms of whether spaces are used to separate words. The value should be a string value that matches a language code listed in ISO 639 (http://www.w3.org/WAI/ER/IG/ert/iso639.htm). For example, if the default locale is English and the text is in Japanese, which does not use spaces to separate words, set NLS_SEARCH_LOCALE=ja. If this parameter is not defined or is invalid, the default locale of the server is used.

Parameter	Description
REPLACE_TITLE	This parameter enables you to change the names of Quality Center modules across all your projects. Rename one or more modules by entering the following parameter value: <original title1 [singular]>;<new title1 [singular]>; <original title1 [plural]>;<new title1 [plural]>; <original title2 [singular]>;<new title2 [singular]>;... For example, if you want to change the name of the Defects module to **Bugs**, and the Requirements module to **Goals**, enter the following: Defect;Bug;Defects;Bugs;Requirement;Goal; Requirements;Goals **Note:** To rename the Defects module for a specific project only, see "Renaming the Defects Module for a Project" on page 60.
REQ_SHOW_ NUMERATION	This parameter determines whether the option to display numeration is available in the Requirements module and in the requirements coverage grid. If the parameter does not exist, is empty, or is set to "N", then this option is unavailable. If the parameter is set to "Y", you can display numeration in the following ways: ➤ **Requirements Module.** Select **View** > **Numeration**. ➤ **Requirements coverage grid.** Right-click the coverage grid and choose **Numeration**. Note that the numeration of the requirements is correct only if you do not sort or filter in the requirements tree. In addition, you cannot view the icons for requirement types in the requirements tree if numeration is displayed.
REQUIREMENT_ REVIEWED_FIELD_ AUTOMATIC_UPDATE	If this parameter is set to "Y" (default), then any change to a requirement field automatically sets the **Reviewed (RQ_REQ_REVIEWED)** field to "Not Reviewed". If it is set to "N", then a change to a requirement field does not affect the value of the Reviewed field.

Parameter	Description
RESTRICT_SERVER_ FOLDERS	This parameter enables you to access restricted-access server directories using the OTA **ExtendedStorage.ServerPath** property. If this parameter does not exist, or is set to "Y", you can only use the **ExtendedStorage.ServerPath** property to access the following directories: ➤ the Site Administration (**SA**) directory ➤ the root directory for a project ➤ the **attach** subdirectory for a project ➤ the **components** subdirectory for a project ➤ the **script_templates** subdirectory for a project ➤ the **StyleSheets** subdirectory for a project ➤ the **tests** subdirectory for a project For the project-related directories, this only applies if your project repository is stored in the file system. If this parameter is set to "N", you can access all server directories using the **ExtendedStorage.ServerPath** property. For more information on this property, refer to the *HP Quality Center Open Test Architecture API Reference*. For more information about Quality Center project structure, see "Understanding the Quality Center Project Structure" on page 27.
SECURED_QC_URL	When Quality Center generates e-mail, it includes a link to Quality Center in the e-mail. If this parameter is set to "Y", the Quality Center URL uses an SSL connection (starting with https:). If it is set to "N" (default), SSL is not used.

Parameter	Description
SELECT_FS_OVER_DB	This parameter enables you to set the **Store project's repository in the database** check box as preselected when creating new projects. If this parameter is set to "Y", the **Store project's repository in the database** check box is selected by default in the Create Project dialog box. If this parameter does not exist, is empty, or is set to "N", the check box is not selected. **Note:** The option to store project data in the database is only available if the **SHOW_REPOSITORY_OVER_DB** parameter is set to "Y". For more information, see "SHOW_REPOSITORY_ OVER_DB" on page 138.
SHOW_REPOSITORY_ OVER_DB	This parameter enables you to use the repository over database option to store project data in the project's database. If the parameter does not exist, is empty, or is set to "N", the option to store project data in the project's database is not available when creating or upgrading a project, and you cannot export or import Quality Center projects. If this parameter exists and is set to "Y", you can store project data in the project's database when creating or upgrading a project. You can also export Quality Center projects, and create new projects by importing data from an exported Quality Center project file. When this parameter is enabled, you can use the following additional parameters: ➤ **CREATE_DB_ REPOSITORY_VISIBILITY** (see page 132) to hide the **Store project's repository in the database** option when creating a new project. ➤ **SELECT_FS_OVER_DB** (see page 138) to set the **Store project's repository in the database** option as preselected. For more information, see "Storing Project Data in the Project's Database" on page 363.

Parameter	Description
SQL_QUERY_ VALIDATION_ENABLED	By default, Quality Center checks SQL queries in Excel reports to ensure that they are valid and do not alter the project database. For more information on this validation, see the *HP Quality Center User's Guide*. If this parameter is set to "N", this validation is not performed. If this parameter does not exist, is empty, or is set to "Y", this validation is performed.
SQL_QUERY_ VALIDATION_BLACK_LIST	By default, Quality Center checks that SQL queries for an Excel reports do not include any of the following commands: **INSERT**, **DELETE**, **UPDATE**, **DROP**, **CREATE**, **COMMIT**, **ROLLBACK**, **ALTER**, **EXEC**, **EXECUTE**, **MERGE**, **GRANT**, **REVOKE**, **SET**, **INTO**, or **TRUNCATE**. This ensures that you do not inadvertently modify or delete records in the project database. You can modify which commands are on this list by adding this parameter. The parameter's value must be a comma-separated list of SQL commands that Quality Center should verify are not included in SQL queries for an Excel report. Note that this verification is not performed if the **SQL_QUERY_VALIDATION_ENABLED** parameter exists and is set to "N".

Parameter	Description
UNIX_SERVER	If this parameter is set to "Y", it enables direct file access from a testing tool on a Windows machine to a UNIX based repository. You must then add a new parameter for each directory on the UNIX server machine you want to be able to access externally and specify the corresponding Windows path, as follows: ➤ **Parameter name** is FOLDER_MAPPING_*n* where *n* is an identifying number. For example, FOLDER_MAPPING_1 ➤ **Parameter value** is in the format *UNIXpath->Windowspath* For example, /opt/Mercury/repository/qc/->\\netapp\qc\repository\ **Note:** This parameter applies to the following testing tools: HP WinRunner and HP LoadRunner.
WR DIRECTFILEACCESS	This parameter applies if you are integrating with HP WinRunner. If set to "Y", it enables the direct accessing of scripts located within the same LAN as your Quality Center client/server. **Note:** In a UNIX or Linux environment, you must also set the UNIX_SERVER parameter.

Setting Quality Center Parameters

You can add, modify, and delete parameters in the Site Configuration tab. You can also export parameters to a text file.

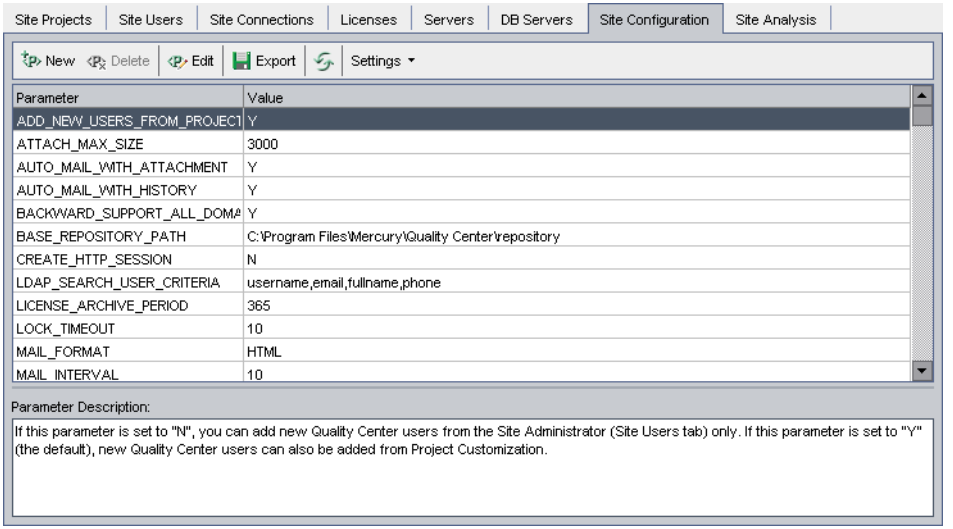
Notes:

➤ You cannot add or delete default parameters, you can only modify them.

➤ You must reconnect to any open projects to work with the new settings.

To set Quality Center parameters:

1 In Site Administration, click the **Site Configuration** tab.



2 To add a new parameter to the list, click the **New Parameter** button. The New Parameter dialog box opens. Type a name, value, and description for the parameter you want to add. Click **OK**.

3 To delete a parameter from the list, select it and click the **Delete Parameter** button. Click **Yes** to confirm.

4 To edit a parameter, select it from the list and click the **Edit Parameter** button. The Edit Parameter dialog box opens. Type a new value and value description, and click **OK**.

5 To export parameters from the site configuration grid to a text file, click the **Export** button. The Export Data To File dialog box opens. Select the directory where you want to save the parameters, and enter a name for the file in the **File name** box. Click **Save**.

6 You can click the **Refresh Parameters List** button to refresh the parameter list.

Setting the Quality Center Mail Protocol

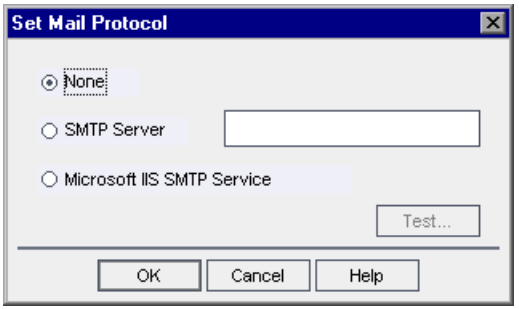
Quality Center uses e-mail to send project information to users. You can select the mail service to be used by all the server nodes in your Quality Center site. Quality Center supports the SMTP mail protocols.

For more information on setting the Quality Center mail protocol, refer to the *HP Quality Center Installation Guide*.

To set the Quality Center mail protocol:

1 In Site Administration, click the **Site Configuration** tab.

2 Click the **Settings** button and choose **Set Mail Protocol**. The Set Mail Protocol dialog box opens.



3 Select one of the following options:

- **None.** Quality Center does not send e-mail.
- **SMTP Server.** Quality Center sends e-mail from an SMTP server on the network. Type the address of an SMTP server available on your local area network.
- **Microsoft IIS SMTP Service.** Quality Center sends e-mail from the Quality Center server machines. This option is available if you installed Microsoft IIS SMTP Service on your Quality Center server machines during IIS installation.

4 Click **Test** to send a test e-mail to your mailbox. The Test Mail dialog box opens. Type your e-mail address and click **Send**. A pop-up message confirms whether the mail was sent successfully.

5 Click **OK** to close the Set Mail Protocol dialog box.

7

Analyzing Site Usage

In Site Administration, you can track the number of licensed users that have connected to your Quality Center site at specific points over a period of time. You can also analyze Quality Center usage by filtering the number of licensed users by projects or users.

This chapter describes:	On page:
About Analyzing Site Usage	143
Monitoring Site Usage	144
Filtering Site Usage	146
Exporting Site Analysis Data to a File	147
Customizing the Site Analysis Line Chart Graph	148

About Analyzing Site Usage

You use the **Site Analysis** tab in Site Administration to monitor license usage for each time interval displayed. You can specify the time interval displayed along the x-axis. You can also specify what information appears in the graph by filtering the graph content by projects or users.

For example, you may want to charge each department in your organization according to license usage. You can filter by projects in a specific department to view license usage for the department. You can also view license usage for a specific group of users by filtering according to selected users.

If the **Site Analysis** tab is not displayed, you can make it available by changing the **SITE_ANALYSIS** parameter in the **Site Configuration** tab. For more information, see "SITE_ANALYSIS" on page 129.

Monitoring Site Usage

You can monitor the number of licensed users that have connected to a Quality Center site over a period of time. You can view site usage for the last seven days, the last five weeks, the last twelve months, or for all days that users were connected to a Quality Center server.

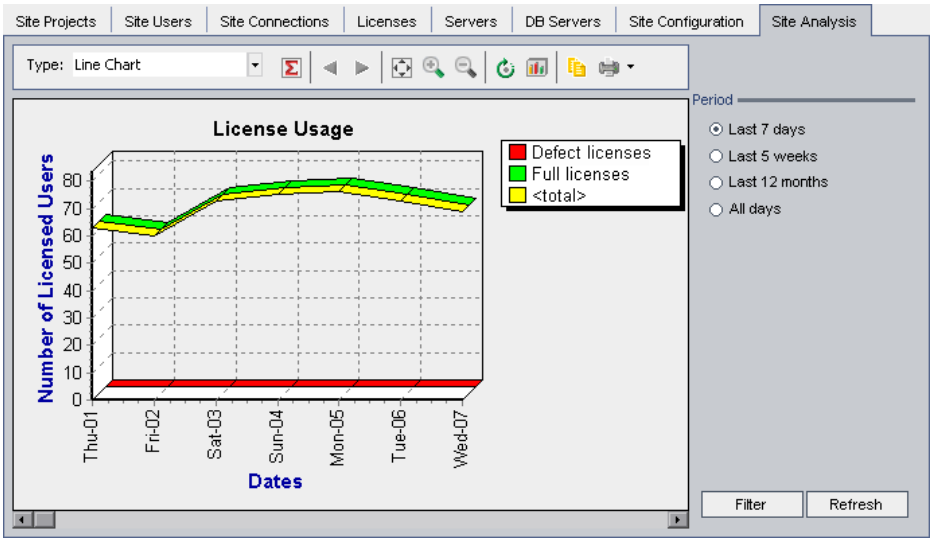
You can also monitor usage of different license types. Users with **Full Licenses** can access all modules in a specific project. Users with **Defect Licenses** can access only the Defects module. This data can be displayed in line graphs or data grids.

In addition, you can filter records by projects or users, refresh and clear filter settings, and save data to a file.

Note: You can monitor the users currently connected to a Quality Center server. For more information, see Chapter 5, "Managing User Connections and Licenses."

To monitor site usage:

1 In Site Administration, click the **Site Analysis** tab.



2 In the **Type** box, select a display type:

- **Line Chart.** Displays the data as a line graph.
- **Data Grid.** Displays the data as a grid.

3 In the right pane under **Period**, select the period of time you want the line graph or data grid to show.

4 Click the **Filter** button to open the Set Filter dialog box and filter the graph contents. For more information, see “Filtering Site Usage” on page 146.

5 To customize the appearance of a Line Chart graph, see “Customizing the Site Analysis Line Chart Graph” on page 148.

6 If you chose Data Grid, you can save the contents of a data grid as a text file, Microsoft Excel spreadsheet, Microsoft Word document, or HTML document. To save, click the **Save As** button. For more information, see “Exporting Site Analysis Data to a File” on page 147.

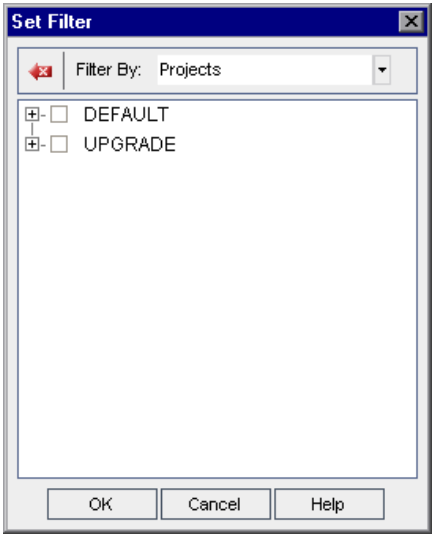
7 To refresh data in the graph, click the **Refresh** button.

Filtering Site Usage

You can analyze the number of users that have connected to your Quality Center site at specific points over time by filtering by projects or users.

To filter site usage:

1 Click the **Filter** button. The Set Filter dialog box opens.



2 Under **Filter by**, select the category that you want to filter:

- **Projects.** Displays all the Quality Center domains and projects.
- **Users.** Displays all the Quality Center site users.

3 Click the items you want to include in the filter.

- For **Projects**, double-click the domain folder to display the domain's projects, and select the projects you want to include. To filter all projects in the domain, select the domain folder.
- For **Users**, select the users you want to include.

4 To clear the selected projects or users in a filter, click the **Clear** button.

5 Click **OK** to apply the filter and close the Set Filter dialog box. The new line chart or data grid is displayed.

Exporting Site Analysis Data to a File

You can export site analysis data in a Data Grid as a text file, Microsoft Excel spreadsheet, Microsoft Word document, HTML document, or XML document.

To export Site Analysis data to a file:

1. In Site Administration, click the **Site Analysis** tab.
2. In the **Type** field, select the **Data Grid** display type.
3. Select the graph period and filter.
4. Click **Save as**, and select one of the following formats:
   - **Text Format.** Saves the data as a Text file.
   - **Excel Sheet.** Saves the data as an Excel sheet.
   - **Word Document.** Saves the data as a Word document.
   - **HTML Document.** Saves the data as an HTML document.
5. In the **Save in** box, choose a location for the file.
6. In the **File name** box, type a name for the file.

   The **Save as type** box is automatically filled according to the format you selected.
7. Click **Save**.

Customizing the Site Analysis Line Chart Graph

You can determine how information appears in the Line Chart graph using the line chart toolbar. The toolbar includes the following buttons:

Show Total Values. Toggles between displaying and hiding a total value in the graph.

Scroll to the Left. Scrolls the graph to the left. (This button is enabled when the Zoom In and Zoom Out buttons are in use.)

Scroll to the Right. Scrolls the graph to the right. (This button is enabled when the Zoom In and Zoom Out buttons are in use.)

Show All. Returns the graph to its normal size. (This button is enabled when the Zoom In and Zoom Out buttons are in use.)

Zoom In. Increases the magnification of the selected portion of the graph.

Zoom Out. Decreases the magnification of the selected portion of the graph.

Rotate Bottom Labels. Toggles between displaying the text on the x-axis vertically and horizontally.

Set 2D/3D Graph. Toggles the graph from two to three dimensions.

Copy Graph to Clipboard. Copies the graph to the Clipboard.

Print Graph. You can choose to print the graph in portrait or landscape view.

Part II

Project Customization

8

Project Customization at a Glance

As a Quality Center project administrator, you use Project Customization to control access to a project by defining the users who can access the project and by determining the types of tasks each user can perform. You can also customize a project to meet the specific requirements of your testing team. Non-project administrators can also use Project Customization, however, the customization functions available are limited depending on the user group to which they belong.

This chapter describes:	On page:
Starting Project Customization	151
Understanding the Project Customization Window	156

Starting Project Customization

You can customize your Quality Center projects using the Project Customization window.

Note: Users belonging to the Viewers group cannot view or change any settings in the Project Customization window.

You can also open the Project Customization window without logging in to a Quality Center project, if necessary. For more information, see "Starting Project Customization Without Logging In to a Project" on page 155.

To start project customization:

1 Open your Web browser and type your Quality Center URL http://<Quality Center server name>[<:port number>]/qcbin. The Quality Center Options window opens.

2 Click the **Quality Center** link.

The first time you run Quality Center, files are downloaded to your workstation. Subsequently, Quality Center carries out a version check. If there is a newer version on the server, updated files are downloaded to your workstation.

Note: To download files to your computer, you must log in with administrator privileges. This applies if you are running Quality Center for the first time, upgrading to a newer version, or applying a service pack.

After the Quality Center version has been checked and files have been updated if necessary, the Quality Center Login window opens.

3 In the **Login Name** box, type your user name.

If you type a user name that does not have administrator privileges for a particular project, you are restricted to the customization functions available for that user group. For more information, see "About Managing User Groups and Permissions" on page 166.

4 In the **Password** box, type your password.

After you log in to Quality Center, you can change your password from the Project Customization window. For more information, refer to the *HP Quality Center User's Guide*. In addition, site administrators can change their password from Site Administration. For more information, see "Changing Passwords" on page 97.

5 Select the **Automatically log in to my last domain and project on this machine** check box if you want Quality Center to automatically log in to the last project in which you were working.

6 Click **Authenticate**. Quality Center verifies your user name and password and determines which domains and projects you may access. If you specified automatic login, Quality Center opens.

7 In the **Domain** list, select a domain. By default, the last domain in which you were working is displayed.

8 In the **Project** list, select a project. By default, the last project in which you were working is displayed.

9 Click **Login**. Quality Center opens and displays the module (Releases, Requirements, Test Plan, Test Lab, and Defects) in which you last worked during your previous session.

10 Choose **Tools > Customize** on the upper-right corner of the window. The Project Customization window opens and displays the customization functions available for the user group to which the user belongs. For more information, see "Understanding the Project Customization Window" on page 156.

11 To exit the Project Customization window and return to your Quality Center project, click the **Return** button located on the upper-right corner of the window.

Starting Project Customization Without Logging In to a Project

You can open the Project Customization window without logging in to a Quality Center project. This can be useful when a workflow script prevents you logging in to a project and you need to access Project Customization to fix the workflow script. You can only access the customization functions available for the user group to which you belong.

To start Project Customization without logging in to a project:

1 Type the following URL in your Web browser:

testdirector:[server name]:[port number]/qcbin,[domain],[project],[username];13:[ignore_workflow_parameter]

2 To bypass workflow events, set the value of **ignore_workflow_parameter** to "1". Otherwise, workflow events are triggered. Only users belonging to the **TDAdmin** group can activate this option to bypass workflow events.

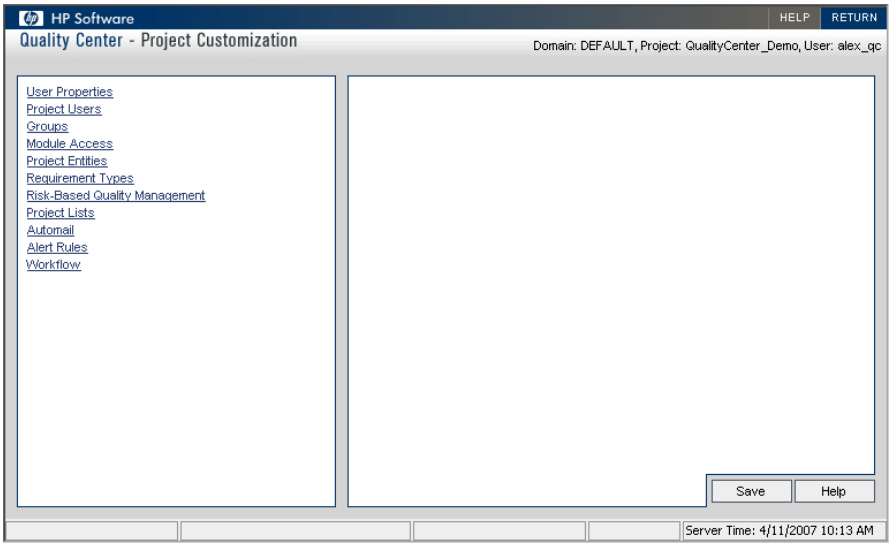
For example, suppose that you have user name alex_qc. You want to customize the project MyProject in the domain MyDomain on the server MyServer. To start Project Customization without triggering workflow events, type the following URL:

testdirector:MyServer:8080/qcbin,MyDomain,MyProject,alex_qc;13:1

3 When the Quality Center Login window opens, type the password and click **Authenticate**.

Understanding the Project Customization Window

As a Quality Center project administrator, you can customize a project to meet the specific requirements of your testing team in the Project Customization window.



The Project Customization window contains the following links:

- **User Properties.** Non-project administrators can use this option to change their user properties and password. For more information, refer to the *HP Quality Center User's Guide*.

  In Site Administration, a site administrator can override and change a user's properties and password from the **Site Users** tab. For more information, see "Updating User Details" on page 96, and "Changing Passwords" on page 97.

- **Project Users.** You can add and remove users from a Quality Center project. You can also assign users to user groups to restrict user access privileges. For more information, see Chapter 9, "Managing Users in a Project."

  Note that you create Quality Center users and define user properties from Site Administration. For more information, see Chapter 4, "Managing Quality Center Users."

- **Groups.** You can assign privileges to user groups by specifying permission settings. This includes specifying transition rules and hiding data. For more information, see Chapter 10, "Managing User Groups and Permissions."
- **Module Access.** You can control the modules that each user group can access. By preventing users from accessing unnecessary modules, you can better utilize your Quality Center licenses. For more information, see "Customizing Module Access for User Groups" on page 194.
- **Project Entities.** You can customize your Quality Center project to suit your testing environment. A project can contain system fields and user-defined fields. System fields can be modified. User-defined fields can be added, modified, and deleted. For more information, see "Customizing Project Entities" on page 199.
- **Requirement Types.** You can add requirement types to your Quality Center project and define which fields are available and which fields are required for each requirement type. For more information, see "Customizing Project Requirement Types" on page 208.
- **Risk-Based Quality Management.** You can customize criteria and criterion values for risk-based testing, and customize default testing efforts and testing levels. For more information, see Chapter 13, "Customizing Risk-Based Quality Management."
- **Project Lists.** You can add customized field lists to a project. A field list contains values that the user can enter in system or user-defined fields. For more information, see "Customizing Project Lists" on page 213.
- **Automail.** You can set up automatic mail notification rules to inform users via e-mail about defect repair activity. For more information, see Chapter 12, "Configuring Automail."
- **Alert Rules.** You can activate alert rules for your project. This instructs Quality Center to create alerts and send e-mail when changes occur in the project. For more information, see Chapter 14, "Setting Alert Rules."
- **Workflow.** You can generate scripts to perform commonly needed customizations on the fields of the Defects module dialog boxes. For more information, see Chapter 15, "Generating Workflow Scripts."
- In addition, you can write scripts to customize dialog boxes in any module, and to control the actions that users can perform. For more information, see Chapter 16, "Workflow Customization at a Glance."

9

Managing Users in a Project

As a Quality Center project administrator, you can control access to a project by defining the users who can log in to the project and by specifying the types of tasks each user may perform.

This chapter describes:	On page:
About Managing Users in a Project	159
Adding a User to a Project	160
Assigning Users to a User Group	162
Removing a User from a Project	164

About Managing Users in a Project

For each Quality Center project, you must select a list of valid users from the overall Quality Center users list. (The users list is created in Site Administration. For more information, see Chapter 4, "Managing Quality Center Users.")

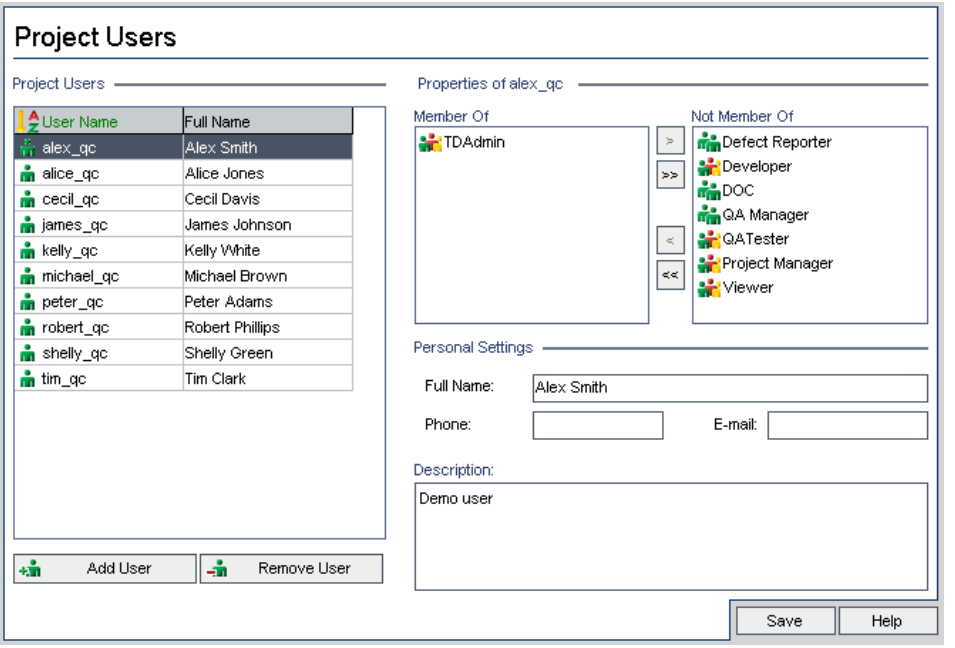
You then need to assign each project user to a user group. Each group has access to certain Quality Center tasks.

Adding a User to a Project

You add new users to a Quality Center project.

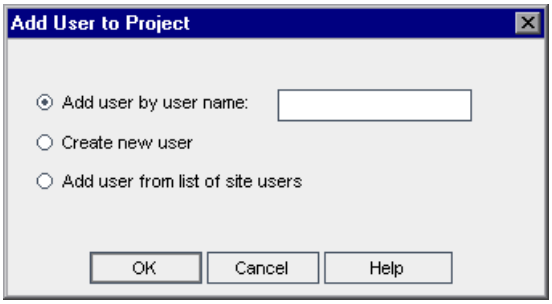
To add a user to a project:

1 In the Project Customization window, click the **Project Users** link. The Project Users page opens.



You can click the **User Name** column to change the sort order from ascending to descending user names. You can also click the **Full Name** column to sort according to full names instead of user names.

2 Click the **Add User** button. The Add User to Project dialog box opens.



3 Add users to the project using one of the following options:

- To add an existing user by user name, select **Add user by user name** and type the user name. Click **OK**.
- To create a new user in the Site Users list and add the user to the project, select **Create new user** and click **OK**. In the New User dialog box, type the details for the new user and click **OK**. If this option is not available, you can enable it by setting the **ADD_NEW_USERS_FROM_PROJECT** parameter in Site Administration. For more information, see "ADD_NEW_USERS_FROM_ PROJECT" on page 126.
- To add existing users from the Site Users list, select **Add user from list of site users** and click **OK**. In the Add User to Project dialog box that opens, select the users you want to add to the project and click **OK**.

The users are added to the Project Users list and the user details are displayed. User details are defined in Site Administration. For more information, see "Updating User Details" on page 96.

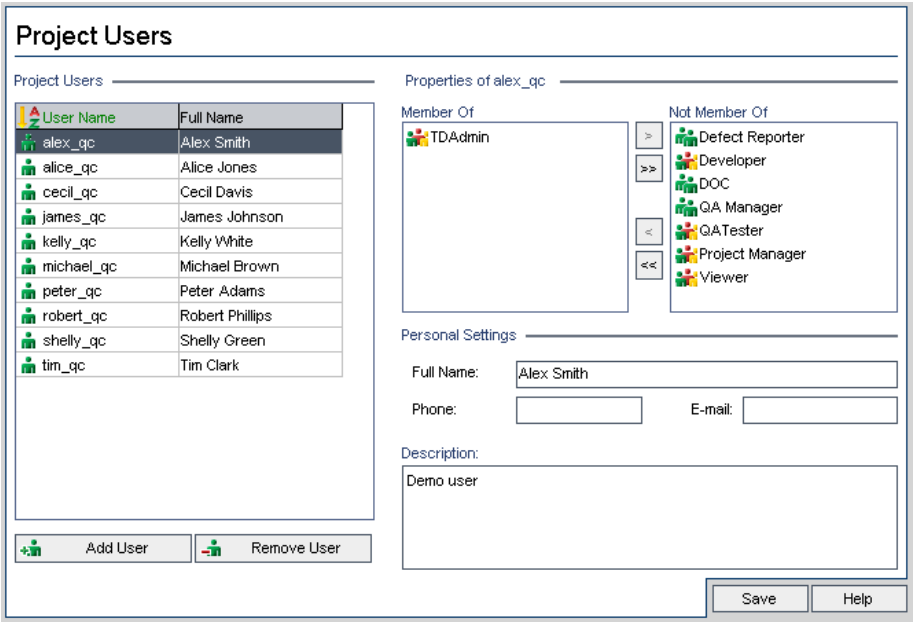
4 Click **Save** to save your changes to the Project Users page.

Assigning Users to a User Group

After you add a user to the project, you can assign the user to one or more user groups. By default, new users are assigned to the project as members of the **Viewer** user group. You can assign a user to a default user group, or to a customized user group. For more information on customizing a user group, see Chapter 10, "Managing User Groups and Permissions." You can change the access privileges for existing users at any time by changing the user group to which they are assigned.

To assign a user to a user group:

1 In the Project Customization window, click the **Project Users** link. The Project Users page opens.



2 In the **Project Users** list, select the user you want to assign to a user group. The user properties are displayed (name, e-mail, phone, and description).

The e-mail information is important as it enables a user to receive defects, tests, requirements, and test set notifications directly to their mailbox.

The user details are defined in Site Administration. For more information, see "Updating User Details" on page 96.

3 To assign the selected user to a user group, click a user group name in the **Not Member Of** list and click the left arrow button.

4 To remove the user from the currently selected user group, click a user group name in the **Member Of** list and click the right arrow button.

Note: The **Member of** list can never be empty. A user must always belong to at least one user group.

5 To move all the user groups from one list to the other, click the double arrow buttons.

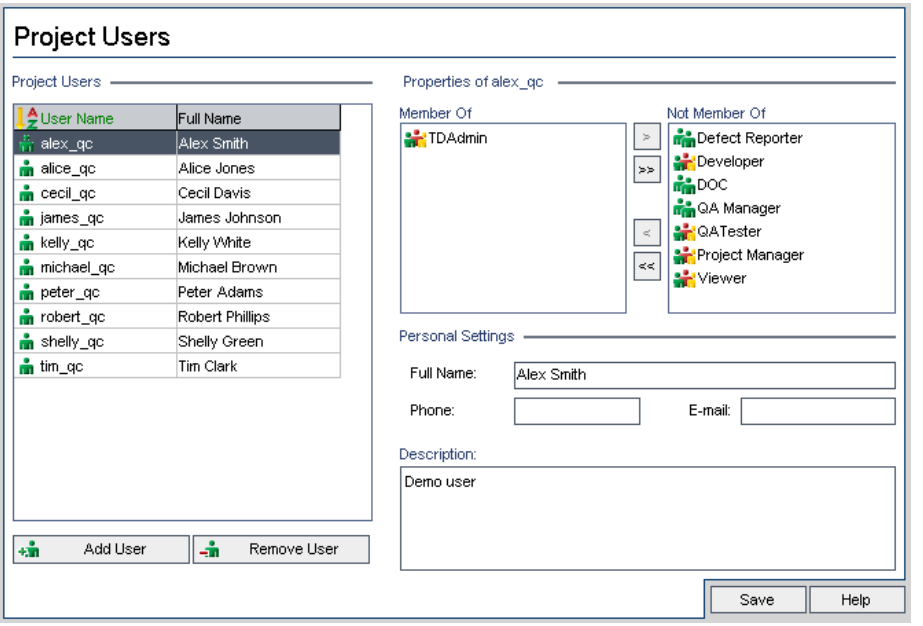
6 Click **Save** to save your changes to the Project Users page.

Removing a User from a Project

To ensure the security of a project, remove any users who are no longer working on the project. Removing a user from a project does not delete the user from the Quality Center users list in Site Administration.

To remove a user from a project:

1 In the Project Customization window, click the **Project Users** link. The Project Users page opens.



2 In the **Project Users** list, select the user you want to remove and click the **Remove User** button.

3 Click **OK** to confirm. The user is removed from the Project Users list.

4 Click **Save** to save your changes to the Project Users page.

10

Managing User Groups and Permissions

You can control access to Quality Center projects and modules by defining the user groups that can enter them, and by determining the types of tasks each user group performs.

This chapter describes:	On page:
About Managing User Groups and Permissions	166
Adding User Groups	168
Setting User Group Permissions	169
Setting Transition Rules	173
Hiding Data for a User Group	176
Assigning Existing Sets of Permissions to User Groups	179
Renaming User Groups	179
Deleting User Groups	180
Understanding the Permission Settings Tasks	180
Customizing Module Access for User Groups	194

About Managing User Groups and Permissions

To enable team members to do their jobs and protect a project from unauthorized access, Quality Center lets you assign each member to a specific user group. Quality Center includes predefined user groups with default privileges. Each group has access to certain Quality Center tasks.

User Group	Permissions
TDAdmin (Project Administrator)	Group members have full privileges in a Quality Center project and in Project Customization.
Project Manager	➤ Group members have full privileges in the following modules: Releases, Requirements, Test Plan, Test Lab, and Defects. ➤ In Project Customization, the group has privileges to change user properties and password, customize project lists, and set alert rules.
QATester	➤ Group members have full privileges in the following modules: Releases, Requirements, Test Plan, and Test Lab. ➤ In the Defects module, the group can add and modify defects and defect links. ➤ In Project Customization, the group has privileges to change user properties and password, customize project lists, and set alert rules.

User Group	Permissions
Developer	➤ Group members have full privileges in the Releases module. ➤ Group members are limited to modifying attachments or specified record fields in the following Quality Center modules: Requirements, Test Plan, and Test Lab. ➤ In the Defects module, the group can add and modify defects, and add defect links. ➤ In Project Customization, the group has privileges to change user properties and password.
Viewer	➤ Group members have read-only privileges in a Quality Center project. ➤ In Project Customization, the group has privileges to change user properties and password.

When a project requires that certain user groups have privileges that are outside the scope of their default permissions, you can add your own customized user groups and assign each group a unique set of privileges.

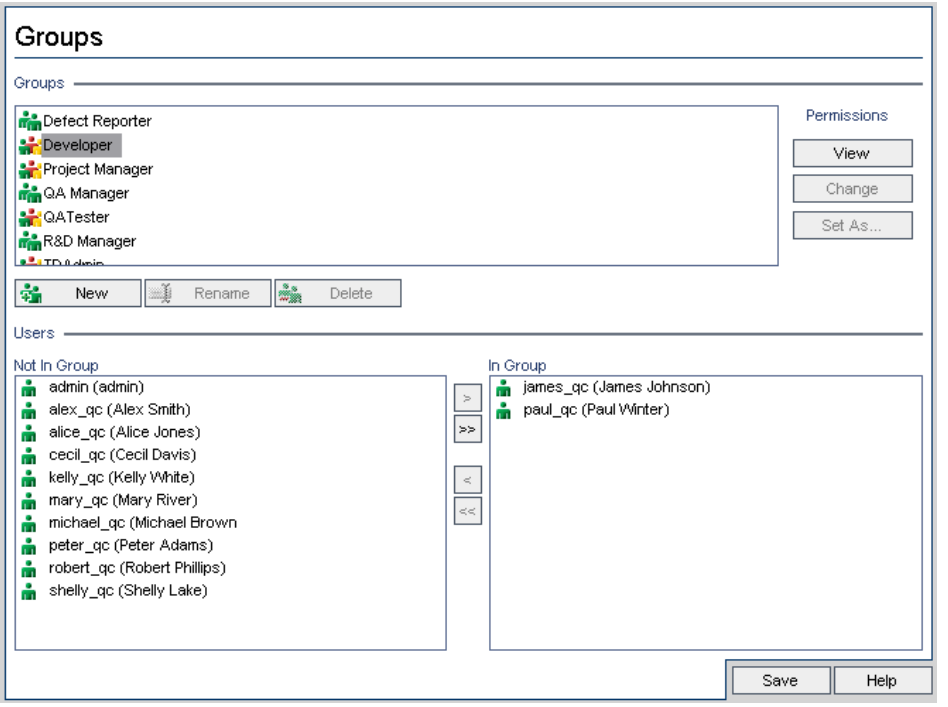
After you set user group permissions, you can also define the Quality Center modules to which you want to give a user group access. When a user group member logs in to a project, only the authorized modules are displayed.

Adding User Groups

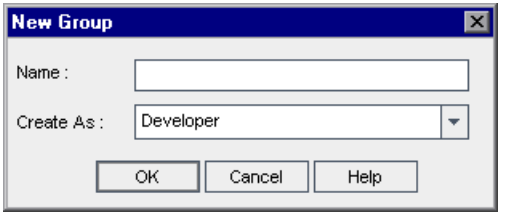
If you determine that the default user groups do not meet the needs of your project, you can create additional user groups for your project.

To add a user group:

1 In the Project Customization window, click the **Groups** link. The Groups page opens.



2 Click the **New** button. The New Group dialog box opens.



3 In the **Name** box, type a name for the group.

4 In the **Create As** list, assign the new group the privileges of an existing user group.

Tip: Choose an existing user group that has similar access privileges to the new user group you want to create. This minimizes the level of customization you need to do.

---

5 Click **OK**.

6 Click **Yes** to confirm. The new group name is added to the Groups list in the Groups page.

7 Click **Save** to save your changes to the Groups page.

Setting User Group Permissions

Every user group has a set of privileges, or permissions, which are defined by the Quality Center project administrator. You generally set the permissions for custom user groups at the beginning of the project, but you can modify a user group's permissions at any time.

For example, suppose a group of users called DOC has Viewer permissions. In order to work more effectively on the project, they need to add, modify, and delete defects. As the Quality Center project administrator, you can assign these privileges to the DOC group by specifying permission settings.

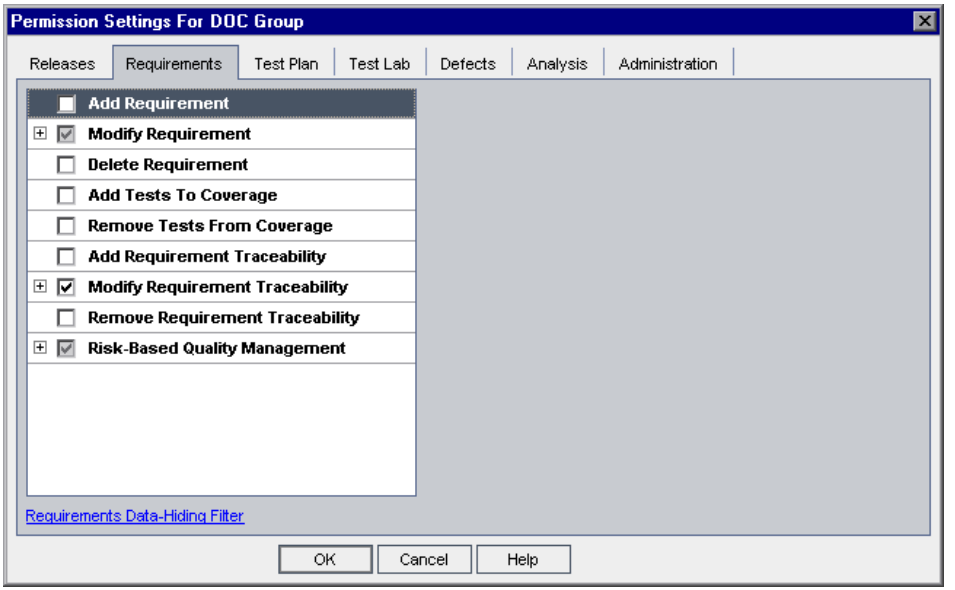
Note: You cannot modify the privileges of a default user group. To view permissions for a default user group, in the Groups page, select the user group in the **Groups** list and click the **View** button. For more information, see "Understanding the Permission Settings Tasks" on page 180.

To set user group permissions:

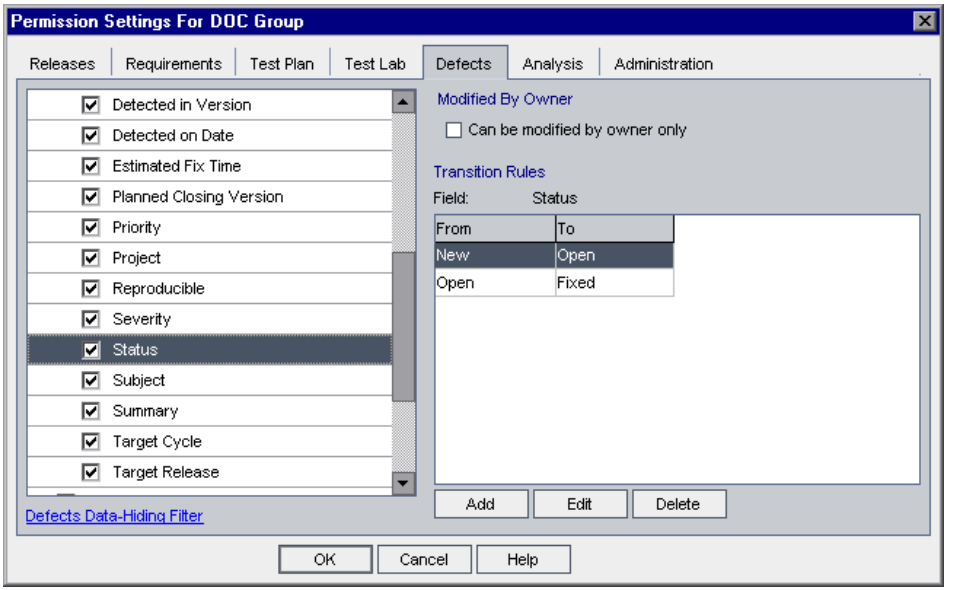
1 In the Project Customization window, click the **Groups** link. The Groups page opens.

2 In the **Groups** list, choose the user group for which you want to set permissions.

3 Click the **Change** button. The Permission Settings dialog box opens.



4 Click a permission tab. For example, click **Defects**. The tab displays the tasks available in the Defects module.



5 Select the tasks that the selected user group can use. For more information on the available tasks, see “Understanding the Permission Settings Tasks” on page 180.

6 When you select a task with a sublevel, a list of associated fields appears below. Select the check boxes of the fields that the selected user group can use.

7 To limit the capabilities of modifying a field, do any of the following:

- To ensure that only the person who originally created the entry can change that value, select **Can be modified by owner only**. For more information, see the following section, “Owning Quality Center Objects”.
- To limit the values a user group can select from a lookup list type field, set transition rules of permissible field values. For more information, see “Setting Transition Rules” on page 173.

8 For deleting tasks, you can ensure that only the person who originally created the entry can delete the value by selecting **Can be deleted by owner only**. For more information, see the following section, "Owning Quality Center Objects".

9 You can click the **Data-Hiding Filter** link to hide data from the current user group in the Requirements, Test Plan, Test Lab, and Defects modules. For more information, see "Hiding Data for a User Group" on page 176.

10 Click **OK** to close the Permission Settings dialog box.

11 Click **Save** to save your changes to the Groups page.

Owning Quality Center Objects

When setting group permissions, you can limit the capabilities of modifying or deleting a field value, so that only the person who originally created the entry can change or delete the value. The following table describes the objects in Quality Center and the users that are defined as the default owners of the objects.

Quality Center Object	Owner
Requirement	The **Author** field (**RQ_REQ_AUTHOR**).
Test in the Test Plan module	The **Designer** field (**TS_RESPONSIBLE**).
Test in the Test Lab module	The **Responsible Tester** field (**TC_TESTER_NAME**).
Test run in the Test Lab module	The **Tester** field (**RN_TESTER_NAME**).
Defect	The **Assigned To** field (**BG_RESPONSIBLE**).

Note: You can change the owner of a Quality Center object by modifying the value of **TB_OWNER_FIELD_NAME** in the **Tables** table. For more information on the Tables table, refer to the *HP Quality Center Database Reference*.

Setting Transition Rules

You can limit a group's modifying privileges by setting transition rules for modifying values in fields. These rules determine the values that the group can modify in fields that you specify. Note that transition rules can be set only for lookup and user list fields.

For example, when modifying defect information, you can limit the items a user group can select in the **Status** field of a defect record. You can set a transition rule that only allows a user group to edit the **Status** field from "Fixed" to "Closed".

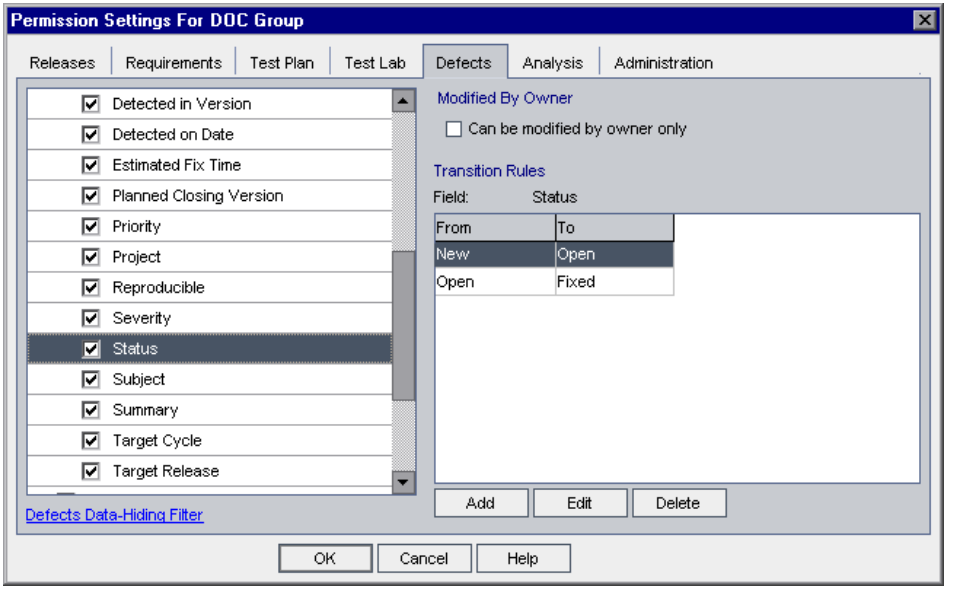
Note: When Workflow has been used to change a list of values for a field that is set with transition rules, the field may only be modified in a way that satisfies both the workflow script and the transition rules. For more information, see Chapter 18, "Workflow Event Reference."

To set transition rules:

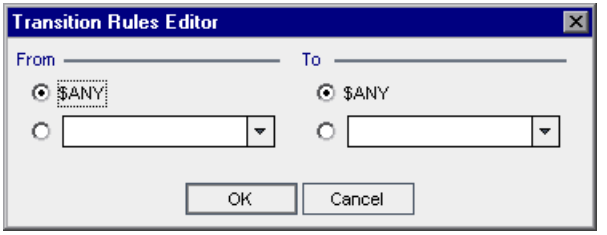
1. In the Project Customization window, click the **Groups** link. The Groups page opens.
2. In the **Groups** list, choose the user group for which you want to set permissions.
3. Click the **Change** button. The Permission Settings dialog box opens.
4. Click a permission tab. For example, click **Defects**. The tab displays the tasks available in the Defects module.
5. Select a task. For example, select **Modify Defect**. The task expands and lists available fields.

   For more information on the available tasks, see "Understanding the Permission Settings Tasks" on page 180.

6 Under the selected task, select a field. For example, select **Status.** The Transition Rules grid appears on the right pane of the Permission Settings dialog box.



7 Click **Add** to add a transition rule. The Transition Rules Editor dialog box opens.



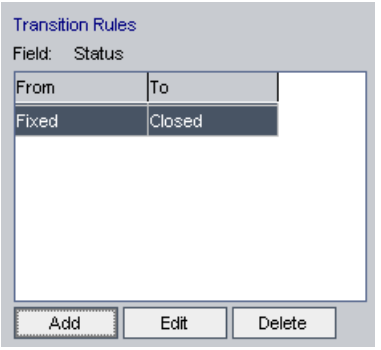
8 Under **From**, you can:

- Select **$ANY** to allow a user group to modify the field, irrespective of the currently displayed value.
- Select a value from the list. A user group is able to modify the selected field only when the field displays the value you select. For example, to allow a user group to edit the Status field of a defect only if "Fixed" is the current value, select **Fixed**.

9 Under **To**, you can:

- Select **$ANY** to allow a user group to change the field to any value.
- Select a value from the list. A user group is able to change the value of the selected field to only the value that you specify. For example, to allow a user group to change the value of the Status field only to "Closed", select **Closed**.

10 Click **OK** to save and close the Transition Rules Editor dialog box. The new rules are displayed in the Transition Rules grid.



11 To modify a transition rule, select a rule from the Transition Rules grid and click the **Edit** button. In the Transition Rules Editor dialog box, modify the rule. Click **OK**.

12 To delete a transition rule, select a rule from the Transition Rules grid and click the **Delete** button. Click **OK** to confirm.

13 Click **OK** to close the Permission Settings dialog box.

14 Click **Save** to save your changes to the Groups page.

Hiding Data for a User Group

You can instruct Quality Center to hide specific records that a user group can view in the Requirements, Test Plan, Test Lab, and Defects modules. This includes the following options:

- **Filtering Data.** You can set filters for specific fields, limiting the records that the user group can view. For example, you can set the filter for the field **Assigned To** to "[CurrentUser]". This instructs Quality Center to allow only the current user to view specific records that are assigned to him or her.

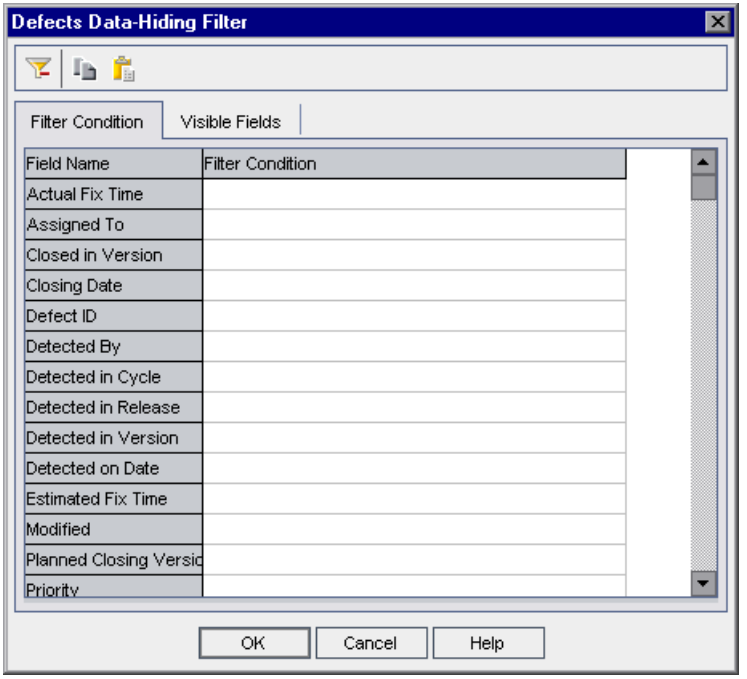
  For more information on filtering, refer to the *HP Quality Center User's Guide*.

- **Defining Visible Fields.** You can select which fields in a module the user group can see and which should be hidden. This can help in simplifying the volume of data displayed. Users belonging to a specific user group need to view only data that relates to their work. For example, in the Test Plan tab, you may want to hide the **Path** field from user groups that should not be able to access test scripts from the file system. Note that you cannot hide required fields.

To hide data:

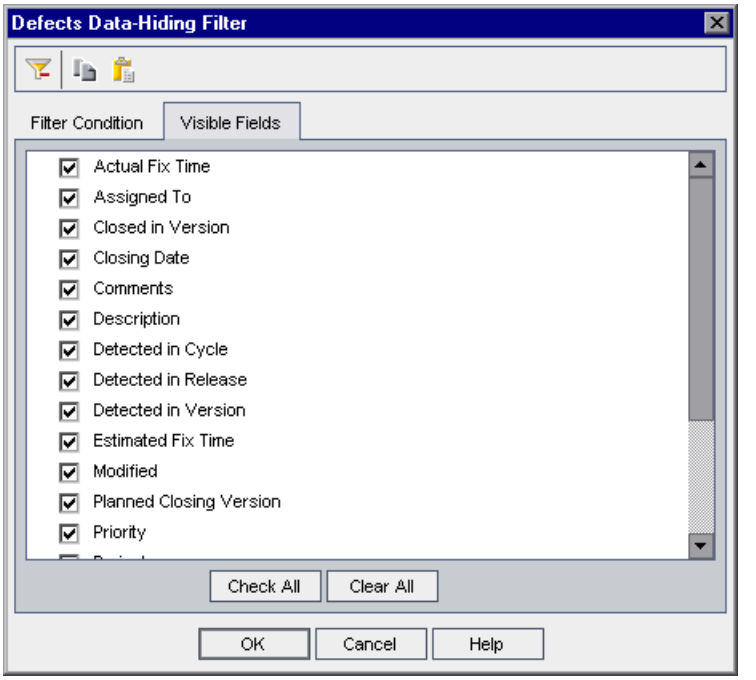
1. In the Project Customization window, click the **Groups** link. The Groups page opens.
2. In the **Groups** list, choose the user group for which you want to set permissions.
3. Click the **Change** button. The Permission Settings dialog box opens.
4. Click a permission tab. For example, click **Defects**. The tab displays the tasks available in the Defects module.

5 Click the **Data-Hiding Filter** link located at the bottom left corner of the dialog box. For example, in the Defects tab, click the **Defects Data-Hiding Filter**. The Defects Data-Hiding Filter dialog box opens and displays the Filter tab.



6 Set one or more filters. The filter set determines the records that a user group can view in Quality Center. For more information, refer to the *HP Quality Center User's Guide*.

7 Click the **Visible Fields** tab.



8 Select or clear the appropriate fields.

9 Click **OK** to close the Data-Hiding Filter dialog box.

10 Click **OK** to close the Permission Settings dialog box.

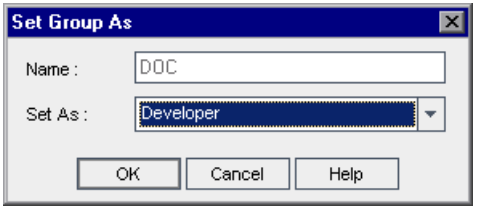
11 Click **Save** to save your changes to the Groups page.

Assigning Existing Sets of Permissions to User Groups

During the course of a project, you can assign one user group another user group's permissions.

To assign an existing set of permissions to a user group:

1. In the Project Customization window, click the **Groups** link. The Groups page opens.
2. In the **Groups** list, select a group name.
3. Click the **Set As** button. The Set Group As dialog box opens.



4. In the **Set As** list, select a group name.
5. Click **OK**.

Renaming User Groups

You can rename a user group. Note that all customization performed on the group remains.

To rename a user group:

1. In the Project Customization window, click the **Groups** link. The Groups page opens.
2. In the **Groups** list, select a group name.
3. Click the **Rename** button. The Rename Group dialog box opens.
4. Type a new name for the group.
5. Click **OK** to save your changes.

Deleting User Groups

You can delete user groups that were added to a Quality Center project.

To delete a user group:

1. In the Project Customization window, click the **Groups** link. The Groups page opens.
2. In the **Groups** list, select a group name.
3. Click the **Delete** button.
4. Click **OK** to confirm.

Understanding the Permission Settings Tasks

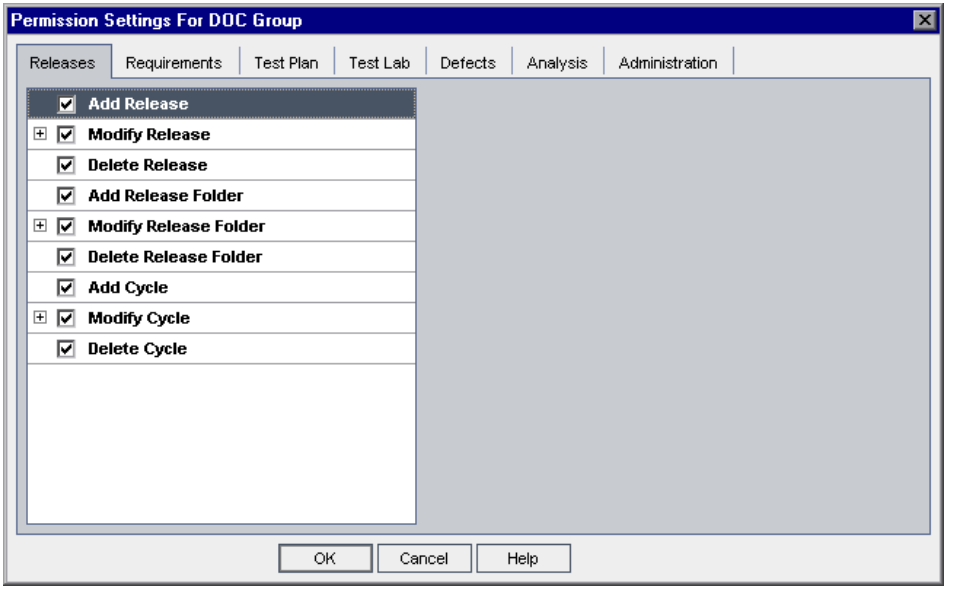
You can display the permissions of user groups in the Permission Settings dialog box. You can modify the permissions of custom user groups at any time. You cannot modify the permissions of the default user groups (TDAdmin, QATester, Project Manager, Developer, and Viewer).

To display permissions for a custom user group, in the Groups page, select the user group in the **Groups** list, and click the **View** or **Change** button. For a default user group, click the **View** button. The Permission Settings dialog box opens.

The Permission Settings dialog box contains the following tabs: Releases, Requirements, Test Plan, Test Lab, Defects, Analysis, and Administration. If you use HP Business Process Testing, refer to the *HP Business Process Testing Module User's Guide*.

Releases Tasks

The Releases tab displays the tasks available in the Releases module.



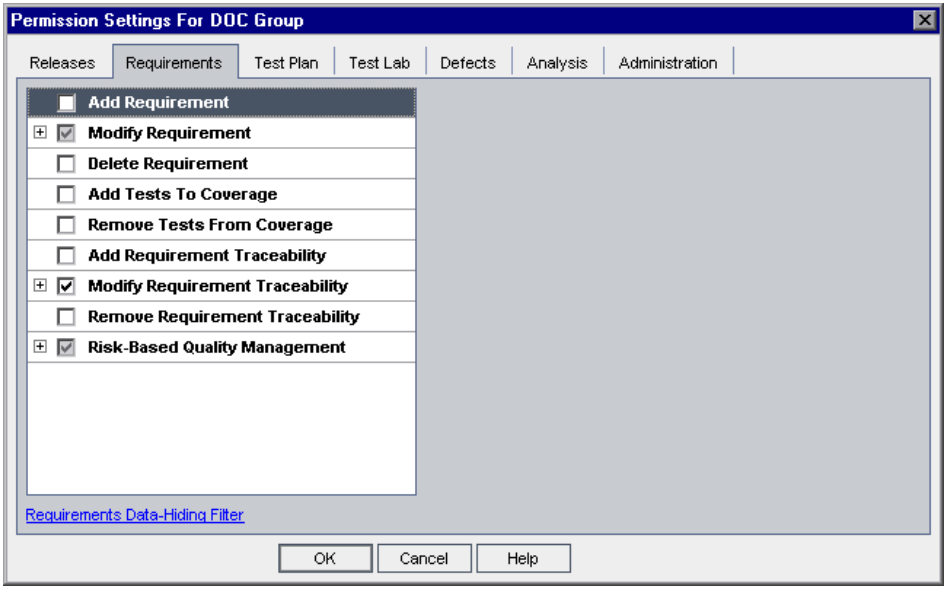
The Releases tab includes the following tasks:

Task	Description
Add Release	User group can add releases to release folders in the releases tree. By default, the user group can also modify releases.
Modify Release	User group can modify releases in release folders. This task enables you to specify the fields that the selected user group can modify.
Delete Release	User group can delete releases and cycles from the releases tree.
Add Release Folder	User group can add release folders to the releases tree. By default, the user group can also modify release folders.

Task	Description
Modify Release Folder	User group can modify release folders in the releases tree. This task enables you to specify the fields that the selected user group can modify.
Delete Release Folder	User group can delete release folders, releases, and cycles from the releases tree.
Add Cycle	User group can add cycles to the releases tree. By default, the user group can also modify cycles.
Modify Cycle	User group can modify cycles in the releases tree. This task enables you to specify the fields that the selected user group can modify.
Delete Cycle	User group can delete cycles from the releases tree.

Requirements Tasks

The Requirements tab displays the tasks available in the Requirements module.



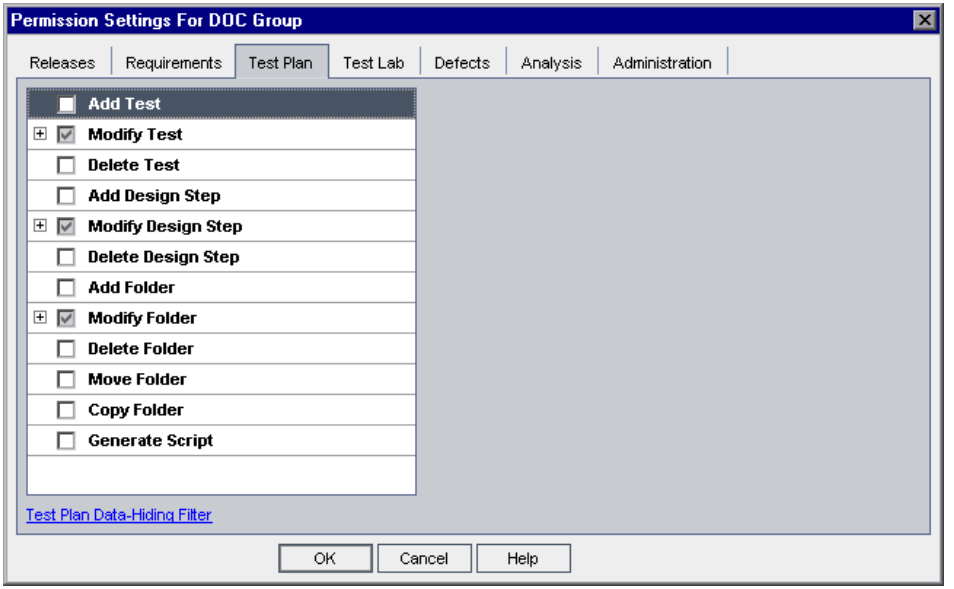
The Requirements tab includes the following tasks:

Task	Description
Add Requirement	User group can add requirements to the requirements tree.
Modify Requirement	User group can modify requirements in the requirements tree. Note that this task enables you to specify the fields that the selected user group can modify. To ensure that only the owner of the requirement can modify it, click the **Can be modified by owner only** check box.
Delete Requirement	User group can delete requirements from the requirements tree. To ensure that only the owner of the requirement can delete it, click the **Can be deleted by owner only** check box.
Add Tests to Coverage	User group can add tests coverage to a requirement and requirements coverage to a test.
Remove Tests from Coverage	User group can remove tests coverage from a requirement and requirements coverage from a test.
Add Requirement Traceability	User group can add traceability links to a requirement.
Modify Requirement Traceability	User group can modify traceability links for a requirement. Note that this task enables you to specify whether the user group can modify the comment for a traceability link. To ensure that only the owner of the requirement can modify the traceability link, click the **Can be modified by owner only** check box.

Task	Description
Remove Requirement Traceability	User group can remove traceability links from a requirement. To ensure that only the owner of the requirement can remove the traceability link, click the **Can be removed by owner only** check box.
Risk-Based Quality Management	Enables you to specify permission settings for the following risk-based quality management tasks: ➤ **Assess Business Criticality.** User group can assess the Business Criticality and override calculated analysis results of a requirement. ➤ **Assess Failure Probability.** User group can assess the Failure Probability and override calculated analysis results of a requirement. ➤ **Analyze.** User group can perform risk-based quality management analysis on a requirement and its children. For more information on risk-based quality management, see the *HP Quality Center User's Guide*.

Test Plan Tasks

The Test Plan tab displays the tasks available in the Test Plan module.

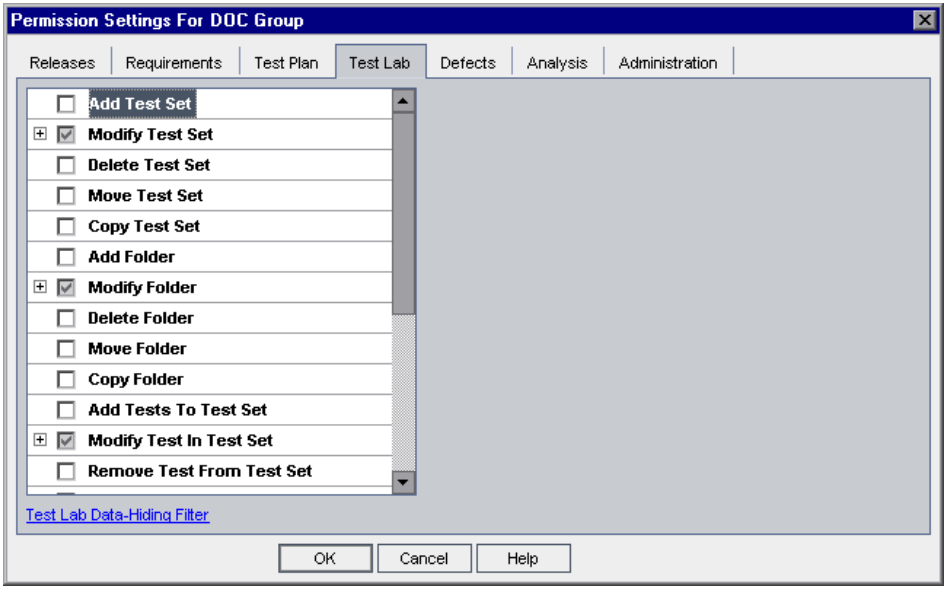


The Test Plan tab includes the following tasks:

Task	Description
Add Test	User group can add tests to the test plan tree.
Modify Test	User group can modify tests in the test plan tree. Note that this task enables you to specify the fields that the selected user group can modify. To ensure that only the owner of the test can modify it, click the **Can be modified by owner only** check box.
Delete Test	User group can delete tests from the test plan tree. To ensure that only the owner of the test can delete it, click the **Can be deleted by owner only** check box.
Add Design Step	User group can add design steps in the Design Steps tab.
Modify Design Step	User group can modify design steps in the Design Steps tab. Note that this task enables you to specify the fields that the selected user group can modify.
Delete Design Step	User group can delete design steps from the Design Steps tab. To ensure that only the owner of the design step can delete it, click the **Can be deleted by owner only** check box.
Add Folder	User group can add folders to the test plan tree.
Modify Folder	User group can modify folders in the test plan tree. Note that this task enables you to specify the fields that the selected user group can modify.
Delete Folder	User group can delete folders from the test plan tree.
Move Folder	User group can move folders in the test plan tree.
Copy Folder	User group can copy folders in the test plan tree.
Generate Script	User group can convert the test steps of a manual test, displayed in the Design Steps tab, into an automated test.

Test Lab Tasks

The Test Lab tab displays the tasks available in the Test Lab module.



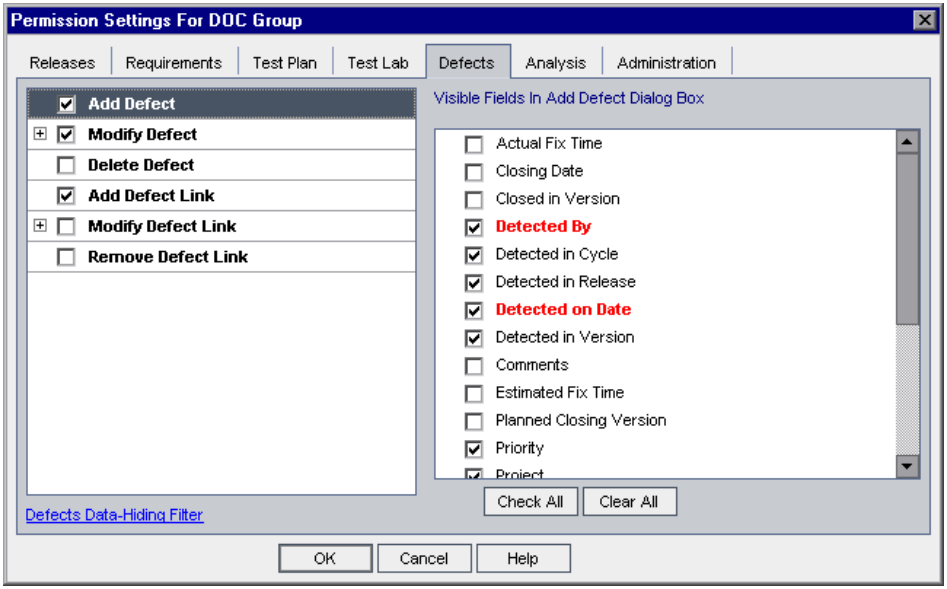
The Test Lab tab includes the following tasks:

Task	Description
Add Test Set	User group can add test sets.
Modify Test Set	User group can modify test sets. Note that this task enables you to specify the fields that the selected user group can modify.
Delete Test Set	User group can delete test sets.
Move Test Set	User group can move test sets to different folders in the test sets tree.
Copy Test Set	User group can copy test sets to folders in the test sets tree.
Add Folder	User group can add folders to the test sets tree.

Task	Description
Modify Folder	User group can modify folders in the test sets tree. Note that this task enables you to specify the fields that the selected user group can modify.
Delete Folder	User group can delete folders in the test sets tree.
Move Folder	User group can move folders in the test sets tree.
Copy Folder	User group can copy folders in the test sets tree.
Add Tests to Test Set	User group can add tests to a test set.
Modify Test in Test Set	User group can modify tests in a test set. Note that this task enables you to specify the fields that the selected user group can modify. To ensure that only the owner of the test set can modify it, click the **Can be modified by owner only** check box.
Remove Test from Test Set	User group can remove tests from a test set.
Run Test	User group can run tests.
Modify Run	User group can modify test run information. Note that this task enables you to specify the fields that the selected user group can modify. To ensure that only the owner of the run can modify it, click the **Can be modified by owner only** check box.
Delete Run	User group can delete test run information. To ensure that only the owner of the run can delete it, click the **Can be deleted by owner only** check box.
Reset Test Set	User group can clear all runs in a test set.
Add Hosts	User group can add hosts for running tests.
Modify Hosts	User group can modify host information.
Delete Hosts	User group can delete hosts.
Add Host Group	User group can add host groups for running tests.
Modify Host Group	User group can modify host group information.
Delete Host Group	User group can delete host groups.

Defects Tasks

The Defects tab displays the tasks available in the Defects module.



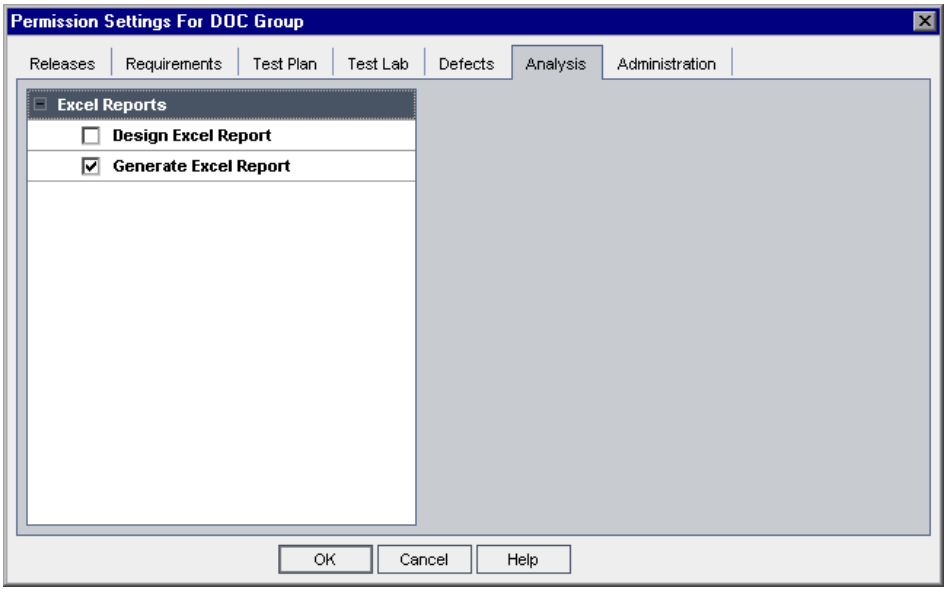
The Defects tab includes the following tasks:

Task	Description
Add Defect	User group can add defects to the Defects Grid. Note that you can customize the fields that appear in the Add Defect dialog box. Under **Visible Fields in Add Defect Dialog Box,** select the fields you want to be visible. Fields that are marked in red are mandatory if they are visible.
Modify Defect	User group can modify defects in the Defects Grid. Note that this task enables you to specify the fields that the selected user group can modify. To ensure that only the owner of the defect can modify it, click the **Can be modified by owner only** check box.

Task	Description
Delete Defect	User group can delete defects from the Defects Grid. To ensure that only the owner of the defect can delete it, click the **Can be deleted by owner only** check box.
Add Defect Link	User group can add defect links to the Quality Center entities.
Modify Defect Link	User group can modify defect links. This task enables you to specify the fields that the selected user group can modify. To ensure that only the owner of the defect link can modify it, click the **Can be modified by owner only** check box.
Remove Defect Link	User group can remove defect links from the Quality Center entities. To ensure that only the owner of the defect link can remove it, click the **Can be removed by owner only** check box.

Analysis Tasks

The Analysis tab displays the tasks available in the Analysis module.

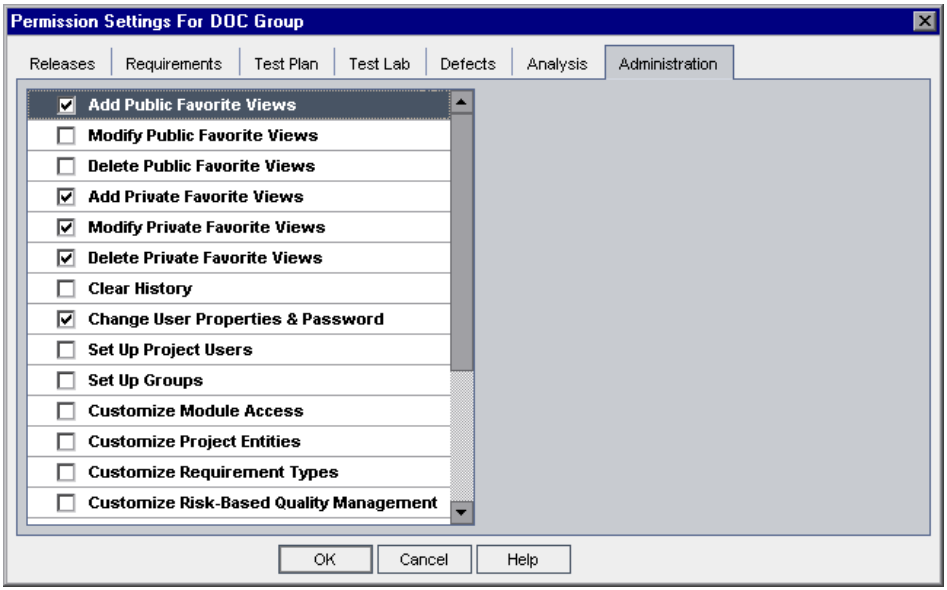


The Analysis tab includes the following tasks:

Task	Description
Design Excel Report	User group can design Excel reports from the Analysis module.
Generate Excel Report	User group can generate Excel reports from the Analysis module. If a user does not have **Design Excel Report** permissions, the Query, Post-processing, and Generation Settings tabs in the Analysis module are not visible, and the settings in the General tab cannot be modified.

Administration Tasks

The Administration tab displays the administrative tasks available in Quality Center.



The Administration tab includes the following tasks:

Task	Description
Add Public Favorite Views	User group can add public favorite views.
Modify Public Favorite Views	User group can modify public favorite views.
Delete Public Favorite Views	User group can delete public favorite views.
Add Private Favorite Views	User group can add private favorite views.
Modify Private Favorite Views	User group can modify private favorite views.
Delete Private Favorite Views	User group can delete private favorite views.
Clear History	User group can clear the information displayed in the History table. For instructions on clearing history, refer to the *HP Quality Center User's Guide*.
Change User Properties & Password	User group can change their properties and password, using the **User Properties** link in the Project Customization window.
Set Up Project Users	User group can add and remove users from a Quality Center project, using the **Project Users** link in the Project Customization window.
Set Up Groups	User group can assign privileges to user groups and specify permission settings, using the **Groups** link in the Project Customization window.
Customize Module Access	User group can decide the type of access a user group can have for Quality Center, using the **Module Access** link in the Project Customization window.
Customize Project Entities	User group can customize fields in a Quality Center project, using the **Project Entities** link in the Project Customization window.
Customize Requirement Types	User group can customize requirement types in a Quality Center project, using the **Requirement Types** link in the Project Customization window.

Task	Description
Customize Risk-Based Quality Management	User group can customize criteria and default settings for risk-based testing using the **Risk-Based Quality Management** link in the Project Customization window.
Customize Project Lists	User group can add their own customized lists to a project, using the **Project Lists** link in the Project Customization window.
Configure Automail	User group can set up a mailing configuration to routinely inform users about defect repair activity, using the **Automail** link in the Project Customization window.
Set Up Alert Rules	User group can set up alert rules, using the **Alert Rules** link in the Project Customization window.
Set Up Workflow	User group can write and/or generate scripts that dynamically change the user interface in the Quality Center modules, using the **Workflow** link in the Project Customization window.

Customizing Module Access for User Groups

For each Quality Center project, you can control the modules that each user group can access. By preventing users from accessing unnecessary modules, you can better utilize your Quality Center licenses. For example, if a user group uses Quality Center only to add defects to a project, you can limit the group's access to the Defects module only.

You can specify module access for a user group as follows:

- the Defects module only
- all Quality Center modules excluding the Business Components module
- all Quality Center modules including the Business Components module

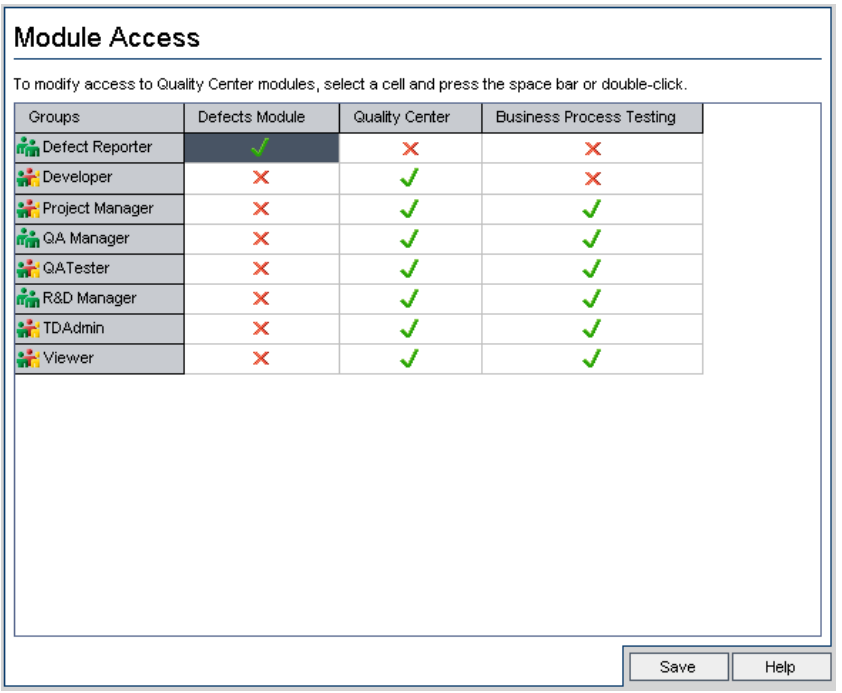
---

Note: If access to the Business Components module is not enabled for a user group, those users can still view existing business process tests in read-only mode. For more information, refer to the *HP Business Process Testing Module User's Guide*.

You can monitor how many users are currently connected to a project, the time the users first logged in to the project, the time of the last action, and the type of access. For more information, see "Monitoring User Connections" on page 106. You can also determine the total number of Quality Center licenses in use. For more information, see "Managing Quality Center Licenses" on page 109.

To customize module access for user groups:

1 In the Project Customization window, click the **Module Access** link. The Module Access page opens.



The ✓ icon indicates the modules that the user group can access.

To select or clear a cell in the table, double-click the cell, or select the cell and press the space bar.

2 To select the Defects module only, select the **Defects Module** column. This clears the **Quality Center** column and the **Business Process Testing** column.

3 To select the Quality Center modules, select the **Quality Center** column. This clears the **Defects Module** column.

4 To select the Business Components module, select the **Business Process Testing** column. This selects the **Quality Center** column and clears the **Defects Module** column.

5 Click **Save** to save your changes.

11

Customizing Quality Center Projects

As a Quality Center project administrator, you can customize a project to meet the specific needs of your testing team. For example, you can add or customize fields, customize requirement types, and create categories and lists that reflect the needs of your testing project.

This chapter describes:	On page:
About Customizing Quality Center Projects	197
Customizing Project Entities	199
Customizing Project Requirement Types	208
Customizing Project Lists	213

About Customizing Quality Center Projects

Before you begin a project, you can customize your project to reflect your unique testing requirements. As a project progresses, you can further adjust the project to meet its changing needs.

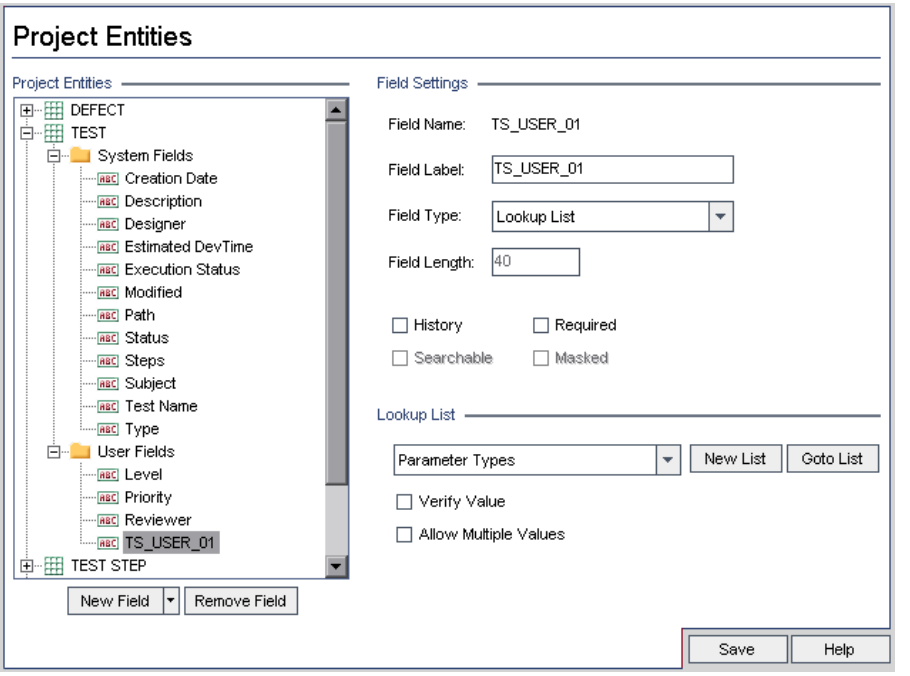
Quality Center contains system fields in which you enter information about a requirement, test, test step, test set, test run, or defect. You can modify the behavior of these fields by restricting users to selecting values only from associated lists, by making entry in certain fields mandatory, and by preserving a history of values entered in the field. In addition, you can include data unique to your project by creating user-defined fields. You can associate these fields with Quality Center system and user-defined lists.

For example, if you are running tests on several builds of an application, you can add a **Detected in Build** field to the Add Defect dialog box. You can then create a selection list containing the values **Build1**, **Build2**, and **Build3**, and associate the list with the **Detected in Build** field.

In the Requirements module, you can also assign each requirement to a requirement type. A requirement type defines which fields are available and which fields are required for a requirement of that type. This enables you to make available for a requirement only the fields relevant to the type to which it is assigned.

Customizing Project Entities

Using the Project Entities page, you can customize your Quality Center project to suit your testing environment.



Each Quality Center project is divided into project entities. *Entities* contain data entered by users for a specific testing process and the data is stored in tables.

The following entities are available:

Entity	Description
Cycle	Cycle data in the Releases module.
Defect	Defect data in the Defects module.
Release	Release data in the Releases module.
Release Folder	Release folder data in the Releases module.
Requirement	Requirement data in the Requirements module.
Run	Test run data in the Test Lab module.
Test	Test data in the Test Plan module.
Test Instance	Test instance data in the Test Lab module.
Test Set	Test set data in the Test Lab module.
Test Step	Design step data in the Test Plan module, and test step data in the Test Lab module.

Each entity contains system fields and user-defined fields:

- **System fields.** These are Quality Center default fields. You cannot add or delete system fields, you can only modify them.
- **User fields.** These are fields that you can define and include in a Quality Center project to customize for your specific project needs. You can add, modify, and delete user-defined fields.

  For detailed information on Quality Center entities and fields, refer to the *HP Quality Center Database Reference*.

The **Field Settings** section displays the field properties. The following properties are available:

Properties	Description
Field Name	Indicates the field name used in the Quality Center database table.
Field Label	Indicates the field name as it is displayed in Quality Center. You can type a new name or use the default name.
Field Type	Specifies the type of data that the user can enter in the field. It includes the following types: ➤ **Number.** Enables integer entry only. ➤ **String.** Enables the entry of any character string. ➤ **Date.** Enables the selection of a date. ➤ **Lookup List.** Displays the Lookup List area and enables the selection from a drop-down list. ➤ **User List.** Enables the selection of a user name from your Quality Center users list. ➤ **Memo.** Enables the entry of blocks of data. Note that you can add up to 5 memo fields to each Quality Center entity.
Field Length	Indicates the field size. (Available only when the **String** type is selected.) **Note:** The maximum field length is 255 characters.
History	Preserves a log of values entered in the selected field.
Required	Indicates that a user must enter a value for the field. **Note:** If you set a field as required in a project that already contains data, users do not need to enter a value for the field when they modify an existing record if the field is already empty.
Masked	Indicates the input data mask for the field. (Available only when the **String** type is selected.) For more information, see “Defining Input Masks” on page 205.

Properties	Description
Searchable	Indicates a searchable field. (Available only when the **Text Search** option is enabled in the DB Servers tab. For more information, see "Defining Searchable Fields" on page 124.)
Lookup List	Includes a list of predefined lists. (Available only when the **Lookup List** type is selected.) To associate a field with a predefined list, select a list from the **Lookup List** box. To view or modify the selected list, click the **Goto List** button.
New List	Creates a new list. (Available only when the **Lookup List** type is selected.) To associate a field with a new list, click the **New List** button. The Project Lists dialog box opens. For more information on customizing a list, see "Customizing Project Lists" on page 213.
Goto List	Displays a predefined list. (Available only when the **Lookup List** type is selected.) To open a predefined list, select a list from the **Lookup List** box. Click the **Goto List** button. The Project Lists dialog box opens. For more information on customizing a list, see "Customizing Project Lists" on page 213.

Properties	Description
Verify Value	Limits the user to select a value only from the items that are listed in the list box. (Available only when the **Lookup List** type is selected.)
Allow Multiple Values	For user-defined fields, this option allows the user to select more than one value in any field that is associated with a predefined lookup list. (It is only available when the **Lookup List** type is selected.) For example, if you create a **Language** user field in the Defect entity and enable the **Allow Multiple Values** option, a user can select English, French, and German language values at the same time when entering this field's value. **Note:** ➤ This option is not available in the TEST STEP entity. ➤ If you group a data grid or summary graph by a field containing multiple values, the information in each value is grouped as its entire value. This value is the category for grouping. For example, a value with English and French is grouped once as English;French, and not as part of separate English and French categories. For more information on customizing a list, see "Customizing Project Lists" on page 213.

Adding User-Defined Fields

You can customize a Quality Center project by adding up to 99 user-defined fields to each Quality Center entity.

To add a user-defined field:

1 In the Project Customization window, click the **Project Entities** link. The Project Entities page opens.

2 Under **Project Entities**, expand an entity.

3 Click the **User Fields** folder.

4 To add a user-defined field, you can:

- ➤ Click the **New Field** button to add a number, string, date, or list type field.
- ➤ Click the **New Field** arrow and choose **New Memo Field** to add a memo field. You can add up to 5 memo fields to each Quality Center entity.

5 In the **Field Settings** section, set properties for the field. For more information, see the "Field Settings" section on page 201.

6 Click **Save** to save your changes to the Project Entities page.

Modifying System and User-Defined Fields

You can modify the properties of system and user-defined fields in your Quality Center project.

Note: You can modify only the following properties for system fields: **Field Label**, **History**, **Required**, and **Verify Value**. For more information, see the "Field Settings" section on page 201.

To modify a system or user-defined field:

1 In the Project Customization window, click the **Project Entities** link. The Project Entities page opens.

2 Under **Project Entities**, expand an entity.

3 Expand the **System Fields** folder or the **User Fields** folder.

4 Click the field that you want to customize. The settings for that field appear under **Field Settings**.

5 Modify the properties for the selected field. For more information, see the "Field Settings" section on page 201.

6 Click **Save** to save your changes to the Project Entities page.

Deleting User-Defined Fields

You can delete user-defined fields from your Quality Center project.

To delete a user-defined field:

1. In the Project Customization window, click the **Project Entities** link. The Project Entities page opens.
2. Under **Project Entities**, expand an entity.
3. Expand the **User Fields** folder.
4. Click the field that you want to delete and click the **Remove Field** button.
5. Click **OK** to confirm. The field is removed from the **User Fields** folder.
6. Click **Save** to save your changes to the Project Entities page.

Defining Input Masks

The input mask option is used to prompt users for data input using a mask pattern. If the user attempts to enter a character that conflicts with the input mask, an error occurs. For example, to prompt the user to enter a phone number, you can define the following input mask:

!\(000\)000-0000

This input mask limits the user to numeric characters only. It is displayed in an edit box as follows:

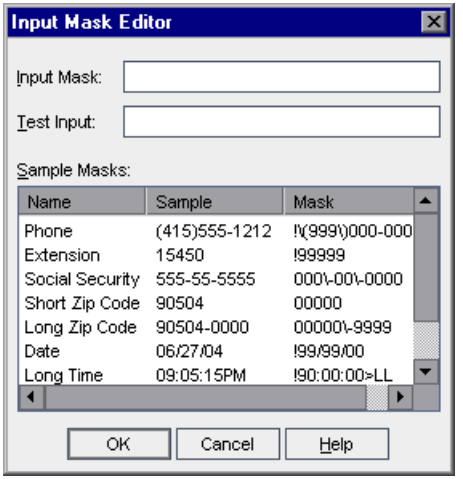
(___) ___ - ____

Note: You can define input masks for string type fields only.

To define an input mask:

1 In the Field Settings section, select **Masked**. For more information, see the "Field Settings" section on page 201.

2 Under **Masked Edit Attributes**, click the **Define** button. The Input Mask Editor dialog box opens.



3 In the **Input Mask** box, type an input mask or select a predefined mask.

You can use the following characters when defining input masks:

Mask Character	Description
!	A space for a leading or trailing blank.
#	A digit.
.	A decimal.
:	A time separator.
/	A date separator.
\	Treats the next character in the mask string as a literal. For example, you can include the (,), #, &, A, and ? characters in the mask.
>	Converts all the characters that follow to uppercase.

Mask Character	Description
<	Converts all the characters that follow to lowercase.
A	An alphanumeric character (entry required). For example: a – z, A – Z, or 0 – 9.
a	An alphanumeric character (entry optional). For example: a – z, A – Z, or 0 – 9.
C	A character (entry required). Valid values are ANSI characters in the following ranges: 32-126 and 128-255.
c	A character (entry optional). Valid values are ANSI characters in the following ranges: 32-126 and 128-255.
L	An alphabetic character or space (entry required). For example: a – z or A – Z.
l	An alphabetic character or space (entry optional). For example: a – z or A – Z.
0	A digit (entry required). For example: 0 – 9.
9	A digit (entry optional). For example: 0 – 9.
_	Inserts spaces. When the user types characters in the field box, the cursor skips the _ character.

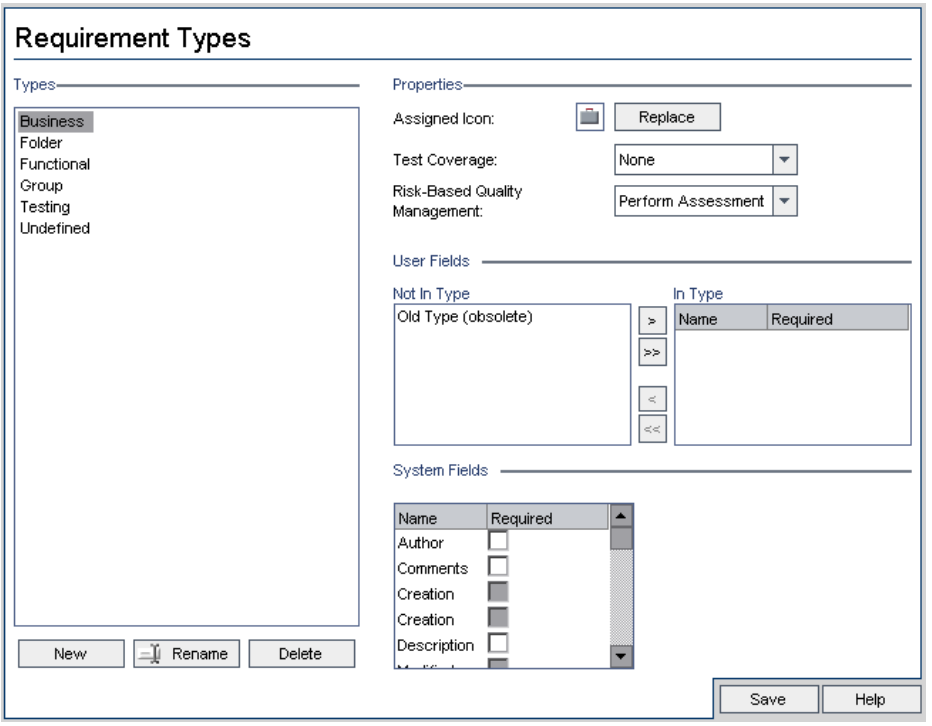
4 In the **Test Input** box, you can test the input mask.

5 Click **OK** to close the Input Mask Editor dialog box.

6 Click **Save** to save your changes to the Project Entities page.

Customizing Project Requirement Types

Using the Requirement Types page, you can create requirement types for your project, and customize their properties.



You can assign each requirement in the Requirements module to a requirement type. A *requirement type* defines for requirements of the type which fields are optional, and which user-defined fields are available. This enables you to create user-defined fields specifically for a particular requirement type, that are only available for requirements of that type.

For example, you might create a requirement type Security Requirement for requirements connected to security. You could then create a user-defined field Security Hazards containing a list of possible security hazards a requirement might cover. This field is not relevant for requirements of types other than Security Requirement, so you would not make it available for any type except for Security Requirement.

Each requirement type has an associated icon, which is displayed next to the requirement in Requirements module tree views, enabling you to easily identify to which type a requirement belongs. In addition, for each requirement type you can determine whether test coverage and risk-based quality management are available.

Creating Requirement Types

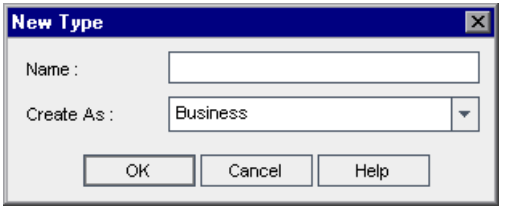
You can create a requirement type.

Note: Quality Center provides the default requirement types **Business**, **Folder**, **Functional**, **Group**, **Testing**, and **Undefined**. For more information on these types, see the *HP Quality Center User's Guide*.

To create a requirement type:

1 In the Project Customization window, click the **Requirement Types** link. Requirement Types page opens.

2 Click the **New** button. The New Type dialog box opens.



3 In the **Name** box, type a name for the type.

4 In the **Create As** list, assign the new type properties of an existing requirement type.

Tip: Choose an existing requirement type that has similar properties to the new type you want to create. This minimizes the level of customization you need to do.

---

5 Click **OK**. The New Type dialog box closes and the new type is added to the Types list.

6 Click **Save** to save your changes to the Requirement Types page.

Customizing Requirement Types

You can customize a requirement type by changing its icon, determining whether requirements of the type can have test coverage and risk analysis, and defining which fields are available and which are required for requirements of the type.

To customize a requirement type:

1 In the Project Customization window, click the **Requirement Types** link. The Requirement Types page opens.

2 Under **Types**, select a requirement type.

3 To change which icon is displayed next to requirements of the type in Requirements module tree views, under **Properties**, click the **Replace** button. The Change Image for Type dialog box opens displaying available icons for the type. Select an icon and click **OK**. The Change Image for Type dialog box closes and the icon is changed.

Note: You cannot change the icon for the default requirement types **Folder** and **Group**.

---

4 Under **Properties**, in the **Risk-Based Quality Management** box, you can select whether to **Perform Analysis** or **Perform Assessment** for risk-based quality management on requirements of the type. You can select **None** if you do not want to enable risk-based quality management for requirements of the type. For more information on risk-based quality management, see the *HP Quality Center User's Guide*.

5 Under **Properties,** in the **Test Coverage** box, you can select whether to enable adding test coverage to requirements of the type. The following options are available:

- **Has Coverage.** You can add test coverage to requirements of this type.
- **None.** You cannot add test coverage to requirements of this type.

Note: You cannot select the **None** option for a requirement type, if there are requirements of that type which already have test coverage. To clear the **Testing Coverage** check box for the type, you must either delete the requirements of that type with test coverage, remove the test coverage from those requirements, or change their type.

---

6 Under **User Fields**, you can choose which user fields are available for requirements of the type, and which available fields are required:

- To determine which user-defined fields are available, select one or more fields from the **Not In Type** or **In Type** lists, and click the arrow buttons (> and <) to move the fields from one list to the other. You can click the double arrow buttons (>> and <<) to move all the fields from one list to the other. For more information on user-defined fields, see "Customizing Project Entities" on page 199.
- To make a user-defined field that is available for the type a required field, in the **In Type** list, select the check box in the **Required** column for the field.

7 To make a system field a required field for the type, under **System Fields**, select the check box in the **Required** column for the field. Note that all system fields are automatically included in every type, and that some system fields cannot be set as optional.

8 Click **Save** to save your changes to the Requirement Types page.

Renaming Requirement Types

You can rename a requirement type.

To rename a requirement type:

1. In the Project Customization window, click the **Requirement Types** link. The Requirement Types page opens.
2. Under **Types**, select a requirement type.
3. Click the **Rename** button. The Rename Type dialog box opens.
4. Type a new name for the requirement type.
5. Click **OK** to close the Rename Type dialog box. The requirement type's name is updated.
6. Click **Save** to save your changes to the Requirement Types page.

Deleting Requirement Types

You can delete a requirement type.

Notes:

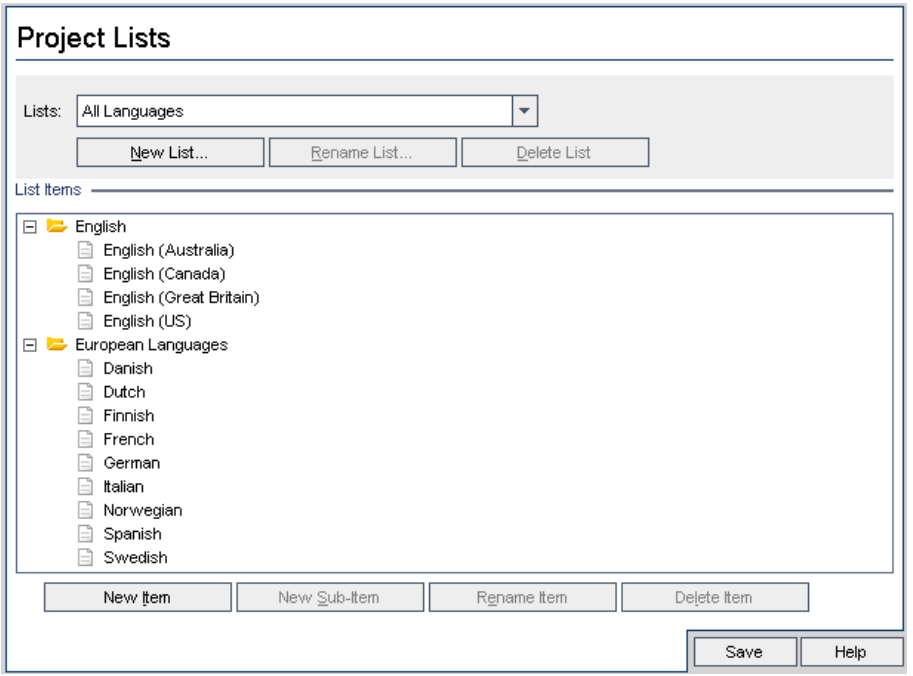
- You cannot delete the default requirement types **Folder** and **Undefined**.
- You cannot delete a type if there are requirements of the type in your project. To delete a type, you must first delete all requirements of the type, or change their types.

To delete a requirement type:

1. In the Project Customization window, click the **Requirement Types** link. The Requirement Types page opens.
2. Under **Type**, select a requirement type.
3. Click the **Delete** button.
4. Click **OK** to confirm. The requirement type is deleted.
5. Click **Save** to save your changes to the Requirement Types page.

Customizing Project Lists

Using the Project Lists page, you can create, rename, and delete user-defined lists.



A list contains items, which are values that you can enter in a field. For example, the selection list for the Languages user-defined field may contain the items English and European Languages.

The list can also contain several levels of sub-items. For example, the item English can contain a sublist with the sub-items English (Australia), English (Canada), English (Great Britain), and English (US).

You can allow the user to select more than one value from a list by enabling the **Allow Multiple Values** option for the relevant field in the Project Entities page. For more information, see "Allow Multiple Values" in the Field Settings table on page 203.

Note: To associate a list with a field, see "Customizing Project Entities" on page 199.

Creating Lists

You can create a list to be assigned to one or more fields.

To create a list:

1. In the Project Customization window, click the **Project Lists** link. The Project Lists page opens.
2. Click the **New List** button. The New List dialog box opens.
3. Type a name for the new list (maximum length 255 characters) and click **OK**. The list name appears in the Lists box.
4. To add an item to the new list or to an existing list, select the list name in the **Lists** box and click the **New Item** button. The New Item dialog box opens. Type a name for the item and click **OK**.

Note: You should not use a semi-colon (";") as part of any list item if the list is to be used in a multiple value field. For more information on multiple value fields, see "Allow Multiple Values" in the Field Settings table on page 203.

---

5. To create a sub-item, select an item in **List Items** and click the **New Sub-Item** button. The New Sub-Item dialog box opens. Type a name for the sub-item and click **OK**.
6. Click **Save** to save your changes to the Project Lists page.

Renaming Lists, Items, or Sub-Items

You can rename user-defined lists, and system and user-defined items or sub-items.

Note: You cannot change some system list items. For example, the Y and N in the **YesNo** list. For more information on system items that cannot be changed, refer to the Mercury Support Knowledge Base (http://support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp), select **TestDirector for Quality Center**, and search for Article Number 7165.

To rename a list:

1. In the Project Customization window, click the **Project Lists** link. The Project Lists page opens.
2. In the **Lists** box, select a list.
3. Click the **Rename List** button. The Rename List dialog box opens.
4. Type a new name for the list.
5. Click **OK** to close the Rename List dialog box.
6. Click **Save** to save your changes to the Project Lists page.

To rename an item or sub-item:

1. In the Project Customization window, click the **Project Lists** link. The Project Lists page opens.
2. In the **Lists** box, select a list.
3. Under **List Items**, select an item.
4. Click the **Rename Item** button. The Rename List Item dialog box opens.
5. Type a new name for the item. Click **OK**.
6. Click **Save** to save your changes to the Project Lists page.

Deleting Lists, Items, or Sub-Items

You can delete user-defined lists, and system and user-defined items or sub-items.

Note:

- ➤ You cannot delete a user-defined list that is being used as a lookup list for a field.
- ➤ You cannot delete some system list items. For example, the Y and N in the **YesNo** list. For more information on system items that cannot be deleted, refer to the Mercury Support Knowledge Base (http://support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp), select **TestDirector for Quality Center**, and search for Article Number 7165.

To delete a list:

1. In the Project Customization window, click the **Project Lists** link. The Project Lists page opens.
2. In the **Lists** box, select a user-defined list name.
3. Click the **Delete List** button.
4. Click **Yes** to confirm.
5. Click **Save** to save your changes to the Project Lists page.

To delete an item or sub-item:

1. In the Project Customization window, click the **Project Lists** link. The Project Lists page opens.
2. In the **Lists** box, select a list name.
3. Under **List Items**, select a list item.
4. Click the **Delete Item** button.
5. Click **Yes** to confirm.
6. Click **Save** to save your changes to the Project Lists page.

12

Configuring Automail

As a Quality Center project administrator, you can routinely inform your personnel about defect repair activity. You determine the conditions for sending defect messages to each recipient by defining a mailing configuration.

This chapter describes:	On page:
About Setting Automail	217
Designating Automail Fields	219
Defining Automail Conditions	220
Customizing the Subject of Defect Mail	222

About Setting Automail

Quality Center enables you to automatically notify users through e-mail each time changes are made to specified defect fields. Configuring mail for a Quality Center project involves the following steps:

- Click the **Automail** link to define the defect fields and specify the users and conditions. See "Designating Automail Fields" on page 219, and "Defining Automail Conditions" on page 220.
- In Site Administration's **Site Projects** tab, enable the mail configuration for a project by selecting the **Send mail automatically** check box. Note that this check box must be selected for your mail configuration to work. For more information, see "Updating Project Details" on page 42.

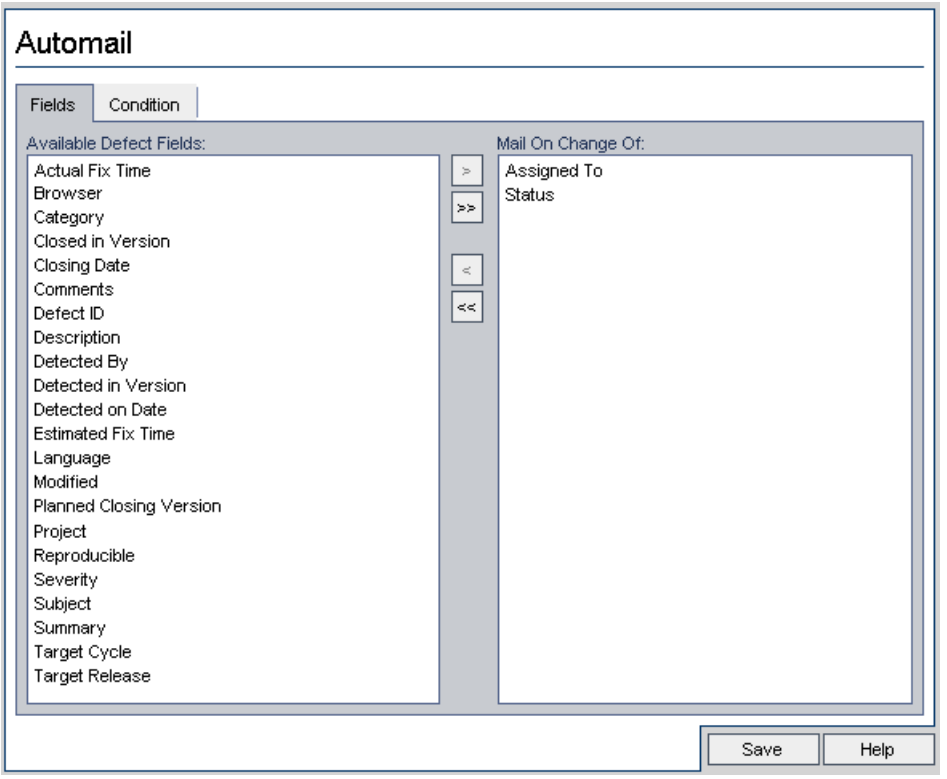
- In Site Administration's **Site Configuration** tab, you can edit the MAIL_INTERVAL parameter, which defines the time interval for sending defect e-mail in all projects. You can also set parameters to define the format and character set of mail, and whether attachments or history are included in the mail. For more information, see "Setting Quality Center Configuration Parameters" on page 126.
- You can customize the subject line of defect e-mail for all projects or for a specific project. For more information, see "Customizing the Subject of Defect Mail" on page 222.
- In Site Administration's **Site Users** tab, make sure you have specified the e-mail addresses of the users who should receive defect messages. For more information, see "Updating User Details" on page 96.

Designating Automail Fields

When you designate a field as a mail field, any changes made to that field cause Quality Center to send an e-mail message in the next time interval. For example, suppose you designate Status as a mail field and then update the Status field for a particular defect. In the next time interval, the details of the defect, including the updated status information, are sent to designated users.

To designate Automail fields:

1 In the Project Customization window, click the **Automail** link. The Automail page opens.



Available Defect Fields contains the names of the fields that appear in the Defects Grid. **Mail On Change Of** contains the names of the fields currently assigned as mail fields.

2 Choose one or more fields and click the arrow buttons (> and <) to move the fields from one list to the other. Click the double arrow buttons (>> and <<) to move all the fields from one list to the other.

3 Click **Save** to save your changes.

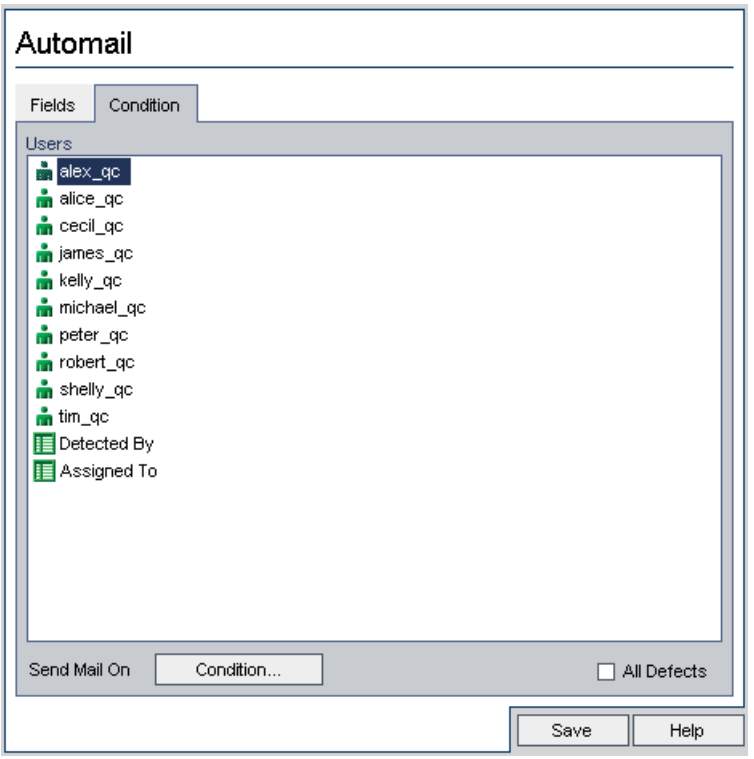
Defining Automail Conditions

Mail conditions determine when various users receive defect messages. For each user, you can define separate mail conditions. For example, you can specify that a user receives messages only for defects assigned an urgent priority.

To define Automail conditions:

1 In the Project Customization window, click the **Automail** link. The Automail page opens.

2 Click the **Condition** tab.



3 Choose a name from the **Users** list.

In addition, you can choose **Detected By** or **Assigned To**. Select these items to notify users when defects that they detected or are responsible for repairing are modified.

4 Select the **All Defects** check box to notify the selected user of every change to a defect.

5 Alternatively, click the **Condition** button to define a filter under which the selected user receives mail. If you define multiple filters, the selected user only receives mail if all of the conditions are met. For more information on filtering, refer to the *HP Quality Center User's Guide*.

6 Click **Save** to save your changes.

Customizing the Subject of Defect Mail

You can customize the subject line of defect e-mail sent automatically to users, for all projects or for a specific project. For example, you can define a subject line such as the following:

```
Defect # 4321 has been created or updated - Buttons on print dialog are not aligned
```

The line can contain the values of Quality Center fields. To include a field value from the defect that is being sent, prefix the field name with a question mark (?). Field names must be upper-case. For example:

```
Defect # ?BG_BUG_ID has been created or updated - ?BG_SUMMARY
```

To customize the subject of defect mail for all projects:

You can customize the subject line for all your projects by adding the **AUTO_MAIL_SUBJECT_ FORMAT** parameter in the **Site Configuration** tab. For more information, see "AUTO_MAIL_SUBJECT_ FORMAT" on page 131.

To customize the subject of defect mail for a specific project:

1. In Site Administration, click the **Site Projects** tab.
2. In the Projects list, double-click the project for which you want to customize the e-mail subject line.
3. Select the **DATACONST** table.
4. In the SQL pane, type an SQL INSERT statement to insert a row into the table with the following values:
   - In the **DC_CONST_NAME** column, insert the parameter name **AUTO_MAIL_SUBJECT_FORMAT**.
   - In the **DC_VALUE** column, insert the strings and the names of fields to be placed in the subject line.

   For example, type the following SQL statement into the SQL pane:

   ```
   insert into dataconst values ('AUTO_MAIL_SUBJECT_FORMAT',
   'DEFAULT.TESTPROJ - Defect # ?BG_BUG_ID has been created or updated -
   ?BG_SUMMARY')
   ```

The subject line you define is specific to the project, so you can include the project name in the line.

For more information on modifying project tables, see "Querying Project Tables" on page 51.

5 Click the **Execute SQL** button. The row is added to the **DATACONST** table to set the e-mail subject.

13

Customizing Risk-Based Quality Management

This chapter describes how to customize the criteria used to determine the Business Criticality and Failure Probability of a requirement, and how to define the default values for constants used in risk-based quality management.

This chapter describes:	On page:
About Customizing Risk-Based Quality Management	226
Customizing Risk-Based Quality Management Criteria	227
Customizing Risk-Based Quality Management Constants	233

About Customizing Risk-Based Quality Management

You use risk-based quality management to determine at which Testing Level to test each requirement in the Requirements module. Quality Center then calculates the total estimated Testing Time for an analysis requirement based on the Testing Levels of its child assessment requirements. You compare this with the resources you have available to test the analysis requirement, and if necessary make adjustments to the Testing Levels for the requirement and its children. This enables you to plan the testing strategy for your requirements. For more information on risk-based quality management, see the *HP Quality Center User's Guide*.

The Testing Level used to test a requirement is based on the requirement's Business Criticality and Failure Probability. These factors together comprise the Risk Category for the requirement. You determine values for these factors by assigning values to a series of criteria associated with each factor. Each criterion has a number of possible values. You can customize these criteria and values and how Quality Center uses these to determine the Business Criticality and Failure Probability. For more information, see "Customizing Risk-Based Quality Management Criteria" on page 227.

You can also customize what Testing Time is associated by default with each Testing Level and Failure Probability. In addition, you can customize how Quality Center determines the Testing Level with which to test a requirement based on the requirement's Business Criticality and Failure Probability. For more information, see "Customizing Risk-Based Quality Management Constants" on page 233.

In addition, you can customize for each requirement type whether requirements of the type enable risk assessment, risk analysis, or do not enable risk-based quality management. For more information, see "Customizing Requirement Types" on page 210.

Customizing Risk-Based Quality Management Criteria

You can customize the criteria used to determine the Risk Category of a requirement, the possible values for each criterion and the weight assigned to each value. You can then define how the total of these weights determines the Risk Category.

Note: If you already calculated the Risk Category for a requirement, modifying these criteria does not automatically recalculate the requirement's Risk Category. To recalculate the Risk Category, you must reassess the requirement and change at least one of its criterion values.

Customizing Criteria and Values

You can customize the criteria, criterion values, and weights used by Quality Center to determine the Risk Category for each requirement.

Note: Quality Center provides a default set of criteria when you create a new project. You can delete these criteria if you do not want to use them.

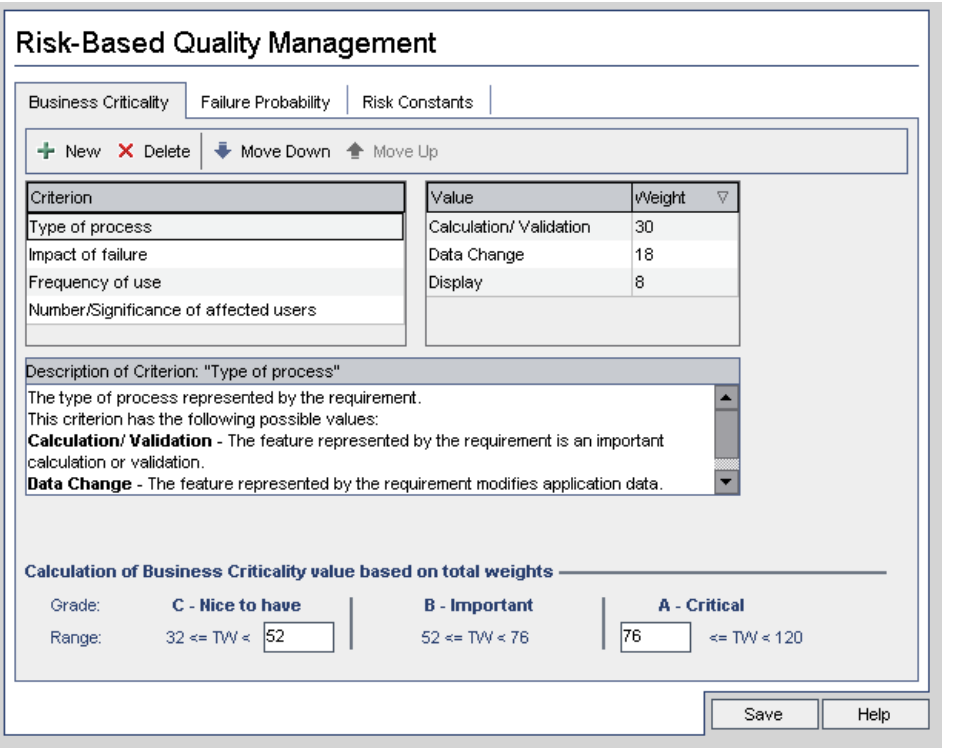
To customize criteria and values:

1 In the Project Customization window, click the **Risk-Based Quality Management** link. The Risk-Based Quality Management page opens.

2 Click one of the following tabs:

- To customize criteria for determining Business Criticality, click the **Business Criticality** tab.
- To customize criteria for determining Failure Probability, click the **Failure Probability** tab.

The Business Criticality tab and Failure Probability tab display criteria used to determine Business Criticality and Failure Probability.



3 To add a new criterion, select the **Criterion** list and click the **New** button. A new row is added to the end of the **Criterion** list. Type a name for the criterion in the new row.

4 To add a description for a criterion, select the criterion from the **Criterion** list and type the description in the **Description** box. This description is displayed in the Risk tab of the Requirements module when a user assesses Business Criticality and Failure Probability. It is recommended that you provide a full description of each criterion, including an explanation of its available values, as this helps the user decide which value to assign to each criterion for a requirement.

5 To add a value for a criterion, select the criterion from the **Criterion** list and select the **Value** list. Click the **New** button. A new row is added to the **Value** list. Type a name for the value in the new row.

Note: Each value for a criterion must be unique.

---

6 To assign a weight to a criterion value, select the criterion from the **Criterion** list and then select the value from the **Value** list. In the **Weight** column for the value, type the weight to assign to the value.

When Quality Center calculates the Business Criticality or Failure Probability of a requirement, it checks the values assigned to each criterion and calculates the sum of the corresponding weights for each value. This sum determines the Business Criticality or Failure Probability. For more information, see "Customizing Weight Boundaries" on page 230.

7 You can delete a criterion or a value for a criterion:

- ➤ To delete a criterion, select the criterion from the **Criterion** list and click the **Delete** button. The criterion is deleted
- ➤ To delete a criterion's value, select the criterion from the **Criterion** list and the value from the **Value** list. Click the **Delete** button. The value is deleted.

Note: Business Criticality and Failure Probability must each have at least one associated criterion defined. In addition, each criterion must have at least one possible value.

---

8 To change the order in which criteria are displayed in the **Criterion** list, select a criterion and click the **Move Up** or **Move Down** buttons. Note that values for a criterion are automatically ordered by their weights.

9 Click **Save** to save your changes to the Risk-Based Quality Management page.

Customizing Weight Boundaries

You can customize how Quality Center uses the values assigned to risk-based quality management criteria to determine the Business Criticality and Failure Probability for a requirement.

Customizing Weight Boundaries for Business Criticality

For each requirement, Quality Center calculates the total of the weights (**TW**) of the values assigned to each of the Business Criticality criteria. Quality Center then uses this total to categorize the Business Criticality of the requirement as either **C- Nice to Have**, **B - Important**, or **A - Critical**. Quality Center automatically calculates the highest and lowest possible total weight and uses these to define the upper boundary of the **Critical** category and the lower boundary of the **Nice to Have** category. You define the boundaries between the **Nice to Have** and **Important** categories, and between the **Important** and **Critical** categories.

For example, suppose there are two criteria for Business Criticality, each with three possible values whose weights are 20, 60, and 100. The minimum total weight is therefore 40 (if both criteria are assigned the value with weight 20) and the maximum total weight is 200 (if both criteria are assigned the value with weight 100). Quality Center automatically calculates these totals and uses them to determine the lower and upper boundaries for the categories. You determine the boundaries between the categories by typing 100 in the **Nice to Have** box and 160 in the **Critical** box.

In this example, Quality Center determines the Business Criticality for a requirement as follows:

- If the sum of the weights of each of the criteria for a requirement is less than or equal to 100, the requirement will have Nice to Have Business Criticality. This could happen, for example, if the criteria have values with weights 20 and 60 so the total weight is 80.

- If the sum is greater than 100 but less than 160, the requirement will have Important Business Criticality. This could happen, for example, if the criteria have values with weights 60 and 60 so the total weight is 120.
- If the sum is greater than or equal to 160, the requirement will have Critical Business Criticality. This could happen, for example, if the criteria have values with weights 100 and 60 so the total weight is 160.

To customize weight boundaries for Business Criticality:

1. In the Project Customization window, click the **Risk-Based Quality Management** link. The Risk-Based Quality Management page opens.
2. Click the **Business Criticality** tab. The Business Criticality tab displays criteria used to determine Business Criticality.
3. Under **Total Weight Boundaries between Business Criticality values**, define the boundaries between different Business Criticality values. To define these boundaries, type the relevant values in the **Nice to Have** and **Critical** boxes.
4. Click **Save** to save your changes to the Risk-Based Quality Management page.

Customizing Weight Boundaries for Failure Probability

For each requirement, Quality Center calculates the total of the weights (**TW**) of the values assigned to each of the Failure Probability criteria. Quality Center then uses this total to categorize the Probability of the requirement as either **3 - Low**, **2 - Medium**, or **1- High**. Quality Center automatically calculates the highest and lowest possible total weight and uses these to define the upper boundary of the **High** category and the lower boundary of the **Low** category. You define the boundaries between the **Low** and **Medium** categories, and between the **Medium** and **High** categories.

For example, suppose there are two criteria for Failure Probability, each with three possible values whose weights are 20, 60, and 100. The minimum total weight is therefore 40 (if both criteria are assigned the value with weight 20) and the maximum total weight is 200 (if both criteria are assigned the value with weight 100). Quality Center automatically calculates these totals and uses them to determine the lower and upper boundaries for the categories. You determine the boundaries between the categories by typing 100 in the **Low** box and 160 in the **High** box.

In this example, Quality Center determines the Failure Probability for a requirement as follows:

- If the sum of the weights of each of the criteria for a requirement is less than or equal to 100, the requirement will have Low Failure Probability. This could happen, for example, if the criteria have values with weights 20 and 60 so the total weight is 80.
- If the sum is greater than 100 but less than 160, the requirement will have Medium Failure Probability. This could happen, for example, if the criteria have values with weights 60 and 60 so the total weight is 120.
- If the sum is greater than or equal to 160, the requirement will have High Failure Probability. This could happen, for example, if the criteria have values with weights 100 and 60 so the total weight is 160.

To customize weight boundaries for Failure Probability:

1. In the Project Customization window, click the **Risk-Based Quality Management** link. The Risk-Based Quality Management page opens.
2. Click the **Failure Probability** tab. The Failure Probability tab displays criteria used to determine Failure Probability.
3. Under **Total Weight Boundaries between Failure Probability values**, define the boundaries between different Failure Probability values. To define these boundaries, type the relevant values in the **Low** and **High** boxes.
4. Click **Save** to save your changes to the Risk-Based Quality Management page.

Customizing Risk-Based Quality Management Constants

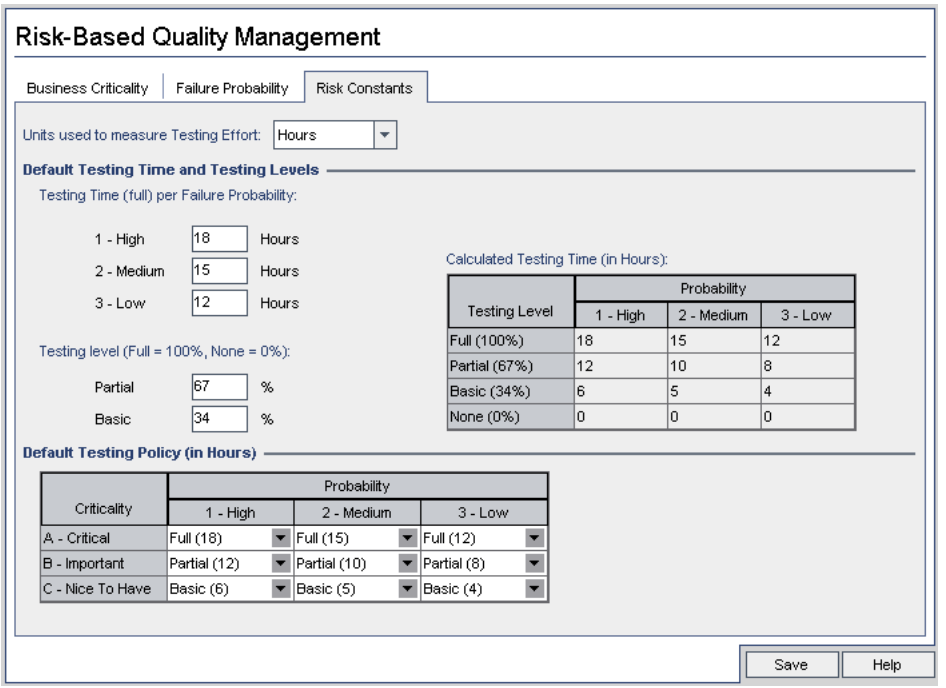
You can define the default estimated Testing Times required to test a requirement with each Failure Probability value at each Testing Level. You can also define the default Testing Level used with each Risk Category. If the user does not enter different values for a requirement in the Requirements module, Quality Center uses these default values when calculating the estimated Testing Time for the requirement during the risk analysis.

Note: Modifying these criteria does not automatically affect the results of existing risk analyses. To update the results of a risk analysis, you must perform the analysis again.

To customize risk-based quality management constants:

1 In the Project Customization window, click the **Risk-Based Quality Management** link. The Risk-Based Quality Management page opens.

2 Click the **Risk Constants** tab. The Risk tab displays constants used by default when calculating the Testing Time and Testing Level for a requirement.



3 In the **Units used to measure Testing Effort** box, select the unit of measurement that you want Quality Center to display when measuring Testing Time. The available units are **Hours**, **Days**, **Weeks**, and **Months**.

Note: If you change the units of measurement for a project, the Testing Time values are not updated automatically. For example, if a requirement has Testing Time 48 hours and you change the units of measurement from **Hours** to **Days**, the requirement has Testing Time 48 days and not 2 days.

---

4 Under **Testing Time (full) per Failure Probability**, for each Failure Probability value, type the estimated time required to fully test a requirement with the Failure Probability value. The Calculated Testing Time grid is updated to reflect these changes.

5. Under **Testing level**, in the **Partial** and **Basic** boxes, type the default Testing Time required for partial testing and basic testing of a requirement. This should be expressed as a percentage of the time required for full testing. The Calculated Testing Time grid is updated to reflect these changes.
6. In the **Default Testing Policy** grid, you can define the default Testing Level for testing a requirement with Risk Category.
7. To define the default Testing Levels, click the arrow next to the cell in the grid corresponding to a particular Business Criticality and Failure Probability value. Select a Testing Level from the available Testing Levels. The available Testing Levels are **Full**, **Partial**, **Basic**, and **None**. Next to each Testing Level, you can see the estimated resources needed to test a requirement at that level, based on the default Testing Times and Testing Levels you defined.
8. Click **Save** to save your changes to the Risk-Based Quality Management page.

14

Setting Alert Rules

As a Quality Center project administrator, you can activate alert rules for your project. This instructs Quality Center to create alerts and send e-mail to notify those responsible when changes occur in your project that may impact the testing process.

This chapter describes:	On page:
About Setting Alert Rules	237
Setting Alert Rules	239

About Setting Alert Rules

You can keep track of your requirements, tests and defects as you perform your project testing process. When an entity changes, you can instruct Quality Center to notify those responsible for any associated entities.

The alert rules you can activate are based on the following associations you can create in Quality Center:

- You can associate a test in the test plan tree with a requirement. This is performed by creating **requirements coverage** in the Test Plan module, or by creating **tests coverage** in the Requirements module.
- You can link a test with a defect. This is performed by adding a defect during a manual test run.
- You can create **traceability links** between requirements in the Requirements module.

After you have established associations in your project, you can then track changes using these associations. When an entity in your project changes, Quality Center alerts you of any associated entities that may be impacted by the change.

Notification involves two steps. Quality Center flags the associated entity, which can be seen by all users, and then sends e-mail to the user responsible for the entity.

There are four alert rules you can activate:

Rule	Change Made	Entities Flagged	User Notified
1	Requirement has any change, excluding changes in the **Direct Cover Status** field and the risk-based quality management fields.	Tests covering the requirement	Test designer. Note that only the test designer can delete the alert.
2	Defect status changes to “Fixed”.	Test instances associated with the defect	Responsible tester for the test instance.
3	Test run status changes to “Passed”.	Defects linked to the test instance	User assigned the defect.
4	Requirement is deleted or has any change, excluding changes in the **Direct Cover Status** field and the risk-based quality management fields.	The requirement’s child requirements and traced to requirements	Author of the requirement.

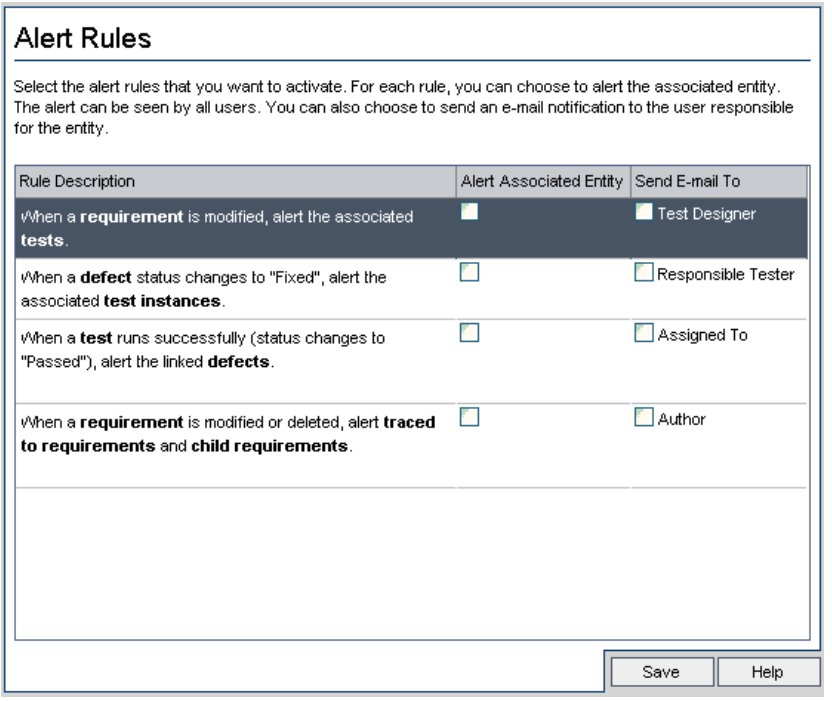
For more information on alerts, refer to the *HP Quality Center User’s Guide*.

Setting Alert Rules

You can activate four alert rules.

To set alert rules:

1 In the Project Customization window, click the **Alert Rules** link. The Alert Rules page opens.



2 Select **Alert Associated Entity** to activate a rule. This instructs Quality Center to flag the entity when the associated entity changes.

3 Select **Send E-mail To** to instruct Quality Center to send notification e-mail to the specified user when the associated entity changes.

4 Click **Save** to save your changes.

15

Generating Workflow Scripts

Quality Center provides script generators to enable you to perform commonly needed customizations on the Defects module dialog boxes.

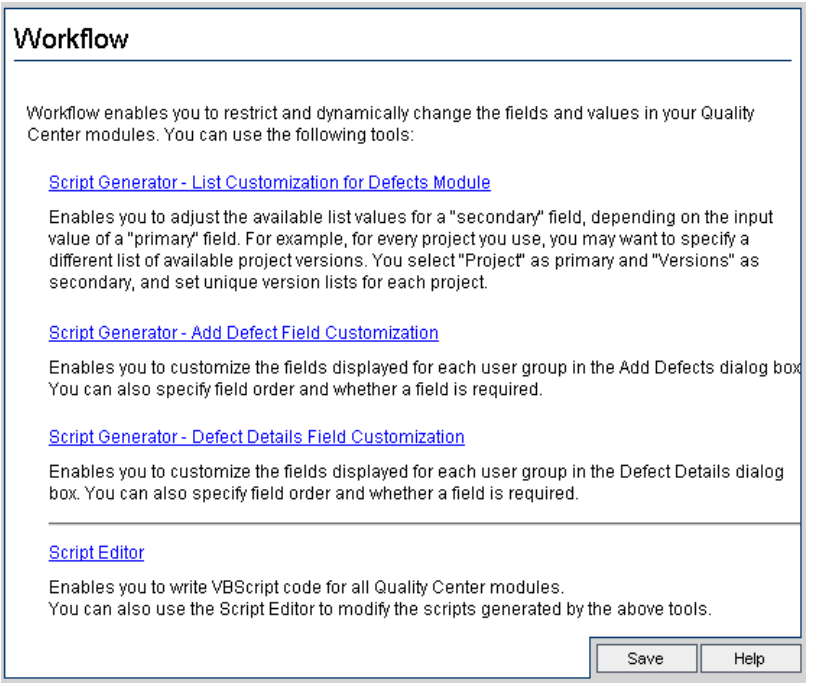
For information on writing workflow scripts to customize the user interface and to control user actions in any Quality Center module, see Part III, “Workflow Customization”.

This chapter describes:	On page:
About Generating Workflow Scripts	242
Customizing Defects Module Field Lists	243
Customizing Defects Module Dialog Boxes	246

About Generating Workflow Scripts

The Workflow page provides links to script generators and a script editor. You can use the script generators to perform customizations on the input fields of the Defects module dialog boxes. You can use the script editor to create scripts to control the workflow in any Quality Center module.

To open the Workflow page, click the **Workflow** link in the Project Customization window.



The Workflow page contains the following links:

- **Script Generator - List Customization for Defects Module**. Enables you to customize the field lists displayed for fields on the dialog boxes and in the Defects Grid of the Defects module. For more information, see "Customizing Defects Module Field Lists" on page 243.
- **Script Generator - Add Defect Field Customization**. Enables you to modify the appearance of the New Defect dialog box. For more information, see "Customizing Defects Module Dialog Boxes" on page 246.

- **Script Generator - Defect Details Field Customization**. Enables you to modify the appearance of the Defect Details dialog box. For more information, see "Customizing Defects Module Dialog Boxes" on page 246.
- **Script Editor**. Enables you to write VBScript code to customize the Quality Center workflow in any module. You place your code in the appropriate Quality Center event so that the script is triggered when the relevant user action takes place. You can also use the script editor to modify scripts created by the script generators. For more information, see Chapter 16, "Workflow Customization at a Glance".

Customizing Defects Module Field Lists

A field list is a list of values displayed in a drop-down list, from which the user can choose a value for the field.

You can specify that a different field list be used for a Defects module field, depending on the value of another field. For example, you can set the **Detected in Versions** list to change depending on the value in the **Project** field.

Note: This script generator can be used to customize field lists in the Defects module only.

To customize a field list, you must define the following rules:

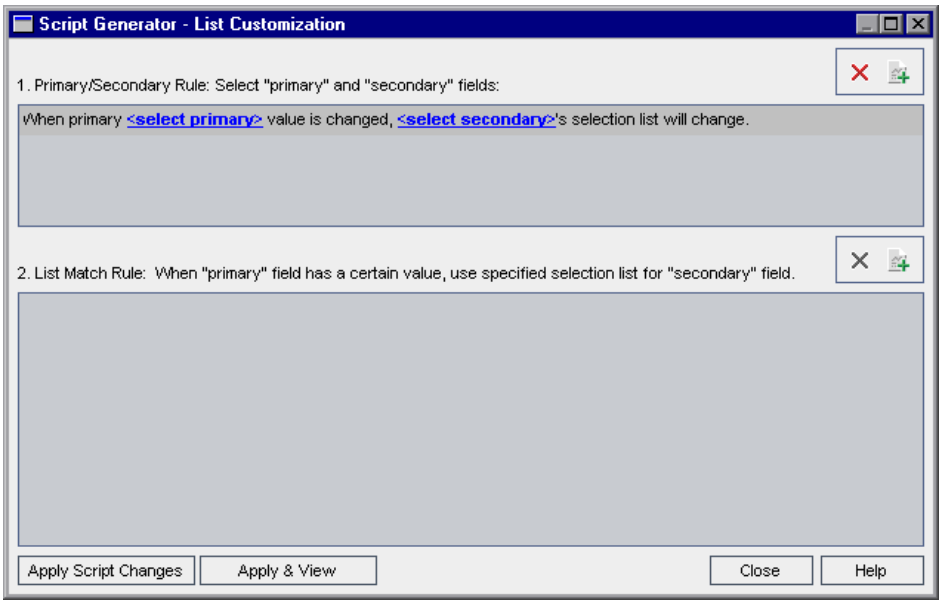
- **Primary/Secondary Rule.** Select the primary and secondary fields. When a primary field value is changed, the list of values in the secondary field changes automatically. For example, you could select **Project** as the primary field and **Detected in Versions** as the secondary field.
- **List Match Rule.** Select the list that you want to display in the secondary field for each value of the primary field.

Note: When workflow customization has been used to change a list of values for a field that has transition rules defined, the field may only be modified in a way that satisfies both the workflow script and the transition rules. For more information, see “Setting Transition Rules” on page 173.

To customize a field list:

1 In the Project Customization window, click the **Workflow** link. The Workflow page opens.

2 Click the **Script Generator - List Customization for Defects Module** link. The Script Generator - List Customization dialog box opens.



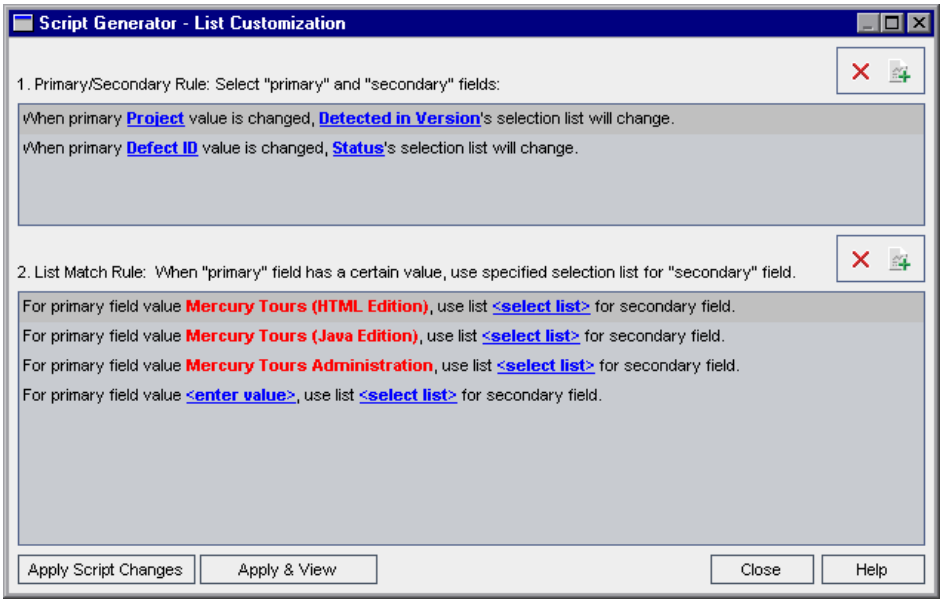
3 Under **Primary/Secondary Rule**, select the primary field and the secondary field:

- To set a rule, click **<select primary>** and select a field name. Click **<select secondary>** and select a field name.

- To add a new rule, click the **Add Primary/Secondary Rule** button. Select field names for **<select primary>** and **<select secondary>**.

- To delete a rule, select the rule and click the **Delete Primary/Secondary Rule** button. Click **Yes** to confirm.

4 Under **Primary/Secondary Rule**, select the primary/secondary rule for which you want to set list match rules.



5 Under **List Match Rule**, select the field list to be used in the secondary field for specific values entered into the primary field:

- To set a rule for a defined primary field value, click **<select list>** and select a list name.
- To set a rule for an undefined primary field value, click **<enter value>** and type a primary field value. Press **Enter**. Click **<select list>** and select a list name.
-  To add a new list match rule, click the **Add List Match Rule** button. Click **<enter value>** and type a primary field value. Click **<select list>** and select a list name.
-  To delete a list match rule, select the rule and click the **Delete List Match Rule** button. Click **Yes** to confirm.

6 To save your changes, do one of the following:

- Click the **Apply Script Changes** button to save your changes and close the script generator.
- Click the **Apply & View** button to save your changes and view the generated script in the Script Editor.

If you use the Script Editor to modify a script that was created by a script generator, your modifications are overwritten the next time you run that script generator. It is recommended that you rename the generated script before you modify it. For more information on the Script Editor, see Chapter 17, “Working with the Workflow Script Editor”.

Customizing Defects Module Dialog Boxes

You can modify the appearance of the New Defect and Defect Details dialog boxes by setting different fields to be visible for each user group. You can also sort the order in which the fields are displayed on the dialog box for each user group.

For example, you may want the **Assigned To** and **Priority** fields to appear only for a user that has developer privileges. Also, you can customize the **Assigned To** field so that it is displayed before the **Priority** field for this user group.

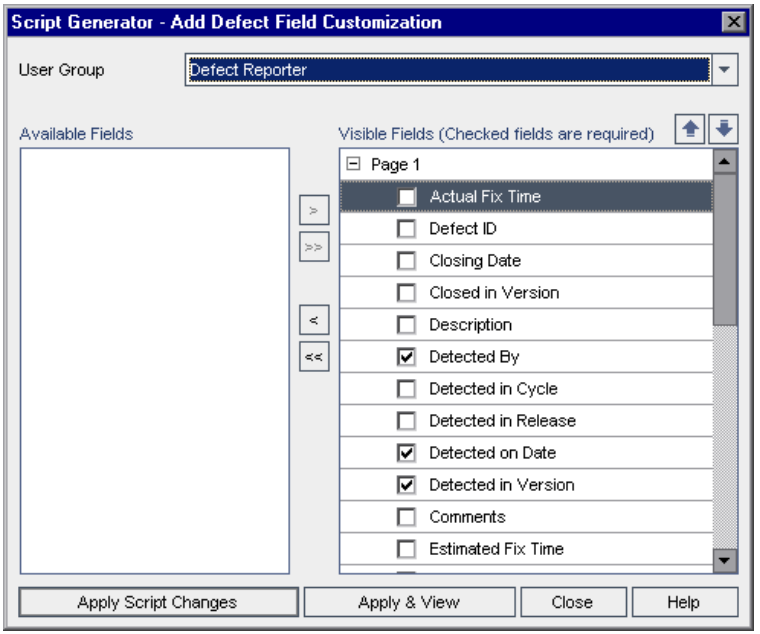
To perform a customization for all user groups, you can use the script editor to write a script. For more information, see "Example: Customizing a Defects Module Dialog Box" on page 307.

Note: These script generators can be used to customize dialog boxes in the Defects module only.

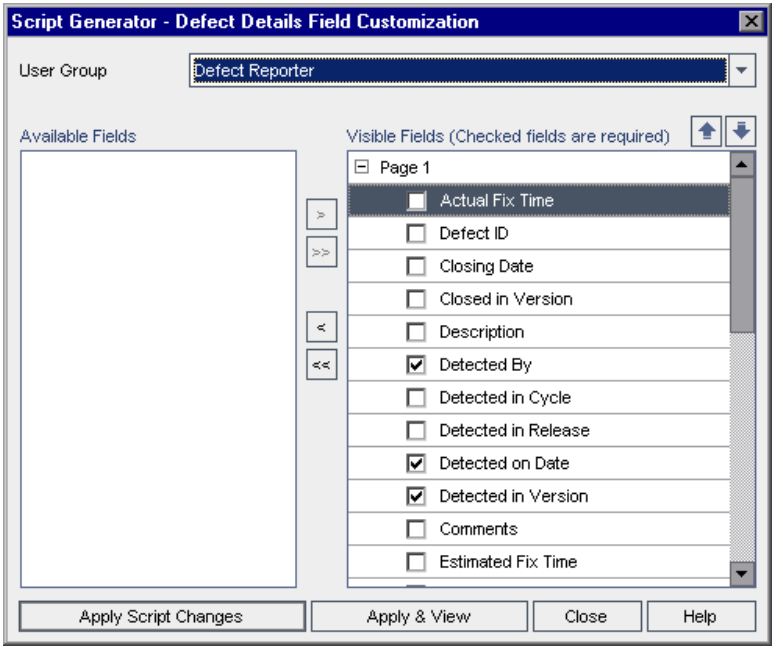
To customize Defects module dialog boxes by user group:

1 In the Project Customization window, click the **Workflow** link. The Workflow page opens.

2 To modify the appearance of the New Defect dialog box, click the **Script Generator - Add Defect Field Customization** link. The Script Generator - Add Defect Field Customization dialog box opens.



To modify the appearance of the Defect Details dialog box, click the **Script Generator - Defect Details Field Customization** link. The Script Generator - Defect Details Field Customization dialog box opens.



Available Fields contains the names of all the fields you can display. **Visible Fields** contains the names of the fields that can currently be seen by the selected user group, and their sorting priority.

3 From the **User Group** list, select the user group to which the customizations are to apply.

4 Choose field names and click the arrow buttons (> and <) to move a name between **Available Fields** and **Visible Fields**. Click the double arrow buttons (>> and <<) to move all the names from one list to the other. You can also drag the field names between lists.

5 In **Visible Fields**, to set a field as a required field, select the check box next to it. For a required field, a value is mandatory. Its title is displayed in red in the Add Defect or Defect Details dialog box.

6 You can set the order in which fields are displayed for the selected user group by using the up and down arrows. You can also drag the field names up or down.

7 You can set the Add Defect and Defect Details dialog boxes to include one or more input pages. By default, all fields are displayed on one page. Use the up and down arrows to move fields to the appropriate page.

8 To save your changes, do one of the following:

- Click the **Apply Script Changes** button to save your changes and close the script generator.
- Click the **Apply & View** button to save your changes and view the generated script in the Script Editor.

  If you use the Script Editor to modify a script that was created by a script generator, your modifications are overwritten the next time you run that script generator. It is recommended that you rename the generated script before you modify it. For more information on the Script Editor, see Chapter 17, “Working with the Workflow Script Editor”.

Part III

Workflow Customization

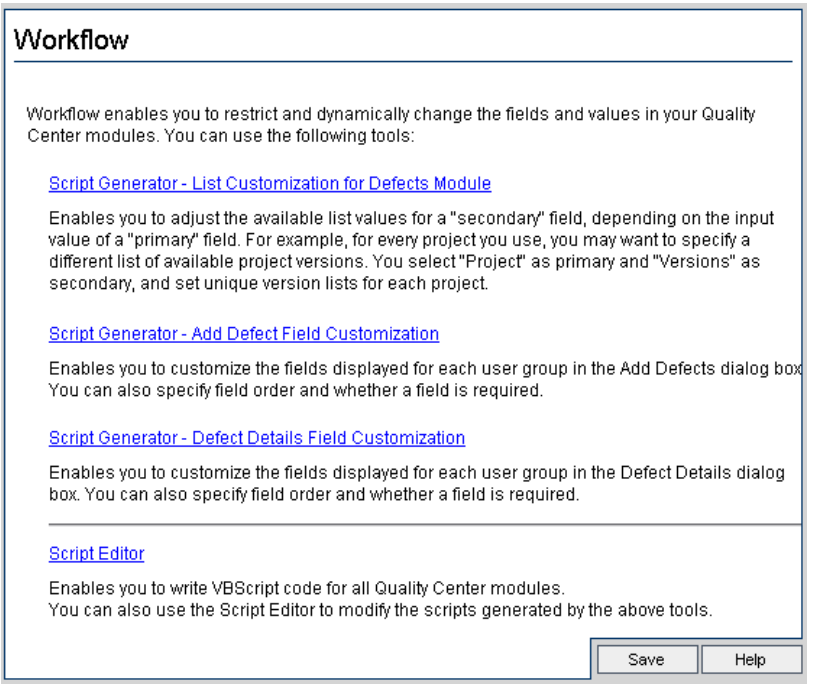
16

Workflow Customization at a Glance

You can write workflow scripts to customize the Quality Center user interface, and to control the actions that users can perform.

To customize workflow:

1 In the Project Customization window, click the **Workflow** link. The Workflow page opens.



2 To perform commonly-needed customization of a Defects module dialog box, click the appropriate **Script Generator** link on the Workflow page. You need not be familiar with VBScript, or with Quality Center events and objects to use this feature. For more information, see Chapter 15, "Generating Workflow Scripts".

3 To write or modify scripts by entering code into the appropriate event procedures, open the Script Editor. To create workflow scripts, you must be familiar with VBScript. You can open the Script Editor either from a script generator or directly:

- ➤ To write a script that is similar to a script created by a script generator, click the relevant **Script Generator** link and set the customization you want to perform. Click the **Apply & View** button on the script generator dialog box. The Script Editor opens to display the scripts that were generated.
- ➤ To create your own scripts, click the **Script Editor** link. The Script Editor opens to display a Scripts Tree that lists the existing event procedures.

For more information on the Script Editor, see Chapter 17, "Working with the Workflow Script Editor".

4 Decide which Quality Center event should trigger your script. You must place your code in the procedure of the appropriate module and event so that it is invoked for the relevant user action. For more information, see Chapter 18, "Workflow Event Reference".

5 Decide which Quality Center objects your script must access. Your script performs customizations based on information obtained from the relevant objects. You customize the workflow by using the methods and properties of the objects. For more information, see Chapter 19, "Workflow Object and Property Reference".

6 Examine the sample scripts to find one that can be adapted for your use. Sample scripts are provided in this guide and in the Mercury Support Knowledge Base. Scripts generated by the workflow script generators can also be used as a basis for your scripts.

- For examples of common customizations that can be performed by using workflow scripts, see Chapter 20, "Workflow Examples".
- For an index to Knowledge Base articles that provide examples of workflow scripts, refer to the Mercury Support Knowledge Base (http://support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp), select **TestDirector for Quality Center**, and search for Article Number 29497.

17

Working with the Workflow Script Editor

You can use the Script Editor to create workflow scripts to customize the user interface, and to control user actions.

This chapter describes:	On page:
About Working with the Workflow Script Editor	257
The Script Editor	258
Creating a Workflow Script	261
Adding a Button to a Toolbar	264
Setting the Properties of the Script Editor	267

About Working with the Workflow Script Editor

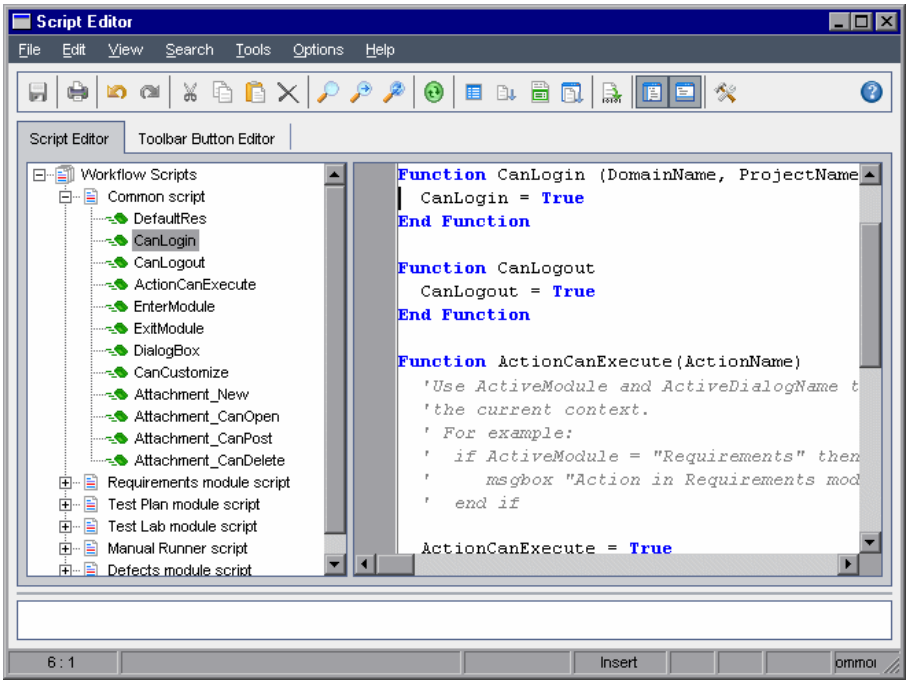
You can use the Script Editor to create workflow scripts and to add a toolbar button to the window of a Quality Center module.

The Script Editor dialog box contains two tabs:

- **Script Editor tab.** You use the Script Editor tab to create and edit workflow scripts. The Script Editor assists you in placing your code in the appropriate Quality Center event procedure. For more information on using the Script Editor, see "Creating a Workflow Script" on page 261.
- **Toolbar Button Editor tab.** You use the Toolbar Button Editor tab to add a toolbar button to the window of a Quality Center module. For more information, see "Adding a Button to a Toolbar" on page 264.

The Script Editor

You can use the Script Editor to modify scripts that have been generated by a script generator, or to create a user-defined workflow script. For information on opening the Script Editor, see Chapter 16, “Workflow Customization at a Glance”.



The Script Editor tab contains the following elements:

- **Script Editor toolbar.** Contains buttons used when creating scripts. For more information, see “Understanding the Script Editor Commands” on page 259.
- **Scripts Tree.** Lists the event procedures to which you can add code. The event procedures are grouped by the module in which they are triggered. For more information, see Chapter 18, “Workflow Event Reference”.
- **Scripts pane.** Displays the code of the selected event procedure. To create or modify a script, you add VBScript code to the event procedure. For more information, see “Creating a Workflow Script” on page 261.

- **Messages pane.** Displays any syntax errors encountered when you save or validate a script.

Understanding the Script Editor Commands

The Script Editor toolbar, menu bar, and right-click menu contain the following buttons and menu commands:


Save. Saves the changes made to scripts in the selected module.


Print. Prints the displayed script.


Undo. Reverses the last command or deletes the last entry you typed.


Redo. Reverses the action of your last **Undo** command.


Cut. Removes the selected text and places it on the Clipboard.


Copy. Copies the selected text to the Clipboard.


Paste. Inserts the contents of the Clipboard at the insertion point.


Delete. Deletes the selected text.


Find. Searches for specified text in the scripts of the selected module.


Find Next. Finds the next occurrence of the text specified in the Find Text dialog box.


Replace. Replaces the specified text with replacement text.


Synchronize Tree with Script. Refreshes the Scripts Tree to reflect procedures you have added, deleted or renamed.


Field Names. Displays a list of field names in the project that you can insert into your script.


Code Complete. Displays a list of objects, properties, methods, or field names that you can insert into your script.


Code Template. Displays a list of templates for commonly used VBScript statements that you can insert into your script.

List Value. Opens the Select Value From List dialog box, to enable you to choose an item from a project list.

Syntax Check. Validates the syntax of your script and displays any messages in the Messages pane.

Show/Hide Scripts Tree. Displays or hides the Scripts Tree. If you have opened the Script Editor from a script generator, this is not available.

Show/Hide Messages Pane. Displays or hides the Messages pane.

Properties. Opens the Properties dialog box, enabling you to change the properties of the Script Editor. For more information, see “Setting the Properties of the Script Editor” on page 267.

Save All. To save script changes in all modules, choose **File** > **Save All**.

Revert to Saved. To return to a saved version of a module, select a changed module and choose **File** > **Revert to Saved**.

Select All. To select all text in the scripts pane, choose **Edit** > **Select All**.

Expand All. To expand all nodes in the Scripts Tree, choose **View** > **Expand All**.

Collapse All. To collapse all nodes in the Scripts Tree, choose **View** > **Collapse All**.

Go to Line Number. To jump to a specific line in the Script Editor, choose **Search** > **Go to Line Number**.

Clear Messages. To clear syntax messages displayed in the messages pane, choose **Tools** > **Clear Messages**.

Sort Field Names by Field Labels. When you choose the **Field Names** option, the Script Editor sorts the list by the field name used in the Quality Center database table (for example, **BG_BUG_ID**). To sort the fields by the field label (for example, Defect ID) right-click the script pane and choose **Sort Field Names by Field Labels**.

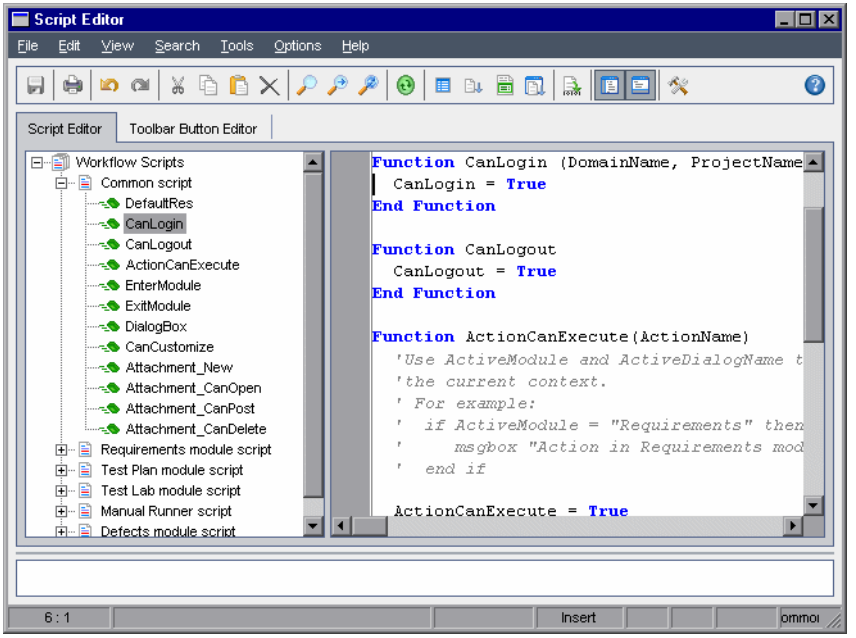
VBScript Home Page. To get help for the VBScript language, choose **Help** > **VBScript Home Page**.

Creating a Workflow Script

You use the Script Editor to add VBScript code to a Quality Center event procedure, or to create user-defined procedures that can be called from a Quality Center event procedure.

To create a workflow script:

1 Click the **Script Editor** link on the Workflow window. The Script Editor opens.



For more information on the Script Editor window, see “The Script Editor” on page 258.

2 Select a module name in the **Modules** list box to expand the node of the module for which you need to customize the workflow.

The Scripts Tree contains the **Common script** node in addition to the nodes for specific modules. When you create user-defined procedures that must be accessible from several modules, place them under the **Common script** node. To declare a global variable that can be used across all modules, declare the variable under the **Common script** node, outside of any function.

3 In the **Events** list box, select the event procedure to which you need to add code, depending on when you want your code to be triggered. The existing script for this event procedure is displayed in the Scripts pane.

For a description of Quality Center event procedures, see Chapter 18, "Workflow Event Reference".

4 Add your VBScript code to the script.

Note: A red indicator ● next to a module name in the Scripts Tree indicates that there are unsaved script changes in that module.

5 To use the code complete feature instead of typing in the names of Quality Center objects, properties, methods, and fields, place the insertion point at the location where you want to insert an object name and click the **Code Complete** button. For information about Quality Center objects, see Chapter 19, "Workflow Object and Property Reference".

6 To use the code template feature instead of typing in commonly used VBScript statements, place the insertion point where you want to insert the code and click the **Code Template** button. Choose one of the following items from the code template list:

Template	Code Added to Script
FVal: Fields value access	Fields.Field("").Value
List: Quality Center list access	Lists.List()
IfAct: Action "switch" If Block	If ActionName = "" Then End IF
Act: Actions access	Actions.Action("")

Template	Code Added to Script

Func: Function template	Function
	  On Error Resume Next
	  On Error GoTo 0
	End Function

Sub: Sub Template	Sub
	  On Error Resume Next
	  On Error GoTo 0
	End Sub

Err: Error Handler	On Error Resume Next

7 To insert an item from a field list defined in the project, place the insertion point at the location where you want to add the item. Click the **List Value** button. In the **Lists** box of the Select Value From List dialog box, choose the name of the list. In the **List Items** box, select the list value.

8 To insert a Quality Center field name, place the insertion point at the location where you want to add the field name. Click the **Field Names** button. Select a name from the list of system and user-defined fields in the Quality Center project.

9 To validate the syntax of the script, click **Syntax Check**. Any messages are displayed in the Messages pane.

10 Click the **Save** button to save the script.

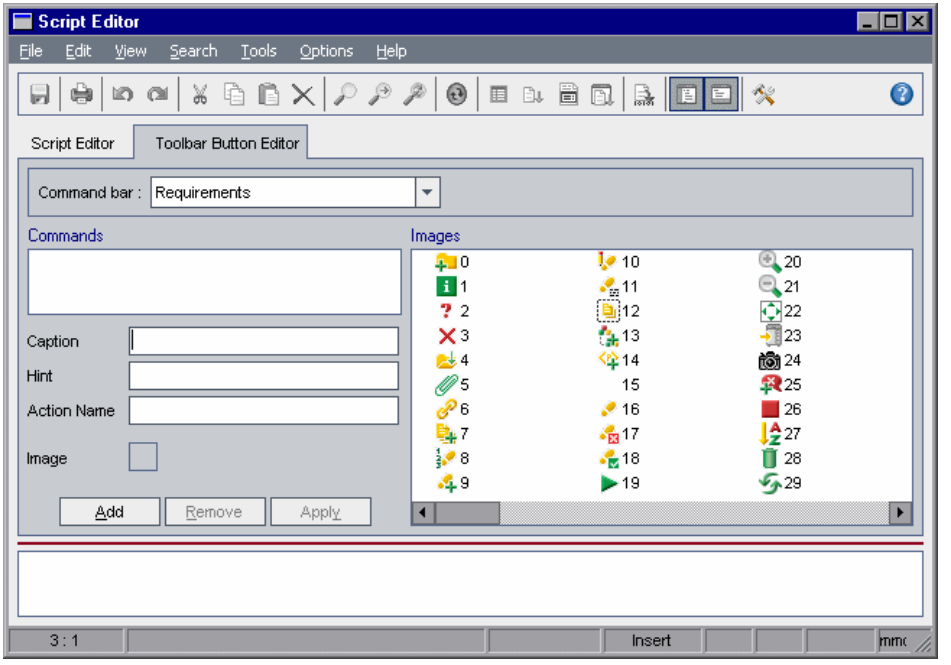
11 Close the Script Editor.

Adding a Button to a Toolbar

You can use the Toolbar Button Editor to define a toolbar button to be displayed on the window of a Quality Center module, or on the Manual Runner dialog box.

To add a button to a toolbar:

1 In the Script Editor, click the **Toolbar Button Editor** tab.



2 From the **Command bar** list, select the toolbar to which you want to add a button:

Option	Toolbar Location
Requirements	Requirements module window
TestPlan	Test Plan module window
TestLab	Test Lab module window
ManualRun	Manual Runner dialog box
Defects	Defects module window

3 Click **Add**. A default command name for the button is added to the **Commands** list.

4 In the **Caption** box, type a new command name for the button, or use the default name.

5 In the **Hint** box, type a tooltip for the button.

6 In the **Action Name** box, type a new action name for the button, or use the default name.

7 Under **Images**, select an icon for the button.

8 Click **Apply** to apply your changes.

9 To delete a button that you have created, select its command name in the Commands list, and click **Remove**.

10 Click the **Save** button to save the new button definition.

11 Click the **Script Editor** tab.

12 In the Scripts Tree of the Script Editor, select the **_ActionCanExecute** event procedure for the module you selected from the **Command bar** list.

13 In the procedure displayed in the scripts pane of the Script Editor, add statements to be performed if the user initiates an action with the action name you defined for the button. Set the return value to True or False.

For example, the following code opens a message box when the user clicks the Requirements_Action1 button on the tool bar of the Requirements module:

```
Function ActionCanExecute(ActionName)
    On Error Resume Next
    ActionCanExecute = True
        If ActionName = "Requirements_Action1" Then
            MsgBox "You clicked the Action1 button."
        End If
    On Error GoTo 0
End Function
```

For more information, see “Example: Adding Button Functionality” on page 321.

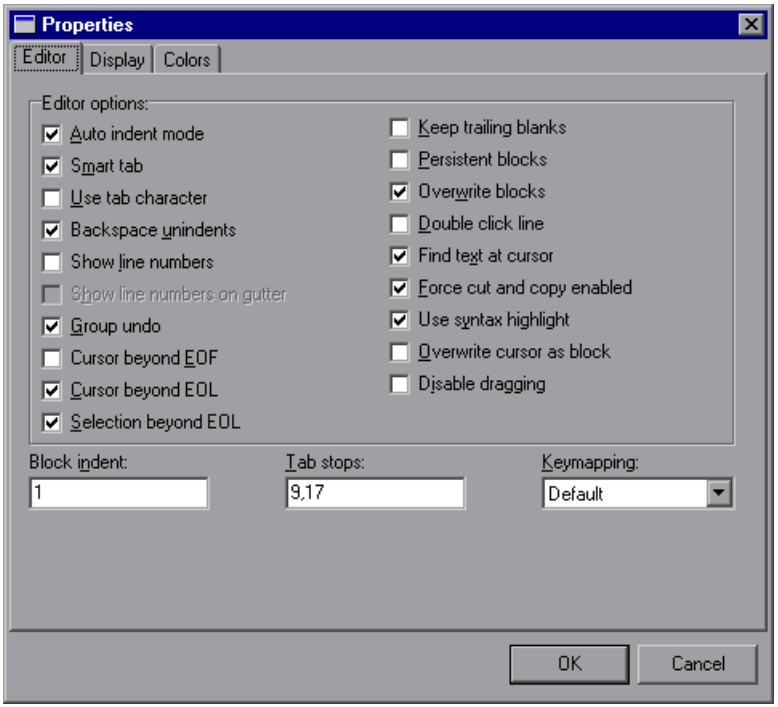
14 Click the **Save** button to save the script.

Setting the Properties of the Script Editor

You can customize the behavior of the Script Editor.

To set the properties of the Script Editor:

1 In the Script Editor, click the **Properties** button or choose **Options** > **Editor Properties**. The Properties dialog box opens.



2 In the **Editor** tab, you can set the following options:

Option	Description
Auto indent mode	Places the cursor under the first non-blank character of the preceding non-blank line when you press **Enter**.
Smart tab	Tabs to the first non-blank character in the preceding non-blank line. If **Use tab character** is selected, this option is cleared.

Option	Description
Use tab character	Inserts a tab character. If cleared, inserts space characters. If **Smart tab** is selected, this option is cleared.
Backspace unindents	Aligns the insertion point to the previous indentation level when you press **Backspace**, if the cursor is on the first non-blank character of a line.
Show line numbers	Displays line numbers. If this option is selected, **Show line numbers on gutter** is enabled.
Show line numbers on gutter	Displays line numbers in the gutter instead of in the left margin. If **Show line numbers** is selected, this option is enabled.
Group undo	Reverses your last editing command and any subsequent editing commands of the same type, if you press **Alt+Backspace** or choose **Edit** > **Undo**.
Cursor beyond EOF	Enables you to place the insertion point after the last line of code.
Cursor beyond EOL	Enables you to position the cursor after the end of the line.
Selection beyond EOL	Enables you to select characters beyond the end of the line.
Keep trailing blanks	Keeps any blank spaces you have at the end of a line.
Persistent blocks	Keeps marked blocks selected, even when the cursor is moved using the arrow keys, until a new block is selected.
Overwrite blocks	Replaces a marked block of text with new text. If **Persistent Blocks** is also selected, text you enter is appended following the currently selected block.
Double click line	Highlights the line when you double-click any character in the line. If disabled, only the selected word is highlighted.

Option	Description
Find text at cursor	Places the text at the cursor into the **Text To Find** list box in the Find Text dialog box when you choose **Search** > **Find**.
Force cut and copy enabled	Enables the **Cut** and **Copy** commands, even when there is no text selected.
Use syntax highlight	Displays script elements according to colors and attributes defined in the **Display** tab and **Colors** tab.
Overwrite cursor as block	Controls the appearance of the caret when using the Overwrite mode.
Disable dragging	Disables dragging and dropping text.
Block indent	Specifies the number of spaces to indent a marked block.
Tab stops	Specifies the locations to which the cursor moves when you press **Tab**.
Keymapping	Sets the keyboard mappings in the Script Editor. Supports the following keyboard mappings: Default, Classic, Brief, Epsilon, and Visual Studio.

3 In the **Display** tab, you can set the following options:

Option	Description
Editor gutter	Enables you to set the visibility, width, color, and style of the gutter.
Editor margin	Enables you to set the visibility, width, color, style, and position of the right margin.
Use mono font	Displays only monospaced screen fonts, such as Courier, in the Editor font box.
Editor font	Lists the available text fonts.
Editor color	Lists the available background colors.
Size	Lists font sizes.

Option	Description
Use Read-Only Color	Enables you to select a color for displaying read-only text from the Read-Only Color box.
Draw Special Symbols	Sets special characters for displaying end-of-file, end-of-line, space, and tab characters.

4 In the **Colors** tab, you can set the following options:

Option	Description
Color SpeedSetting	Enables you to configure the Script Editor display using predefined color combinations.
Element	Specifies syntax highlighting for a particular code element.
Foreground color	Sets the foreground color for the selected code element.
Background color	Sets the background color for the selected code element.
Use defaults for	Displays the code element using default system colors for the foreground, background, or both.
Text attributes	Specifies format attributes for the code element.
Open	Loads a color scheme from your computer.
Save	Saves a color scheme to your computer.

18

Workflow Event Reference

You can write workflow scripts to customize the actions that Quality Center users can perform, and the fields that are available to users in dialog boxes. To write a workflow script, you add VBScript code to event procedures that are triggered by user actions.

This chapter describes:	On page:
About Quality Center Events	271
Naming Conventions for Quality Center Event Procedures	273
Reference for Quality Center Events	274

About Quality Center Events

During a Quality Center user session, as the user initiates various actions, Quality Center triggers event procedures. You can place code in these procedures to customize the execution of the associated user actions.

The Script Editor lists the event procedures for each Quality Center module, and allows you to add your code to the appropriate procedure. For more information, see Chapter 17, “Working with the Workflow Script Editor”.

The code you add to the event procedures can access Quality Center objects. For more information, see Chapter 19, “Workflow Object and Property Reference”.

Event procedures can be functions or subroutines:

- **Event functions.** These procedures are triggered by Quality Center to check whether the user's action should be performed. You can place code in these functions to determine whether Quality Center may execute the user's request. If your code returns a value of False, Quality Center does not proceed with the action.

  For example, when a user clicks the **Submit** button on the Add Defect dialog box, Quality Center invokes the function Bug_CanPost before posting the defect to the database on the server. You can add code to the Bug_CanPost function to control whether Quality Center posts the defect. For example, you can ensure that a user cannot reject a defect without adding a comment. For example, see "Example: Object Validation" on page 315.

- **Event subroutines.** These procedures are triggered to perform actions when an event takes place.

  For example, when a user opens the Add Defect dialog box, Quality Center invokes the subroutine Bug_New. You can add code to the Bug_New subroutine to perform actions that should be performed when a user opens the dialog box. For example, you can change the value of the **Detection Mode** field to BTW if the user is not in the QA Tester user group. For example, see "Example: Changing a Field Based on the User Group" on page 314.

Naming Conventions for Quality Center Event Procedures

The naming convention for an event procedure is as follows:

<entity>_<event>

Note that some event procedure names do not include an entity name.

Notes:

- For backwards compatibility, the previous naming convention including the module name is still supported.
- You cannot access global variables from the Manual Runner event procedures. A workaround for passing a value to or from Manual Runner is to use the **Settings** object. For example, see "Example: Storing the Last Values Entered" on page 327.

Entity

Entity can be one of the following:

Entity	Description
Req	Requirement data
Test	Test data
DesignStep	Design step data
TestSet	Test set data
TestSetTests	Test instance data
Run	Test run data
Bug	Defect data
Step	Test run step data

Event

The **Event** can be either a function name or a subroutine name. The event names are listed in "Reference for Quality Center Events" on page 274.

Reference for Quality Center Events

This section contains an alphabetical reference of the Quality Center event functions and subroutines. It includes the event name, description, syntax, type (Function or Sub), the value returned by a function, and the entities for which the event procedure is available.

For information on the naming conventions for event procedures, see "Naming Conventions for Quality Center Event Procedures" on page 273.

The following event functions are available:

Function Name	When the Function is Triggered
"ActionCanExecute" on page 276	before performing a user action
"Attachment_CanDelete" on page 277	before deleting an attachment
"Attachment_CanOpen" on page 278	before opening an attachment
"Attachment_CanPost" on page 278	before posting an attachment
"CanAddTests" on page 279	before adding tests to a test set
"CanCustomize" on page 279	before opening Customization window
"CanDelete" on page 280	before deleting an object from the server
"CanLogin" on page 281	before a user logs in to the project
"CanLogout" on page 281	before a user logs out of the project
"CanPost" on page 282	before posting an object to the server
"CanRemoveTests" on page 282	before removing tests from a test set
"DefaultRes" on page 283	before resetting project defaults
"FieldCanChange" on page 285	before changing a field value

Function Name	When the Function is Triggered
"GetDetailsPageName" on page 287	before displaying Defect Details dialog box
"GetNewBugPageName" on page 287	before displaying Add Defect dialog box

The following event subroutines are available:

Subroutine Name	When the Subroutine is Triggered
"AfterPost" on page 277	an object has been posted to the server
"Attachment_New" on page 279	an attachment is added
"DialogBox" on page 283	a dialog box is opened or closed
"EnterModule" on page 284	user switches modules
"ExitModule" on page 284	user exits a module
"FieldChange" on page 286	a field value changes
"MoveTo" on page 288	user changes focus
"MoveToFolder" on page 288	user clicks a folder in the test sets tree
"MoveToSubject" on page 289	user clicks a subject in the test plan tree
"New" on page 289	an object is added
"RunTests" on page 290	user clicks **Run** in the Test Lab module
"RunTestSet" on page 291	user clicks **Run Test Set** in the Test Lab module
"RunTestsManually" on page 291	user clicks **Run** > **Run Manually** in the Test Lab module

ActionCanExecute

This event is triggered before Quality Center performs an action that has been initiated by the user, to check whether the action can be executed.

You can add code to this event procedure to perform actions when the user has initiated a particular action, or to prevent the action from being executed in specific cases. For example, see "Example: Controlling User Permissions" on page 320.

Syntax	**ActionCanExecute(ActionName)** where **ActionName** is the action that the user has initiated
Type	Function
Returns	True or False
Availability	ActionCanExecute

AfterPost

This event is triggered after an object has been posted to the server.

Project fields should not be changed after they have been posted, because then the new value is not stored in the database.

Syntax	<entity>_**AfterPost**
Type	Sub
Availability	➤ Req_AfterPost ➤ Test_AfterPost ➤ TestSet_AfterPost ➤ Bug_AfterPost ➤ Step_AfterPost ➤ Run_AfterPost

Attachment_CanDelete

This event is triggered before Quality Center deletes an attachment from the server, to check whether that attachment can be deleted.

Syntax	**Attachment_CanDelete(Attachment)** where **Attachment** is the **IAttachment** interface. For more information, refer to the *HP Quality Center Open Test Architecture API Reference*.
Type	Function
Returns	True or False
Availability	Attachment_CanDelete

Attachment_CanOpen

This event is triggered before Quality Center opens an attachment from the server, to check whether the attachment can be opened.

Syntax	**Attachment_CanOpen(Attachment)** where **Attachment** is the **IAttachment** interface. For more information, refer to the *HP Quality Center Open Test Architecture API Reference*.
Type	Function
Returns	True or False
Availability	Attachment_CanOpen

Attachment_CanPost

This event is triggered before Quality Center posts an attachment to the server, to check whether the attachment can be posted.

Syntax	**Attachment_CanPost(Attachment)** where **Attachment** is the **IAttachment** interface. For more information, refer to the *HP Quality Center Open Test Architecture API Reference*.
Type	Function
Returns	True or False
Availability	Attachment_CanPost

Attachment_New

This event is triggered when an attachment is added to Quality Center.

Syntax	**Attachment_New(Attachment)** where **Attachment** is the **IAttachment** interface. For more information, refer to the *HP Quality Center Open Test Architecture API Reference*.
Type	Sub
Availability	Attachment_New

CanAddTests

This event is triggered before Quality Center adds tests to a test set, to check whether the specified tests can be added.

Syntax	<entity>**_CanAddTests(Tests)** where **Tests** is an array of Test IDs.
Type	Function
Returns	True or False
Availability	TestSet_CanAddTests

CanCustomize

This event is triggered when a user attempts to open the Customization window, to check whether the specified user can customize the specified project.

Syntax	**CanCustomize(DomainName, ProjectName, UserName)** where **DomainName** is the domain name, **ProjectName** is the project name, and **UserName** is the user name.
Type	Function
Returns	True or False
Availability	CanCustomize

CanDelete

This event is triggered before Quality Center deletes an object from the server, to check if the object can be deleted.

It applies to the following objects: requirements, tests or subject folders (in the Test Plan module), test sets or test set folders (in the Test Set module), and defects. The syntax is different for different objects.

➤ For requirements and defects:

Syntax	<entity>_**CanDelete**
Type	Function
Returns	True or False
Availability	➤ Req_CanDelete ➤ Bug_CanDelete

➤ For tests or test subject folders:

Syntax	<entity>_**CanDelete(Entity, IsTest)** where: ➤ **Entity** is the test or subject folder. ➤ If **IsTest** is True, **Entity** refers to an ITest object. If **IsTest** is False, **Entity** refers to an ISubjectNode object. For more information on ITest and ISubjectNode, refer to the *HP Quality Center Open Test Architecture API Reference*.
Type	Function
Returns	True or False
Availability	Test_CanDelete

➤ For test sets or test set folders:

Syntax	<entity>_**CanDelete(Entity, IsTestSet)** where: ➤ **Entity** is the test set or test set folder. ➤ If **IsTestSet** is True, **Entity** refers to an ITestSet object. If **IsTestSet** is False, **Entity** refers to an ITestSetFolder object. For more information on ITestSet and ITestSetFolder, refer to the *HP Quality Center Open Test Architecture API Reference*.
Type	Function
Returns	True or False
Availability	TestSet_CanDelete

CanLogin

This event is triggered to check whether the specified user can log in to the specified project.

Syntax	**CanLogin(DomainName, ProjectName, UserName)** where **DomainName** is the domain name, **ProjectName** is the project name, and **UserName** is the user name.
Type	Function
Returns	True or False
Availability	CanLogin

CanLogout

This event is triggered to check whether the current user can log out of the current project.

Syntax	**CanLogout**
Type	Function
Returns	True or False
Availability	CanLogout

CanPost

This event is triggered before Quality Center posts an object to the server, to check whether the object can be posted.

You can add code to this event procedure to prevent an object from being posted in specific cases. For example, see "Example: Object Validation" on page 315.

Syntax	<entity>_**CanPost**
Type	Function
Returns	True or False
Availability	➤ Req_CanPost ➤ Test_CanPost ➤ TestSet_CanPost ➤ TestSetTests_CanPost (does not appear in the Scripts Tree) ➤ Run_CanPost ➤ Bug_CanPost ➤ Step_CanPost

CanRemoveTests

This event is triggered to check whether the specified tests can be removed from a test set.

Syntax	<entity>_**CanRemoveTests (Tests)** where **Tests** is an array of Test IDs.
Type	Function
Returns	True or False
Availability	TestSet_CanRemoveTests

DefaultRes

This event is triggered when a user attempts to reset the defaults for Quality Center events. If the function returns False, the defaults are not reset.

Syntax	**DefaultRes**
Type	Function
Returns	True or False
Availability	DefaultRes

DialogBox

This event is triggered when a dialog box is opened or closed.

Syntax	**DialogBox(DialogBoxName, IsOpen)** where **DialogBoxName** is the name of the dialog box, and **IsOpen** indicates whether the dialog box is open.
Type	Sub
Availability	DialogBox

EnterModule

This event is triggered when the user switches to this Quality Center module.

You can add code to this event procedure to perform an action whenever the user switches to the specified module. For example, see "Example: Detecting an Empty Password" on page 324.

Syntax	**EnterModule**
Type	Sub
Availability	EnterModule

ExitModule

This event is triggered when the user exits the specified module.

Syntax	**ExitModule**
Type	Sub
Availability	ExitModule

FieldCanChange

This event is triggered before Quality Center changes a field value, to determine whether the field can be changed.

You can add code to this event procedure to prevent a field from being changed in specific cases. For example, see "Example: Field Validation" on page 316.

Syntax	<entity>_**FieldCanChange(FieldName, NewValue)** where **FieldName** is the name of the field and **NewValue** is the field value.
Type	Function
Returns:	True or False
Availability	➤ Req_FieldCanChange ➤ Test_FieldCanChange ➤ DesignStep_FieldCanChange ➤ TestSet_FieldCanChange ➤ TestSetTests_FieldCanChange ➤ Bug_FieldCanChange ➤ Step_FieldCanChange ➤ Run_FieldCanChange

The code for hiding a field that depends on another field should be placed in the FieldChange event procedure (not in the FieldCanChange event procedure).

FieldChange

This event is triggered when the value of the specified field changes.

Every change of value triggers the field change event when the field loses focus.

You can add code to this event procedure to perform an action when the value of a particular field is changed. For example, you can hide or display one field depending on the value the user enters into another field. For example, see "Example: Changing One Field Based on Another Field" on page 313.

Syntax	<entity>_**FieldChange(FieldName)** where **FieldName** is the name of the field.
Type	Sub
Availability	➤ Req_FieldChange ➤ Test_FieldChange ➤ DesignStep_FieldChange ➤ TestSet_FieldChange ➤ TestSetTests_FieldChange ➤ Bug_FieldChange ➤ Step_FieldChange ➤ Run_FieldChange

When a user changes a field value using the **Find/Replace** command, workflow events are not triggered. If restrictions implemented in workflow scripts are critical, consider disabling the **Replace** command for specific user groups, to ensure that your restrictions cannot be bypassed.

GetDetailsPageName

This event is triggered by Quality Center to retrieve the name of the Defect Details dialog box page (tab) that has the index number specified in PageNum.

You can add code to this event procedure to customize the tab names on the Defect Details dialog box. For example, see "Example: Changing Tab Names" on page 311.

Syntax	**GetDetailsPageName(PageName, PageNum)** where **PageName** is the default page name (for example, Page 1) and **PageNum** is the page number.
Type	Function
Returns	String containing the page name
Availability	GetDetailsPageName

GetNewBugPageName

This event is triggered by Quality Center to retrieve the name of the Add Defect dialog box page (tab) that has the index number specified in PageNum.

You can add code to this event procedure to customize the tab names on the Add Defect dialog box. For example, see "Example: Changing Tab Names" on page 311.

Syntax	**GetNewBugPageName(**PageName, PageNum**)** where **PageName** is the default page name (for example, Page 1) and **PageNum** is the page number.
Type	Function
Returns	String containing the page name
Availability	GetNewBugPageName

MoveTo

This event is triggered when the user changes focus from one object to another.

You can add code to this event procedure to perform actions when the user changes the focus. For example, see "Example: Presenting a Dynamic Field List" on page 317.

Syntax	<entity>_**MoveTo**
Type	Sub
Availability	➤ Req_MoveTo ➤ Test_MoveTo ➤ DesignStep_MoveTo ➤ TestSet_MoveTo ➤ TestSetTests_MoveTo ➤ Run_MoveTo ➤ Bug_MoveTo ➤ Step_MoveTo

MoveToFolder

This event is triggered when the user moves to the specified test set folder in the test sets tree.

Syntax	**MoveToFolder(Folder)** where **Folder** is the **ISysTreeNode** interface. For more information, refer to the *HP Quality Center Open Test Architecture API Reference*.
Type	Sub
Availability	MoveToFolder

MoveToSubject

This event is triggered when the user moves to the specified subject in the test plan tree.

Syntax	**MoveToSubject(Subject)** where **Subject** is the **ISysTreeNode** interface. For more information, refer to the *HP Quality Center Open Test Architecture API Reference*.
Type	Sub
Availability	MoveToSubject

New

This event is triggered when an object is added to Quality Center.

You can add code to this event procedure to perform an action when a new object is added. For example, see "Example: Customizing a Defects Module Dialog Box" on page 307.

Syntax	<entity>**_New**
Type	Sub
Availability	➤ Req_New ➤ Test_New ➤ DesignStep_New ➤ TestSet_New ➤ Bug_New ➤ Step_New

RunTests

This event is triggered when the user clicks the **Run** button to run tests in the Test Lab module.

Syntax	**RunTests(Tests)** where **Tests** is an array of Test IDs.
Type	Sub
Availability	RunTests

RunTestSet

This event is triggered when the user clicks the **Run Test Set** button to run a test set in the Test Lab module.

Syntax	**RunTestSet(Tests)** where **Tests** is an array of Test IDs.
Type	Sub
Availability	RunTestSet

RunTestsManually

This event is triggered when the user clicks the **Run** arrow and chooses **Run Manually** to run tests in the Test Lab module.

Syntax	**RunTestsManually(**Tests**)** where **Tests** is an array of Test IDs.
Type	Sub
Availability	RunTestsManually

19

Workflow Object and Property Reference

Workflow scripts can reference Quality Center objects to obtain information and to change project values. They can also use properties that return information about the current module and dialog box. This chapter lists the Quality Center objects and properties that are available to workflow scripts.

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Action Object	296
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Field Object	299
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About Quality Center Objects and Properties

Workflow scripts can obtain information, make decisions based on that information, and change values in the project based on those decisions.

You can obtain information such as the user group to which the current user belongs, and the value of a field, by accessing objects such as the **User** object or the **Field** object.

You can also obtain information about the active module and active dialog box using workflow properties. For more information on these properties, see "Quality Center Properties" on page 303.

Your script can change the value of a field, or field list. To do so, the script modifies the **Value** property or the **List** property of the appropriate **Field** object.

For information on the event procedures in which you place VBScript code to create workflow scripts, see Chapter 18, "Workflow Event Reference".

The following table lists the Quality Center objects that are available when you write a script.

Object	Description
Actions	The list of actions that are available for the following modules: Project, Requirements, Test Plan, Test Lab, Defects, and the Manual Runner dialog box. See "Actions Object" on page 295.
Action	The **Action** object is handled by the **Actions** object. See "Action Object" on page 296.
Fields	The following objects provide access to specific fields: ➤ **Req_Fields.** The Requirements module. ➤ **Test_Fields.** Tests in the Test Plan module. ➤ **DesignStep_Fields.** Design steps in the Test Plan module. ➤ **TestSet_Fields.** Test sets in the Test Lab module. ➤ **TestSetTest_Fields.** Tests in the Test Lab module. ➤ **Bug_Fields.** Defects in the Defects module and the Manual Runner dialog box. ➤ **Step_Fields.** Steps in the Manual Runner dialog box. ➤ **Run_Fields.** Test runs in the Manual Runner dialog box. See "Fields Objects" on page 298.
Field	The **Field** object is handled by the **Fields** objects. See "Field Object" on page 299.

Object	Description
Lists	Includes the lists that are available in a Quality Center project. See "Lists Object" on page 301.
TDConnection	Provides access to open test architecture (OTA) objects. See "TDConnection Object" on page 302.
User	Includes the properties of the current user. This object is available in all modules. See "TDConnection Object" on page 302.

Note: In some cases, a function returns the object itself instead of the ID property of the object. For example, after the following statement has been executed, testsetf is a reference to a **TestSetFolder** object:
Set testsetf = **TestSet_Fields**("CY_FOLDER_ID")**.Value**.

For information on the Script Editor used to write workflow scripts, see Chapter 17, "Working with the Workflow Script Editor".

For each Quality Center object, this chapter lists the properties of the object. The list includes the property name, a description, and the data type of the property. It indicates whether the property is read-only (R) or whether your script can modify it (R/W).

Actions Object

You can use the **Actions** object to manipulate toolbar buttons, menu commands, and dialog boxes.

The **Actions** object has the following property:

Property	R/W	Type	Description
Action	R	Object	Allows access to every action in a list. The index for this property is the action name.

Action Object

You can use the **Action** object to verify whether a button or command is enabled, checked, or visible. You can also use it to execute actions.

For example, to set the Defect Details dialog box to open automatically when the user moves from one defect to another in the Defects Grid, place the following code in the Bug_MoveTo event procedure:

```
NewDefectAction=Actions.Action("DefectDetailsAction1")
NewDefectAction.Execute
```

To obtain the name of an action, add the following lines to the ActionCanExecute event procedure, perform the action, and note the action name that is printed in the message:

```
Sub ActionCanExecute(ActionName)
    On Error Resume Next
    MsgBox "You have performed an action named: " & ActionName
    On Error GoTo 0
End Sub
```

This object has the following properties:

Property	R/W	Type	Description
Checked	R/W	Boolean	Indicates whether an action is checked in Quality Center.
Enabled	R/W	Boolean	Indicates whether an action is enabled. A disabled action cannot be invoked by the user, but can be invoked from the workflow script.
Visible	R/W	Boolean	Indicates whether an action is visible in Quality Center.

The **Action** object includes the following method:

Method	Description
Execute	Executes the action.

When a workflow script invokes an action using the **Execute** method of the **Action** object, the workflow events that would be triggered if a user initiated the action from a dialog box are by default not triggered. Therefore, when using **Action.Execute**, you must ensure that you do not bypass the site policies you are enforcing with workflow events.

To enable workflow events to be triggered from within a dialog box, set the value of the **AllowReentrancy** flag to **true**. To restore the default settings, so that these events are not triggered, set the value of the **AllowReentrancy** flag to **false**. For example, to set the Add Defect dialog box to open automatically when a user enters the Defects module, place the following code in the **EnterModule** event procedure:

```
AllowReentrancy=true
NewDefectAction=Actions.Action("DefectDetailsAction1")
NewDefectAction.Execute
AllowReentrancy=false
```

If the value of the **AllowReentrancy** flag is set to **false**, the dialog box opens as usual, but you cannot submit the defect as the workflow event to submit the defect is not triggered.

Important: Consider carefully the implications of setting the value of this flag to **true**. If you set the value of the flag to **true**, you enable a function to call another function which may call the original function. This can cause an endless loop. This can also occur when functions call internal functions which call the original function.

Fields Objects

You can use the following objects in workflow scripts to access the fields of Quality Center modules:

Object	Description
Req_Fields	Provides access to the fields of the Requirements module.
Test_Fields	Provides access to the fields of tests in the Test Plan module.
DesignStep_Fields	Provides access to the fields of the design steps in the Test Plan module.
TestSet_Fields	Provides access to the fields of the test sets in the Test Lab module.
TestSetTest_Fields	Provides access to the fields of the tests in the Test Lab module.
Bug_Fields	Provides access to the fields of the defects in the Defects module and the Manual Runner dialog box.
Step_Fields	Provides access to the fields of the steps in the Manual Runner dialog box.
Run_Fields	Provides access to the fields of the test runs in the Manual Runner dialog box.

For example, to set a certain property for all fields in the **Req_Fields** object, you can refer to each field by its ID number (**Req_Fields.FieldById**). To set all fields to be visible (**IsVisible**) in a dialog box, you can use the following code:

```
For i = 1 to Req_Fields.Count
    Req_Fields.FieldById(i).IsVisible = True
Next
```

These objects have the following properties:

Property	R/W	Type	Description
Count	R	Long	Returns the number of fields in the current object.
Field (FieldName)	R	Object	Accesses the fields by field name or field label.
FieldById (FieldID)	R	Object	Accesses the fields by the field ID number.

Field Object

You can use the **Field** object to access the properties of an entity field.

For example, to display a message box when a user does not have permission to change a value in the **Status** field, you can use the following code:

```
Msgbox "You do not have permission to change
<" & _Bug_Fields.Field("BG_STATUS").FieldLabel & "> field."
```

The **Field** object has the following properties:

Property	R/W	Type	Description
FieldLabel	R	String	The displayed label of the field.
FieldName	R	String	The logical name of the field.
IsModified	R	Boolean	Specifies whether the value was modified.
IsMultiValue	R	Boolean	Specifies whether the field can contain multiple values from a lookup list.
IsNull	R	Boolean	Specifies whether the field value is absent.
IsReadOnly	R/W	Boolean	Specifies whether the field is read-only.
IsRequired	R/W	Boolean	Specifies whether a field value is required. This enables you to override field customization information. To modify the **IsRequired** property of a field, the **IsVisible** property must be True. Changes to **IsRequired** are ignored if the field is not visible. Users must always enter a value for a field that is set as required by the workflow. This applies whether they are modifying an existing record or adding a new record, and even if the field is already empty. **Note:** This property cannot be used with the **Run_Fields** object to set the fields of a run as required.
IsVisible	R/W	Boolean	Specifies whether the field is displayed.
List	R/W	List	Sets or retrieves the field list attached to a field of type lookup list.
PageNo	R/W	Integer	Sets or retrieves the page (tab) on which the field is displayed in the Add Defect and Defect Details dialog boxes.

Property	R/W	Type	Description
Value	R/W	Variant	Sets or retrieves the value of the field.
ViewOrder	R/W	Integer	Sets or retrieves the order in which the field appears in the Add Defect and Defect Details dialog boxes.

Lists Object

You can use the **Lists** object to limit field input to a specific list of values.

For example, to set the list in the **Planned Closing Version** field, depending on the **Project** field value, you can use the following code:

```
If Bug_Fields.Field("BG_PROJECT").Value = "Project 1" Then
    Bug_Fields.Field("BG_PLANNED_CLOSING_VER").List _
    = Lists("All Projects")
    ...
End If
```

For more information, see “Example: Presenting a Dynamic Field List” on page 317.

The **Lists** object has the following properties:

Property	R/W	Type	Description
List	R	ISysTreeNode	Accesses the Quality Center lists.

Note: When workflow customization has been used to change a list of values for a field that has transition rules defined, the field may only be modified in a way that satisfies both the workflow script and the transition rules. For more information, see “Setting Transition Rules” on page 173.

TDConnection Object

In workflow scripts, the only objects that are available are the objects of the module in which the code is written and a limited number of global objects. One of the global objects is the **TDConnection** object. **TDConnection** provides access to the open test architecture (OTA) objects.

You can use the **TDConnection** object to access objects from other modules, and to access general session parameters. You can access **TDConnection** properties in any procedure, from any module.

For more information about the **TDConnection** object, and a list of **TDConnection** properties, refer to the *HP Quality Center Open Test Architecture API Reference*.

For examples of using the **TDConnection** object in workflow scripts, see Chapter 20, "Workflow Examples".

User Object

You can access the **User** object to retrieve the user name of the current user and to check whether the user belongs to a particular user group. You can retrieve or modify the first and last name of the user.

For example, to have a message box open when the user has project administrator permissions, use the following code:

```
If User.IsInGroup("TDAdmin") Then
    MsgBox "The user " & User.FullName & _
    " has administrative permissions for this project."
End If
```

For more information, see "Example: Changing a Field Based on the User Group" on page 314, and "Example: Controlling User Permissions" on page 320.

To access user properties such as the user password, that cannot be accessed by the **User** object, you can use the **TDConnection** object of the Quality Center open test architecture (OTA). For more information, see "Example: Detecting an Empty Password" on page 324.

The **User** object has the following properties:

Property	R/W	Type	Description
FullName	R/W	String	Sets or retrieves the first and last name of the current user.
IsInGroup (GroupName)	R	Boolean	Checks whether or not the current user is a member of a predefined/user-defined group.
UserName	R	String	Returns the user name used when logging in to Quality Center.

Quality Center Properties

You can use the **ActiveModule** and **ActiveDialogName** properties to obtain information about the active module and dialog box.

ActiveModule Property

The **ActiveModule** property returns the name of the active Quality Center module. For example, to open a message box displaying the module name when you move to a new module, use the following code:

```
Sub EnterModule
    On Error Resume Next
    msgbox "You have just entered the " & ActiveModule & ” module.”
    On Error GoTo 0
End Sub
```

ActiveDialogName Property

The **ActiveDialogName** property returns the name of the active dialog box. For example, to open a message box displaying the dialog box name when you open a new dialog box, use the following code:

```
Sub DialogBox(DialogBoxName, IsOpen)
    On Error Resume Next
    msgbox "You have just opened the " & ActiveDialogName " dialog box."
    On Error GoTo 0
End Sub
```

20

Workflow Examples

This chapter provides the following examples of workflow scripts:

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About the Workflow Examples

The workflow examples presented in this chapter perform several types of task. The following table lists the examples that illustrate each type of task.

Workflow Task	See Examples
dialog box customization	Example: Customizing a Defects Module Dialog Box Example: Changing Tab Names
field value automation	Example: Adding a Template to a Memo Field Example: Changing One Field Based on Another Field Example: Changing a Field Based on the User Group
data validation	Example: Object Validation Example: Field Validation
dynamic field customization	Example: Presenting a Dynamic Field List Example: Changing Field Properties when a Field Changes
user permission control	Example: Controlling User Permissions
functionality	Example: Adding Button Functionality
error handling	Example: Error Handling
using OTA to obtain session parameters	Example: Obtaining the Session Context Example: Obtaining Session Properties Example: Detecting an Empty Password
sending mail	Example: Sending Mail

Workflow Task	See Examples
the **Settings** object	Example: Storing the Last Values Entered
copying values between modules	Example: Copying Field Values to Another Object

Example: Customizing a Defects Module Dialog Box

This example shows how you can customize the field layout and other field properties in the Add Defect dialog box. You can create similar code to arrange the layout of the Defect Details dialog box.

This example illustrates a solution that customizes field properties for all user groups. You can also use the script generators to customize the layout of the Defects module dialog boxes. If you use the script generators, you must perform customization separately for each user group. For information on these script generators, see "Customizing Defects Module Dialog Boxes" on page 246.

This example involves the following two procedures:

- SetFieldApp is a general purpose procedure that receives a field name and its properties as parameters, and assigns the properties to the field. See "SetFieldApp" on page 308.
- FieldCust_AddDefect calls SetFieldApp for each field in the Add Defects dialog box, to set the properties of the field. For some of the fields, FieldCust_AddDefect checks the user group to which the current user belongs, and customizes the field properties accordingly. A call to FieldCust_AddDefect is placed in the Bug_New event procedure. See "FieldCust_AddDefect" on page 309.

Note: To implement this example, you can run the **Add Defect Field Customization** script generator and then modify the resulting scripts.

- Rename the generated function WizardFieldCust_Add to FieldCust_AddDefect and modify it as necessary. (Before you modify a generated script, you must rename it so that it is not overwritten the next time you run the script generator.)
- The script generator places a call to WizardFieldCust_Add in the event procedure Bug_New. Change this to FieldCust_AddDefect.
- The function SetFieldApp is generated when you run the script generator. You do not need to rename or modify this function.

SetFieldApp

The function SetFieldApp receives a field name and its properties as parameters, and assigns the properties to the field.

The function assigns the following field properties: field visibility, whether the field is required, the number of the page (tab) on which the field should be displayed, and the view order (from left to right and from top to bottom).

Add a call to the function SetFieldApp in the user-defined function FieldCust_AddDefect.

```
Sub SetFieldApp(FieldName, Vis, Req, PNo, VOrder)
    On Error Resume Next
    With Bug_Fields(FieldName)
        .IsVisible = Vis
        .IsRequired = Req
        .PageNo = PNo
        .ViewOrder = VOrder
    End With
    PrintError “SetFieldApp”
    On Error GoTo 0
End Sub
```

FieldCust_AddDefect

The user-defined function FieldCust_AddDefect calls the function SetFieldApp.

The function first sets all fields to be invisible, not required, and to appear on page 100 at location 0. This ensures that if you add a new field using the **Project Entities** link on the Project Customization window, the layout will not be changed.

Add a call to FieldCust_AddDefect in the Bug_New event procedure so that it will be triggered when a user adds a new defect:

```
Sub Bug_New
    FieldCust_AddDefect
End Sub
```

First, the code handles the fields that are common to all user groups. It uses conditional statements for the fields that will appear in the dialog box only for specific user groups, or that will have different properties for different users.

```
Sub FieldCust_AddDefect
    On Error Resume Next
    For i= 0 To Bug_Fields.Count
        SetFieldApp Bug_Fields.FieldByID(i), False, False, 100, 0
    Next

    ViewNum = 0
    PageNum = 0

    SetFieldApp "BG_BUG_ID", True, True, PageNum, ViewNum
    ViewNum = ViewNum + 1
    SetFieldApp "BG_DESCRIPTION", True, False, PageNum, ViewNum
    ViewNum = ViewNum + 1
    SetFieldApp "BG_SUMMARY", True, True, PageNum, ViewNum
    ViewNum = ViewNum + 1
    SetFieldApp "BG_DETECTED_BY", True, True, PageNum, ViewNum
    ViewNum = ViewNum + 1
    SetFieldApp "BG_DETECTION_DATE", True, True, PageNum, ViewNum
    ViewNum = ViewNum + 1
```

```
    SetFieldApp "BG_DETECTION_VERSION", True, True, PageNum, _
    ViewNum
    ViewNum = ViewNum + 1
    SetFieldApp "BG_SEVERITY", True, True, PageNum, ViewNum
    ViewNum = ViewNum + 1
    SetFieldApp "BG_PRIORITY", True, True, PageNum, ViewNum
    ViewNum = ViewNum + 1
    SetFieldApp "BG_PROJECT", True, False, PageNum, ViewNum
    ViewNum = ViewNum + 1
    SetFieldApp "BG_REPRODUCIBLE", True, False, PageNum, ViewNum
    ViewNum = ViewNum + 1
    SetFieldApp "BG_STATUS", True, False, PageNum, ViewNum
    ViewNum = ViewNum + 1

' Now handle fields that are different for different user groups

    If User.IsInGroup("Developer") Then
        SetFieldApp "BG_PLANNED_CLOSING_VERSION", True, False, _
        PageNum, ViewNum
        ViewNum = ViewNum + 1
        SetFieldApp "BG_PLANNED_FIX_TIME", True, False, PageNum, _
        ViewNum
        ViewNum = ViewNum + 1
    End If

    If User.IsInGroup("QATester") Then
        PageNum = PageNum + 1
        SetFieldApp "BG_USER_01", True, False, PageNum, ViewNum
        ViewNum = ViewNum + 1
        SetFieldApp "BG_USER_02", True, False, PageNum, ViewNum
        ViewNum = ViewNum + 1
    End If

    SetFieldApp "BG_ACTUAL_FIX_TIME", True, False, PageNum, _
    ViewNum
    ViewNum = ViewNum + 1
    :
    PrintError “FieldCust_AddDefect”
    On Error GoTo 0
End Sub
```

Example: Changing Tab Names

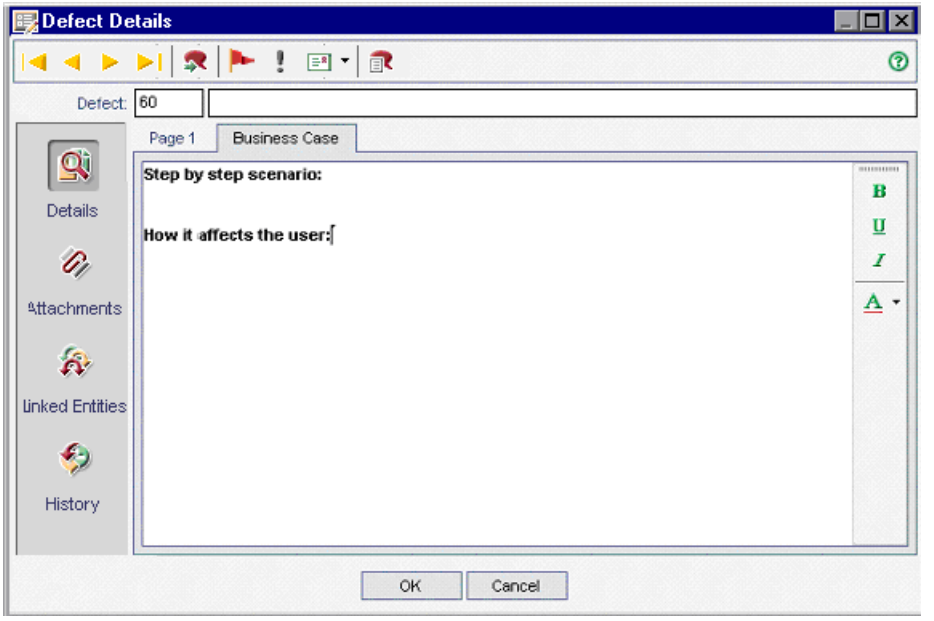
You can change the names of the tabs on the Add Defect dialog box. This example sets the tabs to General, Environments, and Business Case.

Add the following code to the GetNewBugPageName event procedure, which is triggered before Quality Center opens the Add Defect dialog box. To change the tab names on the Defect Details dialog box, add similar code to the event procedure GetDetailsPageName.

```
Function GetNewBugPageName(PageName, PageNum)
    On Error Resume Next
    Select case PageNum
        case "1"
            GetNewBugPageName="General"
        case "2"
            GetNewBugPageName="Environments"
        case else
            GetNewBugPageName="Business Case"
    End Select
    PrintError “GetNewBugPageName”
    On Error GoTo 0
End Function
```

Example: Adding a Template to a Memo Field

You can use workflow scripts to add a default template to a memo field. This example adds text to a memo field called **Business Case** to display the following template:



Perform this customization by placing the HTML code for the text into the **BG_USER_25** field when a defect is added. This example assumes that the user-defined field **BG_USER_25** is used to store a business case string.

Add the code to the Bug_New event procedure, which is triggered when a user adds a new defect.

```
Sub Bug_New
    On Error Resume Next
    Bug_Fields("BG_USER_25").value = _
    "<html><body><b>Step by step scenario:</b>" & _
    "<br><br><br><b>How it affects the user:</b></body></html>"
    PrintError “Bug_New”
    On Error GoTo 0
End Sub
```

Example: Changing One Field Based on Another Field

This example demonstrates how you can change a field value based on the value entered into another field.

For example, you can cause defects to be assigned to user **alex_qc** when UI Suggestion is entered into the **Category** field, and to user **alice_qc** when Security Issues is entered.

The example assumes that the user-defined field **BG_USER_05** is used to store the category. When the **Category** field is changed in the Defects module, the **BG_RESPONSIBLE** field is assigned the appropriate value.

Add the code to the Bug_FieldChange event procedure so that it is triggered when a user changes a field value for a defect.

```
Sub Bug_FieldChange(FieldName)
    On Error Resume Next
    If FieldName = "BG_USER_05" then
        Select case Bug_Fields("BG_USER_05").Value
        case "UI Suggestion"
            Bug_Fields("BG_RESPONSIBLE").value="alex_qc"
        case "Security Issue"
            Bug_Fields("BG_RESPONSIBLE").value="alice_qc"
        End Select
    End If
    PrintError “Bug_FieldChange”
    On Error GoTo 0
End Sub
```

Example: Changing a Field Based on the User Group

This example demonstrates how you can change a field value according to the user group of the user entering the defect.

In this example, the user-defined field **BG_USER_01** is a detection mode field in which the user who detected the defect can enter the way in which it was discovered. Possible values are Formal testing, Informal testing, and BTW.

The example sets the value of the detection mode field to BTW when a defect is opened by a user who is not in the QA Tester group.

Add the code to event procedure Bug_New, so that it is triggered when a defect is added.

```
Sub Bug_New
    On Error Resume Next
    If not User.IsInGroup("QATester") then
        Bug_Fields("BG_USER_01").Value = "BTW"
    End If
    PrintError “Bug_New”
    On Error GoTo 0
End Sub
```

Example: Object Validation

This example demonstrates how you can perform validations of all fields by using the CanPost event procedure. For example, this code segment ensures that a user cannot reject a defect without adding a comment.

In this example, a user may not post a defect where the defect status (**BG_STATUS**) has been changed to Rejected unless some explanatory text has been entered in the **R&D Comment** field (**BG_DEV_COMMENTS**).

Add the code to the Bug_CanPost event procedure so that the check is performed when the user attempts to submit the defect.

```
Function Bug_CanPost
    On Error Resume Next
    If Bug_Fields("BG_STATUS").IsModified and _
    Bug_Fields("BG_STATUS").Value = "Rejected" and _
    not Bug_Fields("BG_DEV_COMMENTS").IsModified then
        Bug_CanPost = False
        msgbox "You must enter a comment when rejecting a defect."
    Else
        Bug_CanPost = True
    End If
    PrintError “Bug_CanPost”
    On Error GoTo 0
End Function
```

Example: Field Validation

This example demonstrates how to validate a single field value. For example, the following code segment shows how you can ensure that a user in a specific group cannot lower the priority of a defect.

In this example, if the user is in the QATester group and the **BG_PRIORITY** field is being modified, the new value of the **BG_PRIORITY** field cannot be lower than the current value.

This example assumes that in the **Priority** field list for the project, lower priorities come first when the values are sorted in ascending order. For example, the list meets this requirement if the elements are as follows: 1-Low, 2-Medium, 3-High.

Add the code to the Bug_FieldCanChange event procedure so that it is triggered when the user attempts to change a defect field value.

```
Function Bug_FieldCanChange(FieldName, NewValue)
    On Error Resume Next
    If User.IsInGroup("QATester") and FieldName ="BG_PRIORITY" Then
        If NewValue < Bug_Fields("BG_PRIORITY").Value then
            Bug_FieldCanChange = False
            msgbox "You do not have permission to lower defect priority."
        Else
            Bug_FieldCanChange = True
        End If
    End If
    PrintError “Bug_FieldCanChange”
    On Error GoTo 0
End Function
```

Example: Presenting a Dynamic Field List

This example demonstrates how you can present a different field list in a field, depending on the value of another field.

The user-defined function SW_SetLists_Environment checks the value of the **Environment Specification** field and assigns the appropriate field list to the **Environment Type** field.

This example assumes that the field lists have been defined in the project. For more information, see "Customizing Project Lists" on page 213.

Note: To use workflow scripts to change or create lists that can be assigned to fields, you must use the Open Test Architecture (OTA) interface.

Add code to the Bug_MoveTo event procedure so that the user-defined function SW_SetLists_Environment is called when the user changes focus in the defects module.

```
Sub Bug_MoveTo()
    On Error Resume Next
    SW_SetLists_Environment
    PrintError "Bug_MoveTo"
    On Error GoTo 0
End Sub
```

Add code to the Bug_FieldChange event procedure so that the user-defined function SW_SetLists_Environment is called when a user changes the value of the **Environment Type** field in the Defects module.

```
Sub Bug_FieldChange(FieldName)
    On Error Resume Next
    If FieldName = "BG_USER_01" then
        SW_SetLists_Environment
    End If
    PrintError "Bug_FieldChange"
    On Error GoTo 0
End Sub
```

The user-defined function SW_SetLists_Environment checks the value of the **Environment Specification** field (**BG_USER_02**) and assigns the appropriate field list to the **Environment Type** field (**BG_USER_01**).

```
Sub SW_SetLists_Environment()
    Dim listName
    On Error Resume Next
    Select Case Bug_Fields("BG_USER_01").Value
    Case "Browser"
        listName = "Browsers"
    Case "Database Type"
        listName = "Database Type"
    Case "Operating System"
        listName = "Platform"
    Case "Web Server"
        listName = "Web Server"
    Case Else
        listName = "Environment Specification"
    End Select
    Bug_Fields("BG_USER_02").List = Lists(listName)
    PrintError ("Set Environment List")
    On Error GoTo 0
End Sub
```

Example: Changing Field Properties when a Field Changes

This example demonstrates how you can change the properties of a field when a different field is changed.

In this example, if the status of the defect (**BG_STATUS**) is changed to Closed, the user must provide a value in the field **Closed in Build** (**BG_CLOSING_VERSION**).

Add the code to the Bug_FieldChange event procedure, to make the **Closed in Build** field a required field if the status is changed to Closed.

```
Sub Bug_FieldChange(FieldName)
    On Error Resume Next
    If FieldName= "BG_STATUS" and _
    Bug_Fields("BG_STATUS").value="Closed" then
        Bug_Fields("BG_CLOSING_VERSION").IsRequired=True
    End If
    PrintError “Bug_FieldChange”
    On Error GoTo 0
End Sub
```

Example: Controlling User Permissions

This example demonstrates how you can prevent members of specific user groups from performing an action.

The code allows a user to replace a defect field value only if the user belongs to the Admin user group.

Add the code to the ActionCanExecute event procedure so that the check is performed when a user attempts to execute an action.

```
Function ActionCanExecute(ActionName)
    On Error Resume Next
    If ActionName = "BugReplaceAction1" _
        And Not User.IsInGroup("Admin") then
        ActionCanExecute = False
        msgbox "You do not have permission to perform this action"
    Else
        ActionCanExecute = True
    End If
    PrintError “ActionCanExecute”
    On Error GoTo 0
End Function
```

Example: Adding Button Functionality

This example opens a calculator when a user clicks a button defined with action name Calculator.

Add the code to the ActionCanExecute event procedure, so that it is triggered when a user initiates an action.

For information about the **Wscript.Shell** object, refer to the Microsoft documentation. To access help for the VBScript language, choose **Help** > **VBScript Home Page** in the Script Editor.

```
Function ActionCanExecute(ActionName)
    On Error Resume Next
    If ActionName = "Calculator" Then
        Set shell = CreateObject("Wscript.Shell")
        shell.Run "Calc"
        set shell = Nothing
    End If
    ActionCanExecute = DefaultRes
    PrintError “ActionCanExecute”
    On Error GoTo 0
End Function
```

Example: Error Handling

This example demonstrates how you can display a standard error message. Error handling should be added to each workflow script that you write, because errors that are not detected by the workflow code can cause the user's browser to crash.

The user-defined function PrintError receives the name of the calling procedure as a parameter. If an error has occurred, PrintError prints out the error number, description and severity, and the name of the procedure in which the error occurred.

You do not need to create an **Err** object, because it is intrinsic to VBScript. For more information about the **Err** object, refer to the Microsoft documentation.

```
Sub PrintError(strFunctionName)
    If Err.Number <> 0 Then
        MsgBox "Error #" & Err.Number & ": " & Err.Description, _
        vbOKOnly+vbCritical, _
        "Workflow Error in Function " & strFunctionName
    End If
End Sub
```

The following code segment illustrates how you can add error handling to your subroutines.

```
Sub <sub_name>()
    On Error Resume Next
    :
    [Your code here]
    :
    PrintError "<sub_name>"
End Sub
```

The following code segment illustrates how you can add error handling to your functions.

```
Function <function_name>()
    On Error Resume Next
    :
    [Your code here]
    :
    PrintError "<function_name>"
End Function
```

Example: Obtaining the Session Context

You can use the **TDConnection** object in a workflow script to retrieve information about the session in which the user is working at the time that the script is executed.

In the following example, the server time is displayed in a message box:

```
MsgBox "The current time on the server is: " & TDConnection.ServerTime
```

Example: Obtaining Session Properties

This example demonstrates how to use the **TDConnection** object to obtain the properties of the current session. Add the code to the procedure where these properties are needed. The properties do not depend on each other, so each of the properties can be retrieved separately.

The following are examples of session properties:

```
TDConnection.ServerName
TDConnection.ServerTime
TDConnection.DomainName
TDConnection.ProjectName
TDConnection.Password
User.UserName
```

Note that there is no need to use **TDConnection** to retrieve the user name because the workflow has a predefined **User** object. For more information, see "TDConnection Object" on page 302.

The example below tests the first five characters of the server URL to determine whether the user is connected to the server using HTTP or HTTPS:

```
If Left(UCase(TDConnection.ServerName), 5) = "HTTPS" Then
    MsgBox "You are currently connected to the server using SSL."
Else
    MsgBox "You are not using SSL."
End If
```

Example: Detecting an Empty Password

This example accesses **TDConnection** to retrieve the password of the current user. It prints a message if the user has an empty password.

The following user-defined function is added to the common script section so that it can be accessed from all modules.

```
Function CheckPassword
    On Error Resume Next
    If isObject(TDConnection) Then
        Set tdc = TDConnection
        currentPwd = tdc.Password
        If len(currentPwd) < 1 Then
            MsgBox "Your password is empty (null).” & _
            “Please change your password (Tools -> Change Password).", 0, _
            "Your Password Is Empty"
        End If
    End If
    On Error GoTo 0
End Function
```

Add the following lines to the EnterModule event procedure so that a user with an empty password receives a message when they enter a module.

```
Sub EnterModule
    On Error Resume Next
    CheckPassword
    On Error GoTo 0
End Sub
```

Example: Sending Mail

These examples demonstrate how to use the **TDConnection** object to send mail from the Defects module, and to send mail when a field value changes in the Test Plan module.

Sending Mail from the Defects Module

This example sends mail from the Defects module.

Add a call to the SendDefect procedure in the Bug_AfterPost event procedure.

Note: If the SendDefect procedure is called before the defect is submitted, the values that were changed in the current modification will not be included. The database is updated with the new values only after the defect is posted.

```
Sub SendDefect (iObjectId, strTo, strCc, strSubject, strComment)
    On Error Resume Next
    Dim objBugFactory, objBug
    Set objBugFactory = TDConnection.BugFactory
    Set objBug = objBugFactory.Item(iObjectId)
    objBug.Mail strTo, strCc, 2, strSubject, strComment
    Set objBug = Nothing
    Set objBugFactory = Nothing
    PrintError "SendDefect"
    On Error Then GoTo 0
End Sub
```

The constant 2 in the call to objBug.Mail indicates that the history should be included with the mail. For a list of the constants that can be used to customize e-mail, refer to the tagTDMAIL_FLAGS enumeration in the *HP Quality Center Open Test Architecture API Reference*. In workflow scripts, use numeric constants and not the enumeration values.

Sending Mail When a Test Plan Module Field Value Changes

The example below demonstrates how a similar function can be called when the value of the status field is changed in the Test Plan module.

The code is added to the Test_FieldChange event procedure. It constructs a subject and comment for the e-mail, and calls a user-defined function, SendTest. SendTest sends mail from the Test Plan module. You could code SendTest similarly to the SendDefect subroutine shown in "Sending Mail from the Defects Module" on page 325.

```
Sub Test_FieldChange(FieldName)
    On Error Resume Next
    Dim strSubject, strComment
    If FieldName = "TS_STATUS" Then
        strSubject = "Test Change Notification" & _
            " for project " & TDConnection.ProjectName & _
            " in domain " & TDConnection.DomainName
        strComment = "The user " & User.FullName & _
            " changed the status of the test " & _
            Test_Fields("TS_NAME").Value & _
            " to " & Test_Fields("TS_ STATUS").Value
        SendTest Test_Fields("TS_TEST_ID").Value, _
            Test_Fields("TS_RESPONSIBLE").Value, "[QA Testers]", _
            strSubject, StrComment
    End If
End Sub
```

Example: Storing the Last Values Entered

This example shows how to use the **TDConnection** object to implement persistent data between actions. The lifetime of a variable in a routine is only for the routine run. Therefore, persistent data must be stored if it must be available later. It is recommended that you use the Quality Center API to store persistent data whenever possible instead of using external objects, files, or the registry.

In this example, a user-defined function SW_KeepLastValue uses the **Settings** object to save the values entered into the fields **BG_DETECTION_VERSION**, **BG_USER_01**, and **BG_USER_03** when a user posts a defect. These values are retrieved and assigned as default values when this user adds a new defect.

The user-defined function is called with the SET action from Bug_CanPost, before a new defect is posted by the user. The values in the fields are stored.

```
Function Bug_CanPost()
    If Bug_Fields("BG_BUG_ID").Value = "" Then
        SW_KeepLastValue ("SET")
    End If
End Function
```

The function is called with the GET action from the Bug_New event procedure. When a user adds a new defect, the values stored in the fields for this user are entered into these fields.

```
Sub Bug_New()
    SW_KeepLastValue ("GET")
End Sub
```

Depending on the action passed as a parameter, the user-defined function SW_KeepLastValue stores the values of the fields in the common settings table for the current user, or reads the values from the **Settings** object and assigns the values to the appropriate fields.

```
Sub SW_KeepLastValue(action)
Dim tdc, vals, flds
Dim uset, pairs, pair
Dim bld
On Error Resume Next
    bld = ""
    Set tdc = TDConnection
    Set uset = tdc.UserSettings

    If action = "SET" Then
        flds = Array("BG_DETECTION_VERSION", _
        "BG_USER_01", "BG_USER_03")
        vals = ""
        For i = 0 To UBound(flds)
            If vals <> "" Then vals = vals & ";"
            vals = vals & flds(i) & "=" & Bug_Fields(flds(i)).Value
        Next
        'Open category KeepLValueSetting
        uset.Open ("KeepLValueSetting")
        'Setting KeepValueFields in category KeepLValueSetting
        uset.Value("KeepValueFields") = vals
        uset.Close
    End If ‘SET
```

```
    If action = "GET" Then
        uset.Open ("KeepLValueSetting")
        vals = uset.Value("KeepValueFields")
        If vals <> "" Then
            pairs = Split(vals, ";")
            For i = 0 To UBound(pairs)
                pair = Split(pairs(i), "=")
                If UBound(pair) = 1 Then
                    Select Case pair(0)
                        Case "BG_USER_03"
                            bld = pair(1)
                        Case Else
                            If Bug_Fields(pair(0)).Value = "" Then
                                Bug_Fields(pair(0)).Value = pair(1)
                            End If
                    End Select
                    If Bug_Fields("BG_DETECTION_VERSION").Value <> "" _
                    And bld <> "" Then
                        SW_SetLists_VersionsBuilds _
                        "BG_DETECTION_VERSION", _
                        "BG_USER_03"
                        Bug_Fields("BG_USER_03").Value = bld
                        If Err.Number <> 0 Then Err.Clear
                    End If 'Bug_Fields
                End If 'UBound(pair)
            Next
        End If 'vals <> ""
    End If 'GET

    uset.Close

    PrintError ("Keep Last Value (" & action & ")")
    On Error GoTo 0
End Sub
```

Example: Copying Field Values to Another Object

This example shows how to use the **TDConnection** object to copy the value from the **Build Number** field of a Run (**RN_USER_02**) to the **Last Ran On Build** field of a Test in a Test Set (**TC_USER_03**).

Add the code to the Run_AfterPost event procedure.

```
Sub Run_AfterPost
    On Error Resume Next
    Set TSFactory = TDConnection.TestSetFactory
    Set TS = TSFactory.Item(Run_Fields("RN_CYCLE_ID").value)

    Set TSTestFactory =TS.TSTestFactory
    Set TSTest = TSTestFactory.Item(Run_Fields("RN_TEST_ID").Value)

    TSTest.Field("TC_USER_03") = Run_Fields("RN_USER_02")
    TSTest.Post

    Set TSFactory = Nothing
    Set TS = Nothing
    Set TSTestFactory =Nothing
    Set TSTest = Nothing

    PrintError ("Run_AfterPost")
    On Error GoTo 0
End Sub
```

Part IV

Appendixes

A

Verifying Quality Center Server Components

You can use the Quality Center Checker to perform component status checks and to verify that the main Quality Center server components are successfully installed.

This appendix describes:	On page:
About Verifying Quality Center Server Components	333
Installing the Quality Center Checker	334
Using the Quality Center Checker	335

About Verifying Quality Center Server Components

The Quality Center Checker is a diagnostic tool that tests many of the Quality Center server components that Quality Center uses. Running the Quality Center Checker can pinpoint the cause of many server side problems associated with accessing Quality Center.

Before you install Quality Center, you can use the Quality Center Checker to check that you have the required permissions and resources to perform the installation. For more information on installing the Quality Center Checker, see “Installing the Quality Center Checker” on page 334.

After you install Quality Center, you can use the Quality Center Checker to verify that the main Quality Center server components are successfully installed. You can also verify information such as directory paths, operating systems, permissions, resources, and port availability. For more information, see “Using the Quality Center Checker” on page 335.

Installing the Quality Center Checker

The Quality Center Checker is installed as part of the Quality Center installation. To use the Quality Center Checker before installing Quality Center, or to get the latest version of the Quality Center Checker, you can download the Quality Center Checker from the Mercury Customer Support Web site.

To manually install the Quality Center Checker:

1. Log in to the Quality Center server machine with administrator privileges.
2. Download the latest version of the Quality Center Checker from the Customer Support Web site (http://support.mercury.com), and extract the files to a local directory on the server machine.
3. Run the **qcchecker.bat** file from the <**Quality Center Checker**>**bin** directory.

To install a newer version of the Quality Center Checker:

1. Log in to the Quality Center server machine with administrator privileges.
2. Find the location of the previous installation of the Quality Center Checker. If Quality Center Checker was installed in Quality Center 9.0, its directory is <**Quality Center home directory**>**qcchecker**.
3. Make a back up of the **qcchecker** folder.
4. Download the latest version of the Quality Center Checker from the Customer Support Web site (http://support.mercury.com) and extract the files to <**Quality Center home directory**>**qcchecker**.
5. Update the **params.properties** file in <**Quality Center home directory**>**qcchecker****tests** with parameter information from the original **params.properties** file.

Using the Quality Center Checker

The following components are verified by the Quality Center Checker:

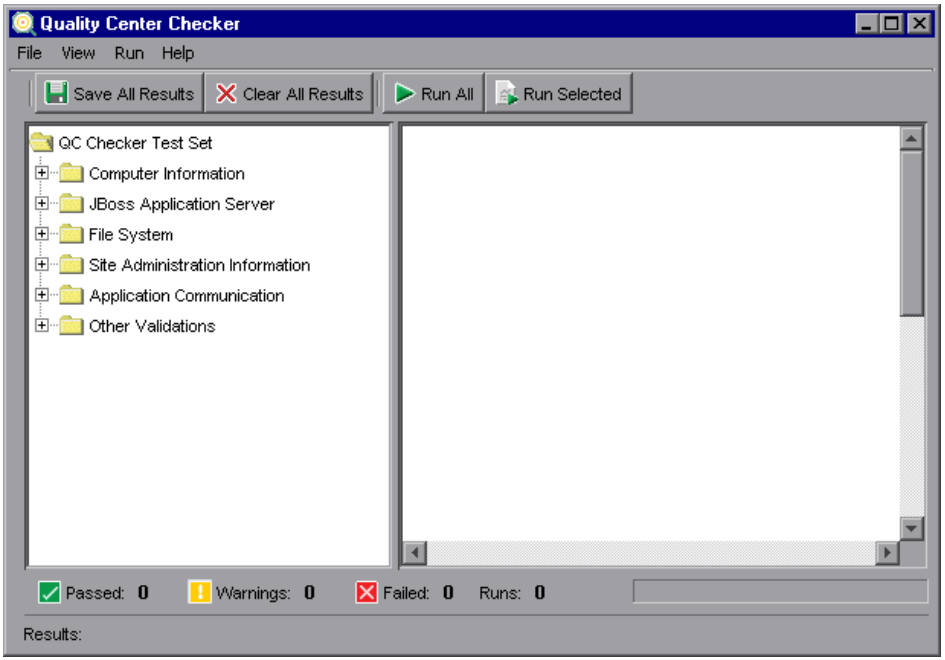
Component	Description
Computer Information	Displays information about your computer, such as environment values, Java properties, and operating system data. It also displays data input in the Quality Center Checker parameter properties file.
<application server name> Application Server	Verifies information about your application server such as directory paths, operating system, ports, and service packs.
File System	Verifies that sufficient disk space is available.
Site Administration Information	Verifies the configuration of the database server and the Site Administration database. Also verifies your Quality Center license.
Application Communication	Verifies the connection between Quality Center and Site Administration.
Other Validations	Verifies the availability of server side resources required to perform the Quality Center installation. This includes port status, service user permissions, installation user permissions, database version, and database permissions.

To use the Quality Center Checker:

1 Open the Quality Center Checker as follows:

- **From Windows:** Choose **Start** > **Programs** > **HP Quality Center** > **Quality Center Checker**. Alternatively, Run the **qcchecker.bat** file from the <**Quality Center home directory**>**qcchecker****bin** directory.
- **From Linux or Solaris:** Run the **qcchecker.sh** file from the <**Quality Center home directory**>**qcchecker****bin** directory.

The Quality Center Checker window opens.

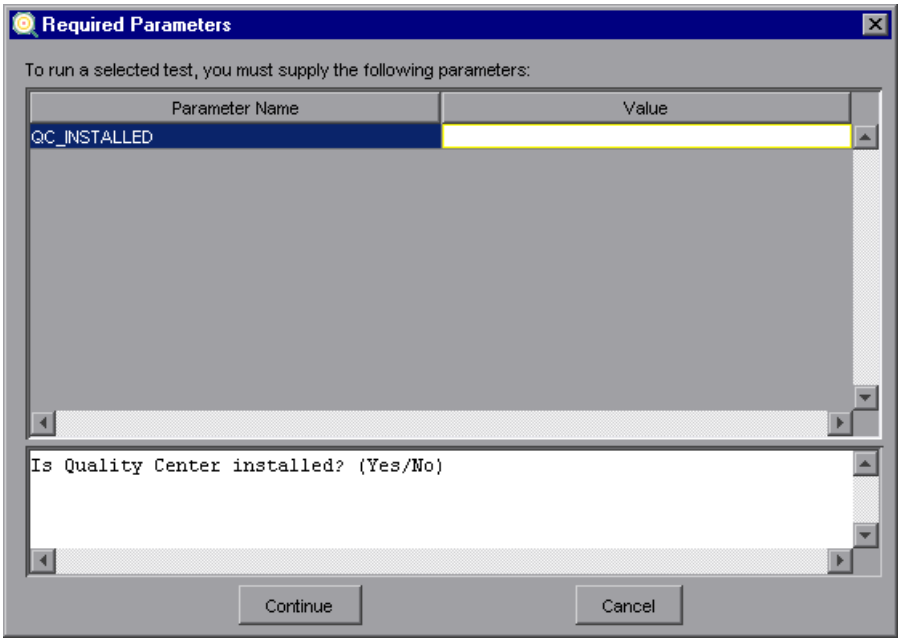


You can expand and collapse all branches in the components tree. To expand all branches, right-click any branch and choose **Expand All**. To collapse all branches, right-click any branch and choose **Collapse All**.

2 To verify the status of the server components, you can:

- Select a branch and click the **Run Selected** button or choose **Run** > **Run Selected**.
- Click the **Run All** button or choose **Run** > **Run All** to verify all components.

3 If a parameter value is required to run a component, the Required Parameters dialog box opens.



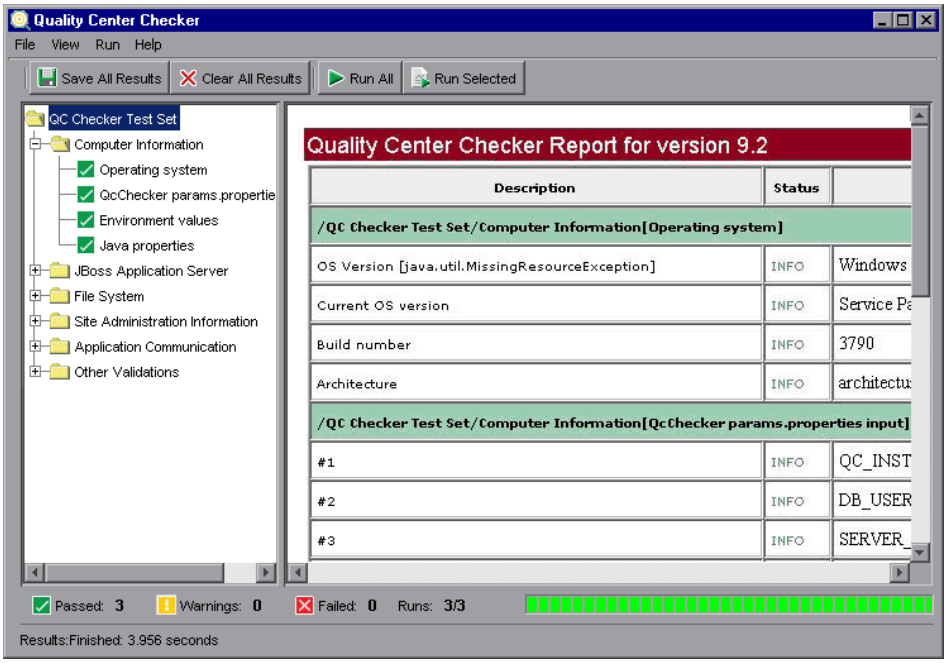
Click the **Value** box of the required parameter and type the value. Click **Continue**. The verification process continues.

Note that to view whether parameters are required before you start verifying a component, select the branch and choose **Run** > **Required Parameter**. If parameters are required the Required Parameters dialog box opens.

Tip: To avoid entering parameters each time you run the Quality Center Checker, you can type the information in the **params.properties** file in the **<Quality Center home directory>\qcchecker\tests** directory. To do so, open the **params.properties** file in a text editor, uncomment the parameter, and type the required parameter information.

---

4 In the right pane of the Quality Center Checker window, you can view a report of the verified components.



The report displays description, status, and information on each branch that was verified. To view additional report information, choose **View** > **Show Properties**.

The status bar indicates the status of the verified components. Passed components are displayed in green with a check mark. Failed components are displayed in red with an X. Components that may lead to problems and require the attention of the Quality Center site administrator are displayed in yellow with an exclamation point.

5 To clear all results, click the **Clear All Results** button or choose **File** > **Clear All Results**.

6 To save all results, click the **Save All Results** button or choose **File** > **Save All Results**.

7 To close the Quality Center Checker, choose **File** > **Exit**.

B

Guidelines for Upgrading and Migrating to Quality Center

This appendix provides guidelines for upgrading and migrating from a previous TestDirector or Quality Center version to the latest Quality Center version. It covers considerations and recommendations involved in the upgrading process from planning, testing, and upgrading, to final verification.

This appendix describes:	On page:
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Upgrade Assessment	341
Upgrade Scope and Strategy	342
Upgrade Checklist	343
Setting Up the Testing Environment	349
Validating the Results	350
Using the E-mail Notification Utility	351
The Upgrade Process	352
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Migrating Projects from Oracle 8.1.7 (and earlier) to Oracle 10	362
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About Upgrading and Migrating to Quality Center

The upgrade process introduces new advanced technology, new features and functionalities, and performance improvements such as scalability and stability. It affects the entire application implementation, including the database structure, the user interface, administration tools, and integrations with other HP products and third-party applications.

Before performing the upgrade from TestDirector to the latest version of Quality Center, consider the following guidelines:

- Check for known issues in Quality Center. For more information, see "Upgrade Assessment" on page 341.
- Define the upgrade scope and strategy, and assess the most efficient and effective way to install the upgrade. For more information, see "Upgrade Scope and Strategy" on page 342.
- Work out a detailed upgrade procedure.
  - Define which key areas will be affected during the upgrade process.
  - Consider upgrade criteria such as database version compatibility (see "Migrating Projects from Oracle 8.1.7 (and earlier) to Oracle 10" on page 362), hardware and software compatibility, and integrations with other HP products or third-party tools.
  - Complete the checklist for the current production environment. This checklist is used during the testing phase and the upgrading process. For more information, see "Upgrade Checklist" on page 343.
  - Set up a testing system to perform testing before the upgrade. For more information, see "Setting Up the Testing Environment" on page 349.
  - Validate the test results by comparing the functionality and performance in the latest version of Quality Center with those in the previous version of Quality Center or TestDirector. For more information, see "Validating the Results" on page 350.
  - Set up the e-mail utility so that you can notify TestDirector end users that they need to log out from certain projects during the upgrade process. For more information, see "Using the E-mail Notification Utility" on page 351.
  - Determine a timeline for the upgrade and schedule accordingly.

➤ Plan how to achieve minimum downtime during the upgrade process.

Note: During the entire project upgrading process, the project is in **inactive** status.

For more information on the upgrade process and procedures, see "The Upgrade Process" on page 352.

➤ Back up your data and prepare a rollback procedure. For more information, see "Backing Up Quality Center and TestDirector Projects" on page 81 and "Restoring Quality Center and TestDirector Projects" on page 83.

➤ Assign roles and responsibilities for testing, performing, and verifying the upgrade. For more information on upgrade verification, see "Verifying the Upgrade Process" on page 357.

➤ When the upgrade to Quality Center has been verified, uninstall TestDirector or the previous version of Quality Center from the original production server. For information on how to uninstall TestDirector, see "Uninstalling TestDirector 7.6 and 8.0" on page 362.

Upgrade Assessment

Before performing an upgrade, carefully review the Quality Center readme and validate system requirements for hardware and software. In addition, check the Mercury Customer Support site for known limitations that have been reported since the release. Look for any limitations that affect your specific hardware, software, or third-party integrations.

In general, the following issues will cause the upgrade to fail:

➤ Non-compliance with hardware requirements, such as display support and memory requirements

➤ Non-compliance with software requirements, such as database type and version, Web server type and version, application server type and version, and browser support

➤ Incompatibility issues (HP or third-party integrations)

➤ Non-compliance with customized projects, such as adding or modifying tables, columns, column types, stored procedures, or triggers to database

- Corrupted database, such as duplicated primary key or corrupted index
- Network connection failure for database or file system
- Insufficient user privileges in the database and operating system

After assessing the upgrade, contact Mercury Customer Support (http://support.mercury.com) for assistance in resolving any of the above issues.

Upgrade Scope and Strategy

Determine which components you want to upgrade, including database server, hardware, and software. The process involves project migration that can be performed by either a mass migration or a gradual migration. Verify the migration in your testing environment before performing the actual upgrade.

Type of Migration	Points to Consider
Mass	➤ During a mass migration, the production environment, including TestDirector and Quality Center servers, will not be available to the end users. ➤ Based on the testing results, you can estimate system downtime and decide whether this strategy is suitable in your environment. ➤ A mass migration can be an appropriate strategy if you do not have many projects to migrate and system downtime is permissible.
Gradual	➤ During a gradual migration, users are not able to access the migrated group of projects during the upgrade. ➤ Once the migration of a group of projects is complete, these projects will be accessible to all end users in the Quality Center production environment. ➤ This strategy provides flexibility in managing the upgrade process by dividing the migration into smaller pieces and minimizing downtime during which end users cannot access their projects.

Upgrade Checklist

Complete the checklist for the current production environment. You use this information checklist when setting up a testing environment and during the upgrade process.

TestDirector Checklist

Use the TestDirector checklist when setting a testing environment and during the upgrade process.

Check Item	Where to get information	Description of item
Operating System version (build# and service pack#)	Click **Start** > **Run**, and type winver.	➤ Windows NT 4.0 Server ➤ Windows 2000 Server ➤ Windows 2000 Advanced Server ➤ Windows 2003 Server ➤ Build# ➤ SP#
IIS version	On the server, open a browser and type **http://localhost**.	➤ IIS 4.0 ➤ IIS 5.0
Proxy Setting	1 On the TestDirector machine, open a Web browser, and choose **Tools** > **Internet Options**. 2 Click the **Connections** tab, and click **LAN Settings**. If **Use automatic configuration script** or **Use a proxy server for your LAN** are selected, make a note of the proxy setting.	➤ Use automatic configuration script ➤ Use proxy server ➤ Proxy server or automated configuration script are not used
SSL	If you use HTTPS as part of the URL to connect to TD, you are using SSL.	➤ Use SSL ➤ Do not use SSL

Check Item	Where to get information	Description of item
User Account set when TestDirector was installed	Check with person who installed TestDirector	
DCOM configuration user account	1 Type dcomcnfg in the run command. 2 In the **Application** Tab, select **Mercury TD2000 server** or **Mercury OTASERVER**. 3 Click **Properties** and select the **Identity** tab. 4 Select **This user** account.	
Database version **(For Oracle)**	**Oracle Server:** From the Oracle client program group, open **SQL Plus Utility** and connect to the Oracle server. Once connected, it displays the version of your Oracle server. **Oracle Client:** 1 Choose **Start** >**Programs** > **Oracle for Windows NT** (or its equivalent) > **Oracle Client Release Notes**. 2 The release number is displayed under the **Oracle Client X** heading (where **X** is the first number of your version).	Oracle: ➤ Oracle Server ➤ Oracle Client

Check Item	Where to get information	Description of item
Database version **(For Microsoft SQL)**	**Microsoft SQL Server:** 1 In your Microsoft SQL Server client program group, open **Query Analyzer** (for Microsoft SQL Server 7.0 and 2000), or **isql_w** (for 6.5). 2 Run the SQL **select @@version** to get the version of your Microsoft SQL Server. **Microsoft SQL Client:** 1 Open **Query Analyzer** (for Microsoft SQL Server 7.0 and 2000) or **isql_w** (for 6.5) 2 Choose **Help** > **About** to get the version of SQL Server client.	Microsoft SQL: ➤ SQL Server ➤ SQL Client
Database version **(For Sybase)**	**Sybase Server:** 1 In your Sybase client program group, open **SQL Advantage**. 2 Run the SQL **select @@version** to get the version of your Sybase client. **Sybase Client:** 1 Open **SQL Advantage**. 2 Choose **Help About** > **SQL Advantage** to get the version of Sybase client.	Sybase: ➤ Sybase Server ➤ Sybase Client
Database version **(For Microsoft Access)**	The version is Microsoft Access 2000.	

Check Item	Where to get information	Description of item
TestDirector Server Alias Connection Information	1 In Site Administration, click **DB server** tab, and check the server alias name and connection string. 2 From the database client side: ➤ For Oracle: In <**Oracle client installation file system**>, open **tnsnames.ora** and get the server alias information. ➤ For Microsoft SQL: Open the **Client Network Utility**, and click the **Alias** tab to get the server alias information. ➤ For Sybase: Open **DSEDIT** utility to get the server alias information.	➤ Oracle ➤ MSSQL ➤ Sybase
TestDirector Domain Repository	1 In the **Projects** tab of Site Administration, select the domain, and look in the **Physical Directory** box. 2 On the TestDirector server, open **C:\WINNT\mercury.ini** and get the TDREPDIR.	Domain Repository

Quality Center Checklist

Use the Quality Center checklist when setting a testing environment and during the upgrade process.

Check Item	Where to get information	Item Description
Operating System (type and version)	➤ For Windows, select **Start > Run**, and type winver ➤ For Unix, type uname -a	➤ Windows 2000 Server ➤ SP# ➤ Windows 2003 Server ➤ SP# ➤ Redhat Enterprise Linux AS/ES version 4 ➤ Solaris 9 OE or 10
Java Virtual Machine	java -version	JVM 1.4.2 or above
Web Server	Check with your system administrator	➤ IIS 5.0 or 6.0 ➤ Apache 2.0.x ➤ JBoss 4.0.x ➤ WebLogic 8.1.x
Application Server	Check with your system administrator	➤ Jboss 4.0.x ➤ WebLogic 8.1.x ➤ WebSphere 5.1.1.x, 6.0.1, 6.1
Proxy Setting	1 Open a Web browser, and choose **Tools > Internet Options**. 2 Click the **Connections** tab, and click **LAN settings**. If **Use automatic configuration script** or **Use a proxy server for your LAN** are selected, make a note of the proxy setting.	➤ Use automatic configuration script ➤ Use proxy server ➤ Proxy server or automated configuration script are not used
SSL	If you use HTTPS as part of the URL to connect to Quality Center, you are using SSL	➤ Use SSL ➤ Do not use SSL

Check Item	Where to get information	Item Description
User Account set when Quality Center was installed	Check with the person who installed Quality Center	
Database version	**For Oracle:** In the Oracle client program group, open **SQL Plus Utility** and connect to the Oracle server. Once you are connected, it displays the version of your Oracle server. **For Microsoft SQL:** 1 In your Microsoft SQL Server client program group, open **Query Analyzer**. 2 Run the SQL **select @@version** to get the version of your Microsoft SQL Server.	
Quality Center Database Server Alias Connection Information	In Site Administration, click **DB server** tab, and check the server alias name and connection string.	➤ Oracle ➤ MSSQL
Quality Center Domain Repository	1 In the **Site Projects** tab of Site Administration, select the domain, and look in the **Physical Directory** box. 2 In the **Site Configuration** tab of Site Administration, look at the BASE_REPOSITORY_PATH parameter value.	Domain Repository

Setting Up the Testing Environment

The upgrade process impacts functionality, performance, and compatibility with other HP products and third-party integrations. Before installing Quality Center on your production environment, test Quality Center in a testing environment that reflects your specific configuration.

The testing environment is separate from, and precisely reflects, the production environment. It simulates the configurations and applications installed on the production system, including the database server, hardware/software, and production projects. By testing the upgrade in your testing environment, you can get a better picture of the results you will achieve, while identifying and preventing any potential negative impact to your production environment.

To set up the testing environment when migrating projects from TestDirector to Quality Center:

1 Build a TestDirector testing server that simulates the existing TestDirector production server:

- **a** Install the operating system on the machine.
- **b** Install the database client.
- **c** Install TestDirector.
- **d** Make copies of the production projects and restore them to the testing machine.
- **e** Verify the database connection.

2 Build a Quality Center testing server that simulates the Quality Center production server.

- **a** Install the operating system on the machine.
- **b** Install the application server and the Web server.
- **c** Install Quality Center.
- **d** Verify the database connection.

3 In Quality Center Site Administration, create a database server alias pointing to a database server. The server alias must have the same name and point to the same database server as the database alias that exists on the TestDirector testing server.

For example, TDORASERVER

➤ If you want to link the domain repository during the migration process, create a mapped drive on the Quality Center testing server so that it can access the domain repository.

➤ If you are using a database version in TestDirector that is not supported in Quality Center (such as Oracle 8.1.7), see "Verifying the Upgrade Process" on page 357.

To set up the testing environment when upgrading projects from previous versions of Quality Center:

Build a Quality Center testing server that simulates the new Quality Center production server.

a Install the operating system on the machine.

b Install the application server and the Web server.

c Install Quality Center 9.2.

d Import project data.

e Upgrade the projects.

Validating the Results

Validate test results by comparing the functionality and performance in the latest version of Quality Center with those in the current version. If you are using HP integration or a third-party tool with Quality Center, validate backward compatibility of these integrations as well. For example, if you use TDAPI functions in an HP WinRunner script, you must run the script after the upgrade to verify whether the new TDAPI components installed during upgrade procedure are compatible with the HP WinRunner application.

Using the E-mail Notification Utility

The e-mail notification utility allows administrators to send notification e-mails (subject only) to TestDirector users, using Open Test Architecture. This program is useful for sending messages to users connected to TestDirector informing them to log out from TestDirector.

The e-mail notification utility does the following:

- It uses the **SAClient.dll** to verify the Site Administration password for security. To use it, unzip the file, copy it in the client machine and register it using **regsvr32**.
- It allows selection of any or all domains and any or all projects.
- It uses one TestDirector user account (such as Guest) to log in to all projects.
- It creates a log file with a list of e-mail addresses.

The utility is available on the Customer Support Web site (http://support.mercury.com). Go to **Downloads** > **Browse**, select the product **TestDirector**, and click the **Retrieve** button. Click the **Sending notification e-mails to TD 7.6 users** link to download the file.

For more information on downloading the e-mail notification utility, refer to the Mercury Support Knowledge Base (http://support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp), select **TestDirector for Quality Center**, and search for Article Number 30099.

The Upgrade Process

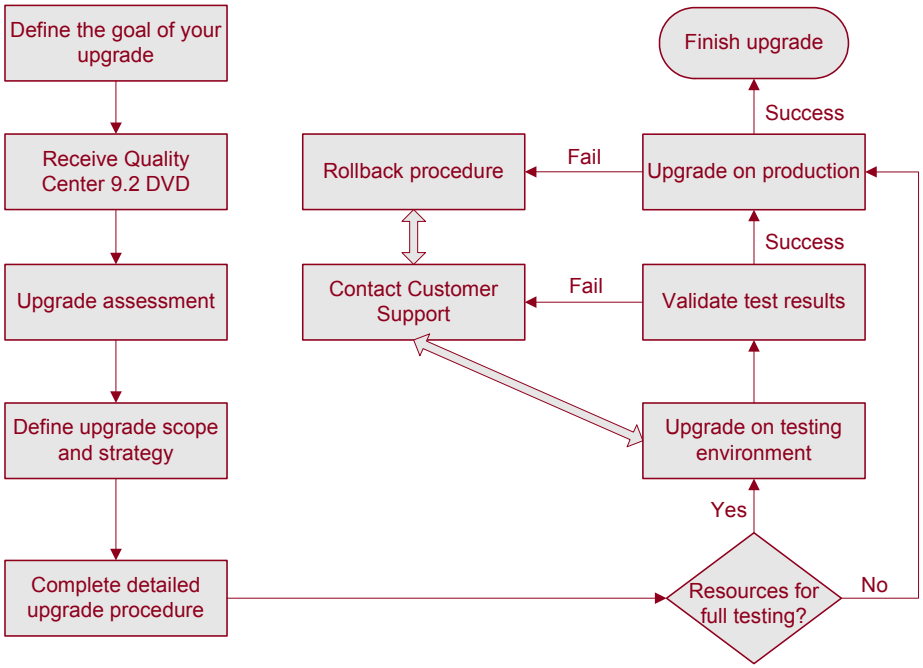
To upgrade from TestDirector 7.6 or 8.0 to the latest version of Quality Center, you must migrate the projects. Projects are migrated to Quality Center using the Migration Tool.

The Quality Center Migration Tool performs the following upgrade steps:

- Deactivates the project from the TestDirector server and upgrades it to TestDirector 8.0 Service Pack 2.
- Migrates the project information to the Quality Center Site Administration database.
- Adds users that exist in the migrated project to Quality Center Site Users (in case they don't exist).
- Upgrades the project to the latest version of Quality Center.
- Removes reference to the project from the TestDirector server.

The Upgrade Flowchart

The upgrade procedure is illustrated in the following flowchart:



Upgrade Recommendations

Before you start the upgrade process, make sure that you consider the following issues:

- Choose supported hardware/software environments for Quality Center. For more information, refer to the Mercury Support Knowledge Base (http://support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp), select **TestDirector for Quality Center**, and search for Article Number 44879. You can also refer to the *HP Quality Center Installation Guide*.
- For maximum convenience in maintaining and managing your test management data, ensure that the domain repository is located on the local Quality Center server machine. However, if a remote repository has to be used under certain circumstances, on the **File System** > **Security** > **Property** setting of the remote repository, add the Quality Center application server service user account with **Read/Write/Execute/Delete** network access permissions to the remote repository.
- To troubleshoot project migration problems, check the Quality Center log files. The path to the log files is determined by the path set in Site Administration in the **Servers** tab.
- Use the e-mail utility described in "Using the E-mail Notification Utility" on page 351 to notify TestDirector end users that they need to log out from certain projects during the upgrade process.

Upgrade Procedures

When you upgrade from TestDirector to Quality Center, you can perform a mass migration or a gradual migration. For more information, see "Upgrade Scope and Strategy" on page 342.

In the upgrade procedures, the following abbreviations are used for the different servers:

- **TD server.** The current TestDirector production server.
- **DB server.** The database server used to store the current versions of TestDirector projects.
- **QC server.** The Quality Center production server.

Notes:

- During the upgrade procedure, the TD server and the QC server share the same project database information on the same DB server, so you cannot change the DB server machine or upgrade the DB server version. If you want to upgrade the DB server version or change to a different DB server machine, do so either before or after the upgrade to Quality Center.
- Quality Center supports Oracle and MSSQL databases. If you have Access or Sybase projects in TestDirector, you must convert them to either Oracle or MSSQL projects prior to the upgrade.

To perform a mass migration:

1. Notify all users to log out from TestDirector projects, and then deactivate all projects. For TestDirector 7.6 and 8.0, you can stop the TestDirector application.
2. Make a full backup of all TestDirector projects on the DB server and the TD server. TestDirector stores data in both the database server backend and the domain repository on the file system. Back up both to ensure a full backup of TestDirector projects.

   For information on backing up data on the database server and file system, see "Backing Up Quality Center and TestDirector Projects" on page 81.
3. Make an image of the TestDirector server machine. The TD server can be used for a rollback system. Do not uninstall TestDirector until you verify the migration process on the QC server.
4. On the TD server, install **MercuryQualityCenter_MigrationTool.exe** from the Quality Center installation DVD. This must be installed with the same user that runs TestDirector.
5. Install Quality Center on the QC server.

   For information on installing Quality Center, refer to the *HP Quality Center Installation Guide*.

6 Verify the new QC server installation.

Verify the database connection to the DB server by pinging the database server. If you want to link the domain repository from the QC server during the migration, you must allow access from the QC server. For more information on checking the connection to the database server, see "Defining New Database Servers" on page 115.

7 Run the Quality Center Migration Tool and migrate all TestDirector projects to the QC server. If the migration procedure fails, use the backup database file and project files to restore the project on the TD server and DB server, and then migrate it to the QC server.

For information on using the Migration Tool, see "Migrating TestDirector Projects to Quality Center" on page 70. For information on restoring data on the DB server, see "Restoring Quality Center and TestDirector Projects" on page 83.

8 Activate all projects on the QC server to verify the migration.

To perform a gradual migration:

1 Determine which TestDirector projects you want to migrate at this time, and make a full backup of them on the DB server and TD server. Deactivate these projects on the TD server.

For information on backing up data on the database server and file system, see "Backing Up Quality Center and TestDirector Projects" on page 81.

2 On the TD server, install **MercuryQualityCenter_MigrationTool.exe** from the Quality Center installation DVD.

3 Install Quality Center on the QC server.

For information on installing Quality Center, refer to the *HP Quality Center Installation Guide*.

4 Verify the new QC server installation.

Verify the database connection to the DB server by pinging the database server. If you want to link the domain repository from the QC server during the migration, you must allow access from the QC server. For more information on checking the connection to the database server, see "Defining New Database Servers" on page 115.

5 Run the Quality Center Migration Tool and select only those TestDirector projects that you want to migrate to Quality Center at this time. If the migration procedure fails, use the backup database file and project files to restore the project on the TD server and DB server, and then migrate it to the QC server.

For information on using the Migration Tool, see "Migrating TestDirector Projects to Quality Center" on page 70. For information on restoring data on the DB server, see "Restoring Quality Center and TestDirector Projects" on page 83.

6 Activate all projects on the QC server to verify the migration.

Verifying the Upgrade Process

After you perform the upgrade, check the following:

- Verify that you can connect to the projects in Site Administration.
- Ask users to check that they can log in to all Quality Center projects using their accounts.
- Ask users to perform their routine operations and report feedback such as response time or the occurrence of any error.
- Ask users to check new features and functionalities within Quality Center and report feedback.
- Perform a load test on the testing environment to verify that it can handle the intended number of users.
- If you are using an HP integration or a third-party tool with Quality Center, validate backward compatibility of the integration and report feedback.

For an example of a checklist for verifying the Quality Center upgrade, see "Quality Center Upgrade Verification Checklist" on page 358. Gather all the feedback and contact Mercury Customer Support if necessary to solve any issues. When the upgrade to Quality Center has been verified, uninstall TestDirector from the original production server. For information on how to uninstall TestDirector, see "Uninstalling TestDirector 7.6 and 8.0" on page 362.

Quality Center Upgrade Verification Checklist

Use this Quality Center checklist to verify the upgrade process after you have performed the upgrade.

Topic	Checks
Logon	➤ Different users ➤ Different projects ➤ Logout
Customize	➤ Projects Users ➤ Groups ➤ Project Entities ➤ Project Lists
Requirements	➤ All data exists (sample few requirements) ➤ All requirements exist ➤ All test coverage exists ➤ Correct requirement details ➤ All attachments exist ➤ Add requirements ➤ Delete requirements

Topic	Checks
Test Plan	➤ All data exists (sample few test) ➤➤ All folders and tests exist ➤➤ Correct test details ➤➤ Correct design steps ➤➤ Correct test script ➤➤ Test attachments exist ➤➤ Correct requirements coverage ➤ Add folder ➤ Move folder ➤ Delete folder ➤ Add new test ➤➤ Manual ➤➤ Script ➤ Delete test ➤ Filter ➤➤ Set ➤➤ Clear ➤➤ Refresh ➤ Launch test ➤➤ QuickTest Professional ➤➤ WinRunner ➤➤ Associate test to defect

Topic	Checks
Test Lab	➤ All data exists ➤➤ All test sets exist ➤➤ All tests in the test sets exist (sample a few test sets) ➤➤ All test run reports exist (sample a few tests) ➤➤ All run steps exist (sample a few runs) ➤➤ Check the Execution Flow (sample a few test sets) ➤➤ Check the Test Set Properties (sample a few test sets) ➤ Add folder ➤ Move folder ➤ Delete folder ➤ Add new test set ➤ Move test set ➤ Delete test set ➤ Copy test set ➤ Filter ➤➤ Set ➤➤ Clear ➤➤ Refresh ➤ Run manual test ➤ Run automated script ➤➤ WinRunner and QuickTest Professional ➤➤ Run locally ➤➤ Run remotely ➤➤ Run test set ➤ Launch test report ➤ Attach file to test set ➤ Attach file to folder

Topic	Checks
Defects	➤ All data exists (sample a few defects) ➤➤ All defects exist ➤➤ Correct defect details ➤➤ Correct defect attachment ➤➤ Correct defect history ➤ Insert new defect ➤ Delete a defect ➤ Update an existing defect ➤ Add attachment to defect ➤ Select columns and arrange columns ➤ Mail defect ➤ Defect workflow ➤➤ Multiple value lists ➤➤ All values exist in all multiple value list fields ➤➤ Fields dependencies ➤➤ Template ➤➤ Delete ➤➤ Save ➤➤ Save as default ➤ Favorites ➤➤ Verify that all favorite filters exist ➤➤ Select ➤➤ Add ➤➤ Organized ➤ Filter ➤➤ Set ➤➤ Clear ➤➤ Refresh ➤ Create Report ➤ Create Graph ➤ Use Copy/Paste ➤➤ Copy Defects

Migrating Projects from Oracle 8.1.7 (and earlier) to Oracle 10

If you are migrating a TestDirector project on an Oracle 8.1.7 and earlier database version (not supported in Quality Center) to a version that is not supported in TestDirector (for example Oracle 10), you must first upgrade the database server to a middle version. Oracle 9.2 is a middle version that is supported by both TestDirector and Quality Center versions.

To migrate projects from Oracle 8.1.7 (and earlier) to Oracle 10:

1. In the TestDirector environment, upgrade the database server to Oracle 9.2.
2. Migrate the projects from TestDirector to Quality Center.
3. Upgrade the database server to Oracle 10.

Uninstalling TestDirector 7.6 and 8.0

When the upgrade to Quality Center has been verified, uninstall TestDirector from the original production server. To uninstall TestDirector, refer to the *TestDirector Installation Guide*.

Note: To ensure a clean uninstall of TestDirector 7.6 and 8.0, also delete the registries that pertain to TestDirector:

- HKEY_CURRENT_USER\Software\Mercury Interactive\TestDirector
- HKEY_LOCAL_MACHINE\SOFTWARE\Mercury Interactive\TestDirector
- HKEY_LOCAL_MACHINE\SOFTWARE\Mercury Interactive\Mercury Tours

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C

Storing Project Data in the Project's Database

Quality Center enables you to store project data in the project's database when creating or upgrading a project. If a project's repository is stored in the database, you can also export and import Quality Center projects.

Note: For projects that have large project repositories (over 500 MB) or when working in a production environment, it is recommended that you use the file system for managing your Quality Center projects. As projects grow in size, you may also experience degradation in performance when storing the project repository in the database.

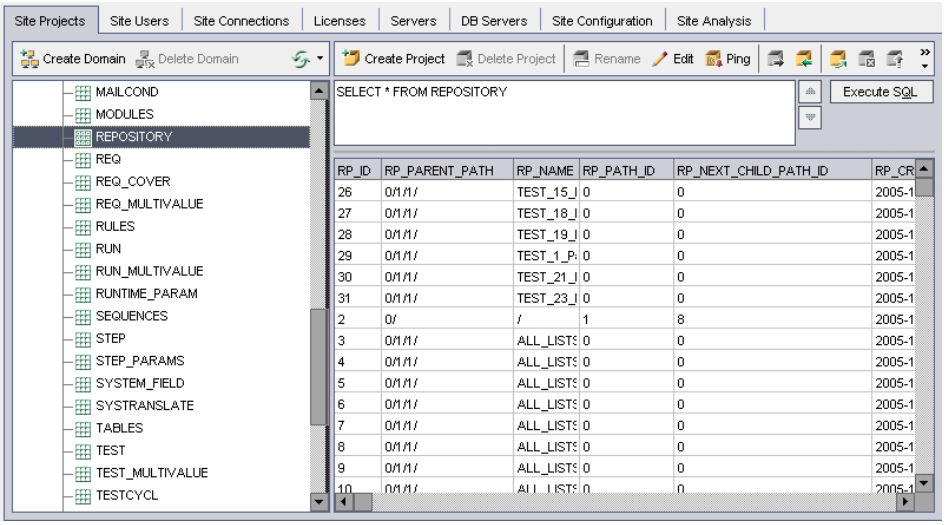
This appendix describes:	On page:
About Storing Project Data in the Project's Database	364
Exporting a Project	367
Importing a Project	368

About Storing Project Data in the Project's Database

When you create a new project, you can store the project data in the **REPOSITORY** table in the project's database. Storage in this table is an alternative to storage on the application server's file system. Note that you can store data in the project's database only if the **SHOW_REPOSITORY_OVER_DB** parameter is enabled in the **Site Configuration** tab. For more information, see "Configuring Parameter Settings to Store Project Data in the Project's Database" on page 366.

By storing project data in the project's database, you can consolidate your data-handling procedure. For example, when you back up or restore a project. You can also perform hot backups on your database. In addition, security and manageability issues caused by storing data in the file system are eliminated. For example, you no longer have to share files.

To query specific data that is stored in the REPOSITORY table, double-click a project in the **Site Projects** tab. Select the **REPOSITORY** table. For more information on querying, see "Querying Project Tables" on page 51. For more information on the REPOSITORY table, refer to the *HP Quality Center Software Database Reference*.



When the **SHOW_REPOSITORY_OVER_DB** parameter exists and is set to "Y", you can do the following:

- Store project data in the project's database when creating a new project.
- Export Quality Center projects. For more information, see "Exporting a Project" on page 367.
- Create a new project by importing data from an exported Quality Center project file. For more information, see "Importing a Project" on page 368.
- Upgrade projects containing project repositories in the file system, and move the project's repository to the database. For more information, see "Upgrading Quality Center Projects" on page 63.

Notes:

- The **dbid.xml** file is stored in the project directory in the file system even if the project data is stored in the database.
- As an alternative to storing project data on the project's database, you can store the project data on the application server's file system. For more information, see "Understanding the Quality Center Project Structure" on page 27.

Configuring Parameter Settings to Store Project Data in the Project's Database

To use the repository over database option to store project data in the project's database, you must add the **SHOW_REPOSITORY_OVER_DB** parameter in the **Site Configuration** tab, and set its value to "Y". When this parameter is enabled, you can enable additional database storage options by adding the following parameters:

Parameter	Setting
CREATE_DB_REPOSITORY_ VISIBILITY	Set to "Y" to display the **Store project's repository in the database** check box in the Create Project dialog box. For more information, see "CREATE_DB_ REPOSITORY_VISIBILITY" on page 132.
SELECT_FS_OVER_DB	Set to "Y" to set **Store project's repository in the database** check box as the default selection in the Create Project dialog box. For more information, see "SELECT_FS_OVER_DB" on page 138.

Exporting a Project

Exporting Quality Center projects enables you to take project data from a Quality Center server, and back it up to another location or on some other media device. For example, you may want to create self-contained project image files that are backed up on a USB key or DVD. You can send the media device to a Quality Center server in another location, and import the project files. When you export a project file, it is saved and exported in ZIP format.

Notes:

- You cannot import Quality Center project export files (**.qcp** files) to Quality Center 9.2 if they were created in an earlier version of Quality Center.
- The export Quality Center project data feature is available only if the **SHOW_REPOSITORY_OVER_DB** parameter exists and is set to "Y" in the **Site Configuration** tab. For more information, see "SHOW_REPOSITORY_OVER_DB" on page 138.
- You can export a Quality Center project only if its project repository is stored in the database. To export a project repository stored in the file system, you must upgrade it and move its repository to the database.
- If you export a Quality Center project that has extensions installed, all data from the project is exported, including data for the extensions. You can only import such an exported project to a server that has the relevant extensions installed.

To export a Quality Center Project:

1 In Site Administration, click the **Site Projects** tab.

2 In the Projects list, select a project, and click the **Export Project to QC Project File** button. Alternatively, right-click the project and choose **Export Project**. If the project is active, you are prompted to deactivate it. For more information, see "Deactivating and Activating Projects" on page 53.

3 The Save As dialog box opens. Select the directory where you want to save the project data. Enter a name for the project in the **File name** box. By default, the data is saved as a Quality Center Project Export file (**.qcp**).

4 Click **Save** to save the project data as a Quality Center Project Export file.

Importing a Project

You can import data from exported Quality Center project files or from customized projects created by content providers. For example, you can import customized tests, requirements, and test sets for SAP testing, Siebel testing, and SOX compliance testing created by HP content providers.

Notes:

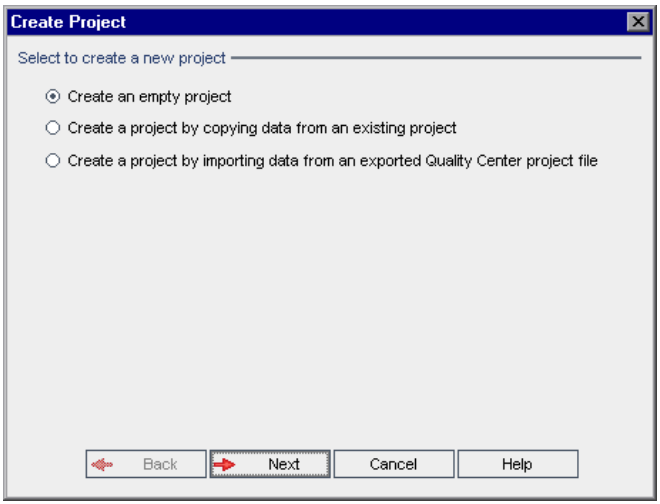
- The import Quality Center project data feature is available only if the **SHOW_REPOSITORY_OVER_DB** parameter exists and is set to "Y" in the **Site Configuration** tab. For more information, see "SHOW_REPOSITORY_OVER_DB" on page 138.
- You cannot import Quality Center project export files (**.qcp** files) to Quality Center 9.2 if they were created in an earlier version of Quality Center.

To import a Quality Center Project:

1 In Site Administration, click the **Site Projects** tab.

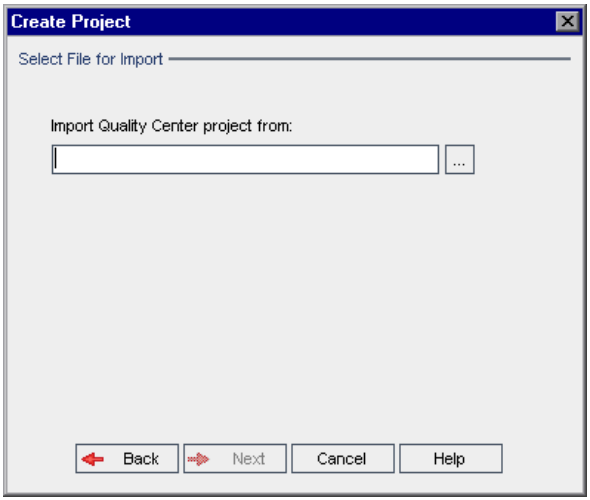
2 You can do one of the following:

- Select the domain to which you want to import a project, and click the **Import Project from QC Project File** button. Alternatively, right-click the domain and choose **Import Project**.
- Click the **Create Project** button. The Create Project dialog box opens.



Choose the **Create a project by importing data from an exported Quality Center project file** option, and click **Next**.

3 The Create Project: Select File for Import dialog box opens.

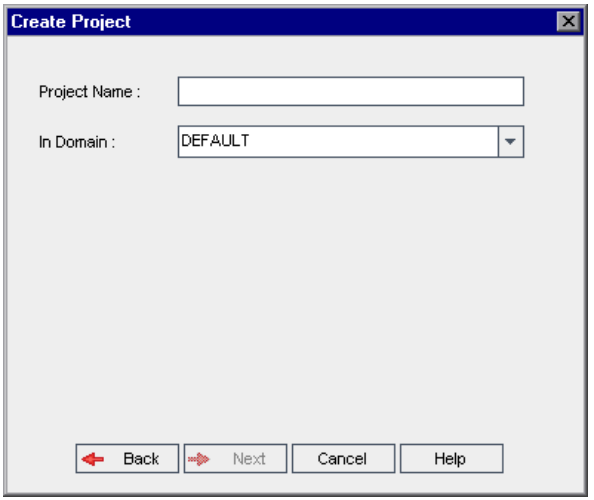


4 Click the browse button to the right of the **Import Quality Center project from** box to locate the project that you want to import. The Open dialog box opens.

5 Locate the directory.

6 Select the Quality Center Project Export file that you want to import, and click **Open**. The selected file is displayed in the **Import Quality Center project from** box.

7 Click **Next**. The following dialog box opens.



8 In the **Project Name** box, type a name for your Quality Center project.

9 In the **In Domain** box, select a domain.

Tip: After the project has been created, you can move it to a different domain in the Projects list using a drag-and-drop operation.

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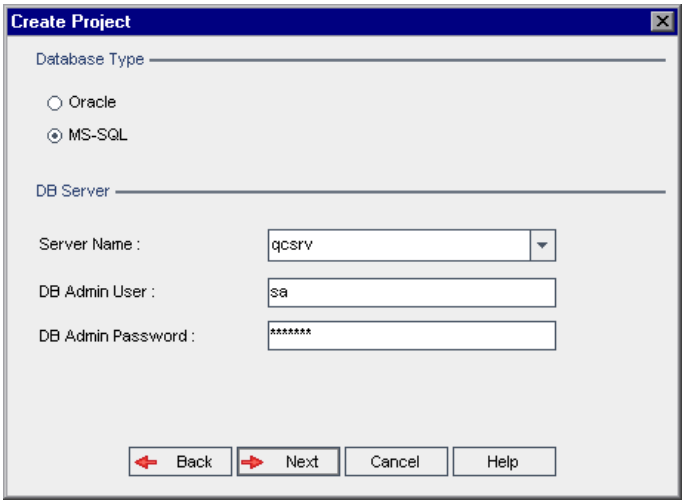
10 Click **Next**. The following dialog box opens.



11 Under **Database Type**, select **Oracle** or **MS-SQL**. If you are working in MSDE, select **MS-SQL**.

12 By default, values defined during the Quality Center installation are displayed for **Server Name**, **DB Admin User**, and **DB Admin Password**. If additional database servers are defined, you can select another name from the **Server Name** list.

Note: For more information on defining database servers, see "Defining New Database Servers" on page 115.

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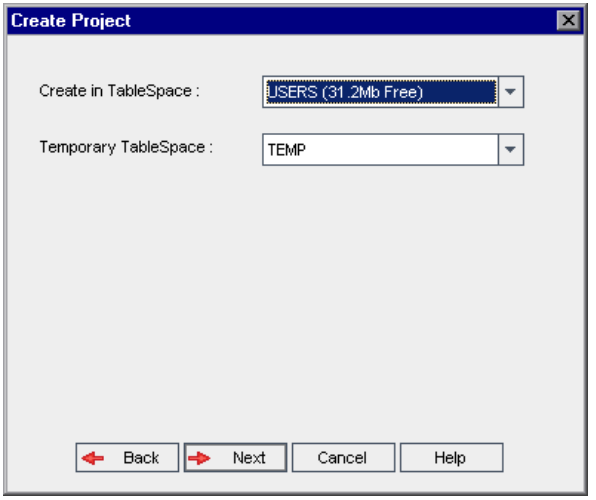
13 Click **Next**.

If your selected database server does not have the text search feature enabled, a message box opens. It indicates that after this process completes, you can enable the text search feature. For more information on enabling the text search feature, see "Configuring Text Search" on page 120.

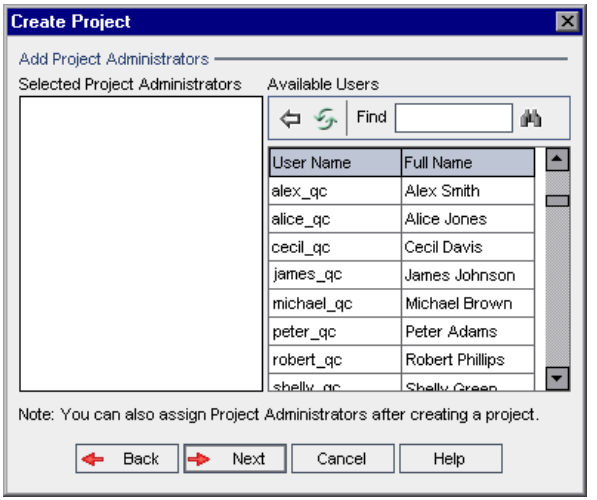
14 If you are creating a Microsoft SQL project, proceed to step 15. For an Oracle project, the following dialog box opens.



In the **Create in TableSpace** box, select a storage location from the list. You should not use **UNDO** as the storage location.

In the **Temporary TableSpace** box, select a temporary storage location for the new project.

15 Click **Next**. The Add Project Administrators dialog box opens.



Selected Project Administrators lists Quality Center users that are assigned as project administrators. **Available Users** lists Quality Center users available in the project. When you assign project administrators, they are moved from the Available Users list to the Selected Project Administrators list.

- **Refresh.** Click the **Refresh** button to refresh the list of available users.
- **Find.** Type the name of a user in the **Find** box, and click the **Find** button to search the Available Users list.

- **Add Selected Users.** Select the users you want to assign as project administrators, and click the **Add Selected Users** button. Alternatively, double-click a user. The selected users are displayed in the Selected Project Administrators list.
- **Delete.** To remove a user from the Selected Project Administrators list, right-click the user and click **Delete**.

Note: You can also assign project administrators after you have created the project. For more information, see "Assigning Project Administrators" on page 48.

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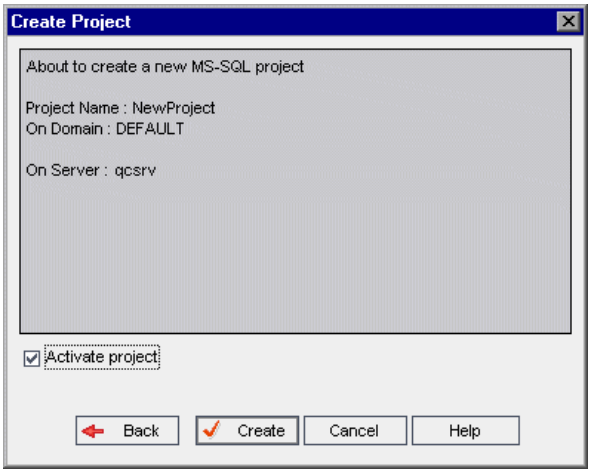
16 Click **Next**. The following dialog box opens.



Verify the project details. To change any of the details, click **Back**.

17 You can select **Activate Project** to instruct Quality Center to activate the new project. For more information, see "Deactivating and Activating Projects" on page 53.

18 Click **Create**. The new project is added to the Projects list.

After you successfully complete these steps, the data is imported to a new project, and the new project is added to the Projects list.

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