HP ALM Performance Center

Software Version: 11.00

User and Administrator Guide

Document Release Date: November 2010
Software Release Date: November 2010

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PART III: TIMESLOT RESERVATION

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Welcome to This Guide

Welcome to HP ALM Performance Center.

ALM Performance Center is HP's Web-enabled global performance testing tool, which is specially designed to simplify the testing process and increase test efficiency for multiple concurrent performance tests across multiple geographic locations.

This guide describes how to use ALM Performance Center. It provides descriptive and conceptual information, step-by-step guidance to help you work with the application, and explanations of reference-oriented material.

How This Guide is Organized

This guide contains the following parts:

Part	Description
Part I: Performance Testing Basics	Provides an overview of HP ALM Performance Center and performance testing methodology. **Relevant task:** "How to Conduct a Performance Test" on page 28
Part II: Performance Testing Assets	Describes how to define project settings and performance testing assets. **Relevant task:** "How to Manage Testing Assets" on page 34
Part III: Timeslot Reservation	Describes how to reserve resources for performance testing. **Relevant task:** "How to Reserve Performance Testing Timeslots" on page 112
Part IV: Performance Test Design	Describes how to design a performance test. **Relevant task:** "How to Design a Performance Test" on page 171
Part V: Performance Test Execution	Describes how to run a performance test. **Relevant task:** "How to Manage a Performance Test Run" on page 340
Part VI: Online Monitoring	Describes how to set monitors for monitoring performance test runs. **Relevant task:** "How to Set Up the Monitoring Environment – Workflow" on page 417
Part VII: Runtime Settings Configuration	Describes how to configure runtime settings in your Vuser scripts. **Relevant task:** "Script Runtime Settings" on page 511

Part	Description
Part VIII: My Performance Center	Describes how to create a personalized view of performance testing features. **Relevant task:** "How to Work with My Performance Center" on page 565
Part IX: Performance Center Administration	Describes how to perform Performance Center administration. **Relevant task:** "How to Work with Performance Center Administration" on page 622.

Documentation Library

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

- Click **Documentation Library** in the ALM 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 ALM 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*)*.

Reference	Description
Using this Documentation Library	Explains how to use the Documentation Library and how it is organized.
What's New?	Describes the newest features in the latest version of ALM. To access, select **Help** > **What's New**.
Product Feature Movies	Short movies that demonstrate the main product features. To access, select **Help** > **Product Feature Movies**.
Readme	Provides last-minute news and information about ALM.

Application Lifecycle Management Guides

Guide	Description
HP ALM User Guide	Explains how to use ALM to organize and execute all phases of the application life cycle management process. It describes how to specify releases, define requirements, plan tests, run tests, and track defects.
HP ALM Administrator Guide	Explains how to create and maintain projects using Site Administration, and how to customize projects using Project Customization.
HP ALM Tutorial	A self-paced guide teaching you how to use ALM to manage the application life cycle management process.

Guide	Description
HP ALM Installation Guide	Describes the installation and configuration processes for setting up ALM Platform.
HP Business Process Testing User Guide	Explains how to use Business Process Testing to create business process tests.

ALM Performance Center Guides

Guide	Description
HP ALM Performance Center Quick Start	A self-paced guide giving the Performance Center user a high level overview of creating and running performance tests.
HP ALM Performance Center Guide	Explains to the Performance Center user how to create, schedule, run, and monitor performance tests. Explains to the Performance Center administrator how to use Lab Management for overall lab resource management, lab settings management, and system configuration.
HP ALM Performance Center Installation Guide	Describes the installation processes for setting up Performance Center Servers, Performance Center Hosts and other Performance Center components.
HP ALM Performance Center Troubleshooting Guide	Provides information for troubleshooting problems while working with HP ALM Performance Center.
HP Performance Center of Excellence Best Practices	Provides best practices for successfully building and operating Performance Centers of Excellence.
HP Performance Monitoring Best Practices	Provides best practices for monitoring the performance of applications under test.

ALM Best Practices

Guide	Description
HP ALM Database Best Practices Guide	Provides best practices for deploying ALM on database servers.
HP ALM Upgrade Best Practices Guide	Provides methodologies for preparing and planning your ALM upgrade.
HP ALM Business Models Module Best Practices Guide	Provides best practices for working with the Business Models module.

ALM API References

Guide	Description
HP ALM Project Database Reference	Provides a complete online reference for the project database tables and fields.
HP ALM Open Test Architecture API Reference	Provides a complete online reference for the ALM COM-based API. You can use the ALM open test architecture to integrate your own configuration management, defect tracking, and home-grown testing tools with an ALM project.
HP ALM 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 ALM users, projects, domains, connections, and site configuration parameters.
HP ALM REST API Reference	Provides an online reference for the ALM REST-based API. You can use the REST API to access and work with ALM data.
HP ALM Custom Test Type Guide	Provides a complete online guide for creating your own testing tool and integrating it into the ALM environment.

Topic Types

The content in this guide is organized by topics. Three main topic types are in use: **Concepts**, **Tasks**, and **Reference**. The topic types are differentiated visually using icons.

Topic Type	Description	Usage
Concepts 	Background, descriptive, or conceptual information.	Learn general information about what a feature does.
Tasks 	**Instructional Tasks.** Step-by-step guidance to help you work with the application and accomplish your goals. Task steps can be with or without numbering: ➤ **Numbered steps.** Tasks that are performed by following each step in consecutive order. ➤ **Non-numbered steps.** A list of self-contained operations that you can perform in any order.	➤ Learn about the overall workflow of a task. ➤ Follow the steps listed in a numbered task to complete a task. ➤ Perform independent operations by completing steps in a non-numbered task.
	Use-case Scenario Tasks. Examples of how to perform a task for a specific situation.	Learn how a task could be performed in a realistic scenario.

Topic Type	Description	Usage
Reference 	**General Reference**. Detailed lists and explanations of reference-oriented material.	Look up a specific piece of reference information relevant to a particular context.
	User Interface Reference. Specialized reference topics that describe a particular user interface in detail. Selecting **Help on this page** from the Help menu in the product generally open the user interface topics.	Look up specific information about what to enter or how to use one or more specific user interface elements, such as a window, dialog box, or wizard.
Troubleshooting and Limitations 	**Troubleshooting and Limitations**. Specialized reference topics that describe commonly encountered problems and their solutions, and list limitations of a feature or product area.	Increase your awareness of important issues before working with a feature, or if you encounter usability problems in the software.

Additional Online Resources

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

Part	Description
Troubleshooting & Knowledge Base	Opens the Troubleshooting page on the HP Software Support Web site where you can search the Self-solve knowledge base. Choose **Help** > **Troubleshooting & Knowledge Base**. The URL for this Web site is http://h20230.www2.hp.com/troubleshooting.jsp.
HP Software Support	Opens the HP Software Support Web site. This site enables you to browse the Self-solve knowledge base. You can also post to and search user discussion forums, submit support requests, download patches and updated documentation, and more. Choose **Help** > **HP Software Support**. The URL for this Web site is www.hp.com/go/hpsoftwaresupport. Most of the support areas require that you register as an HP Passport user and sign in. Many also require a support contract. To find more information about access levels, go to: http://h20230.www2.hp.com/new_access_levels.jsp To register for an HP Passport user ID, go to: http://h20229.www2.hp.com/passport-registration.html
HP Software Web site	Opens 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. Choose **Help** > **HP Software Web site**. The URL for this Web site is www.hp.com/go/software.
Add-ins Page	Opens the HP Application Lifecycle Management Add-ins Page, which offers integration and synchronization solutions with HP and third-party tools.

Part I

Performance Testing Basics

1

HP ALM Performance Center Introduction

This chapter includes:

Concepts

Tasks

Concepts

HP ALM Performance Center Overview

HP ALM Performance Center is a global cross-enterprise performance testing tool which enables you to manage multiple, concurrent performance testing projects across different geographic locations without any need to travel between the locations. Performance Center administers all your internal performance testing needs. With Performance Center, you manage all aspects of large-scale performance testing projects, including resource allocation and scheduling, from a centralized location accessible through the Web. Performance Center helps streamline the testing process, reduce resource costs, and increase operating efficiency.

Performance Center generates load on your Web server or application using HP's virtual user (Vuser) technology. Each Vuser follows a series of steps (for example, hyperlink steps, submit form steps, and so on) that you define in a Vuser script. You design Vuser scripts to emulate typical user activity in your application.

Vusers run on dedicated host machines. Each host machine runs many Vusers. When run concurrently, the Vusers create the same load as tens of thousands of individual human users. While Vusers run, Performance Center collects server response time data.

Performance Center analysis tools, which you access both during and after the performance test, provide you with a clear and concise picture of your application's performance under load.

Performance Center helps you pinpoint performance bottlenecks. It also allows you to determine the number of users your system can scale up to (this number is the "breaking point" after which your application's performance starts to degrade). This information gives clues as to what can be done to increase your application's load capacity.

In addition, the information provided by Performance Center helps you analyze how the load on your system affects the service level agreements (SLAs) or other performance thresholds that are important to your business.

Performance Center had the following system advantages:

- Performance Center's step-by-step process helps guide you through the performance testing procedure.
- Performance Center enables remote testing by anybody, from anywhere, at any time, eliminating the need to travel.
- Performance Center enables multiple concurrent tests, replacing serial testing with parallel testing.
- Performance Center enables remote management from anywhere through a Web server.
- Performance Center is a complete system for managing performance tests, scripts, and resources. Furthermore, Performance Center centralizes the testing environment, with no duplication of testing labs, keeping costs down and minimizing time.
- Performance Center enables you to take advantage of the power of the Web for supporting services such as remote consulting, online support, and so on.

For details on how to conduct a performance test, see "How to Conduct a Performance Test" on page 28.

Tasks

How to Conduct a Performance Test

This task describes how to conduct a performance test on your application.

Note: To view a movie that demonstrates how to conduct a performance test, select **Help** > **Product Feature Movies** in the ALM main window. Under **HP ALM Performance Center 11.00 Movies**, select **Introduction**.

To learn more about performance testing, see "HP ALM Performance Center Overview" on page 26.

This task includes the following steps:

- "Create and add test assets" on page 29
- "Reserve a timeslot for performance testing" on page 29
- "Design a performance test" on page 29
- "Run, monitor, and view results of the performance test" on page 29

1 Create and add test assets

For details, see "How to Manage Testing Assets" on page 34.

2 Reserve a timeslot for performance testing

For details, see "How to Reserve Performance Testing Timeslots" on page 112.

3 Design a performance test

For details, see "How to Design a Performance Test" on page 171.

4 Run, monitor, and view results of the performance test

For details, see "How to Manage a Performance Test Run" on page 340

Part II

Performance Testing Assets

2

Testing Assets - Introduction

This chapter includes:

Tasks

Tasks

How to Manage Testing Assets

The following steps describe how to configure project settings and add testing assets.

Note: This task is part of a higher-level task. For details, see "How to Conduct a Performance Test" on page 28.

This task includes:

- "Configure project settings" on page 34
- "Upload VuGen Scripts" on page 34
- "Design topologies of your applications under test" on page 34
- "Create monitor profiles to monitor your tests" on page 35

Configure project settings

You can configure the monitors, runtime settings, timeout, general, and debug information options for all your Performance Center projects. For details, see "Project Settings > Controller Options Page" on page 659.

Upload VuGen Scripts

After you create Vuser scripts using HP Virtual User Generator, you must upload them to ALM. For details, see "How to Upload VuGen Scripts" on page 39.

Design topologies of your applications under test

You can design topologies of your applications under test using the Topologies feature. For details, see "How to Design Topologies" on page 47.

Create monitor profiles to monitor your tests

To monitor server resources, you must configure the monitor settings for a test. These monitor settings can then be saved as monitor profiles that can be used by any performance test in your project. For details on creating monitor profiles, see "How to Create and Configure Monitor Profiles" on page 75.

3

VuGen Script Management

This chapter includes:

Concepts

Tasks

Reference

Concepts

Vuser Scripts

When you run a performance test, virtual users (Vusers) access your application concurrently in order to put load on your server. The actual steps that the Vusers perform when accessing your application are represented in a Vuser script. Each Vuser performs the actions recorded in one Vuser script.

You design Vuser scripts to emulate typical end-user activities on your application. For example, if you are testing performance on a Web site, the Vuser script emulates a real user accessing URLs, clicking links, submitting forms, and so on. When you create a performance test, you distribute your Vuser scripts among your Vusers.

For example, in the case of testing a Web site, you can specify that a portion of the Vusers run a Vuser script that emulates real users accessing your home page, a portion run a script that performs a search query, and a portion emulate the completion of an order form.

You obtain Vuser scripts by recording them using HP's Virtual User Generator (VuGen) and uploading them to ALM.

In addition to testing Web sites, Performance Center can be used to test performance of non-Web environments. For example, you can test WAP, Real, or Oracle NCA applications. For details of supported protocols, see the *HP Virtual User Generator User Guide*.

For details on how to upload VuGen scripts to ALM, see "How to Upload VuGen Scripts" on page 39.

Tasks

How to Upload VuGen Scripts

This task describes how to upload VuGen scripts to ALM.

Note: This task is part of a higher-level task. For details, see "How to Manage Testing Assets" on page 34.

This task includes the following steps:

- "Prerequisite" on page 39
- "Upload the VuGen scripts to ALM" on page 39

1 Prerequisite

Create scripts in VuGen. For details, see the *HP Virtual User Generator User Guide*.

2 Upload the VuGen scripts to ALM

You can upload scripts in one of the following ways:

- **To upload scripts from the Test Plan module:**
  - Save the VuGen scripts locally. The scripts must be saved in ZIP format and must include all the files in the test scripts folder.
  -  On the Test Plan module toolbar, click the **Upload Scripts** button.
  - Select a destination folder, scripts to upload, and upload options.

  For user interface details, see "Upload VuGen Scripts Dialog Box" on page 42.

➤ **Upload the scripts from VuGen to ALM.**

For details about uploading VuGen scripts from VuGen to ALM, see the section about saving VuGen scripts to ALM in the *HP Virtual User Generator User Guide*.

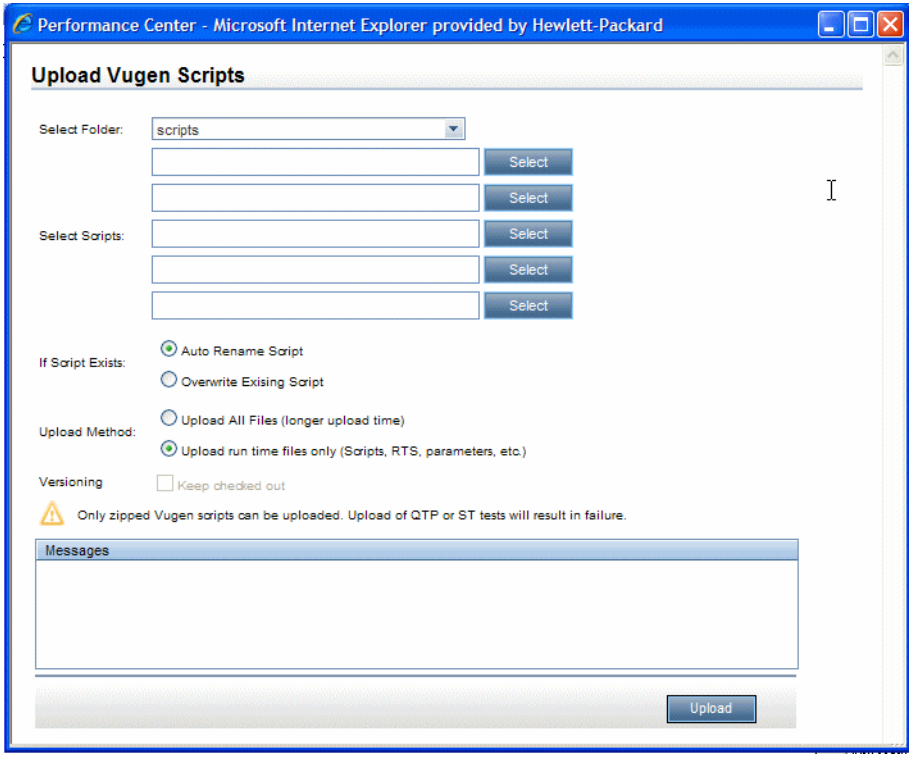
Reference

VuGen Script Management User Interface

This section includes:

Upload VuGen Scripts Dialog Box

This dialog box enables you to upload VuGen scripts to ALM.



To access	**1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** On the Test Plan module toolbar, click the **Upload Scripts** button.
Important information	➤ The Upload VuGen Scripts dialog box is intended for uploading **VuGen scripts** only. The VuGen scripts must be saved locally, must be in ZIP format, and must include all the files in the test scripts folder. ➤ You cannot upload QTP or ST tests using the Upload VuGen Scripts dialog box. To upload QTP or ST tests, see the relevant product's User Guide.

Relevant tasks	"How to Upload VuGen Scripts" on page 39
See also	"Vuser Scripts" on page 38

User interface elements are described below:

UI Elements	Description
	Uploads the selected VuGen Scripts to the specified destination folder.
Select Folder	The destination folder for the uploaded scripts. **Note:** The folder name must not contain a forward slash (/). For more details, see "Troubleshooting and Limitations" on page 44.
Select Scripts	Enables you to select up to five scripts. **Note:** The scripts must be saved locally, must be in ZIP format, and must include all the files in the test scripts folder.
If Script Exist	Action to take if the script already exists in the destination folder. ➤ **Auto Rename Script.** Automatically gives the script a different name. ➤ **Overwrite Existing Script.** Overwrites the existing script.
Upload Method	The method to use for uploading the script: ➤ **Upload All Files.** Uploads all the files contained in the .zip file. With this option the upload takes a long time. ➤ **Upload runtime files only.** Only the runtime files—that is the scripts, runtime settings, parameters, and so on—are uploaded.

UI Elements	Description
Versioning > **Keep checked out**	For version enabled projects, keeps the uploaded scripts checked out. **Version Control:** When you upload a script, it is available only for your own use until you check it in. After you check the script in, other users can access the script as well.
Messages	Enables you to enter messages and comments about the script upload.

Troubleshooting and Limitations

This section describes troubleshooting and limitations for uploading VuGen scripts.

➤ If the name of the folder to which you are uploading VuGen scripts contains a forward slash (/) you cannot upload the scripts using the Upload VuGen Scripts dialog box. Either rename the folder so that it does not contain a forward slash (/) or upload the scripts from VuGen.

4

Topologies

This chapter includes:

Concepts

Tasks

Reference

Concepts

Topologies Overview

ALM Performance Center can articulate the topology of your application under test (AUT) and use it as an interface for defining performance monitors by integrating with HP SiteScope.

Using topologies, you can:

- Manage an inventory of application under test (AUT) hosts which are grouped into AUT host pools, similar to Performance Center hosts and host pools
- Visually understand the tested environment
- Configure monitors using best practice monitor templates
- Pinpoint runtime performance issues by highlighting a topology node's status based on the SiteScope monitor thresholds

The SiteScope user interface hosted in ALM Performance Center enables leveraging SiteScope functionality in a use-case oriented approach, without requiring additional monitor configuration on the ALM Performance Center side.

During runtime, the AUT schema with comprehensive SiteScope monitor data is displayed in different monitor graphs in the ALM Performance Center run screen and measurement names can be identified and filtered.

For details on designing topologies, see "How to Design Topologies" on page 47.

Tasks

How to Design Topologies

This section describes how to design a topology that graphically displays the logical components that make up your application under test (AUT) and the relationships between the components. This provides a useful method for managing your inventory of AUT hosts and enables topology-oriented monitoring and analysis.

Note:

- This task is part of a higher-level task. For details, see "How to Manage Testing Assets" on page 34.
- Ensure that SiteScope is installed and configured to integrate with ALM Performance Center. For details, see the section about installing SiteScope in the *HP ALM Performance Center Installation Guide*.
- After you have designed a topology you can select it for a performance test when you design the test.
- **Product Feature Movie.** To view a movie that demonstrates how to design topologies, select **Help > Product Feature Movies** in the ALM main window. Under **HP ALM Performance Center 11.00 Movies**, select **Topologies and SiteScope Integration**.

Tip: For a use-case scenario related to this task, see "How to Design Topologies - Use-Case Scenario" on page 51.

To learn more about topologies, see "Topologies Overview" on page 46.

This task includes the following steps:

1 Create an empty topology

a On the ALM sidebar, under **Lab Resources**, select **Topologies**.

b To create a topology folder, click the **New Folder** button, and enter the folder name.

c Click the **New Topology** button and enter the topology details. To add SiteScope monitors to the topology, specify the SiteScope server details.

For details about the topology fields, see "Topologies Module Fields" on page 62.

2 Design the topology

Note: The Topology Designer window opens automatically when you create a new topology. If the Topology Designer window did not open, right-click the topology and select **Design Topology**.

In the Topology Designer window:

a From the palette on the left, select relevant nodes representing the components in your AUT and drag them onto the Topology canvas.

b To connect two components, click one component (ensure that it is not selected) and drag the cursor to the other component.

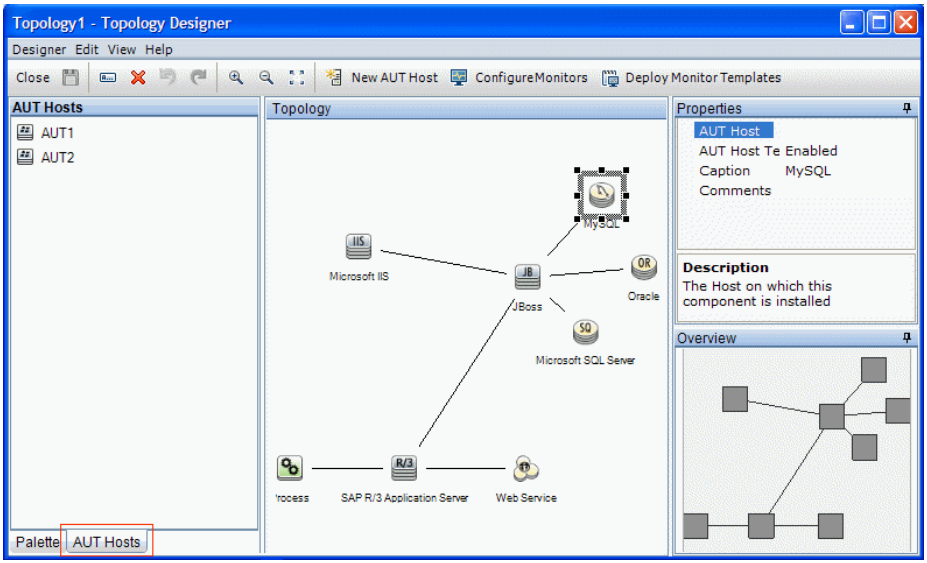
3 Add the AUT hosts

Define the machines that host the relevant components of the AUT.

On the Topology Designer toolbar, click **New AUT Host** to define the machines hosting your AUT.

Tip: If you have an Excel file listing your AUT hosts, you can import the list of AUT hosts into ALM. For details, see "How to Import AUT Host Data from Excel" on page 863.

You can view the list of AUT hosts in the AUT Hosts tab on the left.



4 Configure the component properties

Select a component and, in the **Properties** pane in the top left corner of the Topology Designer, enter the relevant properties for that component. For successful integration with SiteScope, ensure that you select the relevant AUT host, and that all of the relevant properties are accurate.

Tip: When you click a property, a description is displayed in the lower area of the Properties pane.

Repeat this procedure for each of the relevant components.

5 Configure monitors on the components

You can configure groups of monitors for the components on AUT hosts. Ensure that the AUT host details are accurate for each relevant component.

- To deploy relevant system-defined monitors on specific components on your canvas, select the components, right-click the selection, and select **Deploy Monitor Templates**. Monitor groups are created in SiteScope for each selected component, and each group is automatically configured with relevant system-defined monitors.
- To configure monitors for a component manually in SiteScope, right-click the component and select **Configure Monitors**. For more details about configuring monitors in SiteScope, see the *HP SiteScope User Guide*.

Note: The AUT host defined in a component's properties is passed to SiteScope as a remote host and is inserted as the default monitored server for all monitors created for this component.

---

6 Results

After you save the topology, you can select the designed topology for your performance test. For details, see "Performance Test Designer > Topology Tab" on page 71.

During a test run, you can view the SiteScope monitor activity on the relevant components in your AUT. For details, see "Topology Tab" on page 370.

How to Design Topologies - Use-Case Scenario

This use-case scenario describes how to design a topology that graphically displays the logical components that make up your application under test (AUT) and the relationships between the components.

Note: For a task related to this use-case scenario, see "How to Design Topologies" on page 47.

This scenario includes the following steps:

- "Background" on page 52
- "Create the topology and design the outline" on page 52
- "Add the AUT hosts" on page 54
- "Define the component properties" on page 55
- "Deploy the monitor templates" on page 57
- "Results" on page 58

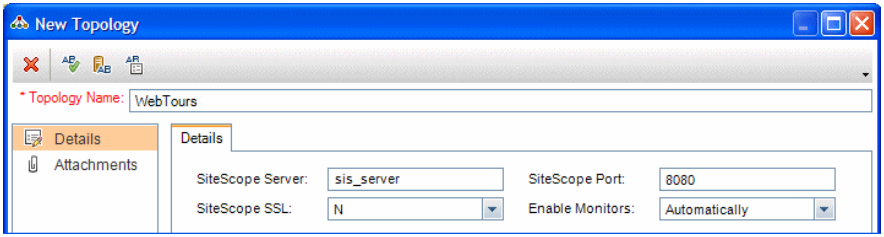
1 Background

John is a performance engineer working with HP Web Tours. He would like to design a performance test for the application.

As a first step, he would like to model the application in ALM Performance Center so that he can keep track of the topology of his application under test. Using this model, he can benefit from the monitoring and online view features that the topology feature offers.

2 Create the topology and design the outline

a On the ALM sidebar, under **Lab Resources**, John selects **Topologies** to open the Topology module, and clicks the **New Topology** button to create new topology. He calls the topology **WebTours**, and enters the details of the SiteScope server with which the application will interact for monitoring purposes.



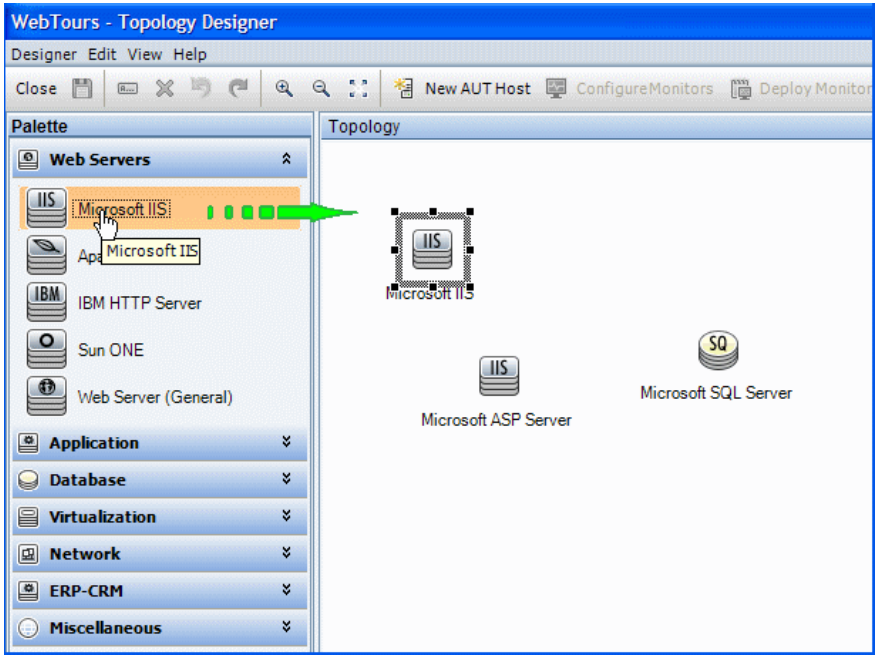
When John clicks **OK**, the Topology Designer window opens, displaying the Topology canvas which, at this stage, is empty.

b John's Web Tours application comprises the following components: A Web server, an application server, and a database server. The user accesses the application through a client workstation.

In the Topology Designer window, from the palette in the left, John drags the nodes representing these components onto the Topology canvas, and changes their captions to names that are relevant to the components they represent.

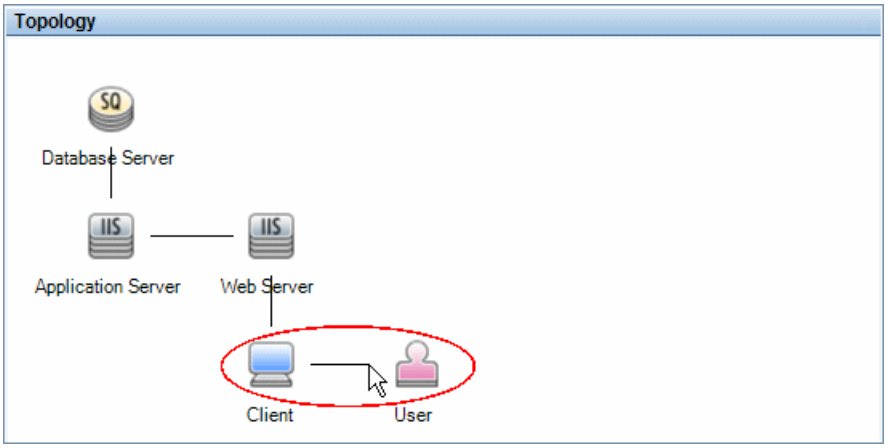
John drags the following nodes:

Palette Category	Component	New Caption
Web Servers	Microsoft IIS	Web Server
Application	Microsoft ASP Server	Application Server
Database	Microsoft SQL Server	Database Server
Miscellaneous	Workstation	Client
Miscellaneous	User	User



c John connects the application server to the Web server by clicking the application server (ensuring that it is not selected) and dragging the cursor over to the Web server.

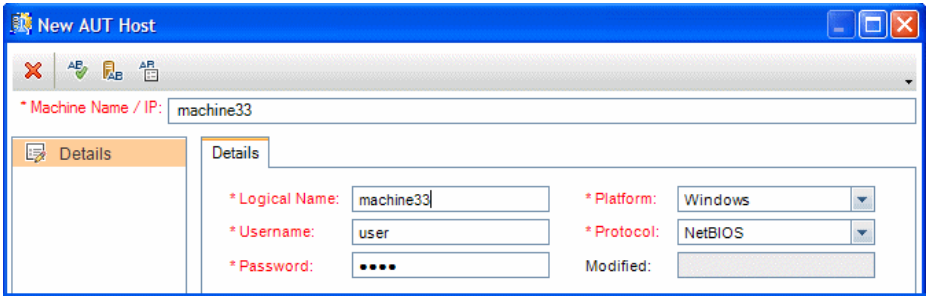
Similarly, he connects the application server to the database server, the client workstation to the Web server, and the user to the client.



3 Add the AUT hosts

The AUT hosts are the physical machines that host the relevant components of the application under test.

On the Topology Designer toolbar, John clicks **New AUT Host**, and enters the name and details of the machine that hosts the database server:



John then adds the AUT host that hosts both the application and Web servers.

Tips:

- Alternatively, if John had an Excel file listing the AUT hosts in his system, he could have imported the list of AUT hosts to ALM. For details, see "How to Import AUT Host Data from Excel" on page 863.
- John can view the list of AUT hosts in the **AUT Hosts** tab by clicking **AUT Hosts** at the bottom of the Palette tab.

---

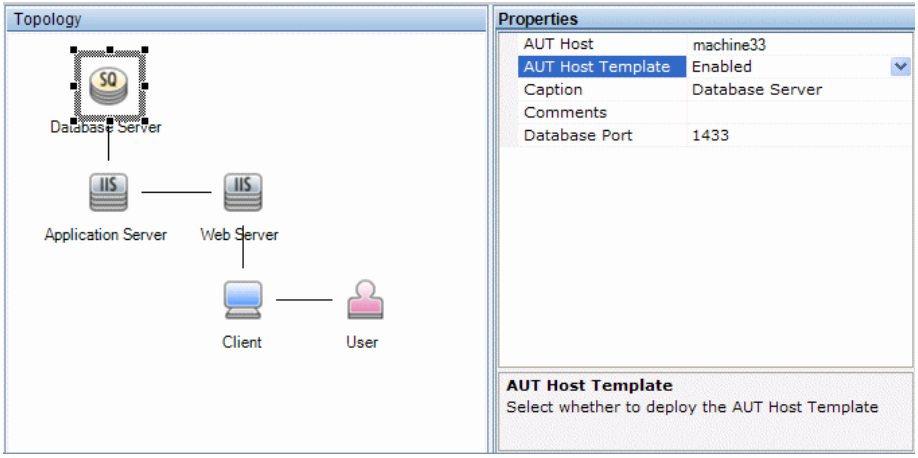
4 Define the component properties

For successful integration with SiteScope, John needs to ensure that the properties for each component are defined correctly.

John selects each component and, in the **Properties** pane in the top right corner of the Topology Designer window, he provides the relevant properties. The properties differ from one type of component to another.

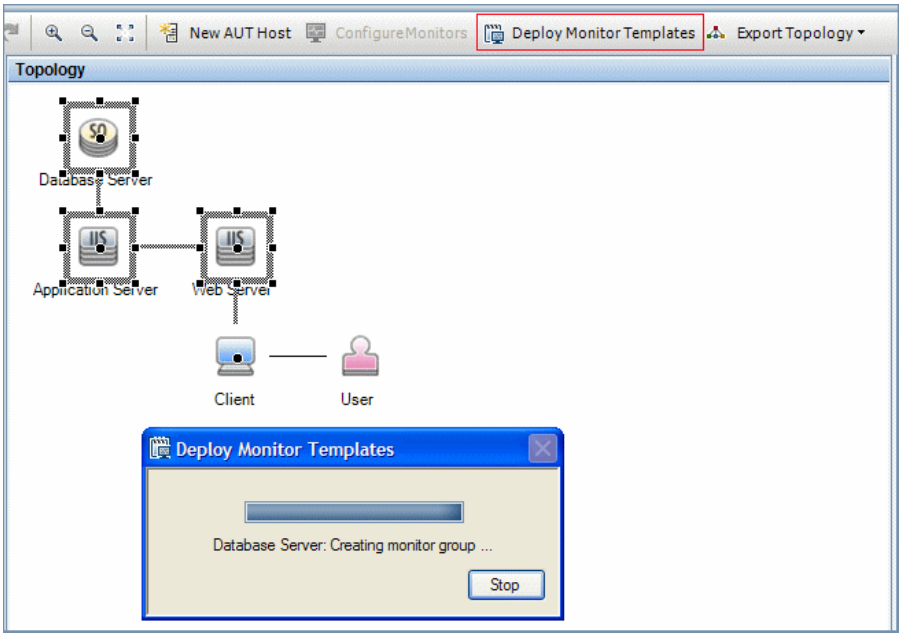
Tip: A description for each property is displayed in the lower area of the Properties pane, and helps John to understand what information to provide for each property.

For example, for the database server, John selects **machine33** from the **AUT Host** drop-down list, and accepts the default values for all of the other properties. Then he provides the relevant details for the application and Web servers.



5 Deploy the monitor templates

John selects the three servers and clicks **Deploy Monitor Templates**. ALM creates a monitor group in SiteScope for each of the selected components, and deploys the relevant system-defined monitor templates for each component. Because the AUT Host Templates property is enabled, the templates for the actual AUT host are deployed as well.



Tip: If John wants to view or modify these monitors, he can do so by clicking **Configure Monitors** on the toolbar, which opens HP SiteScope and displays the monitor trees that were created for each component.

---

6 Results

John saves the topology and closes the Topology Designer window. He selects this topology when designing the performance test for the Web Tours application. When he runs the test, he can view the SiteScope monitor activity on the relevant components in the application in the Performance Test Run page.

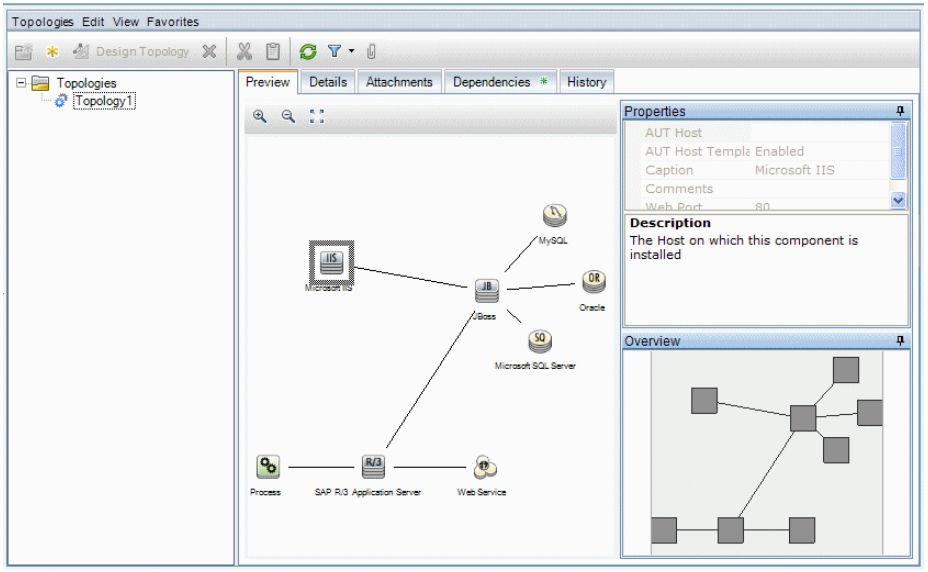
Reference

Topologies User Interface

This section includes:

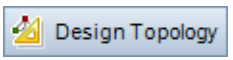
Topologies Module

This module lists the topologies that you have defined.



To access	On the ALM sidebar, under **Lab Resources**, select **Topologies.**
Important information	After you have designed a topology for your performance test, you must associate it with your test. For details about associating a topology with a test, see "Performance Test Designer > Topology Tab" on page 71.
Relevant tasks	"How to Design Topologies" on page 47
See also	"Topologies Overview" on page 46

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**New Topology Folder.** Enables you to create a topology folder.
	**New Topology.** Enables you to create a new topology.
	Opens the Topology Designer window, enabling you to design topologies. For details, see "Topology Designer Window" on page 68.
	**Delete.** Enables you to delete the selected topologies.
	**Cut/Paste.** Enables you to cut and paste the selected topology from one topology folder to another.
	**Refresh All.** Refreshed the page so that it displays the most up-to-date information.
	**Set Filter/Sort.** Enables you to filter and sort the topologies. Any currently applied filters or sorting orders are displayed below the toolbar. For more details, see the *HP Application Lifecycle Management User Guide*.
	**Attachments.** Enables you to add attachments that provide additional information about the topology. For more details, see the *HP Application Lifecycle Management User Guide*.
<Topologies tree>	Located on the left side of the window, organizes and displays your topologies hierarchically.
Preview tab	Displays a preview of the topology selected in the Topology tree. ➤ **Properties pane.** Displays general details about a node selected in the topology on the left. If an AUT host is configured on the node, the host's details are displayed as well. ➤ **Overview pane.** Displays a full overview of the topology structure.

UI Elements	Description
Details tab	Displays the details of the selected topology. For details, see "Topology Details Dialog Box" on page 66.
Attachments tab	Lists attachments that provide additional information about the currently selected topology. For details, see the *HP Application Lifecycle Management User Guide*.
Dependencies tab	Displays dependency relationships that exist between entities. For more information, see the *HP Application Lifecycle Management User Guide*.
History tab	Lists changes made to the selected topology. For more details, see the *HP Application Lifecycle Management User Guide*.

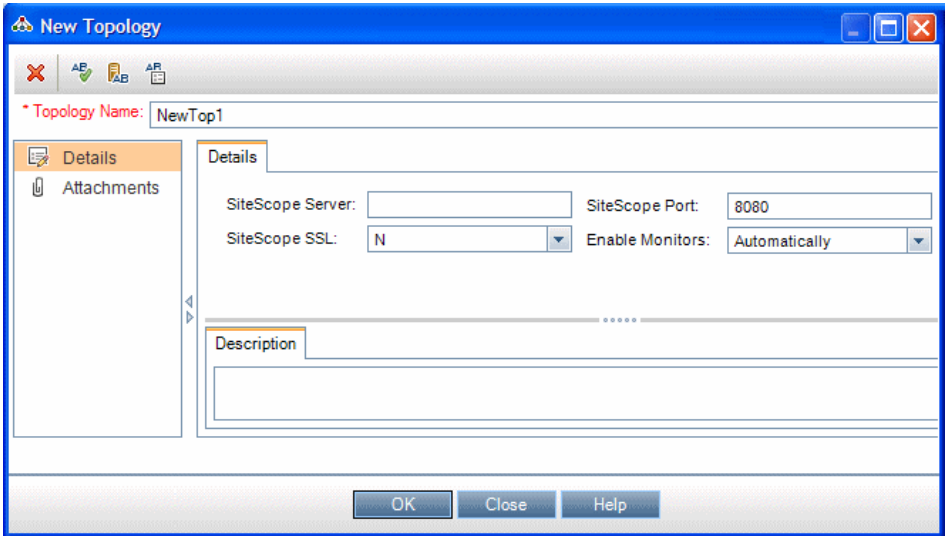
Topologies Module Fields

This section describes the Topologies module fields:

Field (A-Z)	Description
Created by	The user who created the topology.
Creation Date	The date and time the topology was created.
Enable Monitors	Always enables SiteScope monitors, or enables them automatically during monitor configuration and performance test runs.
Modified	The date and time the topology was last modified.
Modified by	The user who last modified the topology.

Field (A-Z)	Description
SiteScope Port	The port defined for SiteScope during installation of SiteScope. **Default value:** ➤ Non-SSL: 8080 ➤ SSL: 8443 For details, see the section about installing SiteScope for Performance Center in the *HP ALM Performance Center Installation Guide*.
SiteScope Server	The name of the SiteScope server.
SiteScope SSL	Indicates whether or not SiteScope uses SSL.
Topology Name	A name for the topology.

New Topology Dialog Box



To access	On the ALM sidebar, under **Lab Resources**, select **Topologies**. Click the **New Topology** button.
Relevant tasks	"How to Design Topologies" on page 47
See also	"Topologies Overview" on page 46

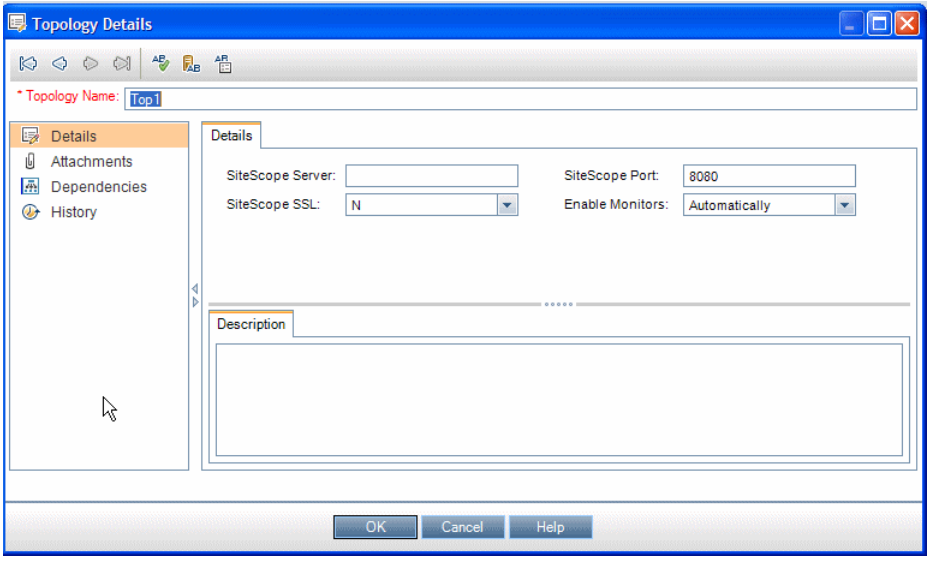
User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	Clear All Fields. Clears the data.
	Spell Check. Checks the spelling for the selected word or text box.
	Thesaurus. Displays a synonym, antonym, or related word for the selected word.

UI Elements	Description
	**Spelling Options.** Enables you to configure how to check the spelling.
Topology Name	The name of the topology.
Details	Enables you to enter the details of the selected topology. Required fields are marked with an asterisk (*) and are displayed in red. For details, see "Topologies Module Fields" on page 62.
Attachments	Lists attachments that provide additional information about the currently selected topology. For details, see *HP Application Lifecycle Management User Guide*.

Topology Details Dialog Box

This dialog box enables you to view topology details.



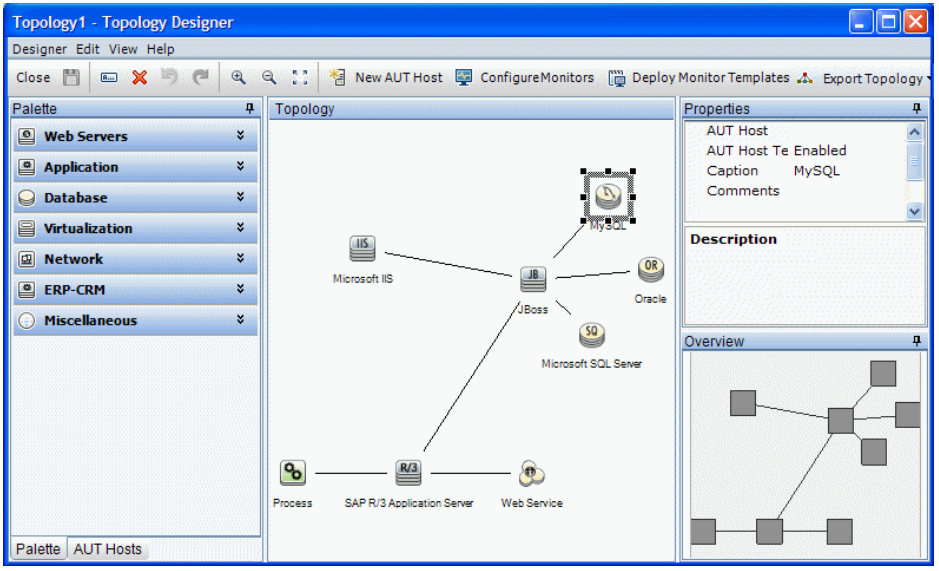
To access	**1** On the ALM sidebar, under **Lab Resources**, select **Topologies**. **2** Select a topology in the Topology tree, and click the **Attachments** button. Then click **Details**.
Relevant tasks	"How to Design Topologies" on page 47
See also	"Topologies Overview" on page 46

User interface elements are described below:

UI Elements	Description
	**First/Previous/Next/Last Entity.** Enables you to browse through the list of topologies.
	**Spell Check.** Checks the spelling for the selected word or text box.

UI Elements	Description
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Topology Name	The name of the topology.
Details	Displays the details of the selected topology. For more details, see "Topologies Module Fields" on page 62.
Attachments	Lists attachments that provide additional information about the currently selected topology. For details, see the *HP Application Lifecycle Management User Guide*.
Dependencies	Displays dependency relationships that exist between entities. For more information, see the *HP Application Lifecycle Management User Guide*.
History	Lists changes made to the selected topology. For more details, see the *HP Application Lifecycle Management User Guide*.

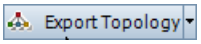
Topology Designer Window



To access	On the ALM sidebar, under **Lab Resources**, select **Topologies**. In the tree, select a topology, and click Design Topology.
Important information	After you have designed a topology for your performance test, you must select it for your test. For more details, see "Performance Test Designer > Topology Tab" on page 71.
Relevant tasks	"How to Design Topologies" on page 47
See also	"Topologies Overview" on page 46

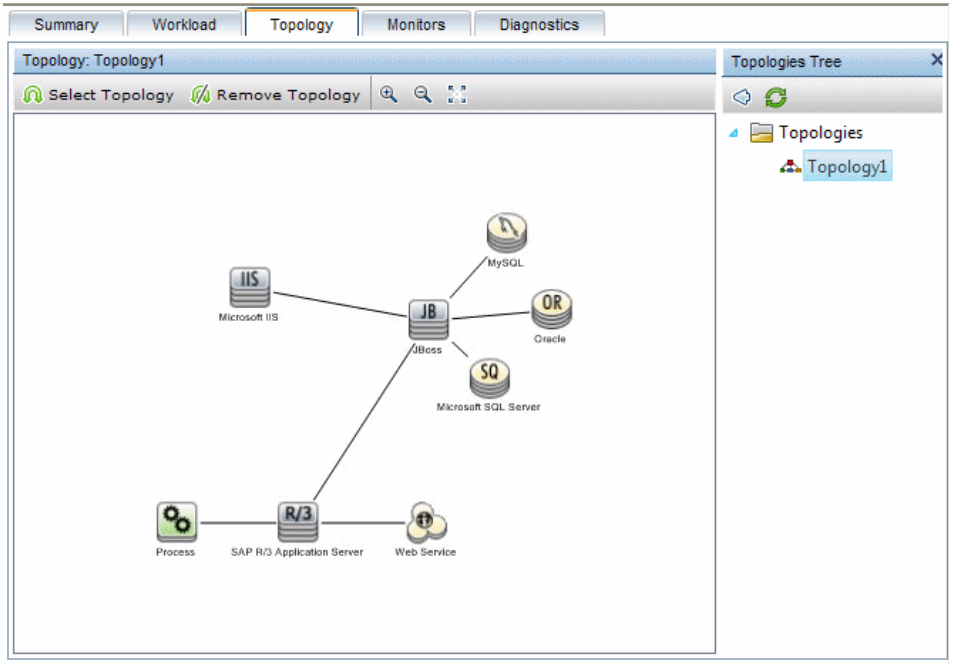
User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Close	Enables you to close the Topology Designer window.
Save & Close	Enables you to save the topology and close the Topology Designer.
	**Save Topology.** Enables you to save your topology.
	**Rename.** Enables you to rename the node selected on the canvas.
	**Delete.** Enables you to delete the nodes selected on the canvas.
	**Undo/Redo.** Enables you to undo or redo the previous action.
	**Zoom in/out.** Enables you to zoom in and out of the canvas.
	**Fit to screen.** Enables you to fit the whole topology design to the current screen size.
New AUT Host	Opens the New AUT Host dialog box, enabling you to add a new AUT host. For details, see "New AUT Host Dialog Box" on page 873. **Tip:** If you have a list of AUT hosts set up in an Excel file, you can import this list instead of adding the hosts one by one. For details, see "How to Import AUT Host Data from Excel" on page 863.
ConfigureMonitors	Opens the Configure Monitors dialog box, enabling you to manually configure SiteScope monitors on the selected node. For details about creating SiteScope monitors, see the *HP SiteScope User Guide*. **Note:** When configuring monitors for these components in SiteScope, the value for **Monitor Run Settings** > **Frequency** should be changed to a more suitable value, such as 5 - 15 seconds.

UI Elements	Description
	Opens the Deploy Monitor Templates dialog box, enabling you to configure SiteScope monitors on the selected node automatically by deploying a template monitor set.
	Enables you to export the whole area of the topology, or only the visible region of the topology to an image file.
Palette tab	Enables you to select components to add to the canvas. The palette includes various types of server categories, as well as a Miscellaneous category. This category includes nodes that are not necessarily AUT-specific but that complete the topology design, such as a user or a client workstation.
AUT Hosts tab	Displays all AUT hosts defined in the projects AUT host pool.
Topology canvas	Provides a canvas where you can lay out the topology by dragging components/server nodes and linking them to each other.
Properties pane	Enables you to define properties for the node selected on the canvas. The lower section of the Properties pane displays a description of the selected property.
Overview pane	Displays an overview of the topology's structure.

Performance Test Designer > Topology Tab

This tab enables you to select a topology for a performance test.



To access	**1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Right-click a performance test in the test plan tree and select **Edit Test**. **3** In the Performance Test Designer window, click the **Topology** tab.
Important information	You design topologies in the Topologies module. After you have designed topologies, you can select one of them for a performance test.
Relevant tasks	➤ "How to Design a Performance Test" on page 171 ➤ "How to Design Topologies" on page 47
See also	"Topologies Overview" on page 46

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Select Topology	Opens the Topologies tree in the right pane, enabling you to select a topology for the test.
Remove Topology	Enables you to remove the selected topology.
	**Zoom in**. Enables you to zoom into the displayed topology.
	**Zoom out.** Enables you to zoom out of the displayed topology.
	**Fit to panel.** Enables you to fit the topology to the size of the Topology pane.
Topologies tree	Opens when you click Select Topology, enabling you to select a topology for the test. Expand the Topologies tree, select a topology, and click  to move it to the Topology pane on the left. To refresh the tree, click  .
Topology pane	Displays the selected topology.

5

Monitor Profiles

This chapter includes:

Concepts

Tasks

Reference

Concepts

Monitor Profiles Overview

You monitor performance test execution using the Performance Center online monitors. To monitor server resources, you must configure the monitor settings for a performance test. You select the type of monitors to run, the servers whose resources you want to monitor, and add the measurements to monitor for each server. These monitor settings can then be saved as a monitor profile that can be used by any performance test in your project.

For details about creating monitor profiles, see "How to Create and Configure Monitor Profiles" on page 75.

Tasks

How to Create and Configure Monitor Profiles

This task describes how to create and configure a monitor profile.

Note: This task is part of a higher-level task. For details, see "How to Manage Testing Assets" on page 34.

To learn more about monitor profiles, see "Monitor Profiles Overview" on page 74.

This task includes the following steps:

- "Prerequisites" on page 76
- "Create the monitor profile test resource type" on page 77
- "Add monitors to the monitor profile" on page 77

1 Prerequisites

To use the following monitors, you must first install or configure monitoring components on the server machine. For task details about configuring the monitoring components, see the specific monitoring sections listed below.

- **Citrix.** For task details, see "How to Set up the Citrix Monitoring Environment" on page 499.
- **J2EE & .NET.** For task details, see "How to Enable and Configure J2EE/.NET Diagnostics" on page 292.
- **Network Delay.** For task details, see "How to Set Up the Network Monitoring Environment" on page 450.
- **Oracle.** For task details, see "How to Set Up the Oracle Monitoring Environment" on page 471.
- **PeopleSoft (Tuxedo).** For task details, see "How to Set Up the PeopleSoft (Tuxedo) Resource Monitor" on page 481.
- **SAPGUI.** For task details, see "How to Set Up the SAPGUI Server Resource Monitor" on page 483.
- **Tuxedo.** For task details, see "How to Set Up the Tuxedo Monitoring Environment" on page 491.
- **UNIX.** For task details, see "How to Set up the UNIX Monitoring Environment" on page 440.

2 Create the monitor profile test resource type

You create test resources from the Test Resources module. For task details, see the *HP Application Lifecycle Management User Guide*.

3 Add monitors to the monitor profile

a In the Test Resources module, select a monitor profile, select the **Monitors Configuration** tab, and then click the **Add Monitor** button. In the Add New Monitor page that opens, select the monitor that you want to run.

b In the Edit Monitor page, enter the required information and select the counters that you want to monitor. The Edit Monitor page varies depending on which monitor type you select:

- For Windows Resources, UNIX, Apache, MS IIS, MS ASP, Citrix, SQL, Oracle, TUXEDO, PeopleSoft (Tuxedo), or SAPGUI monitors user interface details, see "Edit Monitors Dialog Box" on page 83.
- For SNMP monitor user interface details, see "Edit SNMP Monitors Dialog Box" on page 85.
- For SiteScope monitor user interface details, see "Edit SiteScope Monitors Dialog Box" on page 86.
- For Network Delay Time monitor user interface details, see "Edit Network Delay Time Monitors Dialog Box" on page 87.

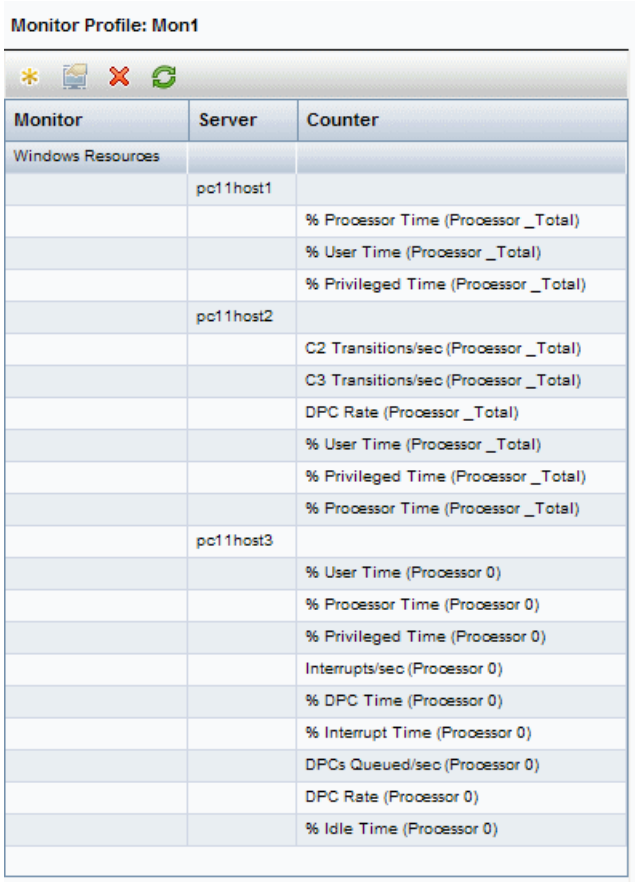
Reference

Monitor Profiles User Interface

This section includes:

Monitors Configuration Page

This page enables you to add and edit monitors that are part of a monitor profile.



Monitor Profile: Mon1

Monitor	Server	Counter
Windows Resources		
	pc11host1	
		% Processor Time (Processor _Total)
		% User Time (Processor _Total)
		% Privileged Time (Processor _Total)
	pc11host2	
		C2 Transitions/sec (Processor _Total)
		C3 Transitions/sec (Processor _Total)
		DPC Rate (Processor _Total)
		% User Time (Processor _Total)
		% Privileged Time (Processor _Total)
		% Processor Time (Processor _Total)
	pc11host3	
		% User Time (Processor 0)
		% Processor Time (Processor 0)
		% Privileged Time (Processor 0)
		Interrupts/sec (Processor 0)
		% DPC Time (Processor 0)
		% Interrupt Time (Processor 0)
		DPCs Queued/sec (Processor 0)
		DPC Rate (Processor 0)
		% Idle Time (Processor 0)

To access	Use one of the following: ➤ In the Test Resources module, select a monitor profile in the test resource tree and click the **Monitors Configuration** tab. ➤ In the Performance Test Designer, click the **Monitors** tab, and then click **View Selected**.
Relevant tasks	➤ "How to Create and Configure Monitor Profiles" on page 75 ➤ "How to Manage a Performance Test Run" on page 340

User interface elements are described below:

UI Elements (A-Z)	Description
	**Add Monitor.** Opens the Add New Monitor page enabling you to select which monitors to run in the monitor profile.
	**Edit Monitor.** Enables you to edit the selected monitor.
	**Delete Selected Item.** Deletes the selected item from the monitor profile.
	**Refresh Monitor List.** Refreshes the monitors list.
Counters	The counters that are being monitored.
Monitor	The name of the monitor.
Server	The server whose resources are being monitored.

Add New Monitors Page

This page enables you to select the monitor type to add to a monitor profile.

To access	Use one of the following: ➤ In the Test Resources module, select a monitor profile in the test resource tree and click the **Monitors Configuration** tab. Then click the **Add Monitor** button . ➤ In the Run-Time Monitors dialog box, click the **Add Monitor** button . For more information, see "Monitor Profile Content Dialog Box" on page 383.
Relevant tasks	➤ "How to Create and Configure Monitor Profiles" on page 75 ➤ "How to Manage a Performance Test Run" on page 340

User interface elements are described below:

UI Elements	Description
Windows Resources **Unix Resources** **Apache** **MS IIS** **MS ASP** **Citrix Server** **SQL Server** **Oracle** **TUXEDO** **PeopleSoft (Tuxedo)** **SAPGUI**	Enables you to select the specific counters for this monitor type. For more information, see "Edit Monitors Dialog Box" on page 83.
SNMP	Opens the Edit Monitors Page, which enables you to select the specific counters that you want to monitor for this monitor type. For more information, see "Edit SNMP Monitors Dialog Box" on page 85.

UI Elements	Description
SiteScope	Opens the Edit Monitors Page, which enables you to select the specific counters that you want to monitor for this monitor type. For more information, see "Edit SiteScope Monitors Dialog Box" on page 86.
Network Delay Time	Opens the Edit Monitors Page, which enables you to select the specific counters that you want to monitor for this monitor type. For more information, see "Edit Network Delay Time Monitors Dialog Box" on page 87.

Edit Monitors Dialog Box

This dialog box enables you to define the server whose resources you want to monitor, and to select the counters to be monitor.

To access	In the Test Resources module, select a monitor profile in the test resource tree and click the **Monitors Configuration** tab. Click the **Add Monitor** button, and then select one of: Windows Resources, UNIX Resources, Apache, MS IIS, MS ASP, Citrix, SQL, Oracle, Tuxedo, PeopleSoft, SAPGUI.
Important information	This dialog box contains information relevant for the following monitor types: Windows Resources, UNIX Resources, Apache, MS IIS, MS Active Server Pages, Citrix, SQL, Oracle, TUXEDO, PeopleSoft (Tuxedo), SAPGUI
Relevant tasks	"How to Create and Configure Monitor Profiles" on page 75

User interface elements are described below:

UI Elements (A-Z)	Description
Get Counters	Click to display a list of available counters.
Available Counters	A list of available counters for the selected monitor.
Client	The PeopleSoft (Tuxedo)/SAPGUI client. **Available for:** PeopleSoft, TUXEDO, SAPGUI
Password	The monitored server's password, if relevant.
Port	The port number of the Apache server. **Note:** To monitor an Apache server through a firewall, use the Web server port (by default, port 80). **Available for:** Apache
SAP Server	The SAP Server. **Available for:** SAPGUI
Selected Counters	A list of selected counters for the monitor.

UI Elements (A-Z)	Description
Server	The name or IP address of the server whose resources you want to monitor.
URL (Apache only)	The Server statistics information URL. To verify the statistics information URL, try to view it through the browser using the following format: http://<server_name/IP address>:<port_number>/server-status?auto For example: http://stimpy:80/server-status?auto. **Format:** Enter the server statistics information URL, without the server name. **Default value:** /server-status?auto **Note:** The default port number and URL can vary from one server to another. Consult your Web server administrator. **Available for:** Apache
User Name	The monitored server's user name, if relevant.

Edit SNMP Monitors Dialog Box

This dialog box enables you to define the SNMP server whose resources you want to monitor, and to select the counters to monitored.

To access	In the Test Resources module, select a monitor profile in the test resource tree and click the **Monitors Configuration** tab. Click the **Add Monitor** button, and then select **SNMP**.
Relevant tasks	"How to Create and Configure Monitor Profiles" on page 75

User interface elements are described below:

UI Elements (A-Z)	Description
Get Counters	Click to display a list of available counters.
<choose counters area>	Displays a list of available counters. **Default:** Displays all nodes of the SNMP objects in a tree-level hierarchy.
Concatenate SNMP Levels	For SNMP object nodes with ten or more levels, select to display the sub-levels as a single string, separated by periods (.).
Server	Enter the name or IP address of the server to monitor. **Note:** Performance Center connects to default SNMP port 161. To use a different port number, specify the machine name in the following format: <server name>:<port number>

Edit SiteScope Monitors Dialog Box

This dialog box enables you to define the SiteScope server whose resources you want to monitor, and to select the counters to monitor.

To access	In the Test Resources module, select a monitor profile in the test resource tree and click the **Monitors Configuration** tab. Click the **Add Monitor** button, and then select **SiteScope**.
Relevant tasks	"How to Create and Configure Monitor Profiles" on page 75

User interface elements are described below:

UI Elements (A-Z)	Description
Get Counters	Click to display a list of available counters.
Password	When **Use Account** is selected, enter the relevant password.
Port	The SiteScope port. **Default:** 8888
Server	The SiteScope server name.
Use Account	Select when SiteScope is working in secure mode, which requires authentication. Enter the SiteScope account name, user name and password in the corresponding fields.
Use HTTPS	Specify if you are using a secure HTTP connection.
User Name	When **Use Account** is selected, enter the relevant user name.

Edit Network Delay Time Monitors Dialog Box

This dialog box enables you to define the Network Delay Time server whose resources you want to monitor, and to select the counters to monitor.

To access	In the Test Resources module, select a monitor profile in the test resource tree and click the **Monitors Configuration** tab. Click the **Add Monitor** button, then select **Network Delay Time**.
Relevant tasks	"How to Create and Configure Monitor Profiles" on page 75

User interface elements are described below:

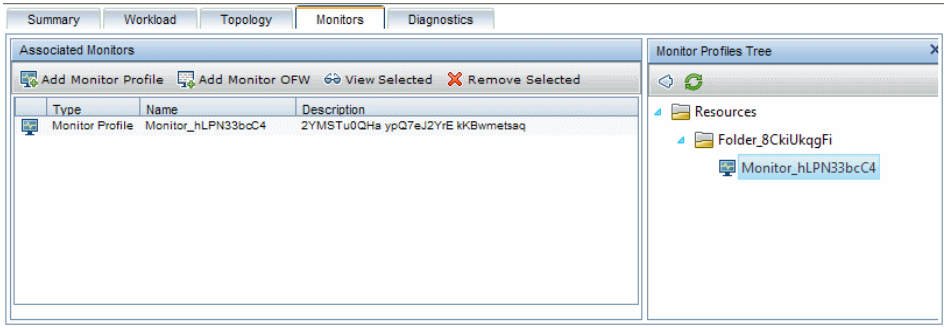
UI Elements (A-Z)	Description
Use Defaults	Uses the default values.
Destination Machine	The name of the machine at the final destination of the path you want to monitor. **Note:** If the destination machine is **localhost**, type the local machine's name and not **localhost**.
Monitor Frequency	**Send next packet Xmilliseconds after receipt of previous packet.** Select the number of milliseconds the monitor should wait between receiving a packet and sending out the next packet. If you have a long, steady load test, you can increase the interval by several seconds. **Default:** 3000 milliseconds

UI Elements (A-Z)	Description
Monitor Settings	➤ **Send Request Using Xprotocol.** Select the relevant protocol. It is recommended that you keep the default protocol. In Windows, the default is **TCP**, and in UNIX, the default is **UDP**. ➤ **Send request to port X.** Enter the port number being used by the network path. ➤ **Enable display of network nodes by DNS names.** Select to view the DNS name of each node along the network path, in addition to its IP address. Note that selecting this option decreases the speed of the Network monitor.
Monitoring Packet Retries	➤ **Wait Xseconds for packet to return before retrying.** Select the maximum number of seconds that the monitor should wait for a packet to return before it retries to send the packet. **Default:** 3 seconds. If your network is very large and loaded (an internet connection with a low capacity), increase the value by several seconds. If you have a small network (such as a LAN), decrease the value. ➤ **Number of retries.** Select the number of times the Network monitor should try resending a packet to a node if the packet is not initially returned. **Default:** 0

UI Elements (A-Z)	Description
Platform	The platform on which the machine runs.
Source Machine	The name of the source machine from which you want the network path monitoring to begin. **Note:** To run the Network Delay Monitor when there are firewalls between the Performance Center Host machine and the source machine, type the server name or IP address of the source machine according to the format: <MI Listener machine>:<source machine local key> Where source machine local key is the unique key that you chose when configuring the Performance Center agent on the source machine. For example, 12.12.12.3:vds For more information about working with firewalls in Performance Center, see the section about firewalls in the *HP ALM Performance Center Installation Guide*.

Performance Test Designer > Monitors Tab

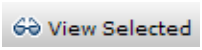
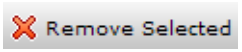
This tab enables you to select monitor profiles and monitor-over-firewall agents to use in your performance test.



To access	**1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Right-click a performance test in the test plan tree and select **Edit Test**. **3** In the Performance Test Designer window, click the **Monitors** tab.
Important information	You must have monitor profiles defined before you can select them for the test.
Relevant tasks	➤ "How to Design a Performance Test" on page 171 ➤ "How to Create and Configure Monitor Profiles" on page 75
See also	"Monitor Profiles Overview" on page 74

User interface elements are described below:

UI Elements(A-Z)	Description
Add Monitor Profile	Opens the Monitor Profiles tree in the right pane, enabling you to select a monitor profile for the test.
Add Monitor OFW	Opens the Monitors Over Firewall tree in the right pane, enabling you tot select a monitor-over-firewall agent for the test.

UI Elements(A-Z)	Description
	Opens a window that displays all of the measurements of the selected monitor profile.
	Removes the selected monitor profile or monitor-over-firewall agent from the test.
Associated Monitors grid	Displays the monitors and monitor-over-firewall agents selected for the test.
Monitor Profile Tree / Monitors Over Firewall Tree	Enables you to select a monitor profile or monitor-over-firewall agent for the test. Expand the Resources tree, select a monitor profile or monitor-over-firewall agent, and click  to move it to the Associated Monitors grid on the left.

Part III

Timeslot Reservation

6

Reserving Timeslots

This chapter includes:

Concepts

Tasks

Reference

Concepts

Reserving Timeslots Overview

When performance testers want to run performance tests, or need to perform maintenance on host machines (administrators only), the resources needed for these tasks must be available, and must fall within the project and license limits. Performance Center's timeslots feature enables you to reserve resources in advance to ensure that the required resources are available when you are ready to perform the tasks. Performance Center itself also reserves resources needed for data processing tasks.

This section includes:

Types of Timeslot Reservations

Timeslots can be reserved ad hoc or manually. This section describes these two types of timeslot reservations.

Ad Hoc Timeslot Reservations

An ad hoc timeslot reserves resources for a task at hand.

For example:

- **Administration:** If you want to perform administrative tasks on particular hosts, such as installing patches, when you start the task—and provided that the hosts are available at the time—Performance Center automatically reserves the requested hosts in an ad hoc maintenance timeslot during which the hosts cannot be used for any other purpose.
- **Performance Testing:** When you start running a performance test manually, before the test starts to run, you specify how much time you need to run the test. Performance Center checks if the required hosts and Vusers are currently available for that amount of time, and that the license and project limits are not exceeded, in which case, you can reserve the hosts and Vusers for that timeslot. If the hosts and Vusers are not available, or license/project limits have been exceeded, you cannot run the test at that time and need to try again at a later time.
- **Data Processing:** Tasks such as test result analysis, SLA status publication, and trending are performed on a data processor host. Performance Center estimates how long a data processor host is needed for the task at hand. As soon as a data processor becomes available for this task, an ad hoc reservation is automatically made.

Manual Timeslot Reservations

If you know which testing resources (hosts and Vusers) you need for running a performance test, or the hosts on which you need to perform maintenance, you can manually reserve the resources in advance for a specified amount of time.

For performance testing timeslots, you must request at least one Controller and one load generator. These can be specific hosts, or alternatively, you can request automatch hosts. When you select automatch hosts, you allow Performance Center to allocate any available host whose properties match those of the automatch host. For more details, see the "Load Generator Types" on page 222.

If you have a test linked to the timeslot, the hosts and Vusers defined in the test are automatically requested for the timeslot, and you can request additional resources.

A timeslot can be reserved successfully only if all of the requested Vusers are available, and all of the hosts can be allocated.

Tip: All users in your project can use the timeslot that you have reserved.

It is important to note that many conditions and changes in the system can affect host allocation, and can cause a shuffling around of the hosts.

For more details about host allocation and examples of resource shuffling, see "Host Allocation" on page 102.

Autostart Timeslots

Some performance tests might require a lot of time and many resources. Performance Center's **Autostart** feature enables you to reserve these resources when resources are more readily available, and/or when you might not be available to run the test manually. This allows for maximum resource usage because your resources can then be used around the clock.

For example, suppose a project has a total of eight hosts for allocation and the employees assigned to the project work a standard 09:00-17:00 day. The hours between 09:00 and 17:00 are peak hours for host usage, during which time all the hosts are usually reserved for testing, data processing, and maintenance tasks. Because of this, there may be periods during the day that employees cannot perform tasks because there are no available hosts. In contrast, the non-standard work hours pass with very little host resource usage.

To extend host resource usage, employees might come in early or stay late to run tests, but this only extends the peak usage by one or two hours at the beginning and end of the day.

Reserving timeslots during non-standard work hours and setting the tests to run during these timeslots allows for maximum resource usage.

Best Practices for Reserving Autostart Timeslots

This section describes some best practices to follow when reserving an Autostart timeslot:

- When reserving an Autostart timeslot, always ensure that the Scheduler is set to stop as soon as all the Vusers have stopped running. This allows more time for post-run actions during the duration of the timeslot. For details on setting test options, see "Test Options Dialog Box" on page 219.
- Where possible, run the test manually to get an indication as to how long it takes for the test to run. This information can assist you when selecting the timeslot duration.
- 15 minutes before the end of a timeslot, Performance Center automatically stops the test run. Five minutes before the end of the timeslot, even if all the Vusers have not yet finished running, Performance Center aborts the run. To ensure that the test ends properly as designed, make sure that you reserve more time than defined for the test schedule.
- If you want to perform auto-collate and analyze operations at the end of the run, you should take the time required for these operations into account when reserving the timeslot.

Note: To prevent loss of run data, we recommend, whenever possible, to collate the results immediately after the run finishes. If your timeslot ends before result collation is completed, collation continues as it does not require reserved resources.

- If you want to analyze the test results straight after the run, take into account that the analysis process can take a long time, so be sure to reserve enough time for this operation.

Prolonging Timeslot Reservations

When a test is running and your testing timeslot is coming to a close, you can prolong the timeslot for a number of minutes, provided the resources you need are available. If any of the resources you are using are already reserved for a timeslot immediately following your timeslot, you cannot prolong the timeslot.

For certain tasks the system prolongs timeslots automatically. For example, when you are running a test, if the Vusers are in the process of stopping gradually, the system will prolong the timeslot automatically for 15 minutes, provided the resources are still available.

If a timeslot cannot be prolonged, the task at hand stops without completing properly.

Modifying Timeslot Reservations

When you modify an open timeslot, depending on the modification, the timeslot might split into two separate timeslots.

A timeslot splits when:

- You stop a run and select to keep the reserved resources for the remaining time.
- The run ends more than 30 minutes before the timeslot ends (not relevant for "NEW" ad-hoc timeslots).
- You modify an open timeslot that is not active.

Note: Active performance testing timeslots—that is, if the test is running—can be modified from within a running performance test only. Changes that can be made include: prolonging a timeslot, adding Vusers, adding hosts.

Understanding Timeslot Failure

Timeslots can be reserved successfully only when all the requested resources are available for the requested duration of time.

Many factors render a valid timeslot invalid. Such factors include:

- Changes to the Performance Center licenses (This does not affect maintenance timeslots)
- Resources can become unavailable
- A test linked to a timeslot can become invalid

In some cases, such as issues with hosts, the system can perform a reshuffle of hosts to try to rectify the situation and revalidate the timeslot. For more information, see "Host Allocation" on page 102. Other factors, such as test invalidation, can be corrected manually.

Tip: You can configure the system to alert you by email when a timeslot becomes invalid. The alert provides as much detail as possible as to the cause of the failure. For details on configuring timeslot alerts, see "Timeslot Settings Page" on page 656.

Host Allocation

When reserving a timeslot, the system calculates the availability of all the requested hosts and Vusers. A timeslot can be reserved successfully only if all of the requested Vusers are available, and all of the requested hosts can be allocated.

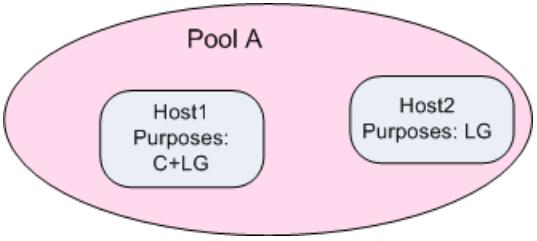
You manually request resources for the timeslot. For performance testing timeslots, you must request at least one Controller and one load generator. If you have linked a test to the timeslot, the hosts and Vusers defined in the test are automatically requested for the timeslot.

Hosts are allocated as follows:

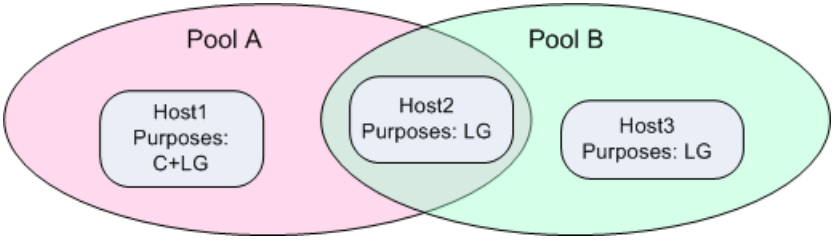
- A **specific host** defined in the system can be allocated for performance testing as long as it is available and operational. A **specific host** can be allocated for maintenance even if it is non-operational.
- An automatch host is matched up with a specific host that has the same properties. A host is allocated after the following criteria have been checked:
  - The system creates a list of all the hosts in the project's host pool that are operational and available, and that match the properties of the automatch host.
  - From this list of candidate hosts, the system allocates the host that best fits the requested properties, taking into account the host priority, the number of pools the host belongs to, the purposes assigned to the host, and the host's attributes. The system tries to allocate hosts in such a way that other hosts with similar but also additional properties may still be available for allocation elsewhere.

Examples:

➤ A load generator is requested for the timeslot. The project's pool, Pool A, contains Host1 and Host2. If Host1 has C+LG purposes, and Host2 has only the Load Generator purpose, then the system selects Host2, leaving Host1 available for other possible allocation.



➤ A load generator is requested for timeslot. If Host1 belongs to Pool A and has C+LG purposes, and Host2 belongs to Pool A and Pool B and has the Load Generator purpose, then the system prefers Host1 over Host2, leaving Host2 available for other allocation, including for projects that use Pool B if necessary.



It is important to note that many conditions and changes in the system can occur that can affect host allocation. At such times, the system attempts to optimize the overall resource usage by reshuffling the hosts that are available among the timeslots.

It is not always possible to shuffle the hosts appropriately. When this happens, a timeslot might become **partially allocated**, and thus invalid. As soon as the requested host becomes available again or another host can be allocated instead, the timeslot becomes valid again.

For example:

- If an allocated host becomes non-operational the system will try to find another host to replace the non-operational host.
- In a version-enabled project, if a test is linked to an autostart timeslot and is checked out, modified, and checked in again before the timeslot starts, the timeslot recalculates the availability of the updated resources.

To view an example of how hosts are allocated, and how they are reshuffled when necessary, see "Example of Allocating and Reshuffling Hosts" on page 105.

Example of Allocating and Reshuffling Hosts

There are many factors that can affect the allocation of hosts among timeslots. Consider the following scenarios which illustrate how hosts are allocated among timeslots and how changes in the system can affect the host allocation. You will see that the system attempts to optimize the overall resource usage by reshuffling the hosts that are available among the timeslots.

Assume the following hosts belong to the project's host pool:

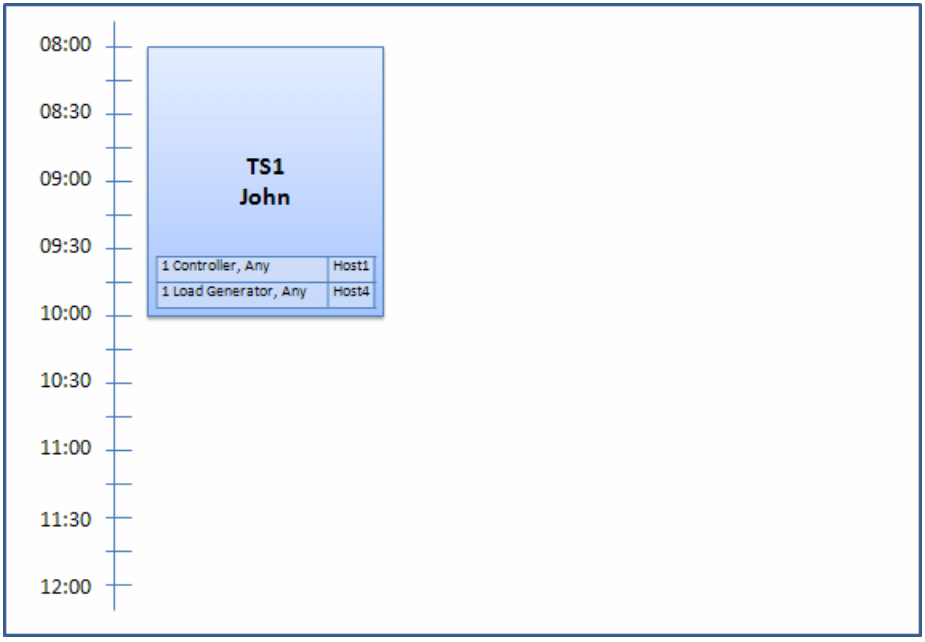
Host	Properties
Host1	Controller
Host2	Controller + Load Generator
Host3	Load Generator with the following property: ➤ **Priority = 1_Lowest**
Host4	Load Generator with the following properties: ➤ **Citrix.** The host can run scripts based on Citrix protocols. ➤ **Priority = 9_Highest**

At 07:00 am, John reserves the following timeslot:

Timeslot	Reserved at	Reserved for	Requested Resources, Properties
TS1	07:00	08:00am - 10:00am	1 Controller, Any 1 Load Generator, Any

John submits the request. The system allocates Host1 as the Controller, leaving Host2 available to serve as either load generator or Controller in other timeslots. Additionally, the system allocates Host4 as the load generator, since it has higher priority than both Host2 and Host3. The following hosts are allocated successfully:

Requested Hosts	Allocated Hosts
1 Controller, Any	Host1
1 Load Generator, Any	Host4



At 07:30 am, Sue submits the following timeslot reservation:

Timeslot	Reserved at	Reserved for	Requested Resources, Properties
TS2	07:30	09:00am - 11:00am Autostart	1 Controller, Any 1 Load Generator, Citrix

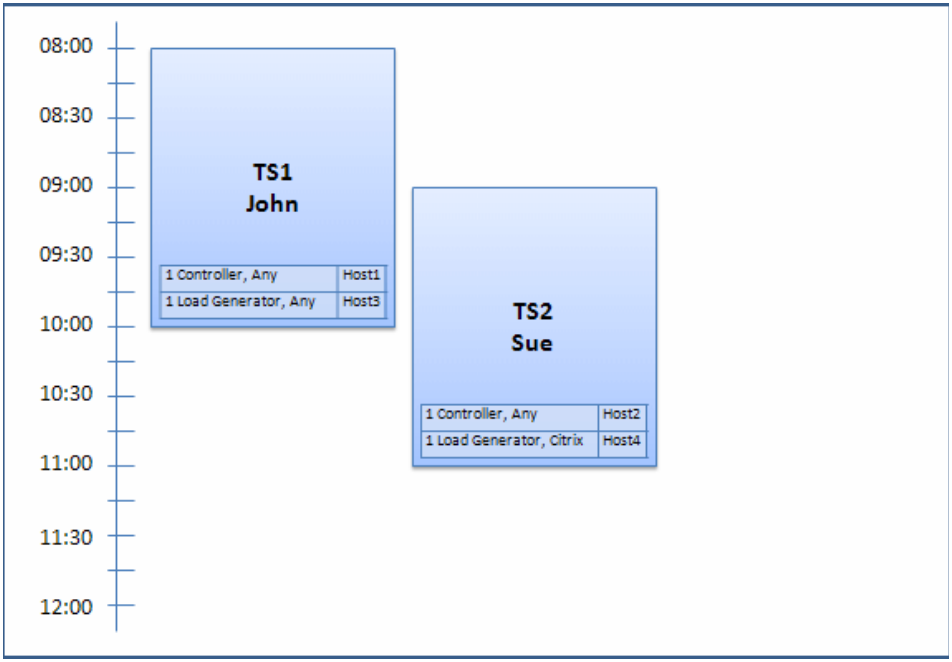
Because Host4 is the only Citrix load generator, the system checks if it can allocate a different load generator to John's timeslot so that Host4 can be allocated to Sue's timeslot instead.

The necessary hosts are available, so the following reshuffle occurs:

- Host3 is allocated to John; Host4 is allocated to Sue
- John's Controller, Host1 remains allocated to John; Host2, also a Controller, (not yet allocated), is allocated to Sue

Sue successfully submits the request. The new host allocation looks as follows:

Timeslot	Requested Hosts	Allocated Hosts
TS1	1 Controller, Any 1 Load Generator, Any	Host1 Host3 (replaced Host4)
TS2	1 Controller, Any 1 Load Generator, Citrix	Host2 Host4



Note: Host allocation works on a "first-come, first-served" basis. Since John reserved Host4 first, if there had been no other host to allocate to his timeslot, Host4 would have remained allocated to John, and Sue would not have been able to reserve her timeslot successfully.

At 07:45am, Peter reserves the following timeslot:

Timeslot	Reserved at	Reserved for	Requested Resources, Properties
TS3	07:45	10:00am - 12:00pm	1 Controller, Host2 1 Load Generator, Any

Peter is specifically requesting Host2 for his Controller, and any load generator. The system checks if the requested hosts can be allocated, taking into consideration requests and timing of the other timeslots:

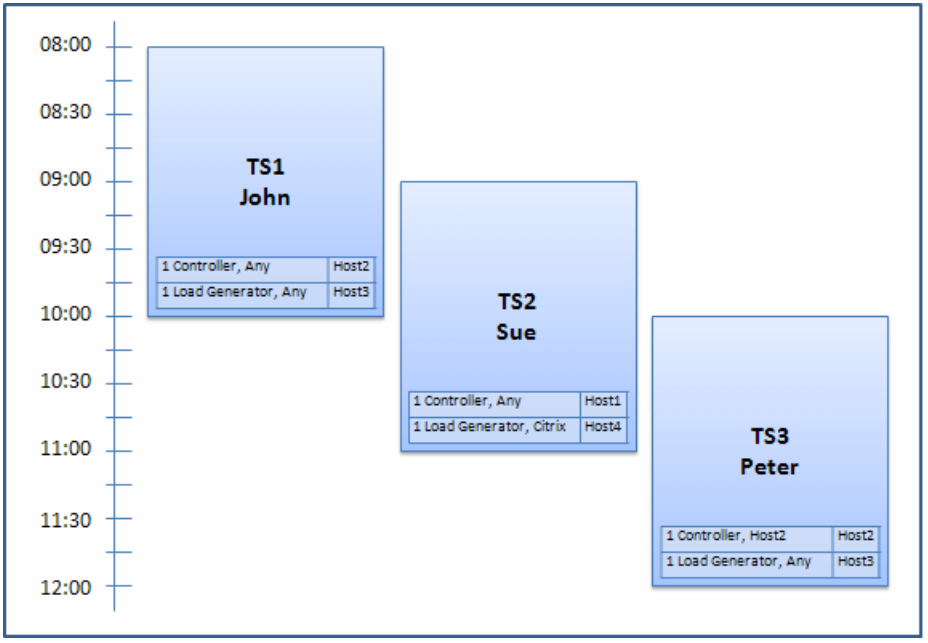
- To allocate Host2 to Peter's timeslot, it must be available by 10:00.
- Sue is willing to have any Controller.
- John's timeslot will end at 10:00 and free resources.

The following reshuffle occurs so that all the timeslots can be accommodated:

- Sue's timeslot gives up Host2, and is allocated Host1 instead; Host4 (Citrix) remains allocated to Sue's timeslot
- Host2 is allocated to John's timeslot; Host3 remains allocated to John's timeslot
- Host2 and Host3 can then be allocated to Peter's timeslot because John's timeslot will be finished by 10:00 when Peter's starts.

Peter successfully submits his request. The new host allocation looks as follows:

Timeslot	Requested Hosts	Allocated Hosts
TS1	1 Controller, Any 1 Load Generator, Any	Host2 Host3
TS2	1 Controller, Any 1 Load Generator, Citrix	Host1 Host4
TS3	1 Controller, Host2 1 Load Generator, Any	Host2 Host3



Note: If John and Peter's timeslots had overlapped, Host2 would not have been available for part of Peter's timeslot. In this case, the reshuffle would not have been possible and Peter would not have been able to reserve his timeslot successfully.

Now let's say at 07:55 Host2 becomes non-operational. As a result, TS1 takes back Host1, and starts at 08:00. It follows from the information above, that TS2 and TS3 both become invalid as their resources have become partially allocated.

Then, at 09:05, Host2 becomes operational again. It is allocated to TS2, and TS2 starts, though five minutes late, but still during the specified autostart retries period. (For details about configuring autostart retries, see "Timeslot Settings Page" on page 656.)

At 11:00, TS3 remains invalid (partially allocated) and is unable to start because Host2 is still being used by TS2.

Tasks

How to Reserve Performance Testing Timeslots

This task describes how to reserve resources for running performance tests.

Note:

- This task is part of a higher-level task. For details, see "How to Conduct a Performance Test" on page 28.
- **Product Feature Movie.** To view a movie that demonstrates how to reserve timeslots, select **Help** > **Product Feature Movies** in the ALM main window. Under **HP ALM Performance Center 11.00 Movies**, select **Timeslots**.

To learn more about timeslot reservations, see "Reserving Timeslots Overview" on page 96.

This task includes the following steps:

1 Prerequisites

- Ensure that there is a host pool defined and that at least one of the hosts in the pool can be designated as a Controller.
- Ensure that the Host, Vuser, and Concurrent Run limits are defined in the project settings.
- If you know which test you want run during the timeslot, ensure that an instance of that test is included in a test set.

2 Create a timeslot

a On the ALM sidebar, under **Lab Resources**, select **Timeslots**.

b In the Timeslots toolbar, click the **New Timeslot** button.

c Enter the details of the timeslot and select resources. For user interface details, see "Timeslot Reservation Dialog Box" on page 138.

3 Verify the availability of the requested resources

Do one of the following:

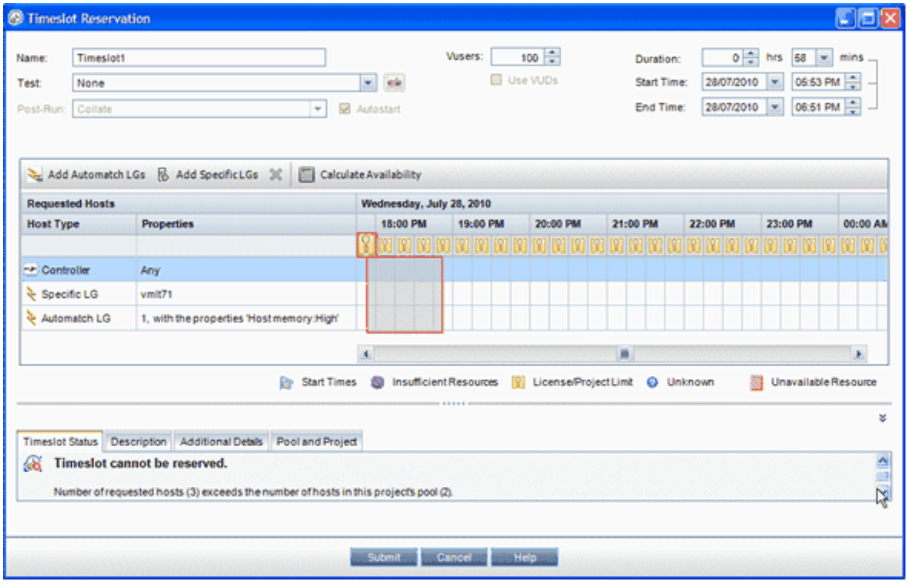
➤ (Recommended) Click **Calculate Availability**. The system checks the availability of the requested resources for the selected timeslot. The results of this calculation are displayed in the **Timeslot Status** tab and graphically on the resource availability timeline.

If the timeslot cannot be reserved, consider the reasons displayed in the Timeslot Status tab when reselecting your resources. If the timeslot can be reserved, you can click **Submit** to save the timeslot.

➤ Click **Submit**. The system calculates the availability of the requested resources during the selected timeslot. If all of the resources are available, the Timeslot Reservation dialog box closes and the timeslot is reserved and displayed in the Timeslots module. If the timeslot cannot be reserved, the reasons are displayed in the Timeslot Status tab.

Example:

In this example, 3 hosts were requested for a performance testing timeslot: 1 Controller + 1 specific load generator, and 1 automatch load generator. There are only 2 hosts in the project's host pool. The icon at the top of the resource availability timeline indicates that the request has exceeded the license/project limits, and the exact reason the timeslot cannot be reserved is indicated in the Timeslot Status tab.



How to Reserve Maintenance Timeslots (Lab Management only)

This task describes how to reserve hosts for performing maintenance tasks.

Note:

- This task is part of a higher-level task. For details, see "Manage and maintain Performance Center lab resources" on page 623.
- **Product Feature Movie.** To view a movie that demonstrates how to reserve timeslots, select **Help** > **Product Feature Movies** in the ALM main window. Under **HP ALM Performance Center 11.00 Movies**, select **Timeslots**.

To learn more about timeslot reservations, see "Reserving Timeslots Overview" on page 96.

This task includes the following steps:

- "Create a maintenance timeslot" on page 115
- "Verify the availability of the requested hosts" on page 116

1 Create a maintenance timeslot

a On the Lab Management sidebar, under **Lab Usage**, select **Timeslots**.

b In the Timeslots toolbar, click the **New Maintenance Timeslot** button.

c Enter the details of the timeslot and select hosts. For user interface details, see "Timeslot Reservation: Maintenance Dialog Box (Lab Management Only)" on page 146.

2 Verify the availability of the requested hosts

Do one of the following:

- (Recommended) Click **Calculate Availability**. The system checks the availability of the requested hosts for the selected timeslot. The results of this calculation are displayed in the **Timeslot Status** tab and graphically on the resource availability timeline.

  If the timeslot cannot be reserved, consider the reasons displayed in the Timeslot Status tab when reselecting your hosts. If the timeslot can be reserved, you can click **Submit** to save the timeslot.

- Click **Submit**. The system calculates the availability of the requested hosts during the selected timeslot. If all of the hosts are available, the Timeslot Reservation dialog box closes and the timeslot is reserved and displayed in the Timeslots module. If the timeslot cannot be reserved, the reasons are displayed in the Timeslot Status tab.

Note: If a host that you are trying to reserve for maintenance is reserved for another timeslot that has not yet started, and you cannot delay the maintenance task, first consult with the user who reserved the other timeslot. If he/she agrees, move the start time of the other timeslot, or delete it accordingly.

Reference

Reserving Timeslots User Interface

This section includes:

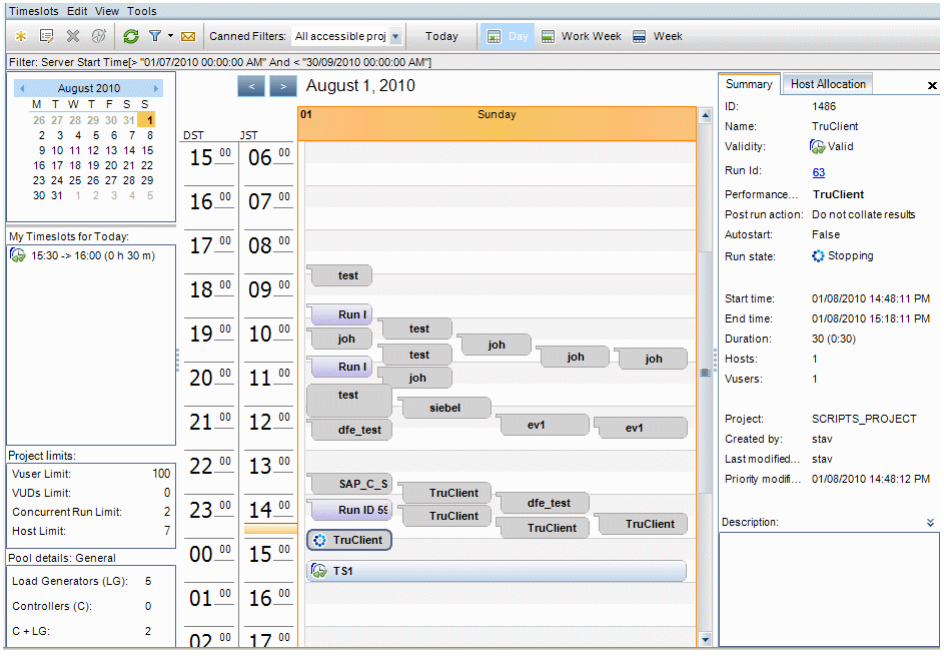
Timeslots Module Window

This module enables you to reserve timeslots for running performance tests or performing maintenance tasks.

It contains the following views: Calendar View, Grid View. You select a view from the **View** menu.

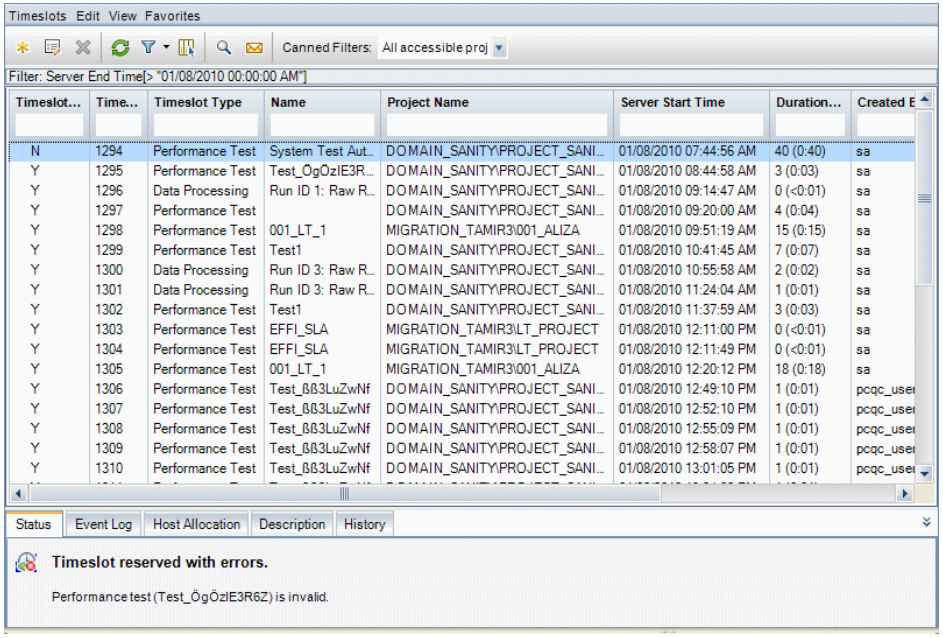
Timeslots Calendar View

This view enables you to view the timeslots in a calendar view. The Calendar view is time-oriented. It allows you to view your timeslots scheduled for the same day, and to get a visual indication of overlapping timeslots.



Timeslots Grid View

Enables you to view timeslots in a flat, non-hierarchical view. Each line in the grid displays a separate timeslot. This view is useful for filtering the timeslots and for viewing the details of multiple timeslots simultaneously.



To access	Use one of the following: ➤ **Administrator (Maintenance timeslots):** On the Lab Management sidebar, under **Lab Usage**, select **Timeslots**. ➤ **Performance Tester (Performance Testing timeslots):** On the ALM sidebar, under **Lab Resources**, select **Timeslots.**
Important information	➤ The Calendar and Grid views display different types of information about the timeslots. To view full details about a particular timeslot, open the timeslot in the Timeslot Reservation dialog box. For details, see: ➤ "Timeslot Reservation Dialog Box" on page 138 ➤ "Timeslot Reservation: Maintenance Dialog Box (Lab Management Only)" on page 146 ➤ Users can reserve timeslots for maintenance (administrators only) or for performance testing. Timeslots for data processing tasks, such analyzing test results, are reserved automatically by the system when needed.
Relevant tasks	"How to Reserve Performance Testing Timeslots" on page 112
See also	"Reserving Timeslots Overview" on page 96

Main Timeslots Area

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
<Timeslots module common UI elements>	➤ **Timeslot menus and buttons.** For command and button descriptions, see "Timeslots Module Menus and Buttons" on page 127. ➤ **Timeslot fields.** For field definitions, see "Timeslots Module Fields" on page 134. ➤ **Timeslot icons.** For icon descriptions, see "Timeslots Module Icons" on page 137. ➤ **ALM main menu and sidebar.** For details on the Tools menu, Help menu and sidebar, see the *HP Application Lifecycle Management User Guide*.
<Calendar>	Displays the reserved timeslots in your projects in calendar form. ➤ The timeslots in the calendar view are color-coded as follows: ➤ Yellow shading: Maintenance timeslots ➤ Blue shading: Performance testing timeslots reserved in the currently signed-in project ➤ Gray shading: Performance testing timeslots reserved in other projects ➤ Lilac shading: Data processing timeslots **Available from:** Calendar view only
<Date navigator>	Enables you to select the day/week to display in the main calendar grid.
<grid filters>	Located under each column name. Displays the filter that is currently applied to a column. If the filter box is empty, no filter is currently applied to the column. Type directly into the box, or click the box to display the **Browse** button which opens the Select Filter Condition dialog box. For more details, see the *HP Application Lifecycle Management User Guide*. **Available from:** Grid view only

UI Elements (A-Z)	Description
Description tab	Describes the currently selected timeslot. **Available from:** Grid view only
Event Log tab	Displays a log of events related to the timeslots. For details, see "Event Log" on page 351. **Available from:** Grid view only
History tab	Lists changes made to the currently selected timeslot. For more details, see the *HP Application Lifecycle Management User Guide*. **Available from:** Grid view only
Host Allocation tab	Displays the allocation of the hosts for the selected timeslot. For more details, see "Host Allocation Tab" on page 124. **Note:** ➤ **Calendar view**: Located on right of calendar, when a timeslot is selected in the calendar. ➤ **Grid view:** Located in the information panel.
My Timeslots for Today	Displays open and future timeslots that you reserved for the current day in the current project. **Available from:** Calendar view only
Pool Details	Displays information about the hosts in the project's pool. **Available from:** Calendar view only
Project Limits	Displays the Vuser limit, VUDs limit, concurrent run limit, and host limit defined for the project. **Available from:** Calendar view only
Status tab	Displays the status and validity of the selected timeslot. **Available from:** Grid view only

UI Elements (A-Z)	Description
Summary tab	Displays a summary of the timeslot selected in the calendar. For more details, see "Summary Tab" on page 125. **Available from:** Calendar view only, when a timeslot is selected in the calendar.
Timeslots grid	Displays the timeslots in your projects in a grid. **Available from:** Grid view only

Host Allocation Tab

This tab displays the allocation of hosts for the selected timeslot. For future timeslots, the host allocation is a temporary allocation.

Important information	If an allocated host becomes unavailable, the system attempts to replace the allocated host with another host with similar properties. If no host is available, the timeslot becomes partially allocated and is rendered invalid. ➤ **Calendar view**: Located on right of calendar, when a timeslot is selected in the calendar. ➤ **Grid view:** Located in Information panel

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Requested	Displays the requested hosts, including the requested properties.
Actual	Displays the specific hosts allocated for the timeslot. May display the following in place of specific host names: ➤ **Not Allocated.** Requested host(s) could not be allocated. ➤ **Allocated (Deleted).** The allocated host was deleted after the timeslot start time. ➤ **From another pool.** The host belongs to a host pool in another project to which you do not have access.

Summary Tab

This tab displays a summary of the timeslot details.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
ID	The timeslot ID.
Name	The name of the timeslot.
Validity	The validity of the timeslot: ➤ **Valid.** The timeslot is valid. ➤ **Failed.** The timeslot failed because resources unexpectedly became unavailable, because of a change in license definitions, or, in the case of performance testing timeslots, due to changes in test validity.
Run ID	The ID of the test run that is running/ran during the timeslot. **Available for:** Performance testing timeslots only, and when a performance test is selected.
Performance Test	The name of the performance test linked to the timeslot. **Available for:** Performance testing timeslots only.
Post-run action	The post-run action specified for the linked performance test. **Available for:** Performance testing timeslots only.
Autostart	Indicates that you selected to start the linked performance test automatically. **Available for:** Performance testing timeslots only.
Run state	The run state of the performance test linked to the timeslot. **Available for:** Performance testing timeslots only, and when a performance test is selected.
Maintenance state	The state of the maintenance timeslot. **Available for:** Maintenance timeslots only.

UI Elements	Description
Processing state	The state of the data processing timeslot. **Available for:** Data processing timeslots only.
Start time	The start time of the timeslot.
End time	The end time of the timeslot.
Duration	The duration of the timeslot (in minutes). Also displays the in HH:MM format in parentheses).
Hosts	The number of hosts requested for the timeslot.
Vusers	The number of Vusers requested for the timeslot. **Available for:** Performance testing timeslots only.
Project	The project in which the timeslot was created.
Created by	The user who created the timeslot.
Last modified by	The user who last modified the timeslot.
Priority modified	The date and time that the priority of the timeslot was modified.
Description	Displays a description of the timeslot.

Timeslots Module Menus and Buttons

The section describes the menus and buttons available in the Timeslots module.

To access	Use one of the following: ➤ **Administrator (Maintenance timeslots):** On the Lab Management sidebar, under **Lab Usage**, select **Timeslots**. ➤ **Regular user (Performance Testing timeslots):** On the ALM sidebar, under **Lab Resources**, select **Timeslots.**
Important information	Some menu commands and buttons are not available in all timeslot views.
Relevant tasks	"How to Reserve Performance Testing Timeslots" on page 112
See also	"Reserving Timeslots Overview" on page 96

User interface elements are described below (unlabeled elements are shown in angle brackets):

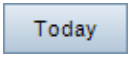
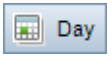
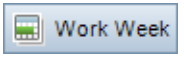
UI Elements (A-Z)	Menu	Description
 **Abort and Free Resources**	Edit and <right-click menu>	Aborts the current timeslot and frees the reserved resources. For performance testing timeslots, if a test is running, the run is aborted. **Notes for aborting and freeing performance testing timeslots:** ➤ You can perform this operation from Lab Management or from the project where the timeslot was reserved only. ➤ If a test is running, you must have **Abort** and **Edit** permissions to perform this operation. If there is no test running, then you need only have **Edit** permissions to perform this operation.
Add to Favorites	Favorites	Opens the Add Favorite dialog box, enabling you to add a favorite view to your private or the public folder. For details, see the *HP Application Lifecycle Management User Guide*. **Available from:** Grid view only
Calendar View	View	When selected, the timeslots are displayed in the Calendar view.

UI Elements (A-Z)	Menu	Description
Canned Filters	None	Enables you to filter the timeslots as follows: ➤ **All accessible projects.** Displays all timeslots from all of your projects. ➤ **Mine (This project).** Displays all of the timeslots that you created in this project. ➤ **My Failed (This project).** Displays all of the timeslots that you created in this project that have failed. ➤ **Mine (All projects).** Displays all of the timeslots that you created in all of your projects. ➤ **My Failed (All projects).** Displays all of the timeslots that you created in all of your projects that have failed.
Copy URL	Timeslots and <right-click menu>	Copies the selected timeslot and pastes its URL as a link. The timeslot itself is not copied. Instead, you can paste the address into another location, such as an email or a document. Clicking the link opens ALM and takes you to the timeslot file or folder. If you are not already logged in, ALM first prompts for login details.
 **Delete**	Edit and <right-click menu>	Deletes the selected timeslot. **Note:** You can only delete future timeslot reservations in the current project. **Note for Administrator:** You can delete future performance testing timeslots from Lab Management.

UI Elements (A-Z)	Menu	Description
Export	Timeslots and <right-click menu>	Opens the Export Grid Data dialog box, enabling you to export the resources in the grid as a text file, Microsoft Excel worksheet, Microsoft Word document, or HTML document. Choose one of the following options: ➤ **Export All.** Exports all resources in the grid. ➤ **Export Selected.** Exports selected resources in the grid. **Available from:** Grid view only
 **Find**	View	Opens the Find dialog box, enabling you to search for a timeslot in the module. For details about search options, see the *HP Application Lifecycle Management User Guide*. **Available from:** Grid view only
 **Go To Timeslot**	Timeslots	Opens the Go To Timeslot dialog box, enabling you to find a specific timeslot by its ID.
 **Go To Timeslot in Calendar/Grid**	Right-click menu	➤ **Calendar view:** Goes to the selected timeslot in the Grid view. ➤ **Grid view:** Goes to the selected timeslot in the Calendar view. **Note:** Toolbar button available in Calendar view only.
Grid Filters	View and <right-click menu>	Enables you filter the data according to an entry in the filter box. For details about filtering options, see the *HP Application Lifecycle Management User Guide*. **Available from:** Grid view only

UI Elements (A-Z)	Menu	Description
Grid View	View	When selected, the timeslots are displayed in the Grid view.
Information Panel	View and <right-click menu>	Shows/Hides the Information Panel in the lower area of the module. **Available from:** Grid view only
 **New Timeslot**	Timeslot and <right-click menu>	Enables you to reserve a new timeslot.
Organize Favorites	Favorites	Organizes your favorite views. For details, see the *HP Application Lifecycle Management User Guide*. **Available from:** Grid view only
Private	Favorites	Lists the favorite views that are accessible only to the user who created them. **Available from:** Grid view only
Public	Favorites	Lists the favorite views that are accessible to all users. **Available from:** Grid view only
 **Refresh All**	View	Refreshes the grid so that it displays the most up-to-date information.
 **Select Columns**	View	Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For more details, see the *HP Application Lifecycle Management User Guide*. For details about the Timeslot module fields, see "Timeslots Module Fields" on page 134. **Available from:** Grid view only

UI Elements (A-Z)	Menu	Description
 **Send by E-mail**	Timeslots and <right-click menu>	Opens the Send E-mail dialog box, enabling you to send timeslot details to recipients selected from a list or to the user who reserved the timeslot. For more details, see the *HP Application Lifecycle Management User Guide*.
 **Set Filter/Sort**	View	Enables you to filter and sort the timeslots. Any currently applied filters or sorting orders are displayed below the toolbar. For more details, see the *HP Application Lifecycle Management User Guide*. **Note:** In the Calendar view you can filter the timeslots only.
Show Timeslot Details	View	Displays the **Summary** and **Host Allocation** tabs (to the right of the calendar grid) which contain details about the selected timeslot. **Available from:** Calendar view only
Time Zone Options	Tools	Opens the Time Zone Options dialog box, enabling you to display an additional time zone in the Timeslots calendar view. For details, see "Time Zone Options Dialog Box" on page 165. **Available from:** Calendar view only

UI Elements (A-Z)	Menu	Description
 **Timeslot Details**	Timeslot and <right-click menu>	Opens the Timeslot Reservation dialog box, enabling you to view and modify details of the selected timeslot. For details, see ➤ "Timeslot Reservation Dialog Box" on page 138 ➤ "Timeslot Reservation: Maintenance Dialog Box (Lab Management Only)" on page 146 **Note:** You cannot modify past timeslots.
		Displays the current day only on the calendar. **Available from:** Calendar view only
		Displays the date selected in the date selector. **Available from:** Calendar view only
		Displays the 5-day work week around the date selected in the date selector. **Available from:** Calendar view only
		Displays the full week around the date selected in the date selector. **Available from:** Calendar view only

Timeslots Module Fields

This section describes the fields in the Timeslots module.

UI Elements (A-Z)	Description
Additional Requested Vusers	The number of Vusers requested for the timeslot in addition to those defined in the linked performance test.
Autostart Enabled	**Y** indicates that the selected performance test will start running when the timeslot starts. **Note:** For maintenance timeslots, this field is empty.
Consumes VUDs	**Y** indicates that the timeslot will use/used Vusers from the VUDs license.
Created By	The user who reserved the timeslot.
Created	The date and time the timeslot was reserved.
Description	A description of the timeslot.
Duration in Minutes	The duration of the timeslot in minutes. **Note:** This field displays the duration in HH:MM format in parentheses.
End Time	The date and time the timeslot is due to end/ended.
Is Active	**Y** indicates an active operation currently occurring in the scope of this timeslot. **Examples:** ➤ A performance test is running. ➤ A host is rebooting. **Note:** You cannot edit an active timeslot.
Modified	The date and time on which the timeslot details were last modified.
Modified By	The user who last modified the timeslot details.
Name	The timeslot's name.
Post Run Action	The action taken after the performance test completes its run.

UI Elements (A-Z)	Description
Project Name	The name of the project to which the timeslot belongs.
Requested Hosts	The number of hosts (including Controller) requested for the timeslot.
Run ID	The ID of the run created in the context of the timeslot.
Server End Time	The date and time that the timeslot is due to end/ended, in terms of the server's time zone.
Server Start Time	The date and time that the timeslot is due to start/ started, in terms of the server's time zone.
Start Time	The date and time that the timeslot is due to start/ started.
State	The state of the timeslot. **Performance testing timeslot states:** ➤ **None.** No test is linked to the timeslot. ➤ **Not Started.** A test is linked to the timeslot but has not started running. ➤ **<Run states>.** Run and post-run states. **Maintenance and data processing timeslot states:** ➤ **Active.** An operation is running during the timeslot. ➤ **Inactive**. No operation is running during the timeslot.
Test Name	The name of the performance test linked to the timeslot. **Note:** If a test that is linked to a timeslot is deleted, this will affect the timeslot.
Test ID	The ID of the performance test linked to the timeslot.
Test Instance ID	The ID of the performance test instance linked to the timeslot.
Test Validity	The validity of the performance test linked to the timeslot.
Timeslot ID	The ID of the timeslot.
Timeslot Type	The type of timeslot: performance testing, maintenance, or data processing.

UI Elements (A-Z)	Description
Timeslot Validity	The validity of the timeslot based on allocation of resources. ➤ **Y.** Indicates that the timeslot is valid, and that all resources were allocated as requested. ➤ **N.** Indicates that a valid timeslot became invalid, due to license, resource, or test validation issues. In this state, the timeslot is **partially allocated**. For more details, see "Understanding Timeslot Failure" on page 102.
Total Vusers	The total number of Vusers reserved for the timeslot.
Vusers from Test	The number of Vusers defined in the linked performance test.

Timeslots Module Icons

This section describes the icons available in the Timeslots module.

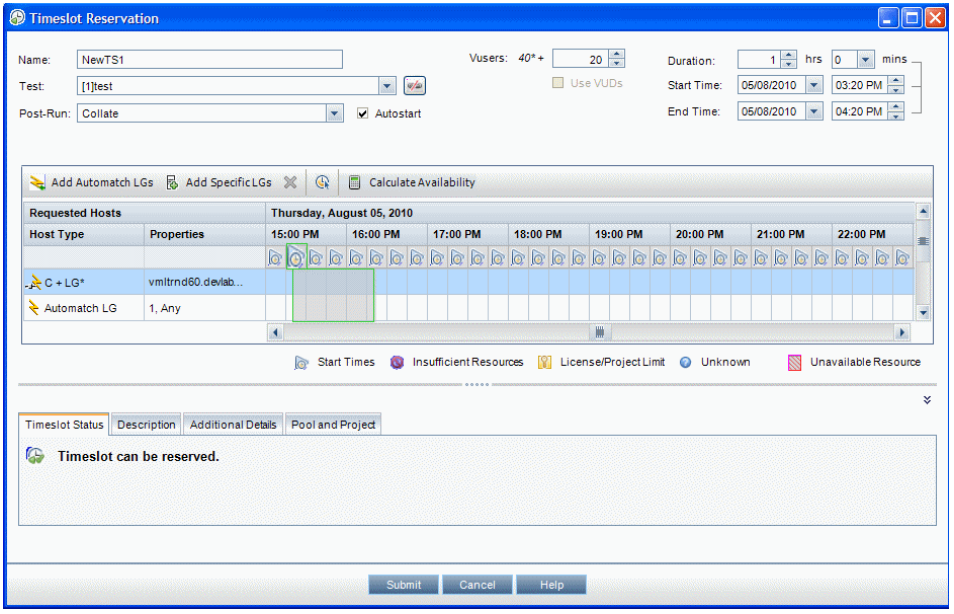
To access	Use one of the following: ➤ **Administrator (Maintenance timeslots):** On the Lab Management sidebar, under **Lab Usage**, select **Timeslots**. ➤ **Performance Tester (Performance Testing timeslots):** On the ALM sidebar, under **Lab Resources**, select **Timeslots.**
See also	"Timeslots Module Window" on page 118

The icons are described below:

UI Elements	Description
	Indicates a valid timeslot.
	Indicates a partially allocated (invalid) timeslot.
	Indicates an active timeslot.

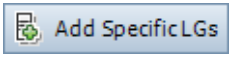
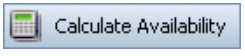
Timeslot Reservation Dialog Box

This dialog box enables you to reserve a performance testing timeslot and view details of a reserved performance testing timeslot.



To access	➤ **New Timeslot Reservation:** On the ALM sidebar, under **Lab Resources**, select **Timeslots.** Then use one of the following: ➤ On the Timeslots toolbar, click the **New Timeslot** button. ➤ Calendar view only: Double-click anywhere on the calendar, or right-click the target time and select **New Timeslot.** ➤ **Existing Timeslot Reservation:** **From Lab Management:** On the sidebar, under **Lab Usage**, select **Timeslots**. **From ALM:** On the sidebar, under **Lab Resources**, select **Timeslots**. Then use one of the following: ➤ Grid View: Right-click a timeslot of type **Performance Test** and select **Timeslot Details**. ➤ Calendar view only: Right-click a performance testing (blue) timeslot and select **Timeslot Details**.
Important information	➤ Use this dialog box to reserve or view a **performance testing** timeslot. ➤ For **maintenance** timeslots, see "Timeslot Reservation: Maintenance Dialog Box (Lab Management Only)" on page 146. ➤ For **data processing** timeslots, see "Timeslot Reservation: Data Processing Dialog Box" on page 151.
Relevant tasks	"How to Reserve Performance Testing Timeslots" on page 112
See also	"Reserving Timeslots Overview" on page 96

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Unlink Test.** Unlinks the performance test selected for this timeslot.
	Opens the Select Automatch Load Generators dialog box, enabling you to select automatch load generators with specific properties for the timeslot. For more details, see "Select Automatch Load Generators Dialog Box" on page 158. **Note:** You must request at least one load generator (automatch or specific) for the timeslot. **Available:** For new, open, or future timeslots
	Opens the Select Specific Load Generators dialog box, enabling you to select specific load generators for the timeslot. For more details, see "Select Specific Load Generators Dialog Box" on page 160. **Note:** You must request at least one load generator (automatch or specific) for the timeslot. **Available:** For new, open, or future timeslots
	**Remove.** Removes the selected load generators from the lists of requested load generators. **Note:** You can change the selected Controller, but you cannot delete it.
	**Set Start Time as Now.** Selects the current time in the resource availability chart. **Note:** A timeslot whose start time is set to the current time opens the immediately upon submitting the reservation.
	Calculates the availability of the requested resources for the selected timeslot. The results are displayed graphically on the resource availability chart, and a message is displayed in the Timeslot Status tab.

UI Elements	Description
<Message bar>	Located at the top of the dialog box. Displays messages and warnings about the timeslot. **Available for:** Existing timeslots only.
<Resource availability timeline>	Displays the availability of requested resources on a timeline: ➤ **Availability not calculated.** Displayed on the timeline before you calculate the availability of the requested resources for a new timeslot, or when modifying a timeslot. ➤  **Start Times.** Indicates available start times for the timeslot, when the requested resources are available. ➤  **Insufficient Resources.** Indicates that not all the requested resources are available at the start times indicated on the timeline. ➤  **Unknown.** Displayed before calculating the availability of the requested resources for the timeslot. ➤  **License/Project Limit.** Indicates license or project limit issues at the start times indicated on the timeline. **Example.** More hosts requested than available in the license limit. ➤  **Unavailable Resource.** Indicates that a requested resource is not available at the start times indicated on the timeline.
Name	A descriptive name for the timeslot.
ID	The ID of the timeslot.

UI Elements	Description
Test	Enables you to select a performance test to run during the timeslot. **Version Control:** You cannot link a test that is checked out. **Note:** ➤ A linked test must be a valid test, and an instance of the test must be included in a test set. For information on working with test sets, see the *HP Application Lifecycle Management User Guide*. ➤ If you make changes to the linked test (in the Performance Test Designer), the timeslot is updated automatically, and you do not need to relink the test manually. ➤ Changes to a linked test might affect the validity of the timeslot. ➤ You do not have to link a test to the timeslot. However, linking a test to the timeslot gives you the option of having a test run automatically during the timeslot, without your manual intervention. For details, see "Autostart Timeslots" on page 99.

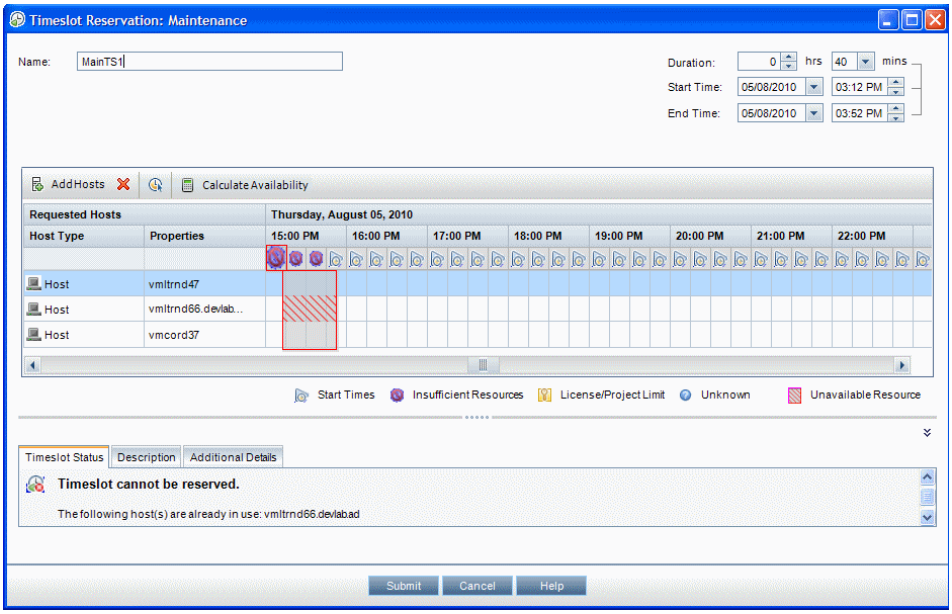
UI Elements	Description
Post-Run	The action to be taken when the performance test run is complete. Available only when a performance test is selected for the timeslot. ➤ **Do not collate results.** Frees the machines immediately after the performance test ends. When the run has finished, the run results left on the load generators. You can analyze the results at a later stage from the Results tab. ➤ **Collate.** When the run has finished, the run results are collected from all the load generators. **Note:** To prevent loss of or inaccessibility to run data, select this option so that the results are collected immediately upon completion of the test run. ➤ **Collate and Analyze.** When the run has finished, the run results are collected and analyzed. Data analysis requires some time, depending on the size of the results file. If there is no timeslot available to include the data analysis, then select the **Collate** option instead, and run late Analysis when a data processor becomes available. You run late Analysis from the Results tab. For details, see "Results/Last Run Results Tab" on page 354. **Default value:** Collate
Autostart	The linked performance test automatically starts running at the start of the timeslot, without any manual intervention. **Version Control:** The last checked-in version of the test always runs, even if you have the test checked out at the start of the timeslot. **Note:** To set autostart retry settings, see "Timeslot Settings Page" on page 656.

UI Elements	Description
Vusers	Enables you to request a number of Vusers for the timeslot. **Note:** ➤ If a test is selected for the timeslot, the number of Vusers defined in the test is displayed automatically (indicated by an asterisk "*"), and you can reserve additional Vusers. ➤ The sum of all Vusers reserved for the requested timeslot and other timeslots must not exceed the Vuser limit specified in the project settings (**Tools > PC Project Settings**), and must not exceed the number of Vusers specified in the license.
Use VUDs	When selected, the timeslot allocates VUD-license Vusers for the timeslot, rather than regular license Vusers. For details about VUDs, see "HP ALM Performance Center Licenses Overview" on page 822.
Duration	The duration of the timeslot, in hours and minutes. **Note:** A timeslot can be reserved for a minimum of 30 minutes and maximum of 480 hours (20 days).
Start Time	The date and time (in hours and minutes) that the timeslot starts.
End Time	The date and time (in hours and minutes) that the timeslot ends.
Requested Hosts grid	Displays the hosts requested for the timeslot. By default, an automatch Controller is selected. You can change this by browsing for a specific Controller. **Note:** ➤ You must request at least one load generator (automatch or specific) for the timeslot. ➤ If a test is selected for the timeslot, the hosts defined in the test are displayed automatically (indicated by an asterisk "*"), and you can request additional hosts.

UI Elements	Description
Timeslot Status tab	Displays the status of the timeslot reservation. For details about timeslot failure, see "Understanding Timeslot Failure" on page 102.
Description tab	Describes the currently selected timeslot. **Tip:** Right-clicking in this area displays a toolbar for formatting and spell checking the text.
Additional Details tab	Displays additional details related to the timeslot.
Pool and Project tab	Displays resources defined in the project's host pool, as well as the project limits.
Event Log tab	Displays a log of events related to the timeslot. For details, see "Event Log" on page 351. **Available:** Only when viewing an existing timeslot.

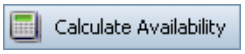
Timeslot Reservation: Maintenance Dialog Box (Lab Management Only)

This dialog box enables you to reserve a maintenance timeslot and view details of a reserved maintenance timeslot.



To access	➤ **New maintenance timeslot reservation (Lab Management only):** On the Lab Management sidebar, under **Lab Usage**, select **Timeslots**. Then use one of the following: ➤ On the Timeslots toolbar, click the **New Maintenance Timeslot** button. ➤ Calendar view only: Double-click anywhere on the calendar, or right-click the target time and select **New Maintenance Timeslot.** ➤ **Existing maintenance timeslot reservation:** **From Lab Management:** On the sidebar, under **Lab Usage**, select **Timeslots**. **From ALM:** On the sidebar, under **Lab Resources**, select **Timeslots**. Then use one of the following: ➤ Grid View: Right-click a timeslot of type **Maintenance** and select **Timeslot Details**. ➤ Calendar view only: Right-click a maintenance (yellow) timeslot and select **Timeslot Details**.
Important information	➤ Use this dialog box to reserve or view a **maintenance** timeslot (administrator only). ➤ For **performance testing** timeslots, see "Timeslot Reservation Dialog Box" on page 138. ➤ For **data processing** timeslots, see "Timeslot Reservation: Data Processing Dialog Box" on page 151.
Relevant tasks	"How to Reserve Maintenance Timeslots (Lab Management only)" on page 115
See also	"Reserving Timeslots Overview" on page 96

User interface elements are described below (unlabeled elements are shown in angle brackets):

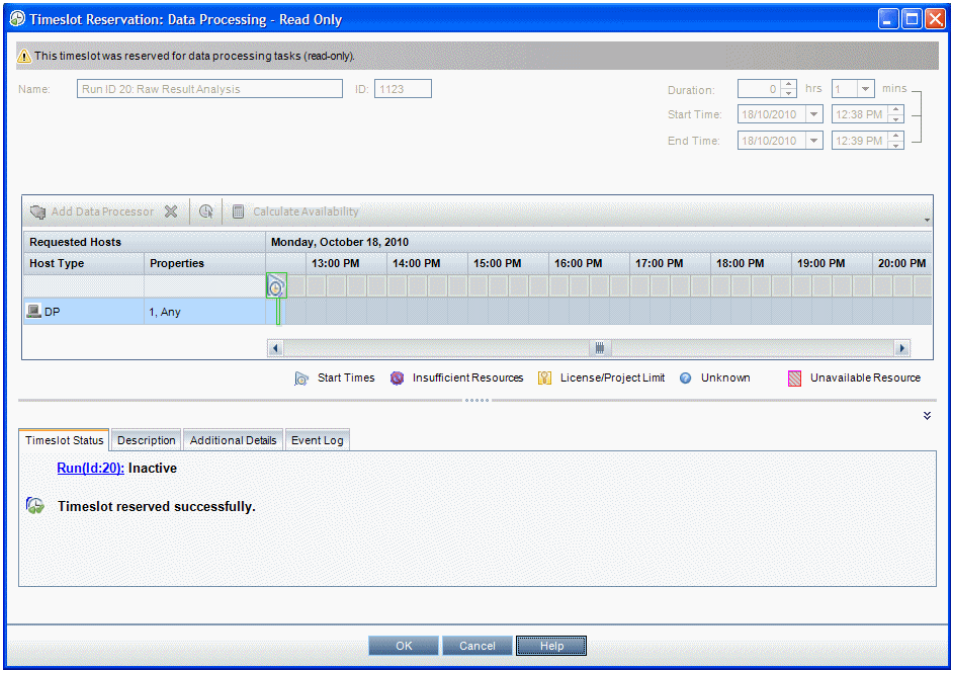
UI Elements	Description
	Opens the Add Hosts dialog box, enabling you to select hosts for the maintenance timeslot. For more details, see "Add Hosts Dialog Box" on page 163. **Note:** You must select at least one host for the timeslot. **Available:** For new, open, or future maintenance timeslots.
	**Remove.** Removes the selected host from the lists of requested hosts.
	**Set Start Time as Now.** Selects the current time in the resource availability chart. **Note:** A timeslot whose start time is set to the current time opens the immediately upon submitting the reservation.
	Calculates the availability of the requested resources for the selected timeslot. The results are displayed graphically on the resource availability timeline, and a message is displayed in the **Timeslot Status** tab.
<Message bar>	Located at the top of the dialog box. Displays messages and warnings about the timeslot. **Available for:** Existing timeslots only.

UI Elements	Description
<Resource availability timeline>	Displays the availability of requested resources on a timeline: ➤ **Availability not calculated.** Displayed on the timeline before you calculate the availability of the requested resources for a new timeslot, or when modifying a timeslot. ➤  **Start Times.** Indicates suggested start times for the timeslots, when the requested resources are available. ➤  **Insufficient Resources.** Indicates that not all the requested resources are available at the start times indicated on the timeline. ➤  **License/Project Limit.** Indicates license or project limit issues at the start times indicated on the timeline. **Example.** More hosts requested than available in the license limit. ➤  **Unknown.** Displayed before calculating the availability of the requested resources for the timeslot. ➤  **Unavailable Resource.** Indicates that a requested resource is not available at the start times indicated on the timeline.
Name	A descriptive name for the timeslot.
ID	The ID of the timeslot.
Duration	The duration of the maintenance timeslot, in hours and minutes. **Note:** A maintenance timeslot can be reserved for a minimum of between 15 minutes and maximum of 480 hours (20 days).

UI Elements	Description
Start Time	The date and time (in hours and minutes) that the timeslot starts. **Note:** If you need to reserve a host for a maintenance task, and the host is already reserved for running a test in the same timeslot, then you can modify the start of the testing timeslot, or delete the testing timeslot. Consult with the user who reserved the testing timeslot before making any changes.
End Time	The date and time (in hours and minutes) that the timeslot ends.
Requested Hosts grid	Displays the hosts requested for the timeslot. **Note:** You must select at least one host for the timeslot.
Timeslot Status tab	Displays the status of the timeslot reservation. For details about timeslot failure, see "Understanding Timeslot Failure" on page 102.
Description tab	Describes the currently selected timeslot. **Tip:** Right-clicking in this area displays a toolbar for formatting and spell checking the text.
Additional Details tab	Displays additional details related to the timeslot. **Available for:** Existing timeslots only.
Event Log tab	Displays a log of events related to the timeslot. For details, see "Event Log" on page 351. **Available:** Only when viewing an existing timeslot's details.

Timeslot Reservation: Data Processing Dialog Box

This dialog box enables you to view the details of an open or past data processing timeslot.



To access	**From Lab Management:** On the sidebar, under **Lab Usage**, select **Timeslots**. **From ALM:** On the sidebar, under **Lab Resources**, select **Timeslots**. Then use one of the following: ➤ Grid View: Right-click a timeslot of type **Data Processing** and select **Timeslot Details**. ➤ Calendar view only: Right-click a data processing (lilac) timeslot and select **Timeslot Details**.
Important information	➤ Use this dialog box to view the details of a current or past data processing timeslot. ➤ For **performance testing** timeslots, see "Timeslot Reservation Dialog Box" on page 138. ➤ For **maintenance** timeslots, see "Timeslot Reservation: Maintenance Dialog Box (Lab Management Only)" on page 146.

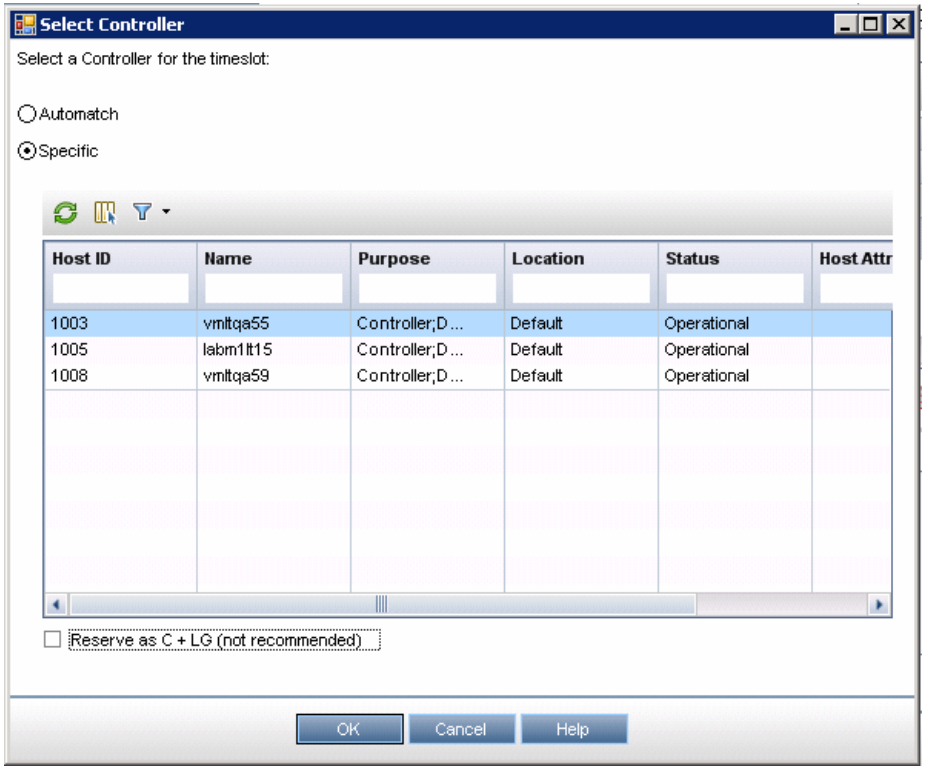
User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
<Message bar>	Located at the top of the dialog box. Displays messages and warnings about the timeslot. **Available for:** Existing timeslots only.
<Resource availability timeline>	Displays the availability of requested resources on a timeline: ➤ **Availability not calculated.** Displayed on the timeline before you calculate the availability of the requested resources for a new timeslot, or when modifying a timeslot. ➤  **Start Times.** Indicates suggested start times for the timeslots, when the requested resources are available. ➤  **Insufficient Resources.** Indicates that not all the requested resources are available at the start times indicated on the timeline. ➤  **License/Project Limit.** Indicates license or project limit issues at the start times indicated on the timeline. **Example.** More hosts requested than available in the license limit. ➤  **Unknown.** Displayed before calculating the availability of the requested resources for the timeslot. ➤  **Unavailable Resource.** Indicates that a requested resource is not available at the start times indicated on the timeline.
Name	A descriptive name for the timeslot. The name is given to the timeslot according to data processing task at hand.
ID	The ID of the timeslot.
Duration	The duration of the data processing timeslot, in hours and minutes. **Note:** A duration of a data processing timeslot is determined internally by the system, depending on the processing task at hand.

UI Elements	Description
Start Time	The date and time (in hours and minutes) that the timeslot started.
End Time	The date and time (in hours and minutes) that the timeslot ended or is scheduled to end.
Requested Hosts grid	Displays the data processor host reserved for the timeslot. **Note:** The data-processor host is selected automatically by the system.
Timeslot Status tab	Displays the status of the timeslot reservation. For details about timeslot failure, see "Understanding Timeslot Failure" on page 102.
Description tab	Describes the currently selected timeslot. **Tip:** Right-clicking in this area displays a menu for formatting and spell checking the text.
Additional Details tab	Displays additional details related to the timeslot.
Event Log tab	Displays a log of events related to the timeslot. For details, see "Event Log" on page 351.

Select Controller Dialog Box

This dialog box enables you to select a Controller for a performance testing timeslot.



To access	In ALM: **1** On the ALM sidebar, under **Lab Resources**, select **Timeslots.** **2** On the toolbar, click the **New Timeslot** button. **3** In the Timeslot Reservation dialog box, in the **Requested Hosts** grid, click the **Controller's Properties** column, and click the down arrow.
Important information	If you select a Controller host that has multiple purposes (C+LG+DP), it is recommended to dedicate the host for Controller functionality, and not to select it for other functionality as well, to avoid performance issues during runtime. This dialog box is available for performance testing timeslots only.
Relevant tasks	"How to Reserve Performance Testing Timeslots" on page 112
See also	"Reserving Timeslots Overview" on page 96

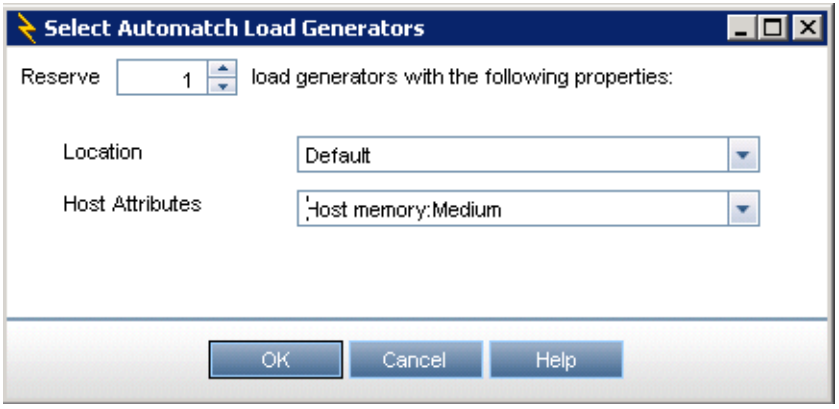
User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Refresh All.** Refreshes the grid so that it displays the most up-to-date list of Controller hosts based on the filters you have selected.
	**Select Columns.** Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For more details, see the *HP Application Lifecycle Management User Guide*. For details about the host fields, see "Host Fields" on page 689.

UI Elements	Description
	**Filter/Sort.** Enables you to filter and sort the Controller hosts in the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For details about filtering options, see the *HP Application Lifecycle Management User Guide*.
<Host grid>	Lists all the specific Controller hosts. **Note:** Enabled when **Specific** is selected.
Select a Controller for the timeslot	➤ **Automatch**. Enables the system to allocate an available Controller for the timeslot. ➤ **Specific.** Enables you to select a specific Controller for the timeslot.
Reserve as C + LG	Allows the selected host to serve both as a Controller and as a load generator. **Note:** This option is not recommended. The Controller host should be dedicated for Controller functionality, and it is recommended not to run Vusers on this host.

Select Automatch Load Generators Dialog Box

This dialog box enables you to select automatch load generators, with selected properties, for a performance testing timeslot.



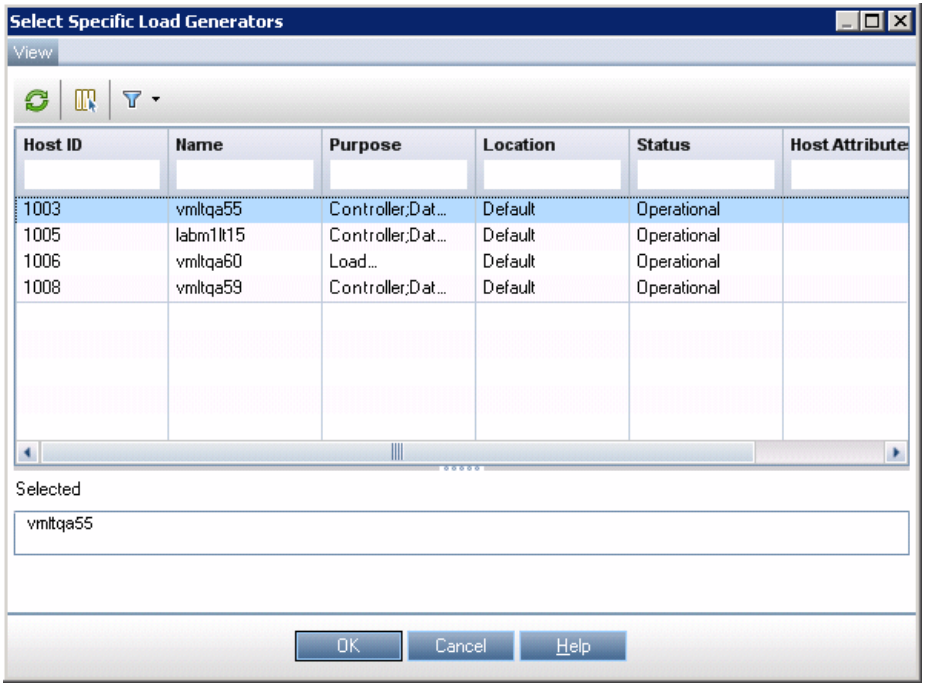
To access	In ALM: **1** On the ALM sidebar, under **Lab Resources**, select **Timeslots.** **2** On the toolbar, click the **New Timeslot** button. **3** In the Timeslot Reservation dialog box, in the **Requested Hosts** grid, click Add Automatch LGs.
Important information	Specific load generators matching the automatch load generators' properties are allocated in place of the automatch load generators. This dialog box is available for performance testing timeslots only.
Relevant tasks	"How to Reserve Performance Testing Timeslots" on page 112
See also	"Reserving Timeslots Overview" on page 96

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Reserve <xx> load generators....	The number of automatch load generators to reserve for the timeslot. **Note:** The total number of hosts (Controller + load generators) reserved for the timeslot may not exceed the project's host and host pool limits defined in the project's settings. For more details, see "Project Settings Details Dialog Box" on page 650. **Tip:** To select multiple automatch load generator with the same properties, you can do one of the following: ➤ In the **Reserve <xx>** box, enter 1, and select the relevant properties. Repeat this for the other automatch load generators. If you do this five times, for example, then five identical automatch load generators are displayed in the Requested Hosts grid. ➤ In the **Reserve <xx>** box enter the number of automatch load generators you want to select with the same properties. For example, enter 5. One entry is displayed in the Requested Hosts grid, representing all five automatch load generators.
<Load Generator Properties>	Enables you to specify properties for the requested automatch load generators: ➤ **Location.** The location of the load generators. To find a specific location, enter the value in the **Find** box, and click  . ➤ **Host Attributes.** Attributes of the load generators. **Tip:** The list of attributes can be customized. For details, see "Load Generator Attribute Customization" on page 224. **Note:** If no properties are specified, any available load generators are allocated.

Select Specific Load Generators Dialog Box

This dialog box enables you to reserve specific load generators for a performance testing timeslot.



To access	In ALM: **1** On the ALM sidebar, under **Lab Resources**, select **Timeslots.** **2** On the toolbar, click the **New Timeslot**  button. **3** In the Timeslot Reservation dialog box, in the **Requested Hosts** grid, click **Add Specific LGs**.
Important information	To avoid a timeslot becoming partially allocated in the case that a specific host unexpectedly becomes unavailable, it is recommended to reserve automatch load generators rather than specific load generators. For details about selecting automatch load generators, see "Select Automatch Load Generators Dialog Box" on page 158. This dialog box is available for performance testing timeslots only.
Relevant tasks	"How to Reserve Performance Testing Timeslots" on page 112
See also	"Reserving Timeslots Overview" on page 96

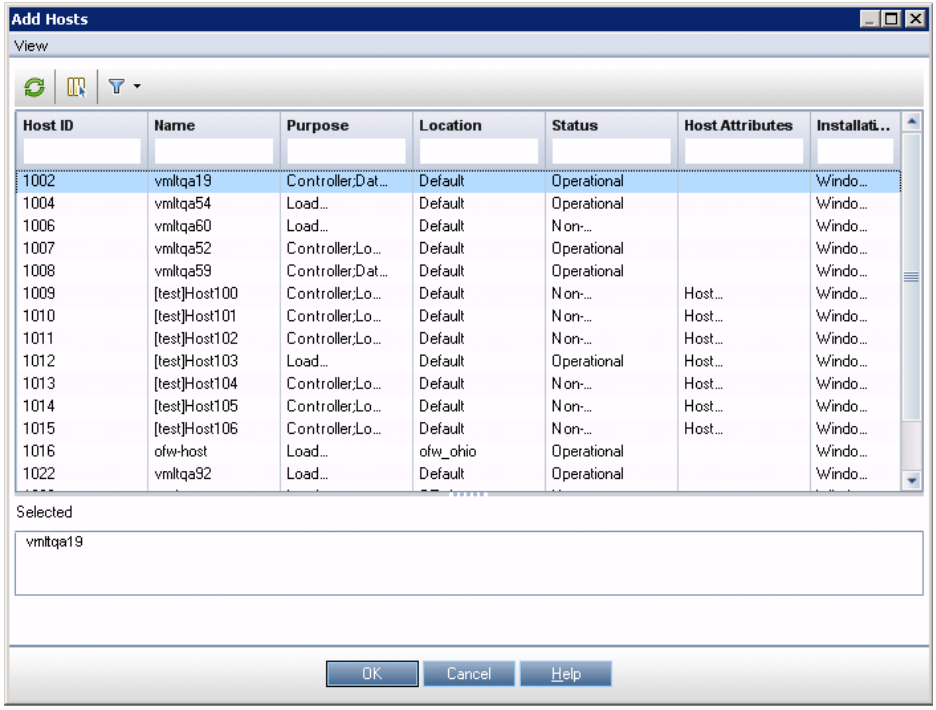
User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Refresh All.** Refreshes the grid so that it displays the most up-to-date list of load generators based on the filters you have selected.
	**Select Columns.** Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For more details, see the *HP Application Lifecycle Management User Guide*. For details about the host fields, see "Host Fields" on page 689.

UI Elements	Description
	**Filter/Sort.** Enables you to filter and sort the load generators in the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For details about filtering options, see the *HP Application Lifecycle Management User Guide*.
View menu	Enables you to: ➤ Show/hide the grid filters ➤ Show/hide the Summary panel which displays the selected load generators ➤ Filter/sort and the grid ➤ Refresh the grid ➤ Select columns to view in the grid
<Specific load generators grid>	Displays the specific load generators available for the reservation. **Tip:** To select multiple load generators, hold down the CTRL button on your keyboard while selecting load generators in the list.
Selected pane	Displays the load generators selected in the grid.

Add Hosts Dialog Box

This dialog box enables you to reserve hosts for a maintenance timeslot.



To access	In Lab Management: **1** On the Lab Management sidebar, under **Lab Usage**, select **Timeslots**. **2** On the toolbar, click the **New Maintenance Timeslot** button. **3** In the Timeslot Reservation: Maintenance dialog box, in the Requested Hosts grid, click Add Hosts.
Important information	This dialog box is available in Lab Management only.

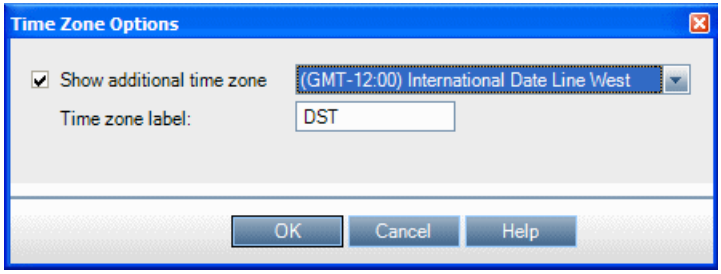
Relevant tasks	"How to Reserve Maintenance Timeslots (Lab Management only)" on page 115
See also	"Reserving Timeslots Overview" on page 96

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Refresh All.** Refreshes the grid so that it displays the most up-to-date list of hosts based on the filters you have selected.
	**Select Columns.** Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For more details, see the *HP Application Lifecycle Management User Guide*. For details about the Host fields, see "Host Fields" on page 689.
	**Filter/Sort.** Enables you to filter and sort the hosts in the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For details about filtering options, see the *HP Application Lifecycle Management User Guide*.
View menu	Enables you to: ➤ Show/hide the grid filters ➤ Show/hide the Summary panel which displays the selected hosts ➤ Filter/sort and the grid ➤ Refresh the grid ➤ Select columns to view in the grid
<Hosts grid>	Displays the hosts available for the reservation. **Tip:** To select multiple hosts, hold down the CTRL button on your keyboard while selecting hosts in the list.
Selected pane	Displays the hosts selected in the grid.

Time Zone Options Dialog Box

This dialog box enables you to display an additional time zone in the Timeslots module calendar view.



To access	In the Timeslots module, in calendar view, select **Tools** > **Time Zone Options**. **Available from:** Calendar view only
Important information	Displaying an additional time zone is useful if you are located in a different time zone to the ALM Platform server or other users. The default time displayed on the calendar is based on the local client machine time.
See also	"Reserving Timeslots Overview" on page 96

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Show additional time zone	When selected, enables you to select an additional time zone to display in the calendar view.
Time zone label	The label by which to display the additional time zone in the calendar view. **Available:** When **Show additional time zone** is selected.

Part IV

Performance Test Design

7

Performance Test Design - Introduction

This chapter includes:

Concepts

Tasks

Reference

Concepts

Performance Test Design Overview

When you design a performance test you create the test, define a workload for the test and, if desired, associate a topology and monitor profiles which provide a diagram of the application under test. You can also enable a diagnostics module to collect diagnostics data during the test run.

Performance Test Design Best Practices

Before you start with designing a performance test, is it recommended to:

- Create scripts for your test in the relevant application (VuGen scripts, QuickTest tests, Service Test tests), and upload them to ALM. For details, see the relevant User Guide.
- Design topologies of your application under test. For details, see Chapter 4, "Topologies."
- Configure the monitor machines or monitor-over-firewall agents that you want to use to monitor the test run, and define monitor profiles for these monitors. For details, see Chapter 5, "Monitor Profiles."
- To enable diagnostic modules to collect diagnostics data from the test run, you must set up the relevant diagnostics components (server/ mediators). For details, see Chapter 40, "Diagnostics Management."

Tasks

How to Design a Performance Test

This task describes how to design a performance test.

Note: This task is part of a higher-level task. For details, see "How to Conduct a Performance Test" on page 28.

To learn more about performance test design, see "Performance Test Design - Introduction" on page 169.

This task includes the following steps:

- "Prerequisites" on page 172
- "Create a new performance test" on page 172
- "Design a workload for the test" on page 173
- "Select a topology for the test - Optional" on page 173
- "Select monitor profiles to monitor the test - Optional" on page 174
- "Enable and configure Diagnostics - Optional" on page 174
- "Define service level agreements for the test - Optional" on page 175
- "Results" on page 175

1 Prerequisites

- Make sure the relevant scripts/tests have been uploaded/saved to ALM. You can use VuGen scripts for performance testing, as well as QuickTest and Service Test tests.
  - VuGen scripts: For details on uploading VuGen scripts, see "Upload VuGen Scripts Dialog Box" on page 42.
  - QuickTest tests: For details on saving QuickTest tests to ALM, see the *HP QuickTest Professional User Guide*.
  - Service Test tests: For details on saving Service Test tests to ALM, see the *HP Service Test User Guide*.
- Under **Lab Resources**, select **Hosts** and make sure that there is at least one Controller, one load generator, and one data processor in your project's host pool. If not, contact your administrator to add them.
- For optional pre-design best practices, see "Performance Test Design Best Practices" on page 170.

2 Create a new performance test

a On the ALM sidebar, under **Testing,** select **Test Plan**.

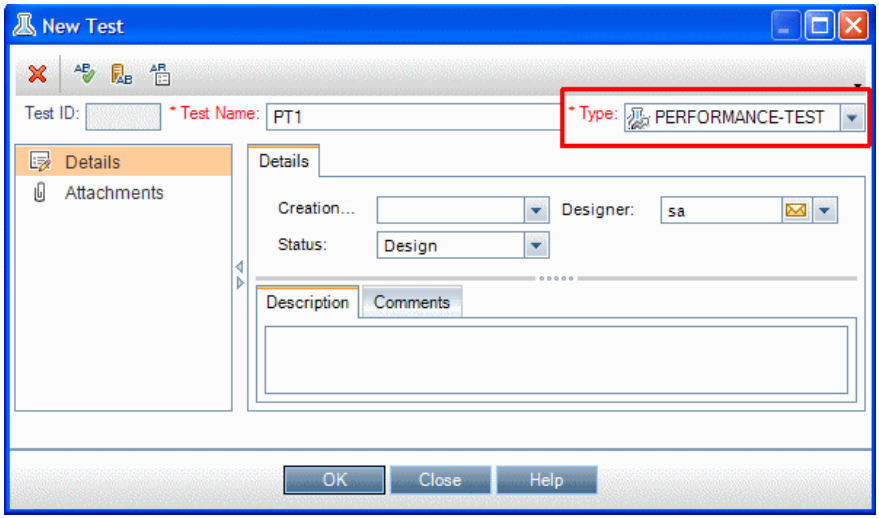
b Select **View** > **Test Plan Tree**.

c Select the **Subject** root folder, click **New Folder**  , and rename the folder that is added to the tree.

d In the tree, right-click the new folder, and select **New Test**.

e Fill in the fields in the New Test dialog box. For details, see the *HP Application Lifecycle Management User Guide*.

In particular, in the **Type** box, select **PERFORMANCE-TEST**.



3 Design a workload for the test

Designing a workload involves creating Vuser group, distributing Vusers among the Vuser groups, assigning hosts to the Vuser groups, and defining a run schedule for the test. For task details, see "How to Define a Performance Test Workload" on page 192.

4 Select a topology for the test - Optional

Note: Before you can select a topology for a test, you must design the topology. To design topologies, see "How to Design Topologies" on page 47.

In the Performance Center Designer's **Topology** tab, click **Select Topology** and select a topology for the test. For user interface details, see "Performance Test Designer > Topology Tab" on page 71.

5 Select monitor profiles to monitor the test - Optional

Note: Before you can select monitors for a test, you must configure monitor machines and create monitor profiles. For details, see "How to Create and Configure Monitor Profiles" on page 75.

Similarly, you must define monitor-over-firewall agents in the system before you can select them to monitor a test.

In the Performance Center Designer's **Monitors** tab, click **Add Monitor Profile** or **Add Monitor OFW**. The respective tree opens on the right. Select a monitor, and drag and drop it into the left pane.

For user interface details, see "Performance Test Designer > Monitors Tab" on page 90.

6 Enable and configure Diagnostics - Optional

Enable and configure diagnostic modules to collect diagnostics data from the test run.

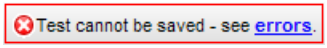
- For ERP/CRM diagnostics, see "How to Enable and Configure ERP/CRM Diagnostics" on page 290.
- For J2EE/.NET diagnostics, see "How to Enable and Configure J2EE/.NET Diagnostics" on page 292.

7 Define service level agreements for the test - Optional

Define service level agreements to measure performance metrics against performance goals. For details, see "How to Define Service Level Agreements" on page 268.

8 Results

When you save the test, it goes through a validation process. The test is valid only if it contain no errors. The result of the validation is stated at the bottom of the Test Designer window.



Click the link to open the Test Validation Results dialog box and view the details of the validation results. For user interface details, see "Test Validation Results Dialog Box" on page 186.

Note: If you make changes to the test, and the test is linked to a timeslot, the timeslot is updated with these changes automatically.

Reference

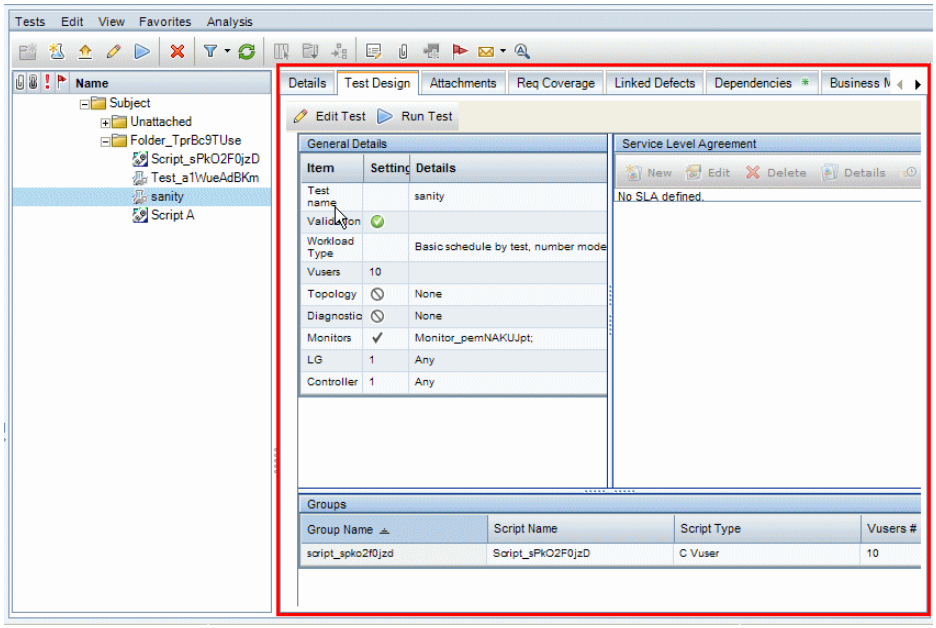
Performance Test Design User Interface

This section includes:

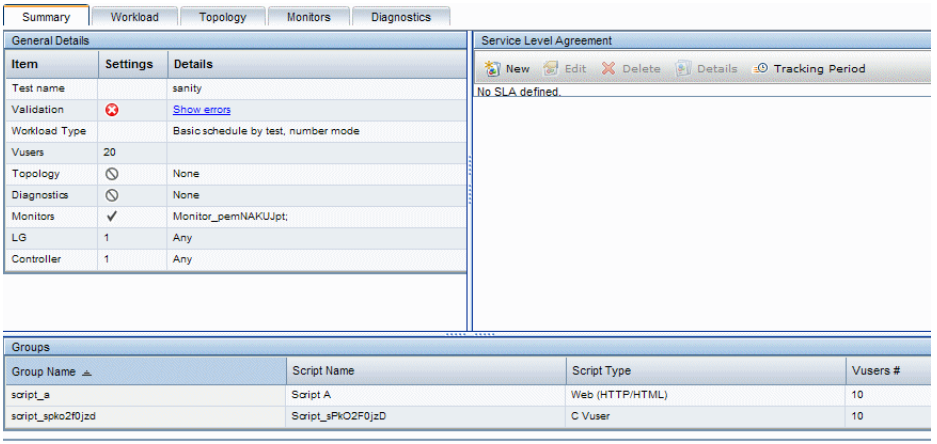
Test Design / Summary Tab

The Test Design / Summary tabs display a detailed summary of a selected performance test.

Test Design Tab

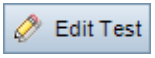
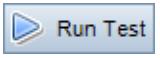


Summary Tab



To access	**Test Design tab:** **1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Select a performance test in the test plan tree and click the **Test Design** tab. **Summary tab:** **1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Right-click a performance test in the test plan tree and select **Edit Test**. **3** In the Performance Test Designer window, click the **Summary** tab.
See also	➤ "Performance Test Designer Window" on page 182 ➤ *HP Application Lifecycle Management User Guide*: Test Plan Module Window

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	Opens the Performance Test Designer window where you design performance tests. For details, see "Performance Test Designer Window" on page 182. **Available in:** Test Design tab only
	Enables you to run the test from the test planning area. **Available in:** Test Design tab only

General Details Pane

This pane displays general summary information about the test.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
<Settings column icons>	➤  . Indicates that there is an error in the test design. ➤  . Indicates that test is valid and can run. ➤  . Indicate whether or not: ➤ A topology is selected for the test. ➤ Monitors are selected for the test. ➤ Diagnostics are enabled for the test. ➤ IP Spoofing is enabled for the test.
Test name	The name of the test.
Validation	Indicates whether the test is valid or not. If the test is not valid or there are notifications about the test, the **Details** column displays a link to the Test Validation Results dialog box which lists errors and messages related to the test. For details, see "Test Validation Results Dialog Box" on page 186.
Workload Type	The workload type selected for the test.

UI Elements	Description
Vusers	The number of Vusers defined in the test.
Topology	Indicates whether or not a topology is associated with the test, and if so, displays the relevant details.
Diagnostics	Indicates whether or not diagnostics are enabled for the test, and if so, displays the relevant details.
Monitors	Indicates whether or not monitor profiles are defined for the test, and if so, displays the relevant details.
IP Spoofer	Indicates whether or not IP spoofing is enabled for the test. For details, see "Test Options Dialog Box" on page 219.
Controller/C+LG/LG	Displays the number of hosts selected for the test, and their properties.

Service Level Agreement Pane

This pane displays service level agreements (SLAs) that are defined for the test.

Important information	➤ You create, modify, and delete SLAs in the Summary tab. ➤ In the Test Design tab you can only view a list of defined SLAs.
Relevant tasks	"How to Define Service Level Agreements" on page 268
See also	"Service Level Agreements Overview" on page 266

For user interface details, see "Service Level Agreement Pane" on page 275.

Groups Pane

This pane displays details about the Vuser groups defined in the test.

User interface elements are described below (unlabeled elements are shown in angle brackets):

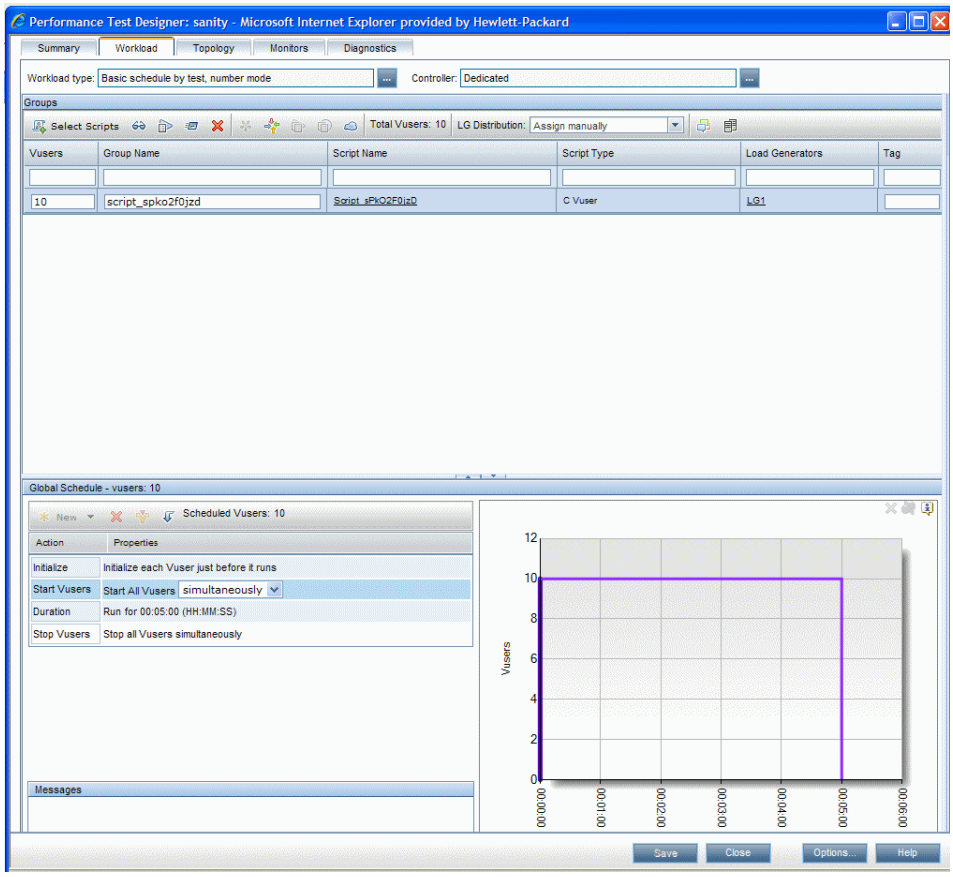
UI Elements	Description
Group Name	The name of the Vuser group.
Script Name	The name of the Vuser script associated with the Vuser group.
Script Type	The Vuser script type.
Vusers #/%	The number/percentage of Vusers distributed to the Vuser group.

Performance Test Designer Window

This window enables you to define a performance test. Defining a performance test includes selecting scripts for the test, scheduling how many Vusers to run in each script and for how long, choosing topologies and monitor profiles for the test, and enabling collection of diagnostics data for the test run.

Version Control: If your project is version-enabled:

- To edit a test, you must check it out.
- When you check out a test, only you can edit the test.
- If the test is checked out by another user, you cannot check the test out as well. You can view the last checked in version in read-only mode.

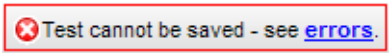


To access	**1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Right-click a performance test in the test plan tree and select **Edit Test**.
Important information	In order to continue working in ALM, you must close the Performance Test Designer window. Make sure to save changes you have made to the test before closing this window.

Relevant tasks	"How to Design a Performance Test" on page 171
See also	➤ "Enabling and Configuring ERP/CRM and J2EE/.NET Diagnostics" on page 289 ➤ "Monitor Profiles" on page 73 ➤ "Topologies" on page 45 ➤ For version control enabled projects, see the *HP Application Lifecycle Management User Guide*.

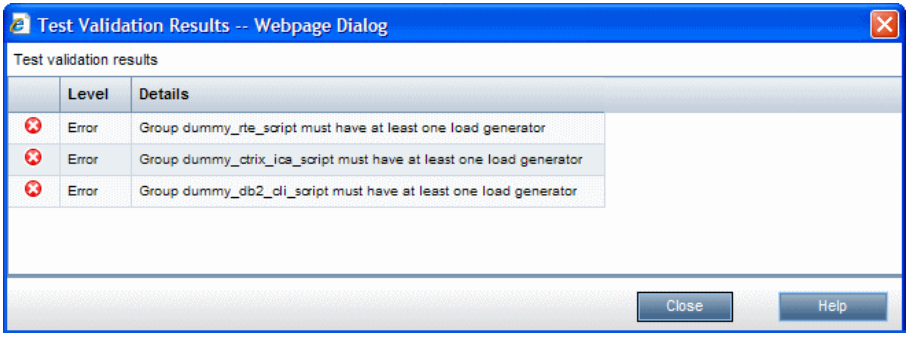
User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Check In	Enables you to check in saved changes to a performance test to create a new, updated version available to other users. **Note:** Available for version control enabled projects only.
Check Out	Enables you to check out a performance test so that you can make changes to it. **Note:** Available for version control enabled projects only.
Undo Check Out	After checking out a test, this button enables you to undo the checkout and cancel your changes. **Note:** Available for version control enabled projects only.
Options...	Opens the Test Options dialog box, enabling you to set general Scheduler and testing options. For details, see "Test Options Dialog Box" on page 219.
Summary tab	Displays a summary of the test. For details, see "Test Design / Summary Tab" on page 177.
Workload tab	Enables you to design a workload for the test. For details, see "Performance Test Designer > Workload Tab" on page 202.
Topology tab	Enables you to associate a topology with the test. For details, see "Performance Test Designer > Topology Tab" on page 71.

UI Elements	Description
Monitors tab	Enables you to select monitors to monitor the test. For details, see "Performance Test Designer > Monitors Tab" on page 90.
Diagnostics tab	Enables you to select a diagnostics module to collect diagnostics data from the test. For details, see "Performance Test Designer > Diagnostics Tab" on page 295.
<Validation message>	When you save the test, this message displays the test validation result. If there are errors or messages, a link to the test validation results is displayed.  For details, see "Test Validation Results Dialog Box" on page 186.

Test Validation Results Dialog Box

This dialog box displays the validation results of your performance test.



To access	**1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Right-click a performance test in the test plan tree and select **Edit Test**. **3** Use one of the following: ➤ Click the validation link at the bottom of the Performance Test Designer window. ➤ In the **Summary** tab, click the Validation link. **Note:** The validation link appears only if the test is invalid or there are messages about the test. If the test is valid and there are no messages, no validation link is displayed.
Important information	A performance test that is not valid cannot run.
Relevant tasks	"How to Design a Performance Test" on page 171
See also	"Test Design / Summary Tab" on page 177

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Level	The type of message:  **Error** or  **Warning**.
Details	Describes the error or warning

8

Defining Performance Test Workloads

This chapter includes:

Concepts

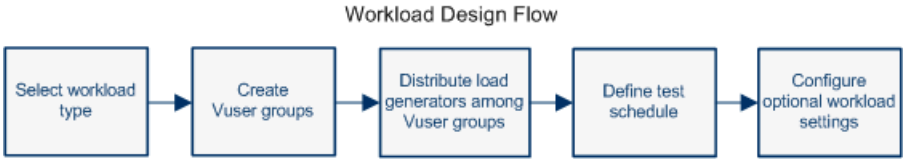
Tasks

Reference

Concepts

Performance Test Workload Overview

When you create a performance test you need to define a workload for the test. Defining a workload involves selecting a type of workload for the test, creating Vuser groups that emulate groups of users running on the application, and configuring how they should behave during the test.



You select a workload depending on the type of schedule and schedule run mode you want use to run your test, and depending on how you want to distribute the Vusers among the Vuser groups in your test.

For details on defining a workload for your performance test, see "How to Define a Performance Test Workload" on page 192.

Rendezvous Points

During a test run, you can instruct multiple Vusers to perform tasks simultaneously by using rendezvous points. A rendezvous point creates intense user load on the server, enabling you to measure server performance under load.

Suppose you want to measure the performance of an application when 10 Vusers perform a given task simultaneously. To make sure that multiple Vusers act simultaneously you create a **rendezvous point** in the Vuser script. When Vusers arrive at a rendezvous point, they are held there by the Controller. The Controller releases the Vusers from the rendezvous either when the required number of Vusers arrives, or when a specified amount of time has passed.

For example, to test an online bank, you could create a test that contains two rendezvous points. The first rendezvous ensures that one thousand Vusers simultaneously deposit cash. The second rendezvous ensures that another thousand Vusers simultaneously withdraw cash. To measure how the server performs when only five hundred Vusers deposit cash, you can set the release policy so that the Vusers are released when 500 Vusers arrive at the rendezvous.

You can configure rendezvous policies when defining the test workload. For task details, see "How to Define a Performance Test Workload" on page 192.

You can manually release Vusers waiting at a rendezvous point during a run. For task details, "How to Manage a Performance Test Run" on page 340.

Tasks

How to Define a Performance Test Workload

This task describes how to define a performance test workload.

Note: This task is part of a higher-level task. For details, see "How to Design a Performance Test" on page 171.

To learn more about performance testing, see "Performance Test Workload Overview" on page 190.

This task includes the following steps:

- "Prerequisite" on page 193
- "Select a workload" on page 193
- "Select a Controller" on page 193
- "Create Vuser groups and distribute Vusers to the groups" on page 194
- "Distribute load generators among the Vuser groups" on page 194
- "Define a schedule for the performance test" on page 194
- "Configure test settings - Optional" on page 195
- "Define topology, monitoring, and diagnostics options" on page 196

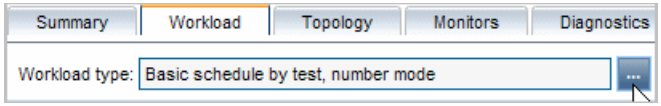
1 Prerequisite

Create a performance test. For details, see step 2 of "How to Design a Performance Test" on page 171.

2 Select a workload

In the Test Plan tree, right-click the test and select **Edit Test**. The test opens in the Performance Test Designer window.

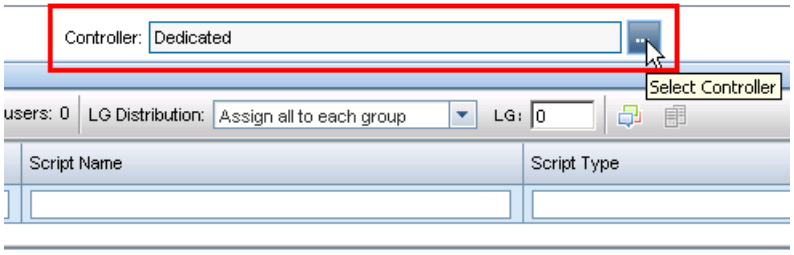
Click the **Select Workload Type** button adjacent to the **Workload type** box, and select a type of workload for the test. The type of workload you choose determines the type of schedule by which the test will run, and how the Vusers will be distributed at runtime.



For user interface details about the Workload Types dialog box, see "Workload Types Dialog Box" on page 211.

3 Select a Controller

Click the **Select Controller** button adjacent to the **Controller** box, and select a host to act as the Controller for the test.



For user interface details about the Select Controller dialog box, see "Select Controller Dialog Box" on page 214.

4 Create Vuser groups and distribute Vusers to the groups

a In the Groups pane, select scripts from the Scripts Tree pane on the right to run in the test. If the Scripts Tree pane is not open, click the **Select Scripts** button.

Tip: You can select complete folders of scripts, or select multiple scripts while holding down the CTRL key on your keyboard.

---

b (Optional) For each selected script, a Vuser group is created in the Groups grid and is given, by default, the same name as the selected script. You can change the group name if desired.

c Distribute Vusers among the Vuser groups according to the Vuser distribution method you selected in the workload type. For details, see "How to Distribute Vusers Among Vuser Groups" on page 197.

5 Distribute load generators among the Vuser groups

Select a method by which to distribute the load generators among the Vuser groups, and specify which load generators to distribute to which groups.

For details, see "How to Distribute Load Generators Among Vuser Groups" on page 225.

6 Define a schedule for the performance test

Schedule how the Vuser groups are to run in the test. For details, see "How to Define a Schedule for the Performance Test" on page 247.

7 Configure test settings - Optional

You can configure the following optional settings for your test:

Optional Test Setting	Description
Command line arguments	Sending command line arguments enables you to configure test settings without the need to manually define them in the UI. In the Groups pane, click the **Edit Command Line** button. For details, see **Edit Command Line** in the "Groups Pane" user interface details on page 205.
Rendezvous Points	When you add Vuser groups to the test, their associated scripts are scanned for rendezvous points. To view and manage the rendezvous points, click the **View Rendezvous** button. For user interface details, see "Rendezvous Dialog Box" on page 216.
Runtime Settings Configuration	You can configure the runtime settings of uploaded Vuser scripts. Runtime settings are applied to Vusers when the script runs. To open the Runtime Settings dialog box, in the Groups pane toolbar, click the **Edit Runtime Settings** button. For user interface details, see "Edit Runtime Settings Dialog Box" on page 516.
Runtime Settings Duplication	You can copy runtime settings from one script in the test to other scripts of the same script type. In the Groups pane toolbar, click the **Duplicate Runtime Settings** button. For details, see **Duplicate Runtime Settings** in the "Groups Pane" user interface details on page 206.

Optional Test Setting	Description
WAN Emulation	WAN Emulation enables you to emulate probable WAN effects over your network, thereby creating a more realistic performance test. To open the WAN Emulation Settings dialog box, in the Groups pane toolbar, click the **WAN Emulation**  button. For user interface details, see "WAN Emulation Settings Dialog Box" on page 410.
Terminal Services	When using manual load generator distribution, you can open terminal services sessions on the load generators, enabling you to run multiple GUI Vusers simultaneously on the same application. For details, see Chapter 13, "Terminal Services Dialog Box."

8 Define topology, monitoring, and diagnostics options

For task details, see "How to Design a Performance Test" on page 171.

How to Distribute Vusers Among Vuser Groups

This task describes how to distribute Vusers in a performance test among the Vuser groups. You distribute Vusers according to the Vuser distribution method you selected for the workload.

You can distribute the Vusers by number, by percentage (manually), or by percentage using the relative distribution method.

Note:

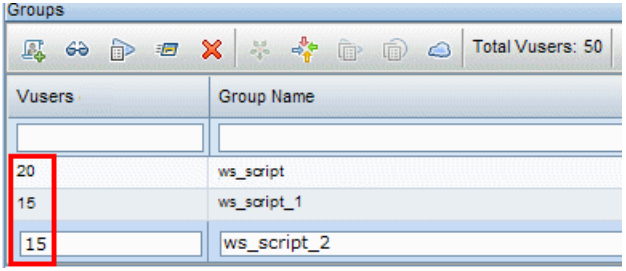
- In workloads with group schedules, you can distribute Vusers by number only.
- This task is part of a higher-level task. For details, see "How to Define a Performance Test Workload" on page 192.

This task describes how to:

Distribute Vusers by number

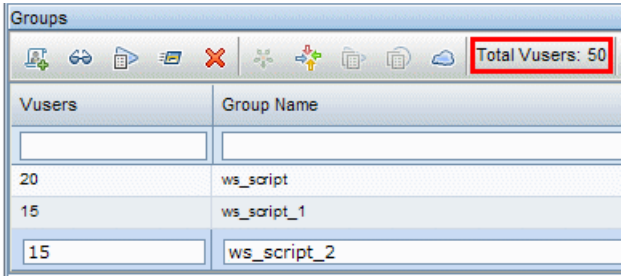
Note: This procedure assumes that you selected **By number** when you selected the workload for the test. For user interface details, see "Workload Types Dialog Box" on page 211.

➤ **Basic schedule**: In the Performance Test Designer window, in the Groups grid, select a group, and in the **Vusers** column, enter the number of Vusers to allocate to that group.



➤ **Real-world schedule:** You define the number of Vusers when you define the test schedule. For details, see "How to Define a Schedule for the Performance Test" on page 247.

For both run modes, the total number of the Vusers assigned to all the Vuser Groups is displayed in the Groups pane toolbar.



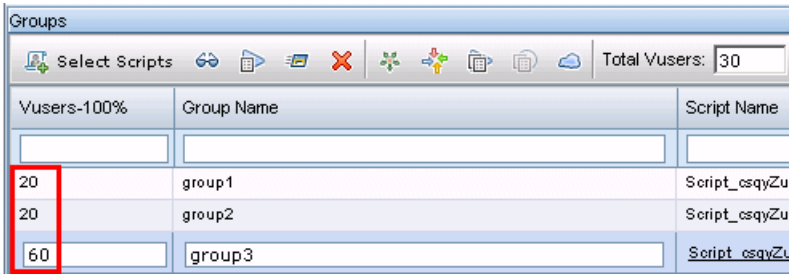
Distribute Vusers by percentage

Note: This procedure assumes that you selected **By percentage** when you selected the workload for the test. For user interface details, see "Workload Types Dialog Box" on page 211.

---

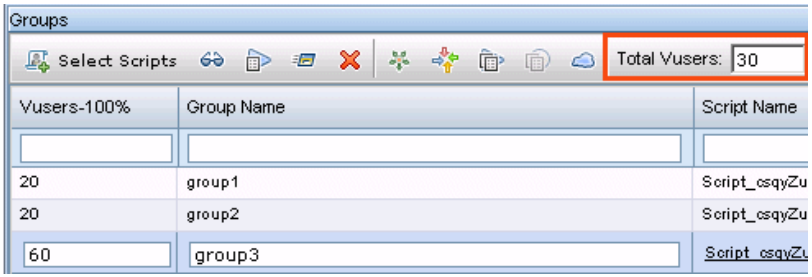
1 In the Performance Test Designer window, in the Groups grid, in the **Vusers-100%** column for each group, enter the percentage of the total number of Vusers to allocate to the group.

Note: The total of all the groups' percentages must be exactly 100% for the test to be valid.



2 Allocate a total number of Vusers to run in the test:

➤ **Basic mode:** In the Groups pane, enter the number of Vusers in the **Total Vusers** box.



➤ **Real-world mode:** You define the number of Vusers when you define the test schedule. For details, see "How to Define a Schedule for the Performance Test" on page 247.

Distribute Vusers by percentage using relative distribution

In the Performance Test Designer window, in the Groups grid, click the **Relative Distribution** button to define a ratio by which to distribute the Vusers from each group. For user interface details, see **Relative Distribution** in the "Groups Pane" on page 204.

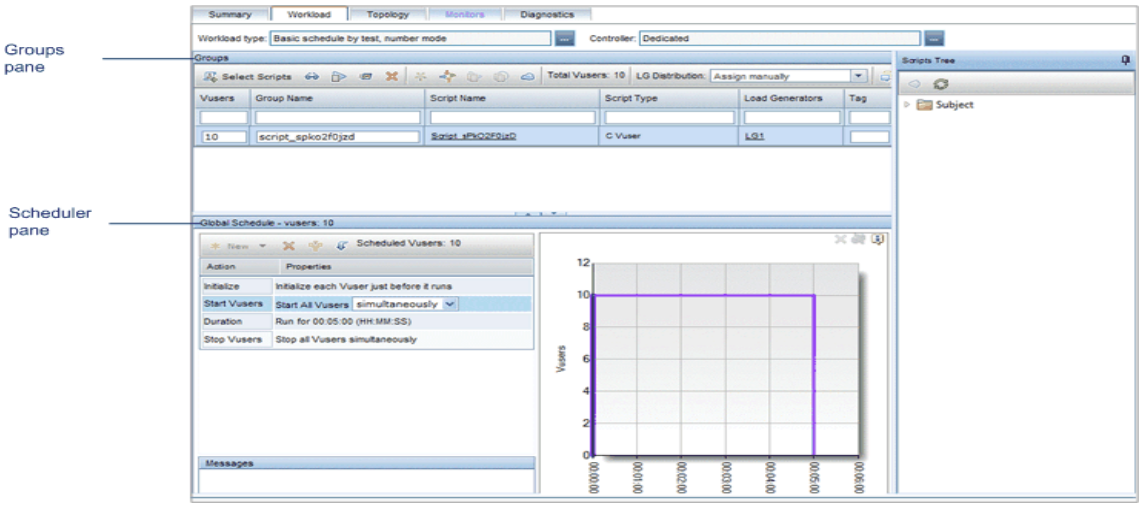
Reference

Defining Performance Test Workloads User Interface

This section includes:

Performance Test Designer > Workload Tab

This tab enables you to define a workload for the test. You select a Controller for the test, scripts to run in the test and load generators on which to run the Vusers. You also define a run schedule for the test.



To access	**1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Right-click a performance test in the test plan tree and select **Edit Test**. **3** In the Performance Test Designer window, click the **Workload** tab.
Relevant tasks	"How to Define a Performance Test Workload" on page 192
See also	See "Groups Pane" below for details about: ➤ View Script dialog box ➤ Edit Command dialog box ➤ Relative Distribution dialog box ➤ Duplicate Runtime Settings dialog box ➤ Duplicate Scheduler Settings dialog box

Workload Tab Common Area

User interface elements are described below (unlabeled elements are shown in angle brackets):

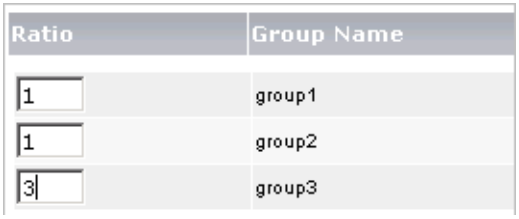
UI Elements	Description
Workload Type	Displays the workload type for the test. Click  to open the Workload Types dialog box and select a type of workload for the test. For details, see "Workload Types Dialog Box" on page 211.
Controller	Displays the Controller selected for the test. Click  to open the Select Controller dialog box and select a Controller for the test. For details, see "Select Controller Dialog Box" on page 214.

Groups Pane

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Select Scripts.** Opens Scripts Tree pane, enabling you to select scripts to run in your test. For details, see "Scripts Tree pane" below.
	**View Script.** Opens the script selected in the Groups grid in a read-only window. **Versioning:** ➤ As long as a script is checked in, the same version is displayed for all users. ➤ If you have checked out the script, the script displayed is your own private copy of the script. If you make changes to the script, other users will not be able to see your changes until you check the script back in. Similarly, if other users check in changes to this script, you will not be able to see them as long as you have the script checked out. ➤ If another user checks out the script, you will still see the latest checked-in version. **Note:** To view Service Test scripts, Service Test 11.00 must be installed on the client machine.
	**Edit Runtime Settings.** Opens the Runtime Settings dialog box for the selected script, enabling you to configure its runtime settings. To use the default settings, click **Use Defaults**. Vuser scripts have individual runtime setting defaults for VuGen and the Controller, to support the debugging environment of VuGen and the performance testing environment of the Controller. For more information, see Part VII, "Runtime Settings Configuration."

UI Elements	Description
	**Edit Command Line**. Opens the Command Line dialog box, enabling you to pass arguments to instruct the Controller how to behave. By passing arguments in the command line, you configure test settings without the need to manually define them in the user interface. ➤ **Command line.** Type the name and value of the parameter you want to send using the format, **<Parameter_Name> <value>**. **Note:** For information about the command line parsing functions, or for details about including arguments on a command line, see the *HP LoadRunner Online Function Reference*, provided with HP Virtual User Generator. ➤ **<Command line options>.** Select whether to: ➤ Apply the command line to the current script only ➤ Apply the command line to all the scripts in the test ➤ Add the command line to all the scripts in the test **Note:** You cannot pass arguments to Service Test tests.
	**Delete Group.** Deletes the selected Vuser group.

UI Elements	Description
	**Relative Distribution.** Opens the Relative Distribution dialog box, enabling you to provide a ration by which ALM calculates the percentage of Vusers to distribute to each Vuser group. ➤ **Ratio.** The part of total number of Vusers to distribute to the corresponding Vuser group. ➤ **Group Name.** The name of the Vuser group. **Example:** To distribute 200 Vusers among the groups at a ratio of 1:1:3, type 1 for **group1**, 1 for **group2**, and 3 for **group3**. 20% of the Vusers are assigned to group1, 20% to group2, and 60% to group3. That is, 40 Vusers are assigned to group1, 40 Vusers to group2 and 120 Vusers to group3.  **Note:** Enabled in percentage mode only.
	**View Rendezvous.** Opens the Rendezvous dialog box, enabling you to enable or disable rendezvous points, and set policies for how to treat Vusers when they arrive at a rendezvous point. For details, see "Rendezvous Dialog Box" on page 216.
	**Duplicate Runtime Settings.** Opens the Duplicate Runtime Settings dialog box, enabling you to select a source script, and copy its runtime settings to one or more scripts of the same type. **Note:** The source and destination scripts must be of the same script type.

UI Elements	Description
	**Duplicate Scheduler Settings.** Opens the Duplicate Scheduler Settings dialog box, enabling you to select a source Vuser group, and copy its schedule settings to one or more Vuser group in the test. For details, see the instructions on how to copy group schedules in "How to Define a Schedule for the Performance Test" on page 247. **Note:** Available for schedules by group only.
	**WAN Emulation Settings.** Opens the WAN Emulation Settings dialog box, enabling you to emulate probable WAN effects over your network, thereby creating a more realistic performance test. For details, see "WAN Emulation Settings Dialog Box" on page 410.
	**Automatch Load Generator Properties.** Opens the Automatch Load Generator Properties dialog box, enabling you to specify properties for automatch load generators. For details, see "Automatch Load Generators Properties Dialog Box" on page 239.
	**Assign Load Generators to Multiple Groups.** Opens the Assign Load Generators to Multiple Groups dialog box, enabling you to assign one or more load generators—automatch or specific—to multiple Vuser groups at once. You can also use this dialog box to remove one or more load generators from multiple Vuser groups at once. For details, see "Assign Load Generators to Multiple Groups Dialog Box" on page 230. **Note:** Available only for the **Assign manually** load generator distribution method. See "LG Distribution" below.
<grid filters>	Located under each column name. Displays the filter that is currently applied to a column. If the filter box is empty, no filter is currently applied to the column. Type directly into the box and press ENTER to apply the filter.

UI Elements	Description
Total Vusers	Displays the total number of Vusers distributed to all of the Vuser groups participating in the test. For details, see "How to Distribute Vusers Among Vuser Groups" on page 197.
LG Distribution	Enables you to select a method for assigning load generators to the Vuser groups in the test. ➤ **Assign all to each group**. All of the automatch load generators are distributed to all of the participating Vuser groups. ➤ **Assign manually.** Load generators are distributed manually. For details, see "Load Generator Distribution Overview" on page 222.
LG	Displays the number of automatch load generators selected for the test. **Note:** Available only if **Assign all to each group** is selected in the **LG Distribution** box.

UI Elements	Description
Groups grid	Displays the Vuser groups participating in the test. ➤ **Vusers.** (By Number mode) The number of Vusers distributed to the Vuser group. **Default:** 10 Vusers ➤ **Vusers-100%.** (By Percentage mode) The percentage of Vusers distributed to the Vuser group. **Note:** The sum of all the groups' percentages must not exceed 100%. ➤ **Group Name.** The name of the Vuser group. ➤ **Script Name.** The name of the Vuser script associated with the Vuser group. When the group is selected, the script name turns into a link. To select a different script, click the script name and select a script. ➤ **Load Generators.** The load generators assigned to the Vuser group. ➤ **Script Type.** The Vuser script type. ➤ **Tag.** A tag for the Vuser group. Tagging enables categorization and easy identification of Vuser groups. **Examples:** ➤ If you have finished configuring runtime and Scheduler settings for the group, you could tag the group Done. A group that is not yet done, you could tag TODO. ➤ Groups running against the Defects or Requirements modules, could be tagged DEF or REQ.

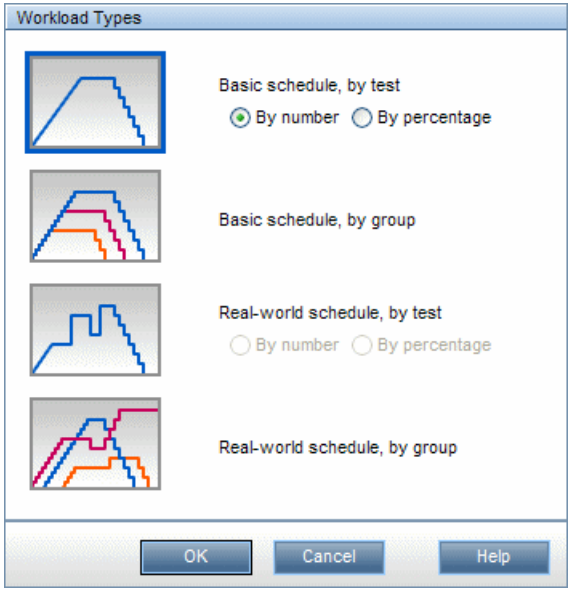
UI Elements	Description
Scripts Tree pane	Opens on the right when you click the **Select Scripts** button. Lists all the VuGen scripts and QuickTest/ Service Test tests that have been uploaded to the project. Drag and drop one or more scripts from the tree into the Groups pane or select the scripts and click . **Tip:** You can select whole folders of scripts, or select multiple scripts while holding down the CTRL key on your keyboard. After selecting a script, the Scripts Tree pane closes by default. ➤ To keep the Scripts Tree open, click the **Dock** button. ➤ To enable the Scripts Tree close automatically, click the **Undock** button.

Scheduler Pane

The Scheduler pane enables you to define a run schedule for your test. For details, see "Scheduler Pane" on page 255.

Workload Types Dialog Box

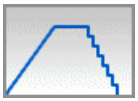
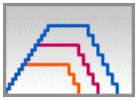
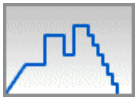
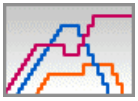
This dialog box enables you to select a type of workload for the performance test. The type of workload you choose determines the type of schedule by which the test will run, and how the Vusers will be distributed at runtime.



To access	**1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Right-click a performance test in the test plan tree and select **Edit Test**. **3** In the Performance Test Designer window, click the **Workload** tab. **4** Next to the **Workload type** box, click **Select Workload Type** ... .
Important information	If you change the workload, Scheduler settings are lost.

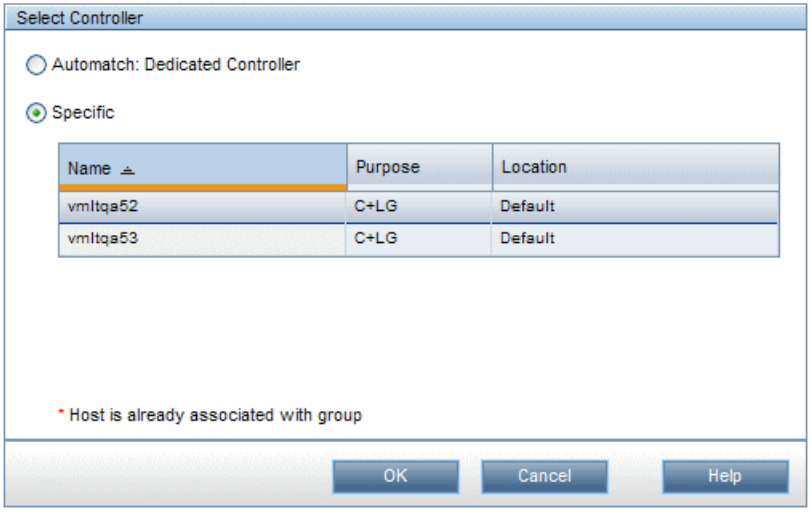
Relevant tasks	"How to Define a Performance Test Workload" on page 192
See also	➤ "Performance Test Workload Overview" on page 190 ➤ "Scheduling Performance Tests Overview" on page 242

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Basic schedule, by test.** Select this workload type to configure all the Vuser groups to run together on the same test schedule, in the basic run mode. Vusers can be distributed: ➤ **By number.** The Vuser are distributed by number. ➤ **By percentage.** The Vusers are distributed by percentage.
	**Basic schedule by group.** Select this workload type to configure each Vuser groups to run on its own test schedule, in the basic run mode. In group schedules, Vusers are always distributed by number.
	**Real-world schedule, by test.** Select this workload type to configure all the Vuser groups to run together on the same test schedule, in the real-world run mode. Vuser can be distributed: ➤ **By number.** The Vuser are distributed by number. ➤ **By percentage.** The Vusers are distributed by percentage.
	**Real-world schedule, by group.** Select this workload type to configure each Vuser groups to run on its own test schedule, in the real-world run mode. In group schedules, Vusers are always distributed by number.

Select Controller Dialog Box

This dialog box enables you to select a Controller for the performance test.



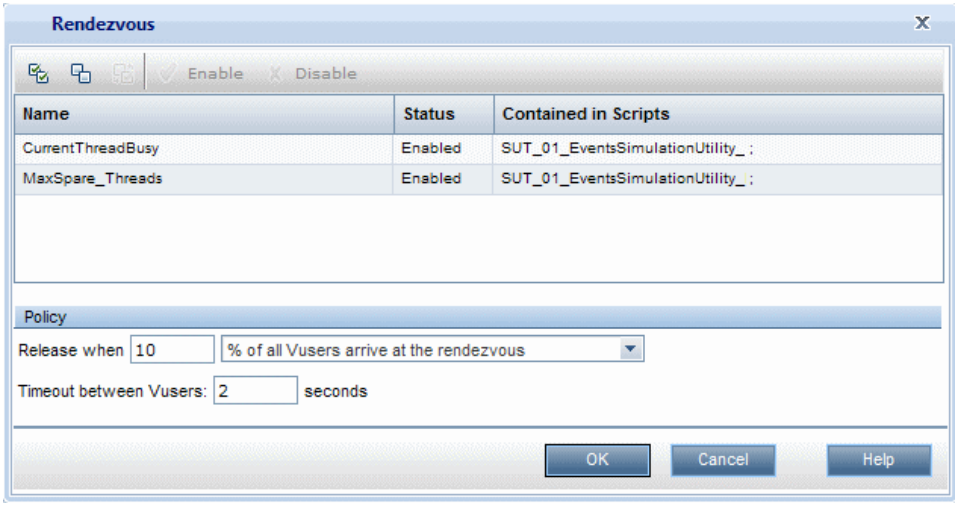
To access	**1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Right-click a performance test in the test plan tree and select **Edit Test**. **3** In the Performance Test Designer window, click the **Workload** tab. **4** Next to the **Controller** box, click ... .
Important information	➤ You select only one Controller for a performance test. ➤ Due to possible heavy load on the Controller and load generator hosts during a performance test, if you select a C+LG host for Controller functionality, it is best practice not to assign it as a load generator as well.
Relevant tasks	"How to Define a Performance Test Workload" on page 192
See also	➤ "Performance Test Workload Overview" on page 190 ➤ "Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Automatch: Dedicated Controller	At runtime, an available Controller host in the project's host pool is allocated for the test run, and is dedicated for Controller functionality. Because it is a dedicated Controller, it cannot be allocated as a load generator as well. For details about host allocation, see "Host Allocation" on page 102.
Specific	Select this option if you want to select a specific Controller host. The grid lists the specific Controller hosts available in the project's host pool. **Note:** If a host is marked with a red asterisk (*), it is already assigned to a Vuser group as a load generator. Due to possible heavy load on the Controller and load generator hosts during a performance test, if a host is assigned to a Vuser group, it is best practice not to select it as a Controller as well.

Rendezvous Dialog Box

This dialog box enables you to enable/disable rendezvous points defined in the Vuser scripts and to set rendezvous policies that determine how the Controller handles Vusers at a rendezvous point.



To access	➤ **During the test design phase:** In the **Workload** tab, click **View Rendezvous** . ➤ **During the test run:** On the Performance Test Run page, click **Rendezvous** .
Important information	Rendezvous points are inserted in the Vuser script when creating the script in VuGen. For information, see the *HP Virtual User Generator User Guide*. Rendezvous points cause multiple Vusers to perform tasks at exactly the same time, thereby creating intense user load on the server. Enabling rendezvous points enables you to check your system's response under specific load. For each rendezvous point, you can set **Policy** attributes. During the test run, you can manipulate the Vuser behavior at the rendezvous points.

Relevant tasks	➤ "How to Define a Performance Test Workload" on page 192. ➤ "How to Manage a Performance Test Run" on page 340
See also	"Rendezvous Points" on page 190

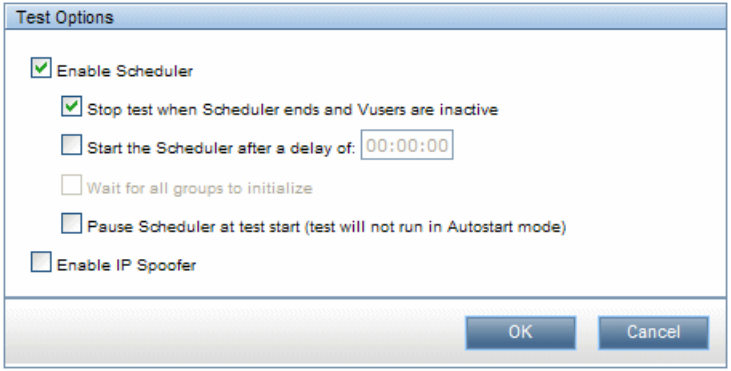
User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Select all.** Selects all the rendezvous points in the grid.
	**Select none.** Clears all the selected rendezvous points in the grid.
	**Switch between selected/none selected.** Inverts the current selection of rendezvous points. That is, the non-selected rendezvous points are selected, and the selected rendezvous points are cleared.
	Enables/Disables the selected rendezvous point. Disabling and enabling a rendezvous influences the level of server load.
	Releases the Vusers at the selected rendezvous points. **Available from:** Performance Test Run page only

UI Elements	Description
<**Rendezvous grid**>	Displays the details about the rendezvous points in the scripts: ➤ **Name.** The name of the rendezvous point as given in the VuGen script. ➤ **Status.** The status of the rendezvous point: **Enabled** or **Disabled**. ➤ **Contained in Scripts.** The names of the scripts in which the rendezvous point was defined. You select a rendezvous point by clicking it.
Policy	Enables you to determine how the Controller handles Vusers at a rendezvous point. You set the following policy attributes for each rendezvous: ➤ **Release when.** Sets how many Vusers are released from a rendezvous point at a time. ➤ **X% of all Vusers arrive at the rendezvous.** Releases the Vusers only when the specified percentage of all Vusers have arrived at the rendezvous point. **Note:** This option interferes with the scheduling of the test. If you select this option, your test will not run as scheduled. ➤ **X% of all running Vusers arrive at the rendezvous.** Releases the Vusers only when the specified percentage of all Vusers running in the test have arrived at the rendezvous point. ➤ **X Vusers arrive at the rendezvous.** Releases the Vusers only when the specified number of Vusers have arrived at the rendezvous point. ➤ **Timeout between Vusers.** The timeout value (in seconds). After each Vuser arrives at the rendezvous point, the Controller waits up to the maximum timeout period specified for the next Vuser to arrive. If the next Vuser does not arrive within the timeout period, the Controller releases all the waiting Vusers from the rendezvous. Each time a new Vuser arrives, the timer is reset to zero. You set a timeout for each rendezvous point.

Test Options Dialog Box

This dialog box enables you to set general Scheduler and testing options.



To access	**1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Right-click a performance test in the test plan tree and select **Edit Test**. **3** In the Performance Test Designer window, click the **Workload** tab. **4** In the lower-right area of the Performance Test Designer window, click Options... .
Important information	This is accessible only when the Workload tab is displayed.
Relevant tasks	➤ "How to Define a Schedule for the Performance Test" on page 247 ➤ "How to Enable IP Spoofing in ALM" on page 325
See also	"Performance Test Workload Overview" on page 190

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Enable Scheduler	Enables the Scheduler so that you can run the test according to a user-defined schedule. To define a schedule, this option must be selected. ➤ **Stop test when Scheduler ends and Vuser are inactive.** Automatically stops the test when the test schedule has stopped and all the Vusers are in any of the following inactive states: **Down**, **Pass**, **Fail**, **Error**, or **Stop**. ➤ **Start the Scheduler after a delay of HH:MM:SS.** Enables you to specify when, after the Run Test command has been issued, the Scheduler should start running the schedule. If this option is not selected, the schedule starts to run as soon as the test starts running. ➤ **Wait for all groups to initialize.** Instructs the Scheduler to wait until all the Vusers in all the Vuser groups have finished initializing before starting to run any of the groups. **Note:** If you select this option, if any of the Vuser groups' Initialize action is **Initialize each Vuser just before it runs**, the Scheduler automatically changes this setting to **Initialize all Vusers simultaneously**. ➤ **Pause Scheduler at test start.** Pauses the Scheduler at the start of a test run, enabling you make changes to the test design just before the test is about to run. You can then restart the Scheduler manually.
Enable IP Spoofer	After you define multiple IP addresses, and before you run the test, select this option to enable IP spoofing. **Note:** You must enable IP spoofing before running a test. For details about multiple IP addressing, see Chapter 14, "Multiple IP Addresses."

9

Load Generator Distribution

This chapter includes:

Concepts

Tasks

Reference

Concepts

Load Generator Distribution Overview

Load generators are Performance Center hosts on which Vusers run during a test run.

This section includes:

Load Generator Types

There are two types of load generators:

- **Specific load generator.** An actual load generator. For example, machine **host1**, located in London.
- **Automatch load generator.** A load generator placeholder, for example **LG1**. When you assign an automatch load generator to a Vuser group, you are not assigning a specific load generator to the group, but rather a placeholder for a load generator with specific properties. At runtime, specific load generators in the project's host pool that have the same properties as the automatch load generators, are allocated in place of the automatch load generators.

Load Generator Distribution Methods

When you design a performance test, you specify how to distribute load generators among the Vuser groups participating in the test. You can automatically assign all load generators to each Vuser group, or you can manually select which load generators to assign to which group.

- **Automatic load generator distribution.** When you select the automatic load generator distribution method, during the test design phase **all of the automatch load generators** in the test are distributed **to all of the participating Vuser groups**.

  At runtime, specific load generators in the project's host pool that have the same properties as the automatch load generators, are allocated in place of the automatch load generators.

- **Manual Load Generator Distribution.** Using the manual distribution method, you can assign specific load generators to Vuser groups.

  If you are not particular about which load generators should be used for the test, you can assign automatch load generators to the groups. At the initialization stage of the test run, the automatch load generators are automatically replaced with specific load generators from the project's host pool that match the automatch load generators' properties.

Tip: Manual distribution enables you to distribute your load generators among Vuser groups, without overloading any one load generator.

Load Generator Attribute Customization

You can customize load generator attributes. For details about how to customize host attributes, see the *HP Application Lifecycle Management Administrator Guide*.

When customizing load generator attributes, consider the following:

- Create attributes that represent properties about your hosts that will help tell one host apart from another host when using them for performance testing.
- Because you can select multiple attributes for your host, you can define an unlimited number of host attributes. They do not need to be related.
- Host attributes can refer to anything, for example, **Host Memory - High**, **Spanish environment**, **Very slow machine**.

Tasks

How to Distribute Load Generators Among Vuser Groups

This task describes how to distribute load generators automatically and manually among Vuser groups participating in the performance test.

Note: This task is part of a higher-level task. For details, see "How to Define a Performance Test Workload" on page 192.

To learn more about load generator distribution, see "Load Generator Distribution Overview" on page 222.

- "Prerequisites" on page 226
- "Select a load generator distribution method" on page 226
- "Specify the load generators to use in the test" on page 226
- "Select properties for the automatch load generators - optional" on page 228

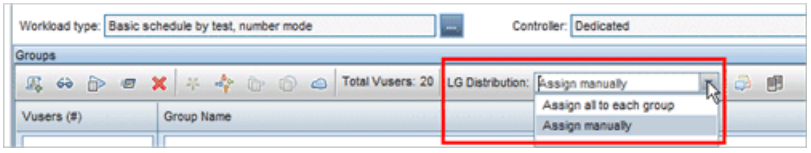
1 Prerequisites

Add Vuser groups to participate in the test. For details, see step 4 of "Create Vuser groups and distribute Vusers to the groups" on page 194.

2 Select a load generator distribution method

On the Groups pane toolbar, in the **LG Distribution** box, select one of the following options:

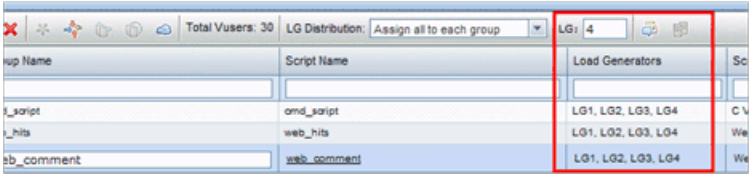
- **Assign all to each group.** Assigns all the load generators automatically to each Vuser group.
- **Assign manually.** Enables you to assign load generators manually to the Vuser groups.



3 Specify the load generators to use in the test

- If you selected **Assign all to each group** in step 2 above, the **LG** box is displayed to the right of the **LG Distribution** box.

  Type the number of load generators to use in the test and press ENTER. The automatch load generators are distributed to each of the Vuser groups and are displayed in the **Load Generators** column.



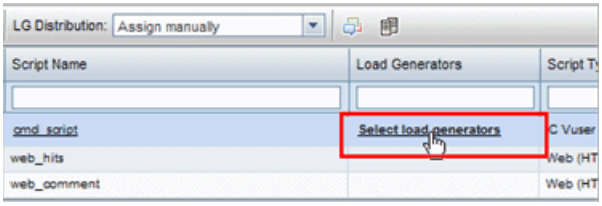
➤ If you selected **Assign manually** in step 2:

➤ To select same load generators for multiple groups at once, click the **Assign Load Generators to Multiple Groups** button. In the dialog box that opens, select automatch and/or specific load generators to to multiple groups.

Similarly, you can remove load generators that have been assigned to the groups.

For user interface details, see "Assign Load Generators to Multiple Groups Dialog Box" on page 230.

➤ To select load generators for a specific group only, you can use the link that appears in the **Load Generators** column of a selected group. Click the link and select automatch and/or specific load generators to assign to the group.



For user interface details, see "Select Load Generators Dialog Box" on page 235.

4 Select properties for the automatch load generators - optional

You can select properties for the automatch load generators that are assigned to Vuser groups in your test. Properties include a location and other attributes. At runtime, each automatch load generator is matched up with an available specific load generator (in the project's host pool) with the same properties.

To select properties for automatch load generators, click the **Configure Automatch Load Generator Properties** button, select one or more automatch load generators, and enter a location and/or attributes.

For user interface details, see "Automatch Load Generators Properties Dialog Box" on page 239.

Note: If no properties are specified, the automatch load generator is matched up with any load generator in the project's host pool.

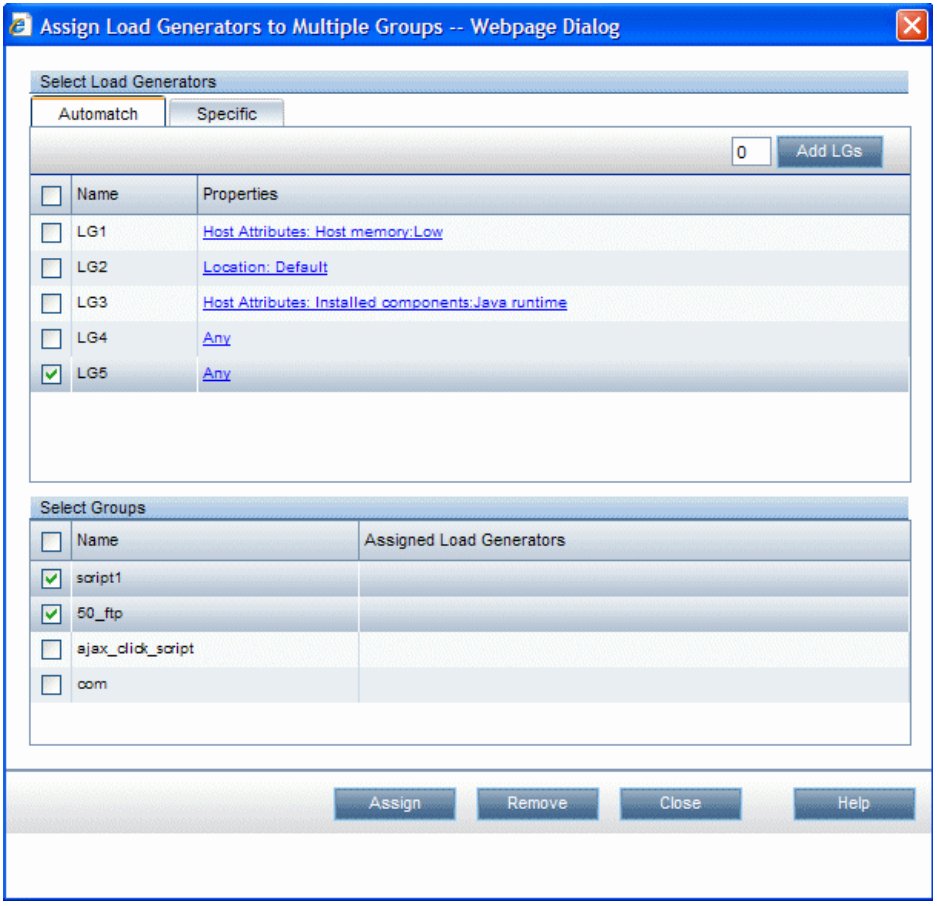
Reference

Load Generators User Interface

This section includes:

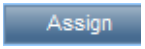
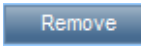
Assign Load Generators to Multiple Groups Dialog Box

This dialog box enables you to assign one or more load generators—automatch or specific—to multiple Vuser groups at once. You can also use this dialog box to remove one or more load generators from multiple Vuser groups at once.



To access	**1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Right-click a performance test in the test plan tree and select **Edit Test**. **3** In the Performance Test Designer window, click the **Workload** tab. **4** From the **LG Distribution** drop-down list, select **Assign manually**. **5** Click **Assign Load Generators to Multiple Groups**  .
Important information	This dialog box is available only when using the **manual** load generator distribution method.
Relevant tasks	➤ "How to Define a Performance Test Workload" on page 192 ➤ "How to Distribute Load Generators Among Vuser Groups" on page 225

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	Enables you to add more automatch load generators for the test. Enter the number of load generators in the adjacent box and click **Add LGs**.
	Assigns the selected load generators to the selected Vuser groups.
	Removes the selected load generators from the selected Vuser groups.

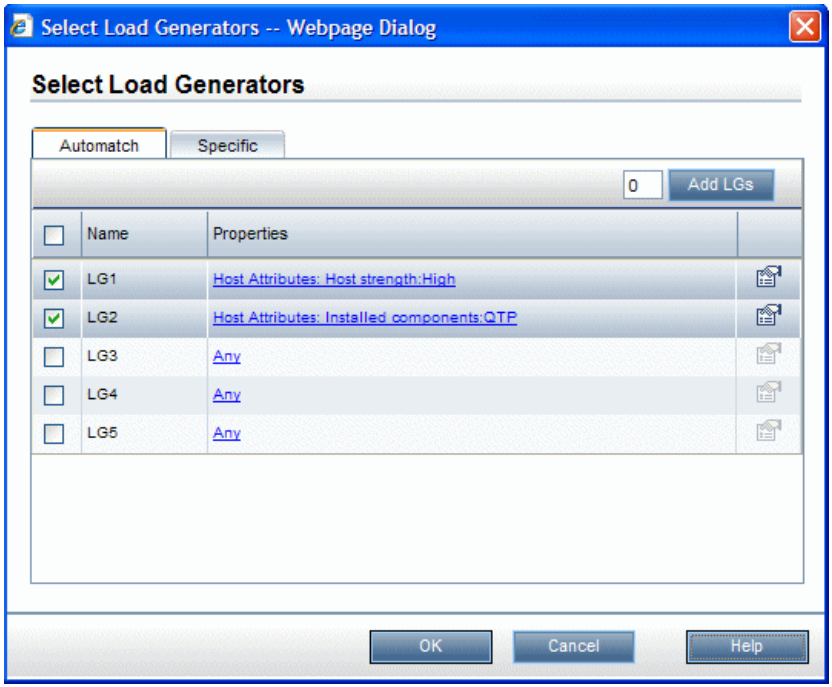
UI Elements	Description
Automatch tab	Enables you to select automatch load generators to assign to Vuser groups in the test, or to remove assigned automatch load generators from the Vuser groups. ➤ **Name.** The name of the automatch load generator. By default, these are named **LG1**, **LG2**, and so on. ➤ **Properties.** The properties by which the automatch load generator is matched up with a specific load generator in the project's host pool at runtime. **Any** is displayed by default. This means that the automatch load generator can be matched up with any load generator in the project's host pool at runtime. To specify properties for an automatch load generator, click the corresponding link in this column to open the Automatch Load Generator Properties dialog box. For details, see "Automatch Load Generators Properties Dialog Box" on page 239. **Tip:** To select all the load generators in the list, select the check box in the check box column heading.

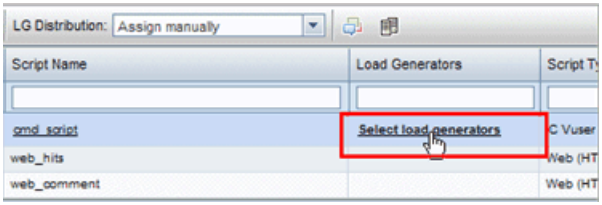
UI Elements	Description
Specific tab	Enables you to select load generators from the project's host pool to assign to the Vuser groups in the test, or to remove them from the Vuser groups. ➤ **Name.** The name of the load generator. ➤ **State.** The state of the load generator: **Operational**; **Non-operational**; **Unavailable** **Note:** Assigned load generators must be operational during runtime. ➤ **Location.** The location of the load generator. ➤ **Purpose.** The purpose of the load generator, that is, **Controller**, **Load Generator**, **Data Processor**, or a combination of these. **Note:** - Only the hosts in the pool with at least a **Load Generator** purpose are displayed. - QuickTest tests cannot run on a load generator that has been selected as the Controller of the performance test. - If a load generator is marked with an asterisk (*), this indicates that the load generator host has been selected as the Controller. It is recommended not to use a Controller host as a load generator as well. **Tip:** To select all the load generators in the list, select the check box in the check box column heading.

UI Elements	Description
<Select Load Generators pane>	Enables you to select load generators to assign to the Vuser groups in the test, or to remove them from the Vuser groups. ➤ Click the **Automatch** tab to select automatch load generators. ➤ Click the **Specific** tab to select specific load generators.
Select Groups pane	Enables you to select the Vuser groups to which the selected load generators are to be assigned, or from which they are to be removed. ➤ **Name.** The name of the Vuser group. ➤ **Assigned Load Generators.** The load generators currently assigned to the Vuser group. **Tip:** To select all the Vuser groups, select the check box in the check box column heading.

Select Load Generators Dialog Box

This dialog box enables you to assign one or more load generators—automatch or specific—to a Vuser group.



To access	**1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Right-click a performance test in the test plan tree and select **Edit Test**. **3** In the Performance Test Designer window, click the **Workload** tab. **4** From the **LG Distribution** drop-down list, select **Assign manually**. **5** Select a Vuser group in the Groups pane and click the link in the Load Generators column. 
Important information	This dialog box is available only when using the **manual** load generator distribution method.
Relevant tasks	➤ "How to Define a Performance Test Workload" on page 192 ➤ "How to Distribute Load Generators Among Vuser Groups" on page 225 ➤ "How to Create a Terminal Session" on page 311
See also	"Load Generator Distribution Overview" on page 222

User interface elements are described below:

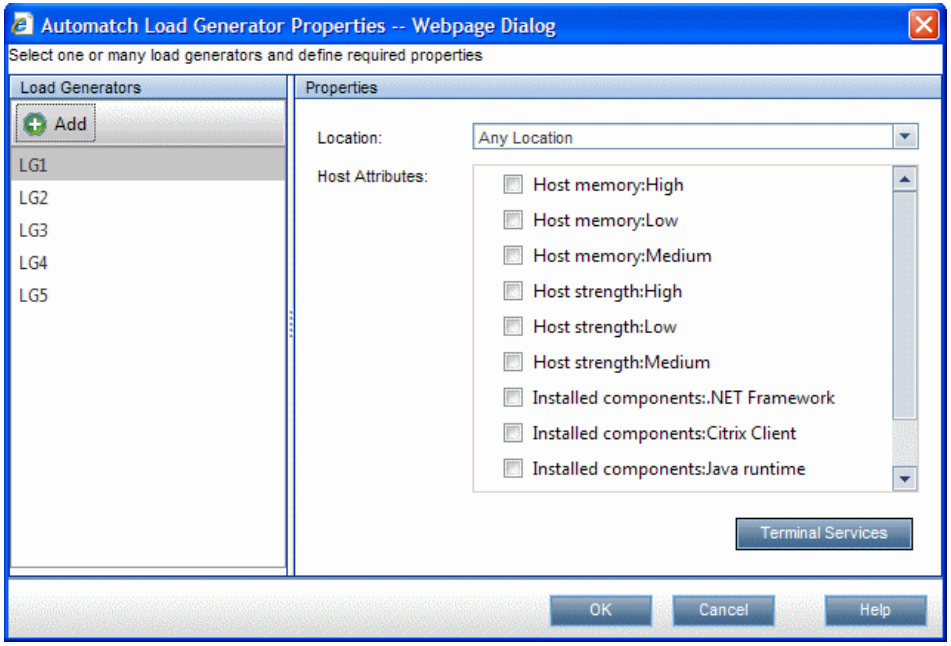
UI Elements	Description
	Enables you to add more automatch load generators for the test. Enter the number of load generators in the adjacent box and click **Add LGs**. **Available:** From the Automatch tab only
	**Terminal Services.** Enables you to configure terminal services sessions on the selected load generator. For details, see Chapter 13, "Configuring Terminal Sessions." **Available:** When you select a load generator in the list.

UI Elements	Description
Automatch tab	Enables you to select automatch load generators to assign to the selected Vuser group. ➤ **Name.** The name of the automatch load generator. By default, these are named **LG1**, **LG2**, and so on. ➤ **Properties.** The properties by which the automatch load generator is matched up with a specific load generator at runtime. **Any** is displayed by default. This means that the automatch load generator can be matched up with any load generator at runtime. To specify properties for a particular automatch load generator, click the corresponding **Any** link in the Properties column to open the Automatch Load Generator Properties dialog box. For details, see "Automatch Load Generators Properties Dialog Box" on page 239. **Tip:** To select all the load generators in the list, select the check box in the check box column heading.

UI Elements	Description
Specific tab	Enables you to assign load generators from the project's host pool to the selected Vuser group. ➤ **Name.** The name of the load generator. ➤ **State.** The state of the load generator: **Operational**; **Non-operational**; **Unavailable**. **Note:** Assigned load generators must be operational during runtime. ➤ **Location.** The location of the load generator. ➤ **Purpose.** The purpose of the load generator, that is, **Controller**, **Load Generator**, **Data Processor**, or a combination of these. **Notes:** - Only the hosts in the pool with at least a **Load Generator** purpose are displayed. - You can run QTP tests only on load generators that are not also assigned as the Controller for the performance test. - If a load generator is marked with an asterisk (*), this indicates that the load generator host has been selected as the Controller. It is recommended not to use a Controller host as a load generator as well. **Tip:** To select all the load generators in the list, select the check box in the check box column heading.

Automatch Load Generators Properties Dialog Box

This dialog box enables you to define properties for an automatch load generator. Properties include a location, and other host attributes. At runtime, a specific load generator in the project's host pool matching these properties is assigned to the Vuser group.



To access	**1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Right-click a performance test in the test plan tree and select **Edit Test**. **3** In the Performance Test Designer window, click the **Workload** tab. **4** On the Groups pane tool bar, click **Configure Automatch Load Generators Properties** .
Relevant tasks	➤ "How to Distribute Load Generators Among Vuser Groups" on page 225 ➤ "How to Create a Terminal Session" on page 311

User interface elements are described below:

UI Elements (A-Z)	Description
	Enables you to add more automatch load generators for the test. Click this button, enter a number of automatch load generators to add, and click **Add**. **Available:** When the **Assign Manually** load generator distribution method is selected.
	Enables you to configure terminal services sessions on the selected load generator. For details, see Chapter 13, "Configuring Terminal Sessions." **Available:** When the **Assign Manually** load generator distribution method is selected.
Load Generators pane	Lists the available automatch load generators.
Properties pane	Enables you to define properties for the automatch load generators selected in the Load Generators list. ➤ **Location.** Select a load generator location. ➤ **Host Attributes.** Select attributes for the load generator. **Tip:** The list of attributes can be customized. For details, see "Load Generator Attribute Customization" on page 224. **Example:** If you want a Vuser group to use a load generator that is located in London, and that has medium strength and memory, then under **Location**, select **London**, and in the **Host Attributes** list, select **Host memory: Medium** and **Host strength: Medium**. At runtime, the system tries to assign a specific load generator with these properties to the Vuser group.

10

Scheduling Performance Tests

This chapter includes:

Concepts

Tasks

Reference

Concepts

Scheduling Performance Tests Overview

You use the Scheduler to create a schedule that distributes load in a performance test in a controlled manner.

Using the Scheduler, you can:

- Set the time at which the test should begin running, and specify how long the Scheduler should wait after the Run Test command is issued, and before running Vusers.
- Stipulate:
  - how to initialize the Vusers in the test
  - how many Vusers to start/stop within a given time period
  - how often to start running the Vusers—simultaneously or gradually

  For details, see "Scheduler Actions" on page 258.
- Limit the run duration of the Vusers or Vuser groups within the test by specifying the amount of time the Vusers or Vuser groups should be in the running state.
- Set a test to run according to the runtime settings defined for the enabled Vuser groups, or set the Vuser groups to run over and over again until the schedule settings instruct them to stop running.

To define a performance test schedule, see "How to Define a Schedule for the Performance Test" on page 247.

This section also includes:

- "Types of Test Schedules" on page 243
- "Schedule Run Modes" on page 245

Types of Test Schedules

When you design a performance test, you can define a schedule according to which the participating Vuser groups should run in the test.

You can schedule all the groups to run together on one schedule, or you can define a separate schedule for each Vuser group.

Scheduling By Test

When you schedule **by test**, all the Vuser groups participate in the test run simultaneously. That is, the schedule is applied to all the Vuser groups concurrently, and each action is applied proportionally to all the Vusers groups.

For example, take a test that includes three participating Vuser groups as follows:

Group Name	Number of Vusers
Group1	10
Group2	20
Group3	30
Total	**60**

When scheduling by test, if the scheduler instructs 30 Vusers to start running when it starts the test run, a proportional number of Vusers starts running from each group as follows:

Group Name	Number of Vusers
Group1	5
Group2	10
Group3	15
Total	**30**

Note: The same principle applies when the test is in percentage mode.

Scheduling By Vuser Group

Note: For tests in Vuser group (number) mode only.

When you schedule **by Vuser group**, each Vuser group participating in the test runs on its own separate schedule. That is, for each Vuser group, you can specify when to start running the Vuser group, how many Vusers in the group to start and stop running within specified time intervals, and how long the group should continue running.

Group schedules can run separately, or all at the same time.

Schedule Run Modes

You can schedule a test to run according to the runtime settings defined for the Vuser groups, or you can let the groups run over and over again until the test schedule instructs them to stop running.

You can schedule a test to run in one of the following run modes:

- **Real-world run mode.** The test runs according to a user-defined group of actions that simulate a real-world schedule of events. Vuser groups run according to the iterations defined in their run-time settings, but you can define how many Vusers to run at a time, how long Vusers should continue to run, and how many Vusers to stop running at a time.
- **Basic run mode.** All enabled Vuser groups run together on one schedule, each according to its own run-time settings. You can schedule how many Vusers to start running at a time, and how long they should run before stopping.

The following table illustrates how the given schedule types run in real-world versus basic run mode:

Schedule by	Run Mode	
	Real-world	**Basic**
Test	All participating Vuser groups run together on one schedule. The test runs according to a user-defined group of actions that emulate a true-to-life schedule of events. You can schedule Vusers to start and stop running numerous times during the test, and specify how long to keep them in their running or stopped state.	All participating Vuser groups run together on one schedule, each according to its own run-time settings. You schedule when to start running all the Vusers, specify how long they should run, and then specify how to stop running all the Vusers.
Group (Not applicable when the test is in Percentage mode)	Each participating Vuser group runs according to its own defined schedule that emulates a true-to-life schedule of events for that Vuser group. You can schedule Vusers in the groups to start and stop running numerous times during the test, and specify how long to keep them in their running or stopped state.	Each participating Vuser group runs according to its own schedule, each according to its own run-time settings. For each Vuser group, you schedule when to start running the Vuser group, how to start running all the Vusers in the group, specify how long the Vusers should run, and then specify how to stop running all the Vusers in the group.

Tasks

How to Define a Schedule for the Performance Test

This task describes how to define a schedule for a performance test.

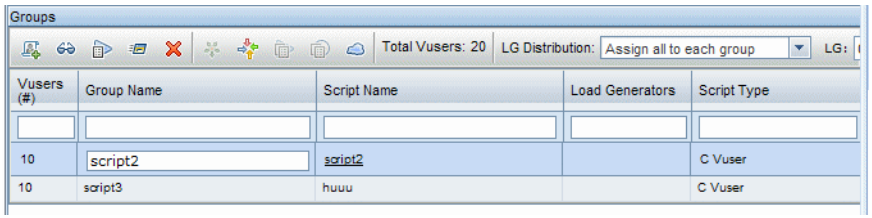
Note: This task is part of a higher-level task. For details, see "How to Define a Performance Test Workload" on page 192.

This task includes the following steps:

- Prerequisites on page 248
- Define a set of scheduler actions on page 248
- Group schedules only: Copy a Vuser group's scheduler settings to other groups - optional on page 249
- Schedule a start time for the test - optional on page 250

1 Prerequisites

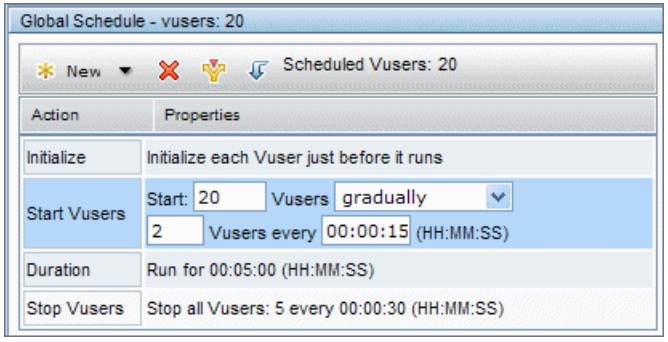
➤ In the Performance Test Designer (**Test Plan** > Right-click a test in the tree and select **Edit Test** > **Workload** tab), make sure the test contains scripts.



➤ The Scheduler must be enabled. Click the **Options** button located at the bottom of the Workload tab. In the Test Options dialog box, ensure that **Enable Scheduler** is selected. For user interface details, see "Test Options Dialog Box" on page 219.

2 Define a set of scheduler actions

The Actions grid displays the default scheduler actions that correspond to the workload type selected in the **Workload type** box.



In real-world schedules, you can add more scheduler actions, and edit or delete existing actions.

In basic schedules, you can edit the existing scheduler actions.

➤ For details about the scheduler actions, see "Scheduler Actions" on page 258).

➤ For details about how to add actions (real-world schedules only), see "How to Add Actions to a Test Schedule" on page 250).

➤ For details about how to edit actions, see "How to Edit Scheduler Actions" on page 253).

3 Group schedules only: Copy a Vuser group's scheduler settings to other groups - optional

When scheduling **by Vuser group**, you can copy a Vuser group's scheduler settings to other Vuser groups.

Note:

➤ Scheduler settings copied include the scheduler run mode (basic or real-world) and the set of defined scheduler actions.

➤ This option is disabled for global schedules.

a On the Groups grid toolbar, click the **Duplicate Scheduler Settings** button.

b Select the source group whose settings you want to copy, and select one or more target groups.

c Click **Apply**. The source group's scheduler settings are copied to the target groups.

4 Schedule a start time for the test - optional

Click the **Options** button located at the bottom of the Workload tab. Select **Start the Scheduler after a Delay of**, and enter the amount of time after which to start running the test.

How to Add Actions to a Test Schedule

This task describes how to add actions to a real-world test schedule.

Note: You can add actions to a **real-world schedule** only.

This task includes the following steps:

- Add an action to the schedule from the Actions grid on page 250
- Add an action by splitting one action into two actions on page 252

Add an action to the schedule from the Actions grid

Note: A new action is always added **after** the action selected in the Actions grid.

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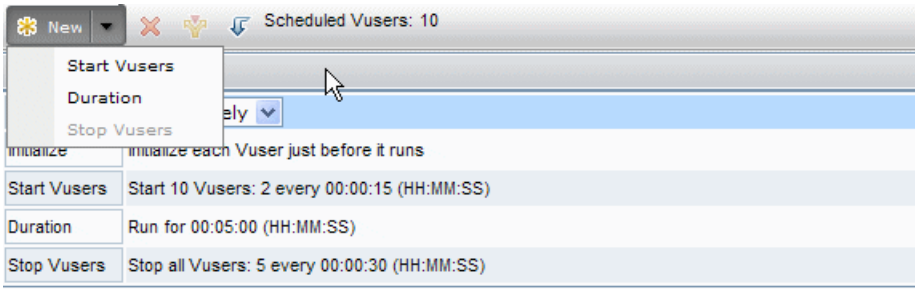
1 In the Actions grid, select an action after which to insert the new action, and click **New scheduler action** button's down arrow.



2 Select the type of action to add.

Note: You can add a **Start Vusers**, **Stop Vusers**, or **Duration** action. For details about each type of action, see "Scheduler Actions" on page 258.

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3 In the **Properties** column, specify the action's properties.

- If you are adding a Start Vusers or Stop Vusers action, enter the number of Vusers to start/stop running, and select how to start/stop running the Vusers: **simultaneously** or **gradually**.

  If you selected **gradually**, enter the number of Vusers to start/stop at a time, and at what time interval.

- If you are adding a Duration action, select how long to run the action.

Click **Apply change** to save the action settings.

4 When you have finished adding actions to the schedule, click **Save** at the bottom of the Workload tab.

Note: If you navigate away from the Performance Test Designer window without clicking **Save**, changes applied to the schedule are not saved.

Add an action by splitting one action into two actions

You can add **Start Vusers**, **Duration**, and **Stop Vusers** actions from the Actions grid or from the graph by splitting an action into two halves of the original actions.

To split an action in two:

1 Select the action in the grid, or line in the graph that represents the action that you want to split.

Tip: Selecting the action in the Actions grid highlights the corresponding line in the graph.

2 Click the **Split Action** button. The selected action/line splits in two. In the Actions grid, the original action splits into two equivalent actions, each representing half of the original action.

For example:

- Splitting a Duration action of 5 minutes results in two Duration actions of 2.5 minutes each.
- Splitting a Start Vusers action that starts 20 Vusers results in two Start Vusers actions, each starting 10 Vusers.

3 (Optional) Edit each of the actions. For details, see "How to Edit Scheduler Actions" on page 253.

How to Edit Scheduler Actions

This task describes how to edit scheduler actions. You can edit all types of actions. For details about each action type, see "Scheduler Actions" on page 258.

To edit a scheduler action:

1 In the Actions grid, select the action that you want to edit. The **Properties** column becomes editable.

2 Modify the action settings and click **Apply change**.

3 When you have finished editing the actions, click **Save**.

Note: If you navigate away from the Performance Test Designer window without clicking **Save**, changes applied to the schedule are not saved.

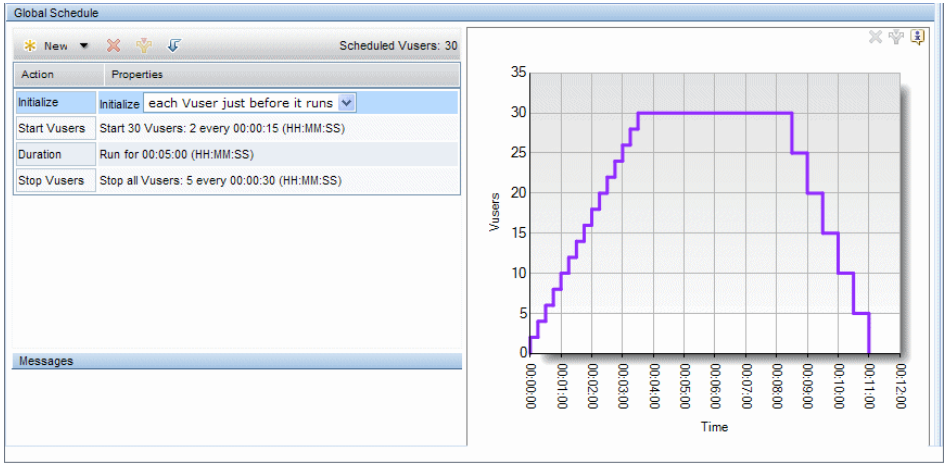
Reference

Scheduling Performance Tests User Interface

This section includes:

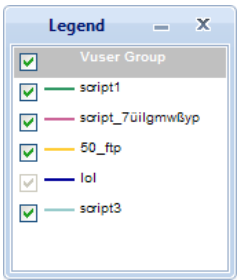
Scheduler Pane

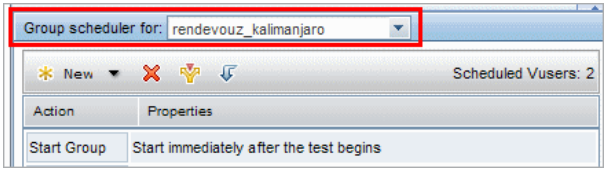
This pane enables you to define a schedule for running your performance test.



To access	**1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Right-click a performance test in the test plan tree and select **Edit Test**. **3** In the Performance Test Designer window, click the **Workload** tab.
Important information	If scripts in your test contain rendezvous points, the test will not run as scheduled because the rendezvous points interfere with the schedule. For details, see "Rendezvous Points" on page 190.
Relevant tasks	"How to Define a Schedule for the Performance Test" on page 247
See also	➤ "Scheduling Performance Tests Overview" on page 242 ➤ "Scheduler Actions" on page 258

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**New scheduler action.** Enables you to add an action to the test schedule. The new action is added **after** the action selected in the grid. You can add Start Vuser, Duration, and Stop Vuser actions only. For details, see "Scheduler Actions" on page 258. **Available from:** Real-world schedule only
	**Delete selected action**. Deletes the selected action.
	**Split selected action.** Splits the selected action into two identical halves of the original action.
	**Apply change**. Enables you to apply modifications made to the actions in the schedule graph.
	**Hide/Show Legend**. Hides/Shows the graph legend. **Note for group schedules only:** When the legend is showing, the group selected in the grid's title bar is read-only in the legend. To view/hide one or more of the other Vuser groups, select/clear the check boxes next to the Vuser groups respectively. 

UI Elements	Description
Scheduled Vusers	Displays a total of the Vusers scheduled to run in the test. **Note:** ➤ When the test is in number mode and you are defining a basic schedule, the number of scheduled Vusers is updated when you modify the number of Vusers in the Vuser groups. You can change the number of Vusers in a selected group: ➤ **In the Groups grid:** Select the group and change the number of Vusers ➤ **In the Actions grid:** Select the group in the Action grid's title bar and change the number of Vusers in the Start Vusers action.  ➤ In real-world schedules, the total number of Vusers is the sum of all the Vusers defined in the Start Vusers actions.
<Actions grid>	Lists the scheduled actions. Initially the grid displays default actions that correspond to the schedule type you selected for your workload. For details, see "Workload Types Dialog Box" on page 211. For all schedules, some of the actions can be modified. In real-world schedules, you can also add and delete actions, enabling you to simulate a more true-to-life schedule by which to run your test.
<Schedule graph>	Provides a graphical representation of the actions listed in the Actions grid. In real-world schedules, you can add new actions from the graph by splitting an action into two identical halves.

UI Elements	Description
<Title bar>	Displays the type of schedule and the number of scheduled Vusers, depending in the type of workload is selected for the test: ➤ **Global Schedule.** Displayed when the schedule is a schedule by test. ➤ **Group Schedule for <group>.** Displayed for group schedules. Displays the name of the group whose schedule is displayed in the actions grid.
Messages	Displays alert messages.

Scheduler Actions

A performance test schedule contains a sequence of actions that instruct the test when to start running a Vuser group, how to initialize Vusers, when to start and stop running Vusers, and how long to run an action.

The following sections describe the available scheduler actions.

➤ "Start Group" on page 259

➤ "Initialize" on page 260

➤ "Start Vusers" on page 261

➤ "Duration" on page 262

➤ "Stop Vusers" on page 263

Start Group

The Start Group action defines when to start running a Vuser group. By default, the **Start Group** action appears as the first action in the Actions grid when you select a workload of type: **by group**.

Options	Description
Start immediately	The Scheduler starts running the selected Vuser group as soon as the test starts running. Resulting action: **Start immediately after the test begins.**
Start with delay	After the test starts running, the Scheduler waits the specified time (in hours, minutes, and seconds) before it starts running the selected Vuser group. Resulting action: **Start (HH:MM:SS) after the test begins.**
Start when group	The Scheduler starts running the selected Vuser group immediately after the Vuser group specified in this option has finished running. Resulting action: **Start when group <group name> finishes.**

Note:

- The **Start Group** action is available for group schedules only.
- The **Start Group** action is always followed by the **Initialize** action.
- The **Start Group** action cannot be deleted.

Initialize

The **Initialize** action instructs the Scheduler to prepare the Vusers so that they are in the **Ready** state and can run. By default, the **Initialize** action appears in the Actions grid for all types of schedules.

Options	Description
Initialize all Vusers simultaneously	The Scheduler initializes all the Vusers in the test or selected Vuser group together, and waits the specified amount of time before running them. Resulting action: **Initialize all Vusers simultaneously** **Wait for** <00:00:00> **(HH:MM:SS) after initialization**
Initialize gradually	The Scheduler initializes the specified number of Vusers gradually, according to the specified time interval (in hours, minutes, and seconds), and waits the specified amount of time before running them. Resulting action: **Initialize <XX> Vusers every (HH:MM:SS)** **Wait for (HH:MM:SS) after initialization.**
Initialize each Vuser just before it runs	The Scheduler initializes each Vuser in the test or selected Vuser group just before it starts running. Resulting action: **Initialize each Vuser just before it runs.** **Note:** This option is not available for Group schedules when **Wait for all groups to initialize** is selected. See "**Wait for all groups to initialize**" on page 220.

Note: The **Initialize** action cannot be deleted.

Start Vusers

The Start Vusers action instructs the Scheduler to start running the Vusers.

Options	Description
Start XX Vusers: Simultaneously	The Scheduler runs the specified number of Vusers simultaneously. Resulting action: **Start XX Vusers: Simultaneously**
Start XX Vusers: gradually **YY Vusers: every <hh:mm:ss> (HH:MM:SS)**	The Scheduler runs the specified number of Vusers (XX) gradually. That is, the Scheduler runs YY Vusers, and waits the specified time (in hours, minutes, and seconds) before running another YY Vusers. Resulting action: **Start XX Vusers: YY Vusers every <hh:mm:ss> (HH:MM:SS)**

Note:

- The Scheduler starts running Vusers only when they have reached the **Ready** state.
- In a basic schedule, the Scheduler always runs **all** the Vusers, whether simultaneously or gradually. In a real-world schedule, you can select how many Vusers to start running at a time.
- While a test is running, you can add Vuser groups/scripts to the test and enable them. When starting the Vusers gradually, if you add a Vuser group after all the Vusers in the test have started running, the new group will start running immediately.

Duration

The Duration action instructs the Scheduler to continue running the test in the current state, for the specified amount of time.

Options	Description
Run until complete	The test runs until all the Vusers have finished running. Resulting action: **Run until completion**
Run for	The test runs in its current state for the specified amount of time (in days, hours, minutes, and seconds) before continuing with the next action. **Default:** 5 minutes **Maximum definable duration period:** 99.23:59:59 dd.HH:MM:SS. Resulting action: **Run for <dd.hh:mm:ss> (dd.HH:MM:SS)**
Run indefinitely	The test runs indefinitely. Resulting action: **Run indefinitely** **Available for:** Basic schedule only

---

Note:

- In a real-world schedule, if a Duration action is not followed by another action, the test continues to run indefinitely.
- In a real-world schedule, to avoid unexpected behavior during the test run, add a Duration action between consecutive Start Vusers and Stop Vusers actions.
- In a basic schedule, a **Run for** Duration action is always followed by a Stop Vuser action.

Stop Vusers

The Stop Vusers action instructs the Scheduler to stop the running Vusers.

Options	Description
Stop All/XX Vusers: Simultaneously	The Scheduler stops the specified number (**All** or **XX**) of running Vusers at once. Resulting action: **Stop <XX> Vusers: Simultaneously**
Stop All/XX Vuser: gradually	The Scheduler stops the specified number of Vusers (**All** or **XX**) gradually. That is, the Scheduler stops YY Vusers, and waits the specified time (in hours, minutes, and seconds) before stopping another YY Vusers. Resulting action: **Stop <XX> Vuser: <YY> Vusers every <hh:mm:ss> (HH:MM:SS)**

Note:

- A basic schedule that has a **Run for** Duration action, is always followed by a Stop Vuser action that stops all the Vusers, simultaneously or gradually.
- In a real-world schedule, to avoid unexpected behavior during the test run, add a Duration action between consecutive Start Vusers and Stop Vusers actions.
- In a real-world schedule, if no action is specified after a **Run for** Duration action, the Vusers continue to run indefinitely—that is, the schedule continues to run indefinitely.
- When scheduling by group, if Group A is scheduled to run indefinitely, and Group B is scheduled to run after Group A, then Group A must be stopped manually before Group B can start running.

11

Service Level Agreements

This chapter includes:

Concepts

Tasks

Reference

Concepts

Service Level Agreements Overview

Service level agreements (SLAs) are specific goals that you define for your performance test. After a test run, HP LoadRunner Analysis compares these goals against performance related data that was gathered and stored during the course of the run, and determines whether the SLA passed or failed.

Depending on the measurements that you are evaluating for your goal, ALM determines the SLA status in one of the following ways:

SLA Type	Description
SLA status determined at time intervals over a timeline	Analysis displays SLA statuses at set time intervals over a timeline within the test run. At each time interval in the timeline—for example, every 10 seconds—Analysis checks to see if the measurement's performance deviated from the threshold defined in the SLA. Measurements that can be evaluated in this way: ➤ **Average Transaction Response Time** ➤ **Errors per Second**
SLA status determined over the whole run	Analysis displays a single SLA status for the whole test run. Measurements that can be evaluated in this way: ➤ **Transaction Response Time - Percentile** ➤ **Total Hits per run** ➤ **Average Hits (hits/second) per run** ➤ **Total Throughput (bytes) per run** ➤ **Average Throughput (bytes/second) per run**

Note:

You can define and edit SLAs in ALM or in HP LoadRunner Analysis.

For details about viewing post-run SLA statuses in ALM Performance Center, see "SLA Report" on page 399.

For details about viewing post-run SLA statuses in Analysis reports, see the *HP LoadRunner Analysis User Guide*.

Tracking Period

When you define service level agreements (SLAs) for measurements that are evaluated over a timeline, Analysis determines SLA statuses at specified time intervals within that timeline. The frequency of the time intervals is called the **tracking period**.

An internally-calculated tracking period is defined by default. You can change this tracking period by defining a value which Analysis plugs into a built-in algorithm to calculate the tracking period. For details, see "Tracking Period Dialog Box" on page 286.

Tasks

How to Define Service Level Agreements

This task describes how to define service level agreements (SLAs).

You can define service level agreements (SLAs) which measure performance test goals over time intervals during a test run, or over a whole performance test run. To learn more, see "Service Level Agreements Overview" on page 266 and the *HP LoadRunner Analysis User Guide*.

Note: This task is part of a higher-level task. For details, see "How to Design a Performance Test" on page 171.

Tip: For a use-case scenario related to this task, see "How to Define Service Level Agreements - Use-Case Scenario" on page 270.

This task includes the following steps:

- "Prerequisites" on page 268
- "Run through the SLA wizard" on page 269
- "Define a tracking period - optional" on page 269
- "Results" on page 270

1 Prerequisites

Create a performance test. For details, see "How to Design a Performance Test" on page 171.

Note: To define Average Transaction Response Time or Transaction Response Time Percentile SLAs, your performance test must include a script that contains at least one transaction.

---

2 Run through the SLA wizard

In the Performance Test Designer, click the **Summary** tab. In the **Service Level Agreement** pane, click **New** to open the Service Level Agreement wizard. For user interface details, see "Service Level Agreement Wizard" on page 277.

a Select a measurement for the SLA.

b If you are defining an SLA for Transaction Response Time (Average/Percentile), select the transactions to include in your goal.

c (Optional) When evaluating SLA statuses over a timeline, select a load criterion to take into account and define appropriate load value ranges for the load criterion.

d Set thresholds for the measurements.

- If the values of **Transaction Response Time (Average/Percentile)** or **Errors per Second exceed** the defined thresholds, Analysis will produce a **Failed** SLA status.
- If value of **Total Hits**, **Average Hits per Second**, **Total Throughput**, or **Average Throughput** are **lower than** the defined threshold, Analysis will produce a **Failed** SLA status.

3 Define a tracking period - optional

For measurements whose SLA statuses are determined over time intervals, you need to define the frequency of the time intervals, that is, the **tracking period**. For details, see "Tracking Period" on page 267.

For user interface details, see "Tracking Period Dialog Box" on page 286.

4 Results

During post test run analysis, HP LoadRunner Analysis compares the data collected from the test run against the settings defined in the SLAs, and determines SLA statuses which are included in the default Summary Report and the SLA Report.

For more information, see "Results/Last Run Results Tab" on page 354.

See also the *HP LoadRunner Analysis User Guide*.

How to Define Service Level Agreements - Use-Case Scenario

This use-case scenario describes how to define a service level agreement (SLA) for Average Transaction Response Time.

Note: For a task related to this scenario, see "How to Define Service Level Agreements" on page 268.

This use-case scenario includes the following steps:

1 Background

The administrator of HP Web Tours would like to know when the average transaction response time for booking a flight and searching for a flight exceeds a certain value. Assume that your performance test includes a script that includes the following transactions: **book_flight** and **search_flight**.

2 Start the SLA wizard

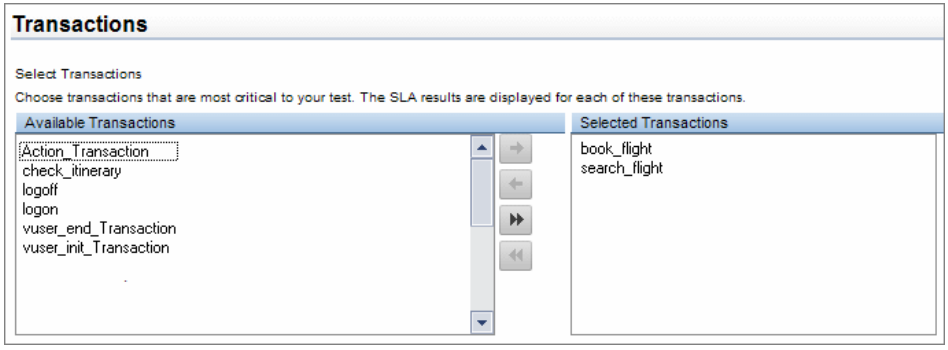
In the Service Level Agreement pane, click **New** to start the Service Level Agreement wizard. Click **Next**.

3 Select the measurement for the SLA

On the Measurement page, select **Transaction Response Time**, and from the drop-down list, select **Average**.

4 Select the transactions to evaluate in your goal

On the Transactions page, select the transactions to be evaluated: **book_flight** and **search_flight**.



5 Select a load criterion and define appropriate ranges of load - optional

On the Load Criteria page, select the load criterion to take into account when evaluating the average transaction response time.

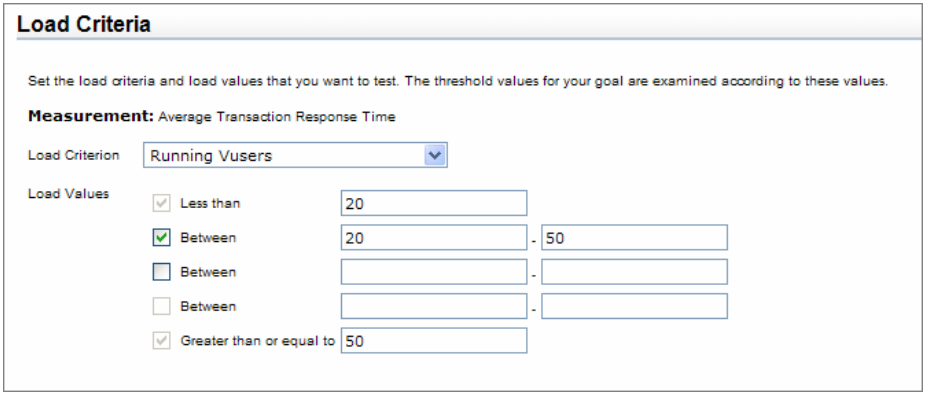
In this case, to see the effect that various quantities of Vusers running on the system has on the average transaction response time of each transaction, in the **Load Criterion** box, select **Running Vusers**.

Then set the value ranges for the running Vusers:

Consider less than 20 Vusers to be a light load, 20 – 50 Vusers an average load, and 50 Vusers or more a heavy load. Enter these values in the Load Values boxes.

Note:

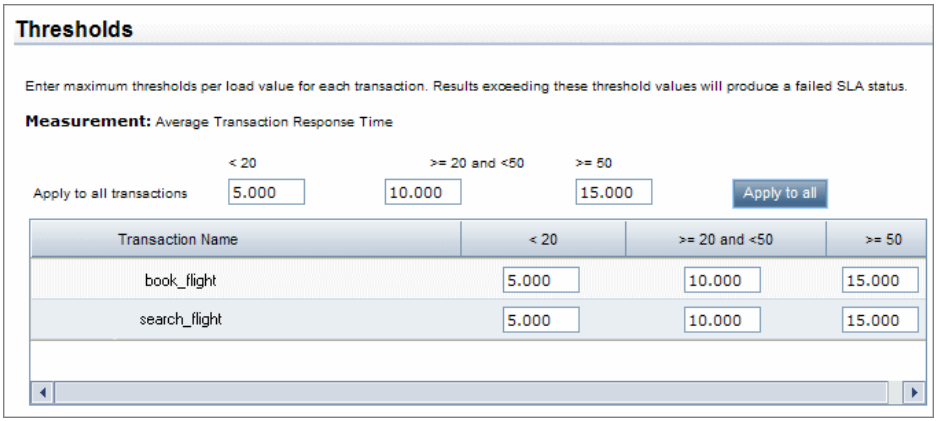
- You can set up to three in-between ranges.
- Valid load value ranges are consecutive—there are no gaps in the range—and span all values from zero to infinity.



6 Set thresholds

On the Thresholds page, you define the acceptable average transaction response times for the transactions, taking into account the defined load criterion.

In this case, define the same threshold values for both transactions as follows: for a light load, a reasonable average response time can be up to 5 seconds, for an average load, up to 10 seconds, and for a heavy load, up to 15 seconds.



Tip: To define the same thresholds for all the transactions, enter the values in the **Apply to all transactions** boxes above the table, and click the **Apply to all** button.

---

7 Define a tracking period - optional

When SLA statuses for a measurement are determined at time intervals over a timeline, the frequency of the time intervals is determined by the **tracking period**.

This step is optional because an internally-calculated tracking period of at least 5 seconds is defined by default. You can change the tracking period in the Tracking Period dialog box:

a In the Service Level Agreement pane, click the **Tracking Period** button.

b Select **Tracking period of at least X seconds**, and select a tracking period. The time intervals are calculated by Analysis according to a built-in algorithm and as a function of the value you enter here.

Example:

If you select a tracking period of 10, and the aggregation granularity for the performance test (defined in Analysis) is 6, then the tracking period is set to the nearest multiple of 6 that is greater than or equal to 10, that is, Tracking Period = 12.

For details, see "Tracking Period" on page 267.

For user interface details, see "Tracking Period Dialog Box" on page 286.

8 Results

When analyzing your test run, Analysis applies your SLA settings to the default Summary Report and the report is updated to include all the relevant SLA information.

For example, it displays the worst performing transactions in terms of defined SLAs, how specific transactions performed over set time intervals, and overall SLA statuses.

For more information, see the *HP LoadRunner Analysis User Guide*.

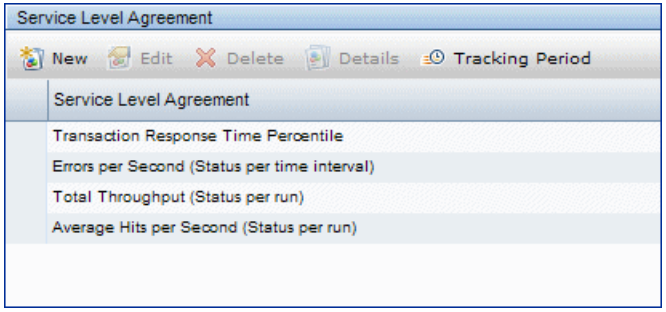
Reference

Service Level Agreement User Interface

This section includes:

Service Level Agreement Pane

This pane lists all the service level agreements (SLAs) defined for the performance test.



To access	1 On the ALM sidebar, under **Testing**, select **Test Plan**. 2 Right-click a performance test in the test plan tree and select **Edit Test**. 3 In the Performance Test Designer window, click the **Summary** tab.

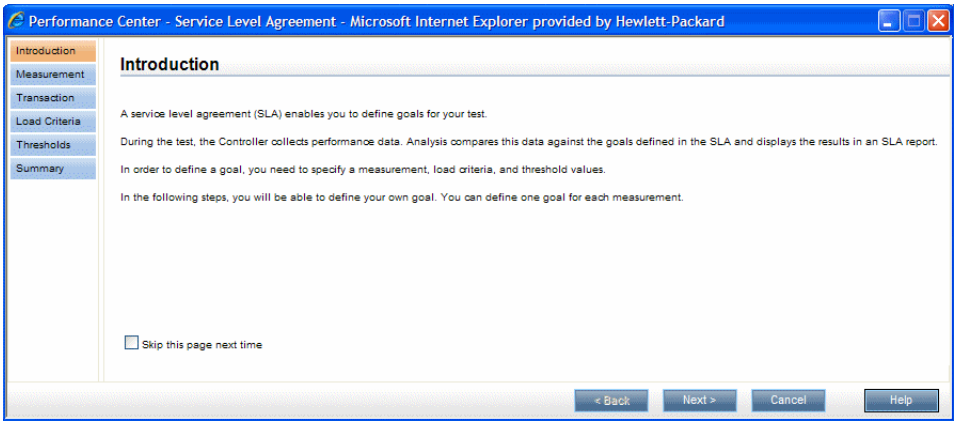
Relevant Tasks	➤ "How to Design a Performance Test" on page 171 ➤ "How to Define Service Level Agreements" on page 268
See also	"Service Level Agreements Overview" on page 266

User interface elements are described below:

UI Elements	Description
	Starts the Service Level Agreement wizard where you can define new goals for the performance test.
	Opens the Service Level Agreement wizard where you can modify the goals defined in the SLA.
	Deletes the selected SLA.
	Opens the SLA Details dialog box which displays a summary of the details of the selected SLA.
	Opens the Tracking Period dialog box where you can adjust the tracking period for measurements that are evaluated per time interval over a timeline. For conceptual information, see "Tracking Period" on page 267. For user interface details, see "Tracking Period Dialog Box" on page 286.
Service Level Agreement list	Lists the SLAs defined for the performance test.

Service Level Agreement Wizard

This wizard enables you to define service level agreements (SLAs). SLAs enable you to define performance targets or goals for your performance test. During a test run, ALM measures performance and collects data. This data is compared against thresholds defined in the SLAs.



To access	**To view a list of defined SLAs:** **1** On the ALM sidebar, under **Testing**, select **Test Plan**, and select a test in the tree. **2** Click the **Test Design** tab. The Service Level Agreement pane lists the defined SLAs. **To define SLAs:** **1** On the ALM sidebar, under **Testing**, select **Test Plan**, right-click a test in the tree, and select **Edit Test**. **2** In the Performance Test Designer window, click the **Summary** tab. **3** In the Service Level Agreement pane, click  .
Important information	You can define SLAs in the Performance Test Designer only.
Relevant tasks	"How to Define Service Level Agreements" on page 268
Wizard map	This wizard contains: **Introduction** > Measurement Page > (Transactions Page) > (Load Criteria Page) > Thresholds Page > Summary Page
See also	"Service Level Agreements Overview" on page 266

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Skip this page next time	When this option is selected, the SLA wizard starts on the Measurements page. For details, see "Measurement Page" on page 279. To view the Introduction page again, on the Measurement page click **Back** and clear the **Skip this page next time** option.

Measurement Page

This wizard page enables you to select a measurement for the SLA. Some measurements are measured at time intervals over a timeline, and others are measured over the whole test run.

Important information	General information about this wizard is available here: "Service Level Agreement Wizard" on page 277.
Wizard map	The Service Level Agreement Wizard contains: Introduction > **Measurement Page** > (Transactions Page) > (Load Criteria Page) > Thresholds Page > Summary Page
See also	"Service Level Agreements Overview" on page 266

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Transaction Response Time	➤ **Percentile.** Measures the percentage of transactions whose transaction response time falls below a specific threshold. The SLA is measured over the whole run. ➤ **Average.** Measures whether the average transaction response time of the transactions over a specified time interval exceeds the defined threshold. **Note:** Transaction Response Time SLAs can be defined only when at least one of the scripts participating in the test includes a transaction.
Errors per Second	Measures whether the errors per second over a specified time interval exceed the defined threshold.
Total Hits	Measures whether the total number of hits over the whole test run reach the defined threshold.
Average Hits per Second	Measures whether the average hits per seconds over the whole test run reach the defined threshold.

UI Elements	Description
Total Throughput	Measures whether the total throughput over the whole test run reaches the defined threshold.
Average Throughput	Measures whether the average throughput over the whole test run reaches the defined threshold.

 Transactions Page

This wizard page enables you to include transactions critical to your test in the evaluation.

Important information	➤ General information about this wizard is available here: "Service Level Agreement Wizard" on page 277. ➤ The Transaction page is displayed only when at least one of the scripts participating in the test includes a transaction.
Wizard map	The Service Level Agreement Wizard contains: Introduction > Measurement Page > (**Transactions Page**) > (Load Criteria Page) > Thresholds Page > Summary Page
See also	"Service Level Agreements Overview" on page 266

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Available Transactions	Lists the transactions in the scripts participating in the test. To move a script to the **Selected Transaction** list, double-click it. **Note:** You must select at least one transaction for evaluation.
Selected Transactions	Lists the transactions in the scripts that have been selected for the SLA. To remove a script from this list, double-click it. **Note:** At least one transaction must be listed.

Load Criteria Page

This wizard page enables you to select a load criterion for your goal and define appropriate load value ranges. For example, you can define the SLA to show the behavior of errors per second when there are less than 5 running Vusers, when there are between 5 and 10 running Vusers, and when there are 10 or more running Vusers.

Important information	➤ General information about this wizard is available here: "Service Level Agreement Wizard" on page 277. ➤ This page is available only when defining the **Average Transaction Response Time** or **Errors per Second** SLAs. ➤ In the next wizard step (Thresholds page), you will set different thresholds per each of these load value ranges.
Wizard map	The Service Level Agreement Wizard contains: Introduction > Measurement Page > (Transactions Page) > (**Load Criteria Page**) > Thresholds Page > Summary Page
See also	"Service Level Agreements Overview" on page 266

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Measurement	The measurement selected for the SLA.
Load Criterion	The load criterion to consider when evaluating the goal. ➤ **None.** Does not consider any load criterion. ➤ **Running Vusers.** Considers the impact of the running Vusers. ➤ **Throughput.** Considers the impact of throughput. ➤ **Hits per Second.** Considers the impact of the hits per second. For Average Transaction Response Time, you can also select: ➤ **Transactions per second**. Considers the impact of the transactions per second. ➤ **Transactions per second (passed).** Considers the impact of the transactions per second that passed the evaluation.
Load Values	Values of load to consider when evaluating the goal. Value ranges must be consecutive, spanning all values from zero to infinity. ➤ **Less than.** The lower range is always from 0 up to, but not including, the value entered here. **Example:** If you enter 5, the lower range is between 0 and 5, but does not include 5. ➤ **Between.** The in-between ranges include the lower value of the range, but not the upper value. **Example:** If you enter 5 and 10, the range is from 5 and up to, but not including, 10. **Note:** You can set up to three in-between ranges. ➤ **Greater than.** The upper range is from the value entered here, and higher. **Example:** If you enter 10, the upper range is from 10 and up.

Thresholds Page

This wizard page enables you to define thresholds for the selected measurement.

Important information	General information about this wizard is available here: "Service Level Agreement Wizard" on page 277.
Wizard map	The Service Level Agreement Wizard contains: Introduction > Measurement Page > (Transactions Page) > (Load Criteria Page) > **Thresholds Page** > Summary Page
See also	"Service Level Agreements Overview" on page 266

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Measurement	The measurement selected for the SLA.
Percentile	Percentage of transactions to measure against the configured threshold. **Available for the following measurement:** Transaction Response Time Percentile
Apply to all transactions	Enables you to define a threshold or a set of thresholds for all of the listed transactions. Click Apply to all to apply the thresholds to all of the listed transactions simultaneously. **Note:** Threshold values for the transactions do not have to be the same. You can assign different values for each transaction. **Available for the following measurement:** Average Transaction Response Time

UI Elements	Description
Provide a threshold value for all transactions	Enables you to define one threshold for all of the listed transactions. Click Apply to all to apply the value to all of the listed transactions simultaneously. **Note:** The threshold values for the transactions do not have to be the same. You can assign different values for each transaction. **Available for the following measurements:** Transaction Response Time Percentile
Threshold/ <Threshold table>	The minimum/maximum threshold value for the selected measurement. ➤ **Transaction Response Time Percentile**: If the resulting value over the whole run exceeds the defined threshold values, the SLA produces a **Failed** status. ➤ **Average Transaction Response Time** and **Errors per Second**: If the resulting value over the specified time interval exceeds the threshold values, the SLA produces a **Failed** status for that time interval. ➤ **Average/Total Throughput** and **Average Hits per Second/Total Hits**: If the resulting value over the whole run is lower than the threshold value, the SLA produces a **Failed** status. **Notes:** ➤ **Transaction Response Time Percentile** and **Average Transaction Response Time:** When more than one transaction is selected, all of the transactions are listed in a table enabling you to define thresholds for each transaction separately. ➤ **Average Transaction Response Time** and **Errors per Second**: When a load criterion is selected, the table displays the load value ranges, enabling you to define thresholds per range of load values. For details, see "Load Criteria Page" on page 281.

Summary Page

This wizard page displays a summary of the SLA you defined and enables you to define more SLAs.

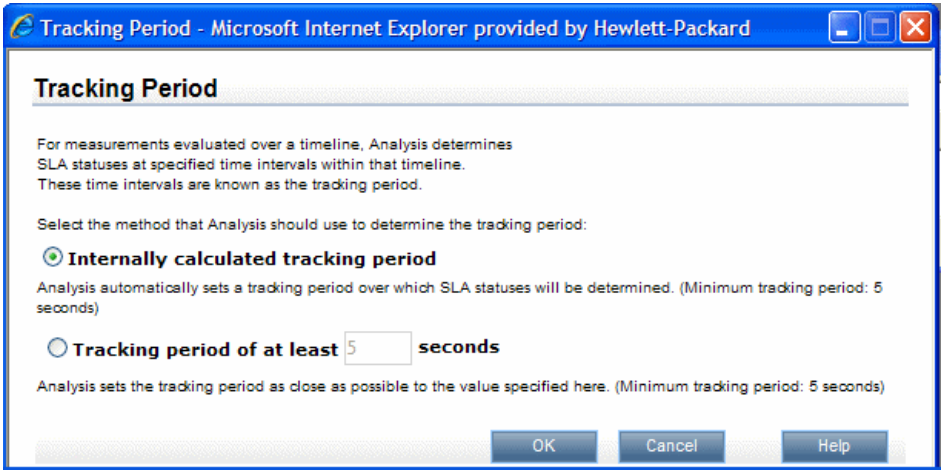
Important information	General information about this wizard is available here: "Service Level Agreement Wizard" on page 277.
Wizard map	The Service Level Agreement Wizard contains: Introduction > Measurement Page > (Transactions Page) > (Load Criteria Page) > Thresholds Page > **Summary Page**
See also	"Service Level Agreements Overview" on page 266

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Define another service level agreement	Enables you to define another SLA while still in the SLA wizard. If this option is selected, clicking **Finish** takes you directly to the page where you can select a measurement for another SLA.

Tracking Period Dialog Box

This dialog box enables you to set a tracking period for service level agreements.



To access	**1** In the Performance Test Designer, click the **Summary** tab. **2** In the **Service Level Agreement** pane, click the **Tracking Period** button.
Important information	For measurements evaluated over a timeline, Analysis determines SLA statuses at specified time intervals within that timeline. These time intervals are known as the tracking period.
Relevant tasks	"How to Define Service Level Agreements" on page 268
See also	"Service Level Agreements Overview" on page 266

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Internally calculated tracking period	Analysis automatically sets a tracking period over which SLA statuses are determined. **Minimum tracking period:** 5 seconds
Tracking period of at least <xx> seconds	Analysis sets the tracking period as close as possible to the value specified here. **Minimum tracking period:** 5 seconds **Example:** Assume that you select a tracking period of X=10, and assume that the aggregation granularity for the performance test is 6. The tracking period is set to the nearest multiple of 6 that is greater than or equal to 10. That is, Tracking Period = 12. For this option, Analysis uses the following formula: **Tracking Period = Max(5 seconds, m(Aggregation Granularity))** where **m** is a multiple of the performance test's aggregation granularity such that **m(Aggregation Granularity)** is greater than or equal to X.

12

Enabling and Configuring ERP/CRM and J2EE/.NET Diagnostics

This chapter includes:

Tasks

Reference

Tasks

How to Enable and Configure ERP/CRM Diagnostics

This task describes how to configure the ERP/CRM Diagnostics modules to communicate with the Mediator, and how to define the servers that you want to monitor in order to generate diagnostics data.

To learn more about ERP/CRM diagnostics, see "ERP/CRM Diagnostics Overview" on page 833.

Note: This task is part of a higher-level task. For details, see "How to Design a Performance Test" on page 171.

---

1 Prerequisites

- Make sure that the ERP/CRM Mediator is installed and configured. If this is not the case, consult the administrator for help.
- Make sure that the performance test is not already running.

2 Manually define transactions in the Vuser script

To ensure that valid diagnostics data are generated, manually define the transactions in the Vuser script rather than using automatic transactions. Make sure to disable the following options in the Run-Time Settings' **General : Miscellaneous** node: **Define each action as a transaction** and **Define each step as a transaction**.

3 (Siebel/Siebel DB) Add think time after transactions

When preparing your script for collection of diagnostics data, we recommend that you add think time at the end of each transaction using the ratio of one second per hour of testing.

4 (Oracle 11i) Clear the server of users while the diagnostics module is running.

Make sure that no real or other virtual users are working on the Oracle server while the diagnostics module is running, as this may affect diagnostics results.

5 (Oracle 11i) Select the Oracle NCA application version

The Oracle 11i Diagnostics module supports Oracle NCA versions 11.5.0 and later. Enter the version of your Oracle application server in VuGen's run-time settings to enable the built-in trace mechanism.

Note: To check the version of your Oracle server, log on to the Oracle server and select **Help** > **About Oracle**. The version of your Oracle server is displayed in the Oracle Application field.

To enter your Oracle application version, open the script in VuGen and select **Vuser** > **Run-Time Settings**. In the **Oracle NCA: Client Emulation** node, select the version of Oracle NCA that you are using in the **Diagnostics** > **Application Version** field.

Note: If the Oracle 11i trace cannot be enabled using the built-in mechanism, you can enable it manually in the Vuser script using the **nca_set_custom_dbtrace** and **nca_set_dbtrace_file_index** functions. This may occur if you are using a custom application that does not have a standard user interface.

---

6 Enable the diagnostics module

On the ALM sidebar, under **Testing**, select **Test Lab**. Then select the desired performance test, and select **Test Design** > **Edit Test** > **Diagnostics** tab where you enable and configure the relevant diagnostics module. For user interface details, see "Performance Test Designer > Diagnostics Tab" on page 295.

How to Enable and Configure J2EE/.NET Diagnostics

This step describes how to capture J2EE/.NET diagnostics metrics in a performance test, and how to select the probes that are included in the test.

To learn more about J2EE/.NET diagnostics, see "J2EE/.NET Diagnostics Overview" on page 832.

Note: This task is part of a higher-level task. For details, see "How to Design a Performance Test" on page 171.

Enable J2EE/.NET diagnostics from the Diagnostics Tab

Select the desired performance test, and then select **Test Design** > **Edit Test** > **Diagnostics** tab where you enable and configure J2EE/.NET Diagnostics. For user interface details, see "Performance Test Designer > Diagnostics Tab" on page 295.

How to View Diagnostics Results

You view results for ERP/CRM as well as J2EE/.NET diagnostics in HP LoadRunner Analysis.

1 Open Analysis

a Select **Start** > **Programs** > **LTS** > **Analysis**.

b Open the desired results file from the following location:

<LTS installation>\orchidtmp\Results\<Domain Name+Project Name>\Run_<Run number>\res<Run number>\res<Run number>.lrr

2 View results in the Analysis diagnostics graphs

You can use the Analysis diagnostics graphs and reports to view the performance data and drill down to pinpoint problem areas in any layer of the application.

For information about specific diagnostics graphs, see the following sections in the *HP LoadRunner Analysis User Guide*:

- Siebel Diagnostics Graphs
- Siebel DB Diagnostics Graphs
- Oracle 11i Diagnostics Graphs
- SAP Diagnostics Graphs
- J2EE & .NET Diagnostics Graphs

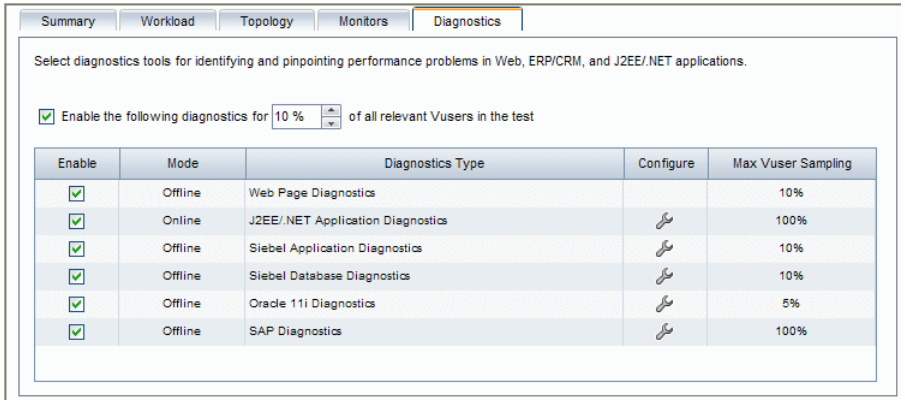
Reference

Diagnostics User Interface

This section includes:

Performance Test Designer > Diagnostics Tab

This tab enables you to enable and define the ERP/CRM and J2EE/.NET diagnostics modules for a performance test.



To access	**1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Right-click a performance test in the test plan tree and select **Edit Test**. **3** In the Performance Test Designer window, click the **Diagnostics** tab.
Important information	➤ The contents of the tab are disabled while the performance tests is running. You must enable and configure the diagnostics modules before running the test. ➤ The settings that you configure are per performance test. All scripts in the performance test run under the same diagnostics configuration.
Relevant tasks	➤ "How to Enable and Configure ERP/CRM Diagnostics" on page 290 ➤ "How to Enable and Configure J2EE/.NET Diagnostics" on page 292

User interface elements are described below:

UI Elements (A-Z)	Description
Configure	Click the  button to configure each diagnostics type. For user interface information for the specific diagnostic types, see: ➤ "J2EE/.NET Configuration Dialog Box" on page 297 ➤ "Oracle 11i Configuration Dialog Box" on page 299 ➤ "SAP Configuration Dialog Box" on page 301 ➤ "Siebel Configuration Dialog Box" on page 303 ➤ "Siebel DB Configuration Dialog Box" on page 305
Enable the following Diagnostics for X% of all relevant Vusers in the test	Specify the percentage of Vusers for which you want to collect diagnostics data. This value determines how many of the transactions on the application server are reported to the Controller. Reducing this percentage will reduce the overhead on the application server for Web Page, Oracle 11i, and J2EE & .NET Diagnostics. **Example:** If you enter a sampling value of 25% and run 12 Vusers in **group1**, 8 Vusers in **group2**, and 1 Vuser in **group3**, diagnostics data will be collected for 3 Vusers in **group1**, 2 Vusers in **group2**, and 1 Vuser in **group3**. **Note:** The minimum percentage of Vuser sampling allowed is 1%, or 1 Vuser per group, whichever is more. The maximum percentage allowed is the lowest of the **Max. Vuser Sampling** values of all the selected diagnostics types. **Example:** If you enable **Web Page** (max 10%), Oracle 11i (max 5%) and J2EE/.NET (max 100%) diagnostics, the percentage of Vuser participation for J2EE/.NET Diagnostics cannot exceed 5%.
Max Vuser Sampling	The maximum percentage of the amount of Vusers specified in the **Enable the following Diagnostics for X% ...** that can be collected.

J2EE/.NET Configuration Dialog Box

This dialog box enables you to set up the J2EE/.NET diagnostics module.

To access	**1** Select **Testing** > **Test Plan**, then select the desired test. **2** Select **Test Design** > **Edit Test** > **Diagnostics** tab. **3** Select **Enable the following diagnostics for X% of all relevant Vusers in the test**. **4** Select **Enable** by J2EE/.NET Application Diagnostics, then click the **Configure** button .
Important information	The dialog box is read only while the performance test is running.
Relevant tasks	"How to Enable and Configure J2EE/.NET Diagnostics" on page 292
See also	J2EE & .NET Diagnostics Graphs in the *HP LoadRunner Analysis User Guide*.

User interface elements are described below:

UI Elements (A-Z)	Description
Monitor server requests	Select to capture a percentage of server requests which occur outside the context of any Vuser transaction. For more information, see"J2EE/.NET Diagnostics Overview" on page 832. **Notes:** ➤ The server requests will be captured at the same percentage that was selected for the percentage of Vusers in the Diagnostics Distribution dialog box. ➤ Enabling this option imposes an additional overhead on the probe.
Select Probes Table	➤ ☐ . Selects a probe for monitoring. At least one probe must be selected. ➤ **Probe Name.** The name of the probe. ➤ **Group.** The probe group. ➤ **Host Name.** The host the probe is running on (or the application server on which the probe is installed). **Note:** If you upgraded your Diagnostics installation, probes from existing performance tests may appear with a red status. Clear any probes that appear in red.
There is a firewall between the Mediator and the Controller. Use the MI Listener for collating results.	Select if the Diagnostics server (or a Diagnostics server in Mediator mode in a distributed environment) is located behind a firewall. **Note:** If there is a firewall between the Controller and the Diagnostics Server involved in a load test, you must configure the Controller and the Diagnostics Server to use the MI Listener to enable the transfer of the offline analysis file. For more information, refer to the *HP Diagnostics Installation and Configuration Guide*.
Troubleshoot diagnostics for J2EE/.NET connectivity	Click to open the HP Diagnostics System Health Monitor to enable you to investigate any connectivity issues between the Diagnostics components.

Oracle 11i Configuration Dialog Box

This dialog box enables you to set up the Oracle 11i Diagnostics module to communicate with the Mediator.

To access	**1** Select **Testing** > **Test Plan**, then select the desired test. **2** Select **Test Design** > **Edit Test** > **Diagnostics** tab. **3** Select **Enable the following diagnostics for X% of all relevant Vusers in the test**. **4** Select **Enable** by Oracle 11i Diagnostics, then click the Configure button .
Relevant tasks	"How to Enable and Configure ERP/CRM Diagnostics" on page 290
See also	➤ "Oracle 11i Server Configuration Dialog Box" on page 300 ➤ Oracle 11i Diagnostics Graphs in the *HP LoadRunner Analysis User Guide*

User interface elements are described below:

UI Elements (A-Z)	Description
Add Server	Opens the Oracle 11i Server Configuration dialog box where you can add Oracle 11i servers and to enter server information. For more information, see "Oracle 11i Server Configuration Dialog Box" on page 300.
Test Mediator	Tests the connections between the Oracle 11i Diagnostics module and the Mediator. **Note:** This does not check the connections to the Oracle servers.
Edit Server	Enables you to edit the server details.

UI Elements (A-Z)	Description
Name	The name of the Mediator used to collect and process the Oracle 11i diagnostics data. Only one Mediator is supported for each diagnostics module.
Servers Table	➤ **Server Name.** The name of the Oracle server. ➤ **Platform.** The platform of the Oracle server. ➤ **Log Directory**. The directory where the Oracle trace files (*.trc) are written.

Oracle 11i Server Configuration Dialog Box

This dialog box enables you to add Oracle 11i servers and to add server information.

To access	In the Oracle 11i Configuration dialog box, click **Add Server**.
Relevant tasks	"How to Enable and Configure ERP/CRM Diagnostics" on page 290
See also	"Oracle 11i Configuration Dialog Box" on page 299

User interface elements are described below:

UI Elements (A-Z)	Description
Domain	The Oracle server domain.
Log Directory	A location where the Oracle application saves the trace files. The trace files can be saved in a shared directory on the Oracle server or in a separate folder.
Password/Passphrase	The user password or passphrase.
Platform	The Oracle server platform.

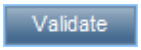
UI Elements (A-Z)	Description
Private Key File	The name of the file where the Private Key is stored. This can be found on the Mediator. If you specify the file name only (without a path), the configuration automatically looks for the file in the Mediator's **<Mediator Root>\bin** directory.
Server Name	The name of the Oracle server.
Use Secure Shell	Select if you are working with a Secure Shell connection.
User Name	The user name of the server where trace files are stored. **Note:** For Windows platforms, the user should have administrator privileges.

SAP Configuration Dialog Box

This dialog box enables you to add SAP servers and to add server information.

To access	**1** Select **Testing** > **Test Plan**, then select the desired test. **2** Select **Test Design** > **Edit Test** > **Diagnostics** tab. **3** Select **Enable the following diagnostics for X% of all relevant Vusers in the test**. **4** Select **Enable** by SAP Diagnostics, then click the **Configure** button .
Relevant tasks	"How to Enable and Configure ERP/CRM Diagnostics" on page 290
See also	SAP Diagnostics Graphs in the *HP LoadRunner Analysis User Guide*

User interface elements are described below:

UI Elements (A-Z)	Description
	Validates the connection to the SAP server. When you click **Validate**, the Controller produces a report of all the servers that are available for diagnostics through the Server Host.
Client Number	The client number of the selected user.
Name	The name of the Mediator used to collect and process the SAP diagnostics data. Only one Mediator is supported for each diagnostics module. **Note:** If you are using a Mediator that is over a firewall, enter the local machine key of the Mediator instead of the Mediator machine name.
Server Host Name	The name of the SAP server.
System Router string	Optional. Enter the system router string of the SAP server.
System number	The system number of the SAP server.
User Name	The user's unique name for logging onto the SAP server.
User Password	The user's password for logging onto the SAP server.

Siebel Configuration Dialog Box

This dialog box enables you to set up the Siebel Diagnostics module to communicate with the Mediator.

To access	**1** Select **Testing** > **Test Plan**, then select the desired test. **2** Select **Test Design** > **Edit Test** > **Diagnostics** tab. **3** Select **Enable the following diagnostics for X% of all relevant Vusers in the test**. **4** Select **Enable** by Siebel Application Diagnostics, then click the **Configure** button .
Relevant tasks	"How to Enable and Configure ERP/CRM Diagnostics" on page 290
See also	➤ "Siebel DB Server Configuration Dialog Box" on page 306 ➤ Siebel Diagnostics Graphs in the *HP LoadRunner Analysis User Guide* ➤ Siebel DB Diagnostics Graphs in the *HP LoadRunner Analysis User Guide*

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
Add Server	Opens the Siebel Server Configuration dialog box where you can add Siebel servers and to enter server information. For more information, see "Siebel Server Configuration Dialog Box" on page 307.
Test Mediator	Tests the connections between the Siebel Diagnostics module and the Mediator. **Note:** This does not check the connections to the Siebel servers.
Edit Server	Enables you to edit the server details.

UI Elements (A-Z)	Description
Name	The name of the Mediator used to collect and process the Siebel diagnostics data. Only one Mediator is supported for each diagnostics module.
Servers Table	➤ **Server Name.** The name of the Siebel server. ➤ **Platform.** The platform of the Siebel server. ➤ **Log Directory**. The Siebel server directory where Siebel log files (*.SARM) are written.

Siebel DB Configuration Dialog Box

This dialog box enables you to add Siebel DB servers and to add server information.

To access	**1** Select **Testing** > **Test Plan**, then select the desired test. **2** Select **Test Design** > **Edit Test** > **Diagnostics** tab. **3** Select **Enable the following diagnostics for X% of all relevant Vusers in the test**. **4** Select **Enable** by Siebel Database Diagnostics, then click the **Configure** button .
Relevant tasks	"How to Enable and Configure ERP/CRM Diagnostics" on page 290
See also	➤ "Siebel DB Server Configuration Dialog Box" ➤ Siebel DB Diagnostics Graphs in the *HP LoadRunner Analysis User Guide*

User interface elements are described below:

UI Elements (A-Z)	Description
Add Server	Opens the Siebel DB Server Configuration dialog box where you can add Siebel DB servers and to enter server information. For more information, see "Siebel DB Server Configuration Dialog Box" on page 306.
Test Mediator	Tests the connections between the Siebel DB Diagnostics module and the Mediator. **Note:** This does not check the connections to the Siebel servers.
Edit Server	Enables you to edit the server details.

UI Elements (A-Z)	Description
Name	The name of the Mediator used to collect and process the Siebel diagnostics data. Only one Mediator is supported for each diagnostics module.
Servers Table	➤ **Server Name.** The name of the Siebel server. ➤ **Platform.** The platform of the Siebel server. ➤ **Log Directory**. The Siebel server directory where Siebel log files (*.SARM) are written.

Siebel DB Server Configuration Dialog Box

This dialog box enables you to add Siebel DB servers and add server information.

To access	In the Siebel DB Configuration dialog box, click **Add Server**.
Relevant tasks	"How to Enable and Configure ERP/CRM Diagnostics" on page 290
See also	"Siebel DB Configuration Dialog Box"

User interface elements are described below:

UI Elements (A-Z)	Description
Domain	The Siebel server domain.
Log Directory	A location where the Siebel application saves the trace files. The trace files can be saved in a shared directory on the Siebel server or in a separate folder.
Password/Passphrase	The user password or passphrase.
Platform	The Siebel server platform.

UI Elements (A-Z)	Description
Private Key File	The name of the file where the Private Key is stored. This can be found on the Mediator. If you specify the file name only (without a path), the configuration automatically looks for the file in the Mediator's **<Mediator Root>\bin** directory.
Server Name	The name of the Siebel server.
Use Secure Shell	Select if you are working with a Secure Shell connection.
User Name	The user name of the server where trace files are stored. **Note:** For Windows platforms, the user should have administrator privileges.

Siebel Server Configuration Dialog Box

This dialog box enables you to add Siebel servers and to enter server information.

To access	In the Siebel Configuration dialog box, click **Add Server**.
Relevant tasks	"How to Enable and Configure ERP/CRM Diagnostics" on page 290
See also	"Siebel Configuration Dialog Box"

User interface elements are described below:

UI Elements (A-Z)	Description
Domain	The Siebel server domain.
Log Directory	A location where the Siebel application saves the trace files. The trace files can be saved in a shared directory on the Siebel server or in a separate folder.
Password/Passphrase	The user password or passphrase.
Platform	The Siebel server platform.

UI Elements (A-Z)	Description
Private Key File	The name of the file where the Private Key is stored. This can be found on the Mediator. If you specify the file name only (without a path), the configuration automatically looks for the file in the Mediator's **<Mediator Root>\bin** directory.
Server ID	The Siebel server ID.
Server Name	The name of the Siebel server.
Server Type	The Siebel server type.
Use Secure Shell	Select if you are working with a Secure Shell connection.
User Name	The user name of the server where trace files are stored. **Note:** For Windows platforms, the user should have administrator privileges.

13

Configuring Terminal Sessions

This chapter includes:

Concepts

Tasks

Reference

Concepts

Terminal Sessions Overview

Using Performance Center's terminal sessions, you can run multiple load generators simultaneously in your performance test on a terminal server. Performance Center allows you to create a new terminal session, or connect to an existing session.

Using terminal sessions enables you to overcome the limitation of being able to run only a single GUI Vuser on a Windows-based load generator. GUI Vusers, which operate graphical user interface (GUI) applications, are defined in a GUI Vuser script. You create GUI Vuser scripts using HP's QuickTest Professional (for Web applications). By opening a terminal server session for each GUI Vuser, you can run multiple GUI Vusers on the same application.

You select the number of terminals to be used in your performance test (provided that you have sufficient terminal sessions running), and the maximum number of Vusers that can be run per terminal. The maximum number of Vusers depends on the Vuser type used in the script. For GUI Vusers, the maximum is one Vuser for each terminal session. Performance Center then evenly distributes the number of Vusers among the client sessions.

For details on how to create or connect to a terminal session, see "How to Create a Terminal Session" on page 311.

Tasks

How to Create a Terminal Session

This task describes how to create a new terminal session.

To learn about terminal sessions, see "Terminal Sessions Overview" on page 310.

Note:

- You can enable terminal sessions when configuring performance tests with manual load generator distribution only.
- The Terminal Services Manager does not support terminal sessions connected over a firewall. To configure terminal sessions over a firewall, see "How to Configure a Terminal Session over a Firewall" on page 318.

This task includes the following steps:

1 Prerequisites

➤ Ensure that a load generator host is installed on the terminal server machine. For details, see the *HP Application Lifecycle Management Installation Guide*.

Note: You cannot use terminal sessions on UNIX load generators.

➤ Ensure that the Remote Desktop Connection client software is installed on the Controller machine.

Note: For computers running Microsoft Windows XP or Windows Server 2003, the Terminal Services client program (Remote Desktop Connection) is already installed. Remote Desktop Connection can also be installed on other 32-bit Windows-based operating systems.

If you are running a terminal client session on a Windows Server 2003 or Windows XP SP2 machine, make sure that the Performance Center user has **Create Global Object** privileges. Add the Performance Center Administrators group (or group the Performance Center user belongs to) to the **Create Global Object** privilege under **Local Security Policies\Users Rights** on the terminal server machine.

---

2 Configure the Performance Center agent on the load generator machine

a Select **Start** > **Programs** > **HP Performance Center Host** > **Advanced Settings** > **Performance Center Agent Configuration**. The Agent Configuration dialog box opens.

b Select **Enable Terminal Services** and click **OK**.

c When prompted to restart the agent, click **OK**.

3 Check the Terminal Services logon settings

Ensure that the correct terminal services settings are selected for the Remote Desktop Connection client.

To configure the correct Terminal Server logon settings:

a On the load generator machine, select **Start** > **Programs** > **Administrative Tools** > **Terminal Services Configuration.** The Terminal Services Configuration dialog box opens. Right-click **RDP-TCP**, and select **Properties** to open the RDP-TCP Properties dialog box.

b Click the **Logon Settings** tab.

c Make sure that **Use client-provided logon settings** is selected and that **Always prompt for password** is not selected.

4 Windows 2003 operating systems: Ensure that each user is not restricted to one session

For load generators running on Windows 2003 operating systems:

a Select **Start** > **Programs** > **Administrative Tools** > **Terminal Services Configuration.** The Terminal Services Configuration dialog opens.

b Select the Server Settings node from the left pane.

c In the right pane, ensure that the **Restrict each user to one session** attribute is **No**.

5 Add the load generator to the system

Use the New Host dialog box to add the load generator the system. For user interface details, see "New Host Dialog Box (Lab Management Only)" on page 699.

6 Configure the terminal session

You configure the terminal session from the Terminal Services dialog box. For user interface details, see "Terminal Services Dialog Box" on page 320.

How to Connect to a Terminal Session

This task describes how to connect an existing terminal session.

To learn about terminal sessions, see "Terminal Sessions Overview" on page 310.

Note:

- You can enable terminal sessions when configuring performance tests with manual load generator distribution only.
- The Terminal Services Manager does not support terminal sessions over a firewall. To configure terminal sessions over a firewall, see "How to Configure a Terminal Session over a Firewall" on page 318.

This task includes the following steps:

1 Prerequisites

➤ Ensure that a load generator host is installed on the terminal server machine. For details, see the *HP Application Lifecycle Management Installation Guide*.

Note: You cannot use terminal sessions on UNIX load generators.

➤ Ensure that the Remote Desktop Connection client software is installed on the Controller machine.

Note: For computers running Microsoft Windows XP or Windows Server 2003, the Terminal Services client program (Remote Desktop Connection) is already installed. Remote Desktop Connection can also be installed on other 32-bit Windows-based operating systems.

If you are running a terminal client session on a Windows Server 2003 or Windows XP SP2 machine, make sure that the Performance Center user has **Create Global Object** privileges. Add the Performance Center Administrators group (or group the Performance Center user belongs to) to the **Create Global Object** privilege under **Local Security Policies\Users Rights** on the terminal server machine.

---

2 Run the Performance Center agent as a process

a On the load generator machine, run **<Performance Center Host installation>\launch_service\bin\Magentconfig.exe**. The Agent Runtime Settings dialog box opens.

b Select **Manual log in to this machine**.

Note: You must run the Performance Center agent as a process for each terminal session that you are running.

---

3 Configure the Performance Center agent on the load generator

a Select **Start** > **Programs** > **Performance Center Host** > **Advanced Settings** > **Performance Center Agent Configuration**. The Agent Configuration dialog box opens.

b Select **Enable Terminal Services** and click **OK**.

c When prompted to restart the agent, click **OK**.

4 Add the load generator to the system

Use the New Host dialog box to add the load generator the system. For user interface details, see "New Host Dialog Box (Lab Management Only)" on page 699.

5 Launch a terminal session from the Controller

Note: You must open a terminal session for each terminal that you want to run Vusers on during the performance test.

---

a Select **Start** > **Programs** > **Accessories** > **Communication** > **Remote Desktop Connection,** or select **Start** > **Run** and run the **mstsc** command. The Remote Desktop Connection dialog box opens.

b Click **Options**.

c In the **General** tab, enter the name or IP address of a terminal server, or select a terminal server from the list of available servers.

d Enter you user name, password, and domain name (if required) for login onto the terminal server.

e Click **Connect** to open a Terminal Client window.

6 Configure the terminal session

You configure the terminal session from the Terminal Services dialog box. For user interface details, see "Terminal Services Dialog Box" on page 320.

How to Configure a Terminal Session over a Firewall

This task describes how to configure a terminal session on a load generator that is located over a firewall.

1 Open the load generator machine console.

2 If the Performance Center Agent is not running as a process, run **<load generator host installation>\launch_service\bin\magentproc.exe**.

3 Configure the Performance Center Agent on the console:

a Select **Enable Firewall Agent**, click **Settings**. In the **Local Machine Key** field, enter a virtual load generator name, for example, machine_ofw.

b Select **Enable Terminal Services**, and click **OK**.

4 Create one or more terminal sessions on the load generator console machine.

Keep in mind the following:

- For each terminal session, run the agent configuration as above. For each session, specify a different Local Machine Key name, for example, machine_ofw_1, machine _ofw_2, etc.
- If you stop the agent on a terminal session, you must reconfigure the settings for that particular session before restarting the agent.
- When selecting the load generator for the scenario in the Controller, select the local machine key for each individual virtual load generator used.

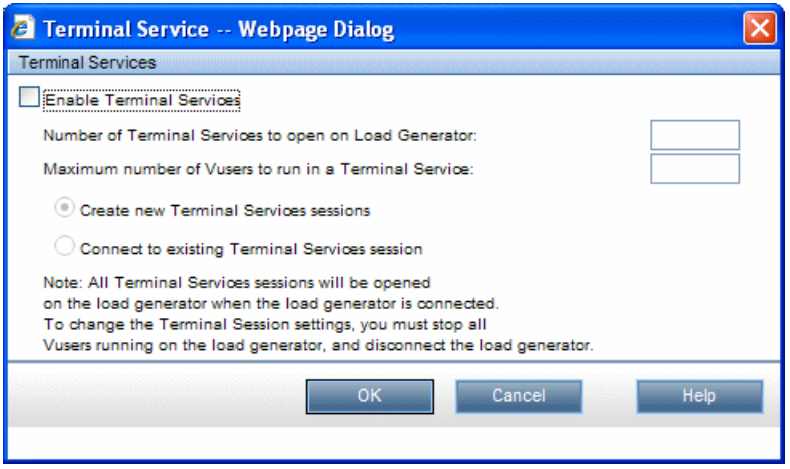
Reference

Terminal Sessions User Interface

This section includes:

Terminal Services Dialog Box

This dialog box enables you to configure terminal sessions.



To access	Use one of the following: ➤ In the Select Load Generators dialog box, select a load generator and click the **Terminal Services** button. For more information, see "Select Load Generators Dialog Box" on page 235. ➤ In the Automatch Load Generators Properties dialog box, select a load generator then click **Terminal Services**. For more information, see "Automatch Load Generators Properties Dialog Box" on page 239. ➤ During Runtime, on the Performance Test Run page, click the **Load Generators** button. Then click **Terminal Sessions Settings**.
Important information	During runtime, you can set or change terminal services settings only when the load generator is non-operational.
Relevant tasks	"How to Create a Terminal Session" on page 311

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
Connects to existing Terminal Services session	Enables a connection to an existing terminal session.
Creates new Terminal Services sessions	Enables the Controller to launch terminal sessions automatically using the Remote Desktop Connection.
Enable Terminal Services	Applies the settings to the load generator running on the terminal server.
Maximum number of Vusers to run in a Terminal Service	Enter the maximum number of Vusers that you want to run in a terminal session. **Note:** The maximum number of Vusers depends on the Vuser type used in the script. For GUI Vusers, the maximum is one Vuser for each terminal session.
Number of Terminal Services to open on Load Generator	Enter the number of terminals in your performance test. **Note:** You must open a terminal session for each terminal on which you want to run Vusers during the performance test.

Performance Center Agent Runtime Settings Dialog Box

This dialog box enables you to run the Performance Center Agent as a service, or as a process.

User interface elements are described below:

UI Elements (A-Z)	Description
Allow virtual users to run on this machine without user login	Select to run the Performance Center Agent as a service. You must enter your user credentials. **Note:** This is the default selection.
Manual log in to this machine	Select to run the Performance Center Agent as a process. This enables you to run multiple GUI Vusers on the same load generator.

Troubleshooting and Limitations

This section describes troubleshooting and limitations for configuring terminal sessions.

➤ **Host name is an IP address or domain name**

You cannot set terminal services for a machine name that was added as an IP address or a domain name, when your environment is configured with a local user.

When your environment is configured with the default Performance Center system user (IUSR_METRO), you cannot set terminal services for a machine name that was added as an IP address or a domain name (for example, 127.0.0.1, localhost.com).

Workaround: Delete the host from Lab Management (Hosts module), and add the host again using the host name only.

14

Multiple IP Addresses

This chapter includes:

Concepts

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Concepts

Multiple IP Addresses Overview

Application servers and network devices use IP addresses to identify clients. The application server often caches information about clients coming from the same machine. Network routers try to cache source and destination information to optimize throughput. If many users have the same IP address, both the server and the routers try to optimize. Since Vusers on the same load generator have the same IP address, server and router optimizations do not reflect real-world situations.

The Multiple IP Addresses feature enables Vusers running on a single load generator to be identified by many IP addresses. The server and router recognize the Vusers as coming from different load generators and as a result, the testing environment is more realistic.

This feature can be implemented on Windows and UNIX platforms, and applies to the following protocols:

Client/Server	DNS, Windows Sockets
Custom	Javascript Vuser, VB Vuser, VB Script Vuser
E-business	FTP, Web (HTTP/HTML), Web Services
ERP/CRM	Oracle NCA, Oracle Web Applications 11i, PeopleSoft Enterprise, SAP-Web, Siebel-Web
Legacy	RTE
Mailing Services	Internet Messaging (IMAP), POP3, SMTP
Streaming Data	Real

Tasks

How to Enable IP Spoofing in ALM

The following steps describe how to add IP addresses to a load generator to enable IP Spoofing.

This task includes the following steps:

- "Create multiple IP addresses on the load generator." on page 325
- "Update the server's routing table with the new addresses" on page 326
- "Enable the Multiple IP Addresses feature from ALM" on page 327

1 Create multiple IP addresses on the load generator.

- **Windows:** Run the IP Wizard to create multiple IP addresses. For details on running the IP Wizard, see "IP Wizard" on page 330.

  The new IP addresses are added to the load generator once and are used for all performance tests. After running the wizard, restart the load generator machine.

- **UNIX:** Manually configure the new IP addresses for UNIX load generators. For details, see "How to Configure Multiple IP Addresses on UNIX" on page 328.

2 Update the server's routing table with the new addresses

Once the client machine has new IP addresses, the server needs the addresses in its routing table, so that it can recognize the route back to the client. If the server and client share the same netmask, IP class, and network, the server's routing table does not require modification.

Note: If there is a router between the client and server machines, the server needs to recognize the path via the router. Make sure to add the following to the server routing table:

- A route from the Web server to the router,
- Routes from the router to all of the IP addresses on the load generator.

Update the Web server routing table as follows:

a Edit the batch file that appears in the IP Wizard Summary page. An example **.bat** file is shown below.

```
REM This is a bat file to add IP addresses to the routing table of a
server
REM Replace [CLIENT_IP] with the IP of this machine that the server
already recognizes
REM This script should be executed on the server machine

route ADD 192.168.1.50 MASK 255.255.255.255 [CLIENT_IP] METRIC 1
route ADD 192.168.1.51 MASK 255.255.255.255 [CLIENT_IP] METRIC 1
route ADD 192.168.1.52 MASK 255.255.255.255 [CLIENT_IP] METRIC 1
route ADD 192.168.1.53 MASK 255.255.255.255 [CLIENT_IP] METRIC 1
route ADD 192.168.1.54 MASK 255.255.255.255 [CLIENT_IP] METRIC 1
```

b For each occurrence of **[CLIENT_IP],** insert your IP address instead.

c Run the batch file on the server machine.

3 Enable the Multiple IP Addresses feature from ALM

After you define multiple IP addresses, you set an option to tell the Controller to use this feature.

a On the ALM sidebar, under **Testing**, select **Test Plan**. In the tree, right-click a performance test select **Edit Test**. In the Performance Test Designer window, click the Workload tab and click the **Options** button at the bottom of the window. Select **Enable IP Spoofer**.

Note: You must select this option before running a performance test.

---

b Specify how the Controller should allocate the IP addresses: per process or per thread. For details, see the Controller's general run option settings described in "Run Options > General" on page 668.

How to Configure Multiple IP Addresses on UNIX

The following sections describe how to manually configure multiple IP addresses on the following UNIX load generators:

- "HP 11.0 or Later" on page 328
- "Linux" on page 328
- "Solaris 2.5, 2.6, 7.0, 8.0" on page 329

HP 11.0 or Later

To define multiple IP addresses for a single Ethernet card, you need IP Aliasing compiled into the kernel. To do this, use the **ifconfig** command:

```
/sbin/ifconfig lan1:0 x.x.x.x netmask 255.255.x.x up
```

Substitute the new IP address for x.x.x.x, and insert the correct information for the subnet mask. Place this command in the **rc.local** file so that it executes upon boot.

Linux

To define multiple IP addresses for a single Ethernet card, you need IP Aliasing compiled into the kernel. To do this, use the **ifconfig** command:

```
/sbin/ifconfig eth0:0 x.x.x.x netmask 255.255.x.x up
```

Substitute the new IP address for x.x.x.x, and insert the correct information for subnet mask. Place this command in the **rc.local** file so that it executes upon boot.

Solaris 2.5, 2.6, 7.0, 8.0

To configure the hme0 device to support more than one IP address:

1 Create entries in **/etc/hosts** for each hostname on your physical machine:

```
128.195.10.31  myhost
128.195.10.46  myhost2
128.195.10.78  myhost3
```

Create **/etc/hostname.hme0:n** files that contain the hostname for the virtual host **n**.

Note: hostname.hme0:0 is the same as **hostname.hme0**.

```
/etc/hostname.hme0   (Contains name myhost)
/etc/hostname.hme0:1 (Contains name myhost2)
/etc/hostname.hme0:2 (Contains name myhost3)
```

The above changes will cause the virtual hosts to be configured at boot time.

2 You can also directly enable or modify logical hosts' configuration by running **ifconfig** directly on one of the logical hosts, using the **hme0:n** naming scheme:

```
% ifconfig hme0:1 up
% ifconfig hme0:1 129.153.76.72
% ifconfig hme0:1 down
```

To verify the current configuration, use **ifconfig –a**.

Reference

IP Wizard

This wizard enables you to create and save new IP addresses on Windows machines.

To access	Use one of the following: ➤ **Start** > **Program Files** > **Performance Center Host** > **Tools** > **IP Wizard** ➤ From the Performance Center Host's **\bin** directory, run **ipwizard.exe**.
Important information	➤ The IP wizard resides on each load generator. ➤ The new addresses can be a range of addresses defined by the Internet Assignment Numbers Authority. They are for internal use only, and cannot connect to the Internet. This range of addresses is the default used by the IP Wizard. ➤ The IP Wizard only works on machines with a fixed IP, not on machines with a DHCP. ➤ Before any of the changes made can take effect, you must restart the machine after you run the wizard, and the Web server's routing table may need to be updated.
Relevant tasks	"How to Enable IP Spoofing in ALM" on page 325

IP Wizard Welcome - Step 1 of 3

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Create new settings	Enables you to define new IP settings on the load generator.
Load previous settings from file	Enables you to use an existing file with IP address settings.
Restore Original Settings	Restores original settings.

IP Wizard - Step 2 of 3 - Optional

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
<Web Server Address box>	If you have more than one network card, enables you to choose the card to use for IP addresses. This step enables the IP Wizard to check the server's routing table to see if it requires updating after new IP addresses are added to the load generator. For details, see "Update the server's routing table with the new addresses" on page 326.

IP Wizard - Step 3 of 3 - Optional

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Add...	Opens the Add dialog box, enabling you to add a new IP address. ➤ **Private Address Spaces.** The class that represents the correct submask for the machine's IP addresses. ➤ **From IP.** Adds IP addresses starting with this number. ➤ **Submask.** IP addresses include two components, a **netid** and **hostid**. The submask determines where the netid portion of the address stops and where the hostid begins. ➤ **Number to add.** The number of IP addresses to add. ➤ **Verify that new IP addresses are not already in use.** Instructs the IP Wizard to check the new addresses. The IP Wizard adds only the addresses that are not already in use.
Remove	Removes a selected IP Address.
IP Address	The IP addresses on the load generator machine.
Subnet Mask	The submasks of the IP addresses on the load generator machine.
Number of IPs added	The number of IP addresses added to the load generator machine.

IP Wizard - Summary

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
<Summary area>	Displays a summary of the operations performed by the IP Wizard. Take note of the location of the batch file (**.bat**). This is used to update the routing table if necessary. See "Update the server's routing table with the new addresses" on page 326.
Reboot now to update routing tables	If you updated the routing table, rebooting initializes the Windows device drivers with the new addresses.

Part V

Performance Test Execution

15

Performance Test Execution

This chapter includes:

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Concepts

Running Performance Tests Overview

After planning, designing and scheduling your performance test, you run it to create load on your application and to test its performance.

This section includes:

Performance Test Execution Flow

The following table explains the various stages of the test run flow.

Run stage	Description
Start of run	At the start of the run, the Controller checks the test configuration information, invokes the applications that were selected to run with the test, and then distributes each Vuser script to its designated load generator. When the Vusers are ready, they start running their scripts.
During run	During the run, you can see a synopsis of the test and can also drill down to see which Vuser actions are causing the application problems. The online graphs display performance data collected by the monitors. You use this information to isolate potential problem areas in your system.
End of run	The test run ends when all the Vusers have completed their scripts, when the duration runs out, or when you terminate it.

Monitoring Performance Test Execution

Online monitors enable you to monitor performance test execution. During a test run, you can view graphs that display information about the load that Vusers generate on your Web server and other applications. ALM Performance Center displays this data in real-time during test execution.

At the conclusion of the performance test, you can use HP LoadRunner Analysis to view a summary and graphs of the data collected from these monitors during the test run. For detailed information on the available graphs, see the *HP LoadRunner Analysis User Guide*.

For a list of supported monitor types, see "Monitor Types" on page 418.

Analyzing Performance Test Results

HP LoadRunner Analysis lets you analyze performance test data off-line, from any computer on which Analysis is installed. You use Analysis to generate various graph views, merge graphs, drill down within graphs, change zoom level and granularity, and so forth.

Analysis integrates with ALM Performance Center to let you analyze data collected during a performance test run. You can download raw results and sessions for analysis on a local machine. After analyzing the data, you can upload the analysis data (HTML and Rich reports) to Performance Center to share the results with other users.

For Analysis to access an ALM project, your version of Analysis must be properly configured, and be connected to ALM Performance Center.

For information about how to work with ALM Performance Center from within Analysis, see the *HP LoadRunner Analysis User Guide*.

For details about running performance tests, see "How to Manage a Performance Test Run" on page 340.

Tasks

How to Manage a Performance Test Run

This task describes the workflow for running a performance test, and the available options for managing the test run.

Note:

- **Version Control:** If your project is version-enabled: If you have checked out your test or related scripts, the checked-out versions are used. If another user has checked out the test or scripts and you want to run the test or script, the last checked-in version is used.
- **Product Feature Movie.** To view a movie that demonstrates the performance testing lifecycle, select **Help** > **Product Feature Movies** in the ALM main window. Under **HP ALM Performance Center 11.00 Movies**, select **Lifecycle of a Run**.

To learn more about running performance tests, see "Running Performance Tests Overview" on page 338.

This task includes the following steps:

➤ "View performance improvements and regressions" on page 343

1 Prerequisite

Make sure that the performance test you want to run is valid. For more information, see "How to Design a Performance Test" on page 171.

2 Begin test execution

a In the Test Lab module, create a test set that includes an instance of the performance test you want to run. For information on working with test sets, see the *HP Application Lifecycle Management User Guide*.

b In the Execution Grid tab, right-click the test you want to run, and select **Run Test**. The Select Timeslot dialog box opens, enabling you to select a timeslot for the test run. For user interface details, see "Select Timeslot Dialog Box" on page 372.

c Select an available timeslot and click **Run**. The Initializing Run page opens. The Initializing Run page displays the performance test initialization steps performed by ALM Performance Center, and the status for each step. If each step is completed successfully, the performance test starts running and the Performance Test Run page opens.

- ➤ For Initializing Run page user interface details, see "Initializing Run Page" on page 348.
- ➤ For Performance Test Run page user interface details, see "Performance Test Run Page" on page 358.

3 Manage Vusers during the test run - optional

You can override the defined schedules and manually control the behavior of Vusers during a performance test run.

For task details, see "How to Manage Vusers During a Test Run" on page 343.

4 Manage runtime monitors, monitor over firewall machines, and load generators during the test run

You can perform actions related to the status and management of runtime monitors, monitor over firewall machines, and load generators during a performance test run.

For task details, see "How to Manage Monitoring and Load Generator Information During a Test Run" on page 345.

5 Manually stop the test run and collate run results - Optional

You can manually stop a test run, for example, if you want to delay data collection and analysis until a more convenient time.

- **To stop the test run gradually.** On the Performance Test Run page, click the **Stop Run** button. The Stop Run dialog box opens, which prompts you to select a post-run collation option. Select an option, then click **Stop**. All Vusers in the test move to the **Gradual Exiting** state. For user interface details, see "Stop Run Dialog Box" on page 376.

- **To stop the test run immediately.** After clicking the **Stop** button in the Stop Run dialog box, the **Stop Run** button on the Performance Test Run page changes to **Stop Now**. Click the button to stop all Vusers immediately.

6 View test results and manage result files

- **View test results.** For task details, see the *HP Application Lifecycle Management User Guide*.
- **Managing test run result and session files.** You view and manage result files generated by the test run in the Test Lab module's Results tab. For user interface details, see "Results/Last Run Results Tab" on page 354.

7 Analyze test run results

You use HP LoadRunner Analysis to analyze test run data off-line, from any computer on which Analysis is installed. For information on how to access your ALM Project from Analysis, see the *HP LoadRunner Analysis User Guide*.

If there are SLAs defined for the performance test, you can calculate SLA results, and view these results in the Analysis Summary report and SLA report which can be accessed from the test run's Result tab. For details, see "Results/Last Run Results Tab" on page 354.

8 View performance improvements and regressions

You can use the Trend Reports feature to view improvements or regressions in performance across several test runs. For more information, see "Trending" on page 575.

How to Manage Vusers During a Test Run

The following steps describe runtime options for managing the behavior of Vusers during a performance test run.

Note: This task is part of a higher level task. For more information, see "How to Manage a Performance Test Run" on page 340.

This task includes the following steps:

View details of individual Vusers

You can view status details of individual Vusers, and run/stop a single Vuser currently in the **down/run** state, irrespective of its defined schedules.

On the Performance Test Run page, click the **Vusers Details** button. The Vusers dialog box opens, enabling you to run or stop individual Vusers. For user interface details, see "Vusers Dialog Box" on page 390.

Run Vusers

You can initialize, run, or stop any number of Vusers irrespective of their defined schedules. In addition, you can add new Vusers to the performance test.

On the Performance Test Run page, click the **Run Vusers** button. The Run Vusers dialog box opens, enabling you to run additional Vusers. For user interface details, see "Run Vusers Dialog Box" on page 392.

Add/Edit Vuser groups

You can add Vuser groups, or you can modify existing groups during the test run.

To open the Add/Edit Vuser Group dialog box:

- **To add a group.** On the Performance Test Run page, click the **Design Groups and Scheduler** button. Then select **Add Groups.** The Add/Edit Vuser Group dialog box opens, enabling you to add a Vuser group.
- **To edit a group.** On the Performance Test Run page, on the Groups pane, place the mouse cursor over the name of the group you want to edit. Click the down arrow that appears adjacent to the name, and select **Edit Group**. The Edit Group dialog box opens, enabling you to edit the group's details.

For user interface details, see "Add/Edit Groups Dialog Box" on page 395.

View Vuser scripts

On the Performance Test Run page, on the Groups pane, place the mouse cursor over a group name. Click the down arrow that appears adjacent to the name, and select **View Script**. The View Script dialog box opens up, enabling you to view the code for each action in the script.

Manually release Vusers from a Rendezvous

You can manually release a Vusers from a rendezvous before the Controller releases them.

On the Performance Test Run page, click the **View Rendezvous** button. The Rendezvous Policy dialog box opens. For user interface details, see "Rendezvous Dialog Box" on page 216.

How to Manage Monitoring and Load Generator Information During a Test Run

The following steps describe runtime options for managing monitor profile, monitor-over-firewall, and load generator information during a performance test run.

Note: This task is part of a higher level task. For more information, see "How to Manage a Performance Test Run" on page 340.

This task includes the following steps:

- "Manage Runtime Monitors" on page 346
- "Edit Monitor Over Firewall Information" on page 346
- "Manage load generators" on page 346

Manage Runtime Monitors

You can add, edit, or remove currently running monitors during a performance test run.

On the Performance Test Run page, click the **Monitors** button, and select **Run Time Monitors**. The Monitor Profile Content dialog box opens. For user interface details, see "Monitor Profile Content Dialog Box" on page 383.

Edit Monitor Over Firewall Information

You can change the status of a monitor over firewall machine during a performance test run.

On the Performance Test Run page, click the **Monitors** button, and select **Monitors Over Firewall**. The Monitors Over Firewall dialog box opens. For user interface details, see "Monitor Over Firewall Dialog Box" on page 388.

Manage load generators

You can perform the following actions with load generators during a performance test run: View status and machine utilization, connect and disconnect load generators, add load generators to the test, and configure terminal sessions.

On the Performance Test Run page, click the **Load Generators** button. The Load Generators dialog box opens. For user interface details, see "Load Generators Dialog Box" on page 385.

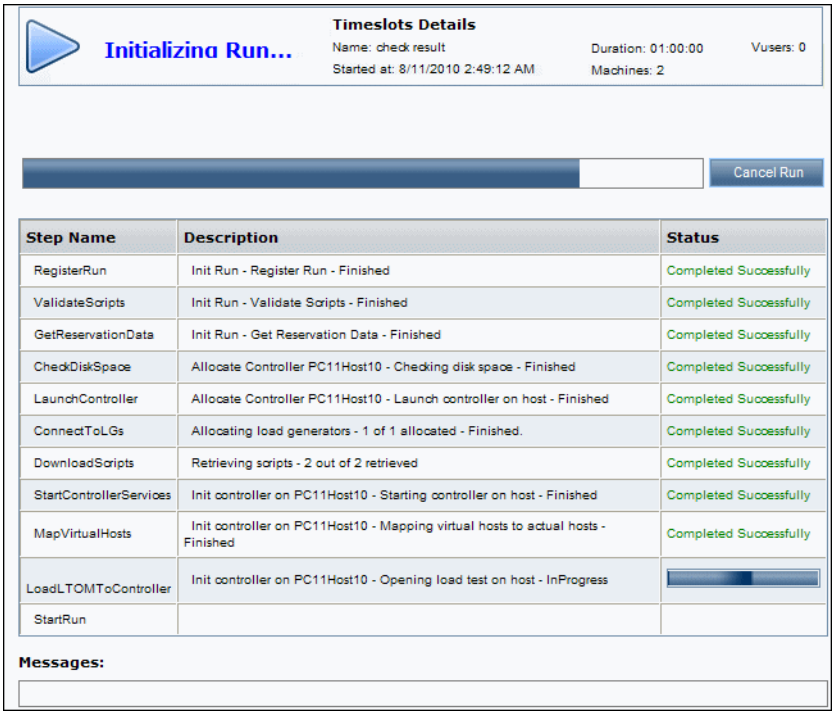
Reference

Performance Test Execution User Interface

This section includes:

Initializing Run Page

The Initializing Run page displays the performance test initialization steps performed by ALM Performance Center and the status for each step.



To access	In the Select Timeslot dialog box, click **Run**. For information about the Select Timeslot dialog box, see "Select Timeslot Dialog Box" on page 372.
Relevant tasks	"How to Manage a Performance Test Run" on page 340

User interface elements are described below:

UI Elements (A-Z)	Description
Description	A detailed description of the current status of the step.
Messages	Displays error messages generated when a step fails. These error messages can also be viewed from the Event Log. For details about the event log, see "Event Log" on page 351.
Status	Displays whether the step passed or failed.
Step Name	Displays the step name. For explanations about the action ALM Performance Center performs for each step, see "Initialization Steps" below.
Timeslot Details	Displays details of the selected timeslot.

Initialization Steps

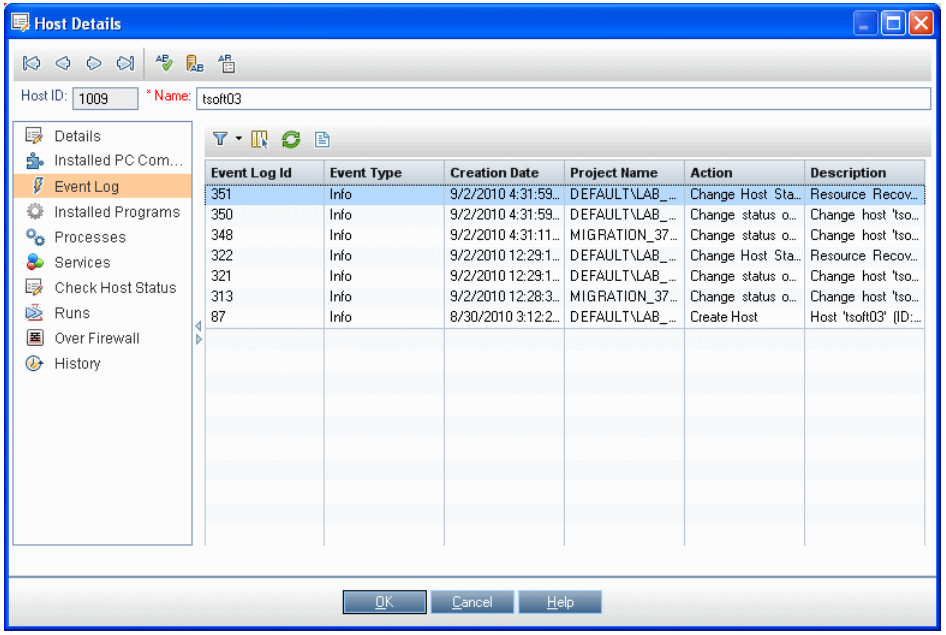
The Initialization steps are described below:

Step	Description
RegisterRun	ALM Performance Center initializes the run process.
ValidateScripts	ALM Performance Center checks that the selected scripts' Run Logic runtime settings are in sync with the scripts' state.
GetReservationData	ALM Performance Center checks the required resource information from the selected timeslot.
CheckDiskSpace	ALM Performance Center checks that there is enough disk space on the Controller.

Step	Description
LaunchController	ALM Performance Center initializes the Controller so that other testing entities, such as load generators and scripts can connect to it. If there is a problem launching the Controller, ALM Performance Center automatically attempts to find an alternative Controller. This attempt appears as an additional initialization step. If no alternative Controller is available, the step fails.
ConnectToLGs	ALM Performance Center checks that the required load generators are valid and connects them to the Controller. If this step fails, ALM Performance Center attempts to find alternative load generators automatically. If this step still fails, check the test definitions and select different load generators for the test.
DownloadScripts	ALM Performance Center downloads the required Vuser scripts.
StartControllerServices	ALM Performance Center initializes the Controller's configuration settings in preparation to run the performance test.
MapVirtualHosts	ALM Performance Center maps virtual hosts to actual hosts.
LoadLTOMToController	ALM Performance Center creates the performance test and adds the Vuser scripts to the Controller.
StartRun	ALM Performance Center starts the performance test run.

Event Log

The Event Log displays the events that occur in a project, reporting the source and severity of each event.



To access	Use one of the following: ➤ Select **Tools** > **Event Log**. ➤ Select the **Event Log** tab. Available from the following modules: ➤ **In Lab Management.** Hosts, Test Runs, Timeslots, PC Servers ➤ **In the ALM project.** Timeslots (Grid view only), Hosts, Test Lab (select the **Test Runs** tab)

Important information	➤ The Event Log is only available in the Grid view. ➤ The Event Log displays information for the relevant selection. That is, it displays events for an entire project, timeslot, host, server, and so on.
Relevant tasks	"How to Manage a Performance Test Run" on page 340

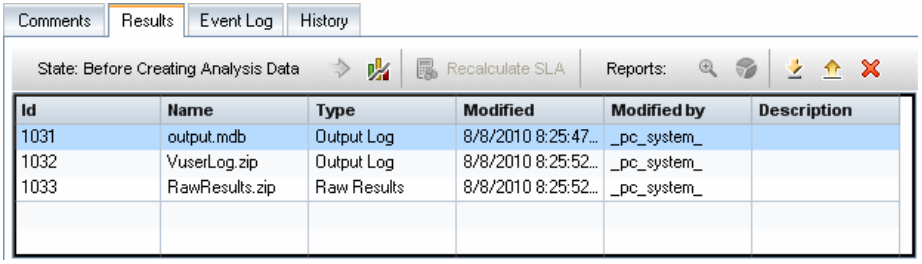
User interface elements are described below:

UI Elements (A-Z)	Description
	**Set Filter.** Enables you to filter and sort the resources in the event log. Any currently applied filters or sorting orders are displayed below the toolbar. For more details, see the *HP Application Lifecycle Management User Guide*.
	**Select Columns.** Opens the Select Columns dialog box, enabling you to determine which fields to display in the event log and their order. For more details, see the *HP Application Lifecycle Management User Guide*.
	**Refresh.** Refreshes the event log so it displays the most up-to-date information.
	**Export.** Opens the Export All Grid Data dialog box, enabling you to export the resources in the grid as a text file, Microsoft Excel worksheet, Microsoft Word document, or HTML document.
Action	The category of action where the event occurred. **Example**. Create Server.
Context	The specific entity where the event occurred. **Example**. PC Server: VM05
Creation Date	The date and time the event was logged.
Description	A description of the event.
Event Log ID	The event ID.
Event Name	The name of the event.
Event Type	An indication of the event's severity. From most to least severe: error, warning, or info.

UI Elements (A-Z)	Description
Flow Context ID	A GUID that indicates a unique action which relates to several events. For example, running a test.
Module	The ALM module where the event originated. **Example**. Testing.
Project Name	The project in which the event occurred.
Responsible	The user, or automated system process responsible for the event.
Source	The system element where the event originated.
Sub Module	The ALM sub module where the event occurred. **Example**. Test Lab.

Results/Last Run Results Tab

This tab enables you to manage results related actions for individual test runs.



To access	➤ **Results tab.** On the **ALM** sidebar, under **Testing**, select **Test Lab**. Then select the **Test Runs** tab. The Results tab is available in the Information Panel below. ➤ **Last Run Results tab.** On the **ALM** sidebar, under **Testing**, select **Test Lab**. In the left pane select a test set, then select the **Execution Grid** tab in the right pane. The Last Run Results tab is displayed in the area below.
Important information	➤ **Results tab.** Displays information for the selected test run in the Test Runs tab. ➤ **Last Run Results tab.** Displays information for the last test run of the selected test in the Execution Grid tab.
Relevant tasks	"How to Manage a Performance Test Run" on page 340

User interface elements are described below:

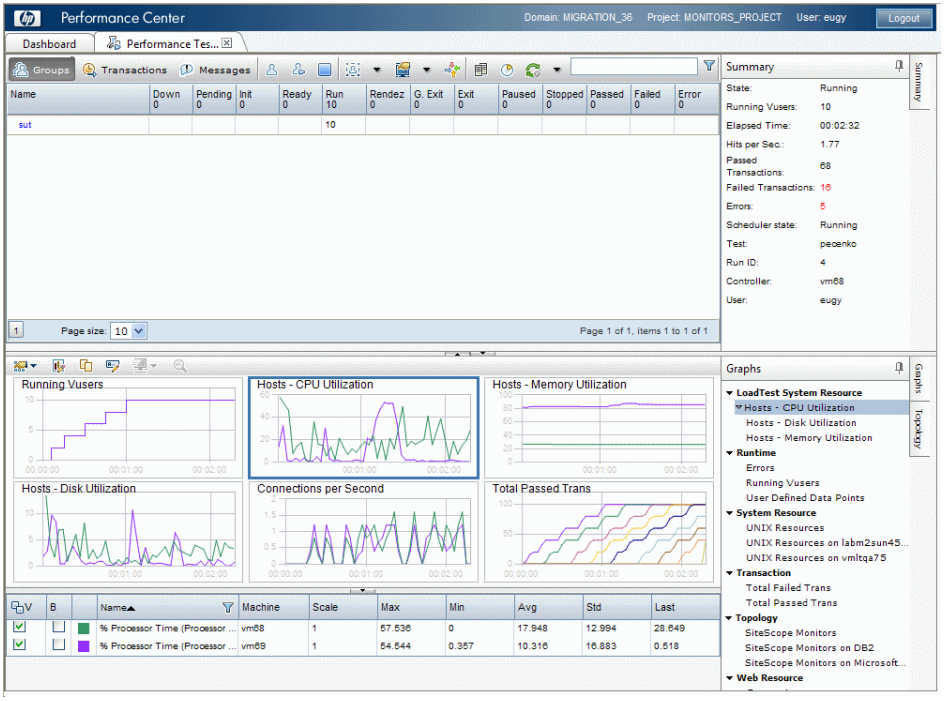
UI Elements (A-Z)	Description
	**Collate Results.** Collates results of test runs that have not yet been collated. **Notes:** ➤ If a test is running on the Controller that will perform the collating, ALM Performance Center issues an alert. Click **OK** to proceed with collating the results, or **Cancel** to defer the action until later. ➤ Should the Collate Results process encounter an error, the Collate Errors dialog box appears, displaying details of the error. To analyze the partially collated results, select **Analyze partially collated results**. Note that analyzing partially collated results is an irreversible operation.
	**Recover Results.** Enables you to recover and collate the results of a failed test run. **Notes:** ➤ Only enabled when the test run is in the **Failed** state. ➤ Enables you to collate results only up to the point where the test failed.
	**Analyze Results.** Analyzes results for the selected test run. ALM Performance Center generates analysis data and deletes the temporary results from the load generators and the Controller. **Note:** Only enabled when the test run state is **Before Creating Analysis Data**.
	**Recalculate SLA.** Opens the Calculate SLA dialog box. For details, see "Calculate Service Level Agreement Dialog Box" on page 401. **Note:** This feature is available only if SLAs were defined during the performance test design phase. For more information about SLAs, see "Service Level Agreements" on page 265.

UI Elements (A-Z)	Description
	**Show HTML Report.** Opens an HTML version of the Analysis Summary report, which analyzes the data collected during the performance test run. The report provides general information about the performance test, lists statistics about the test run, and provides links to graphs containing test run data. For more details regarding the summary report, see the *HP LoadRunner Analysis User Guide*.
	**SLA Report.** Opens the SLA Report for the selected test run. For details, see "SLA Report" on page 399. **Note:** This feature is available only if SLAs were defined during the performance test design phase. Fore more information about SLAs, see "Service Level Agreements" on page 265.
	**Download File.** Enables you to download the selected file in the grid.
	**Upload File.** Enables you to upload a file to the Results tab.
	**Delete.** Deletes the selected result file.
	**Stop.** Stops the current action. **Note:** Appears to the right of the progress bar.
<grid>	Contains a table that displays all available result files. These results include the Analysis session files, raw results, a topology snapshot (if a topology is defined for the test), among others.
<progress bar>	Displays the progress of the current action.
Description	A description of the result file.
ID	The result file ID.
Modified	The date the result file was last modified.
Modified by	The user who last modified the result file.
Name	The name of the result file.

UI Elements (A-Z)	Description
State	Displays the current state of the selected test runs.
Type	The type of result file.

Performance Test Run Page

The Performance Test Run page displays a detailed overview of the running performance test, and enables you to perform all runtime test run actions.



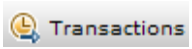
To access	The Performance Test Run page opens as a tab in My Performance Center automatically when a performance test starts, or when you join a running test from My Performance Center.
Relevant tasks	"How to Manage a Performance Test Run" on page 340

Performance Test Details Pane - Toolbar Buttons

The Performance Test Details pane displays details on the running test.

To access	The pane is located in the upper area of the Performance Test Details page.

User interface elements are described below:

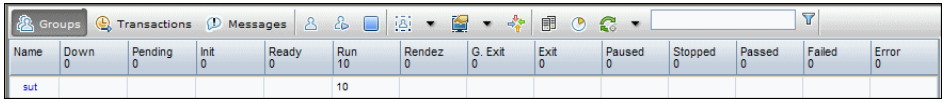
UI Elements (A-Z)	Description
	Displays the Performance Test Run page Details pane Groups view. For more information, see "Performance Test Details Pane - Groups View" on page 361.
	Displays the Performance Test Run page Details pane Transactions view. For more information, see "Performance Test Details Pane - Transactions View" on page 363.
	Displays the Performance Test Run page Details pane Messages view. For more information, see "Performance Test Details Pane - Messages View" on page 364.
	**Vusers Details.** Displays specific details for each Vuser in the performance test, and enables you to run or stop individual Vusers irrespective of their defined schedules. For user interface details, see "Vusers Dialog Box" on page 390.
	**Run Vusers.** Enables you to run additional Vusers during the course of a performance test. That is, you can run Vusers that are not included in the test's original defined schedule. For user interface details, see "Run Vusers Dialog Box" on page 392.

UI Elements (A-Z)	Description
 	**Stop Run/Stop Run Now.** Enables you to stop a running performance test. ➤ **Stop Run.** Stops the test gradually by moving all running Vusers to the Gradual Exiting state. For user interface details, see "Stop Run Dialog Box" on page 376. ➤ **Stop Run Now.** Enabled only after you click the **Stop Run** button. Enables you to stop the Vusers immediately.
	**Design Groups and Scheduler.** Click the arrow adjacent to the button for the following options: ➤ **Add Group.** Enables you to add a Vuser group to a running performance test, or to edit Vuser group settings during a test run. For user interface details, see "Add/Edit Groups Dialog Box" on page 395. ➤ **Edit Scheduler.** Enables you to edit the scheduler during a test run. For user interface details, see "Edit Scheduler Dialog Box" on page 381.
	**Monitors.** Click the arrow adjacent to the button for the following options: ➤ **Runtime Monitors.** Displays a list of monitors which are currently running during a performance test, and enables you to add, edit, and remove monitors during the run. For user interface details, see "Monitor Profile Content Dialog Box" on page 383. ➤ **Monitor Over Firewall Agent.** Enables you to change the status of a monitor over firewall machine. For user interface details, see "Monitor Over Firewall Dialog Box" on page 388.
	**View Rendezvous.** Enables you to enable/disable rendezvous points defined in the Vuser scripts and to set rendezvous policies that determine how the Controller handles Vusers at a rendezvous point. For user interface details, see "Rendezvous Dialog Box" on page 216.

UI Elements (A-Z)	Description
	**Load Generators.** Enables you to manage the load generator in the performance test. For user interface details, see "Load Generators Dialog Box" on page 385.
	**Timeslot Duration.** Enables you to extend or shorten the duration of the performance test. For user interface details, see "Timeslot Duration Dialog Box" on page 375.
	**Refresh.** Enables you to change the rate at which Performance Center refreshes the displayed graph data.
	**Filter Items.** Enables you to filter the information being displayed.

Performance Test Details Pane - Groups View

The Groups view of the Details pane displays the statuses of the Vusers in the performance test.



To access	In the Performance Test Run page, in the Details pane, click **Groups**. **Note:** Displayed by default.

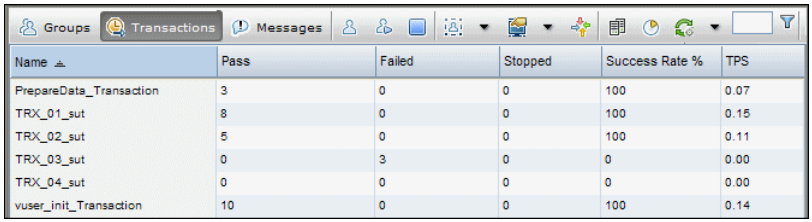
User interface elements are described below:

UI Elements (A-Z)	Description
Down	The number of Vusers that are down.
Error	The number of Vusers for which a problem occurred.
Exiting **(displayed as Exit)**	The number of Vusers that have finished running, or have been stopped, and are exiting now.

UI Elements (A-Z)	Description
Failed	The number of Vusers that have finished running. The script failed.
Gradual Exiting **(displayed as G. Exit)**	The number of Vusers that are finishing their current iteration before exiting.
Init	The number of Vusers that are being initialized on the host machine.
Name	The Vuser group name.
Passed	The number of Vusers that have finished running. The script passed.
Paused	The number of Vusers that have been paused.
Pending	The number of Vusers that are ready to be initialized and are waiting for an available load generator, or are transferring files to the load generator. The Vusers run when the conditions set in their scheduling attributes are met.
Ready	The number of Vusers that have already performed the **init** section of the script and are ready to run.
Rendezvous **(displayed as Rendez)**	The number of Vusers that have arrived at the rendezvous and are waiting to be released.
Run	The number of Vusers that are running. The Vuser script is being executed on a host machine.
Stopped	The number of Vusers that have been stopped manually.

Performance Test Details Pane - Transactions View

The Transactions view of the Details pane displays how many transactions have been executed successfully or unsuccessfully.



Name	Pass	Failed	Stopped	Success Rate %	TPS
PrepareData_Transaction	3	0	0	100	0.07
TRX_01_sut	8	0	0	100	0.15
TRX_02_sut	5	0	0	100	0.11
TRX_03_sut	0	3	0	0	0.00
TRX_04_sut	0	0	0	0	0.00
vuser_init_Transaction	10	0	0	100	0.14

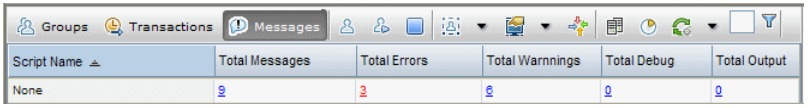
To access	In the Performance Test Run page, in the Details pane, click **Transactions**.

User interface elements are described below:

UI Elements (A-Z)	Description
Failed	The number of times the transaction failed.
Name	The transaction name.
Pass	The number of times the transaction passed.
Stopped	The number of times the transaction stopped.
Success Rate %	The transactions success rate percentage.
TPS	The number of times per second the transaction has run.

Performance Test Details Pane - Messages View

The Messages view of the Details pane displays error, warning, debug, and output messages that are sent to the Controller by the Vusers and load generators during a test run.



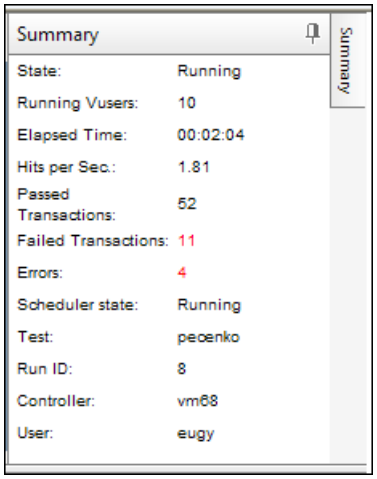
To access	In the Performance Test Run page, in the Details pane, click **Transactions**.
Important information	To view details of specific messages, click the number for the message type to open the Output Details dialog box. For user interface details, see "Output Details Dialog Box" on page 378.

User interface elements are described below:

UI Elements (A-Z)	Description
Script Name	The name of the script that generated the message.
Total Debug	Sent only if the debugging feature is enabled in the Controller. To enable the feature, select **Tools** > **PC Project Settings** > **Controller Options** > **Debug Information**.
Total Errors	The total number of error messages received. Error messages usually indicate that the script failed.
Total Messages	The total number of messages received.
Total Output	The total number of output messages received from the Vuser script.
Total Warnings	The total number of warning messages received. Warning messages indicate that the Vuser encountered a problem, but the test continued to run.

Summary Pane

The Summary pane displays a synopsis of the running performance test.



To access	Displayed in the upper left corner of the Performance Test Run page.

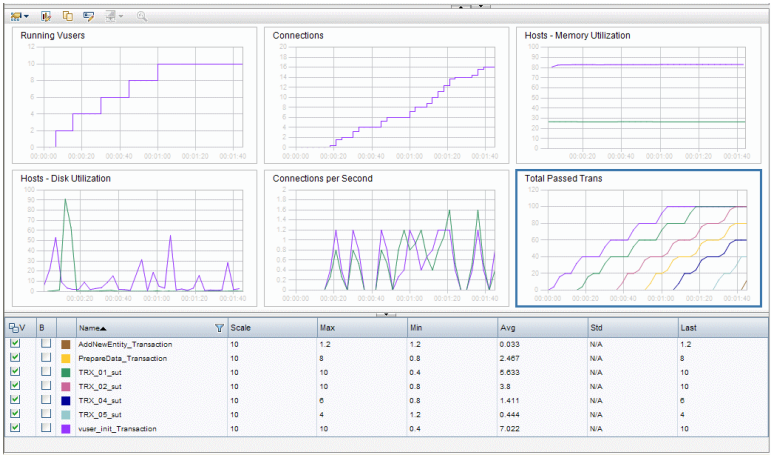
User interface elements are described below:

UI Elements (A-Z)	Description
Controller	The Controller being used in the test.
Elapsed Time	The amount of time since the test began running.
Errors	The number of Vuser errors that occurred during the test run.
Failed Transactions	The number of completed, unsuccessful transactions performed during the test run.
Hits per Sec	How many hits (HTTP requests) there have been to the Web server by Vusers during each second of the test run.
Passed Transactions	The number of completed, successful transactions performed during the test run.

UI Elements (A-Z)	Description
Run ID	The run ID.
Running Vusers	The number of Vusers currently running in the test.
Scheduler State	The current state of the scheduler.
State	The current run state.
Test	The name of the test.
User	The name of the user who is running the test.

Online Graphs Pane

The online monitor graphs are used to display performance measurements for those resources being monitored in a performance test.



To access	Displayed in the lower section of the Performance Test Run page.

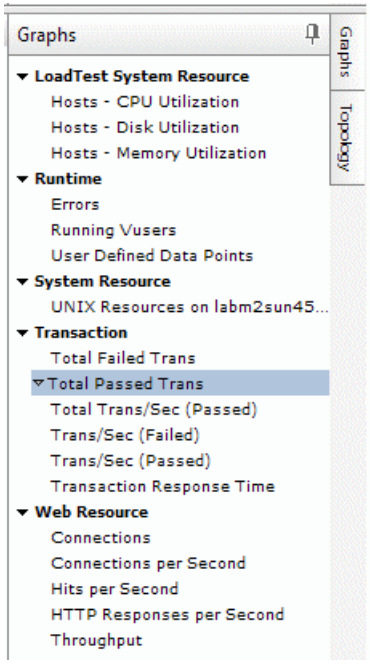
User interface elements are described below:

UI Elements (A-Z)	Description
	**# Graphs.** Enables you to select the number of graphs being displayed.
	**Graph Configuration.** Opens the Graph Configuration dialog box which enables you to configure the graphs display. The following options are available: ➤ **Granularity.** The interval of the test displayed in the graph. ➤ **Time Display.** The time displayed on the x-axis. ➤ **Relative to the test start.** Displays the amount of time that has elapsed since the beginning of the test (in hours, minutes, and seconds) ➤ **Controller clock.** Displays the time on the Controller clock. ➤ **None.** No clock or time is displayed. ➤ **Scale.** Select the desired scale: ➤ **Automatic.** Each measurement in the graph is displayed in the scale that best suits it. ➤ **None.** Each measurement's true values are displayed in the graph. ➤ **Line Style.** Select the desired line style: ➤ **With markers.** Lines in the graph are marked with dots. ➤ **Without markers.** Lines in the graph are smooth. ➤ **Apply to all visible graphs.** Applies the changes to all displayed graphs.
	**Duplicate Graph.** Enables you to duplicate a graph.
	**Rename Graph.** Enables you to rename a graph.

UI Elements (A-Z)	Description
	**Diagnostics Transaction Breakdown.** Opens HP Diagnostics, displaying the Transactions view, which displays performance metrics and drilldown options for the relevant transaction. For more information about interpreting data in the Diagnostics Transactions view, see the section that describes the transaction views in the *HP Diagnostics User Guide*. **Notes:** ➤ Only enabled if your system is configured to work with HP Diagnostics. ➤ To ensure that you can view Diagnostics data during a performance test run, in the Java Settings' Java Control Panel, click the **Network Settings** button and select **Direct Connection**.
<graph legend>	Displays details about graph. The following information is displayed. ➤ **V.** Selects the measurement to be displayed on the graph. ➤ **B.** Displays the measurement in bold. ➤ **<color>.** Enables you to select in which color the measurement appears in the graph. ➤ **Name.** The measurement name. ➤ **Machine.** The machine on which the monitor is running. ➤ **Scale.** The graph scale. ➤ **Max.** The measurement's maximum value. ➤ **Min.** The measurement's minimum value. ➤ **Avg.** The measurement's average value. ➤ **Std.** The measurement's standard deviation. ➤ **Last.** The measurement's last value.
Graphs	Displays a tree which lists all the configured online monitors graphs.

Graph Selection Tab

This tab displays a tree which lists all the configured online monitors graphs, and enables you to select which graphs to display in the Online Graphs pane.



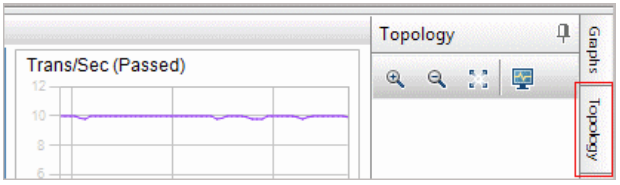
To access	Click the **Graphs** tab, on the right of the Online Graphs pane.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
<Online graphs tree>	Displays a list of the configured online monitors. Select a monitor to display its graph in the Online Graphs pane.

Topology Tab

This tab displays the topology selected for the performance test, enabling you to track the SiteScope monitor status on each component of your AUT.

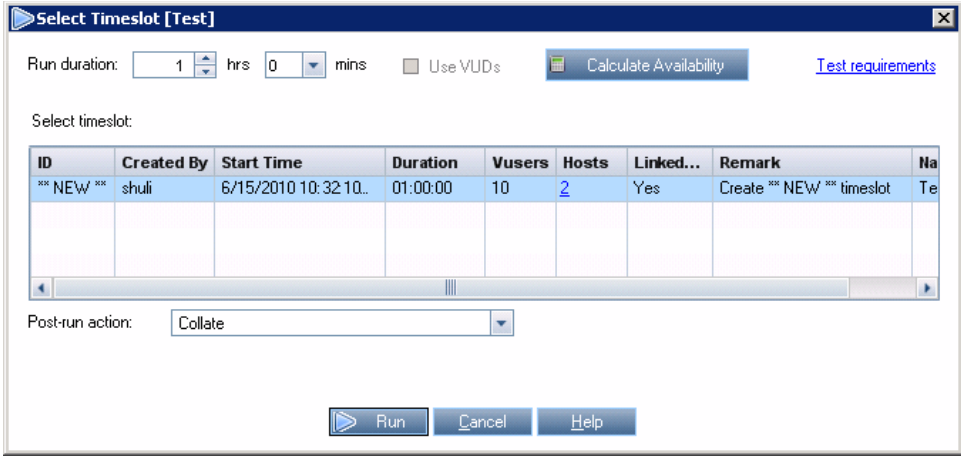
To access	Click the **Topology** tab, on the right of the Online Graphs pane. 
Important information	➤ To ensure that SiteScope monitoring data can be displayed for the topology, ensure that the relevant SiteScope server is up and running and that connectivity has been established. ➤ After the test run, a snapshot of the topology is included among the run result files. For details, see "Results/Last Run Results Tab" on page 354.
See also	"Topologies Overview" on page 46

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
	**Zoom in/out.** Enables you to zoom in and out of the topology tab.
	**Fit to screen.** Enables you to fit the whole topology to the current screen size.
	**Edit monitor.** Opens HP SiteScope, enabling you to edit the monitors defined on the component selected in the Topology tab. **Note:** During a test run, you can only edit monitors that were defined on the components when designing the topology. You cannot add new monitors during the test run.
<Topology display area>	Displays the topology selected for the test. If monitors are defined on a component in the topology, the following icons may appear: ➤  . Indicates that all of the monitors on the component are working successfully. ➤  . Indicates that there is an error with at least one of the monitors on the component. ➤  . Indicates that at least one of the monitors on the component is not working or not receiving data. ➤  . Indicates a warning on at least one of the monitors on the component.

Select Timeslot Dialog Box

This dialog box enables you to request and reserve resources upon manually running a performance test.



To access	Opens when you run a performance test.
Relevant tasks	"How to Manage a Performance Test Run" on page 340
See also	➤ "Running Performance Tests Overview" on page 338 ➤ "Ad Hoc Timeslot Reservations" on page 97

User interface elements are described below (unlabeled elements are shown in angle brackets):

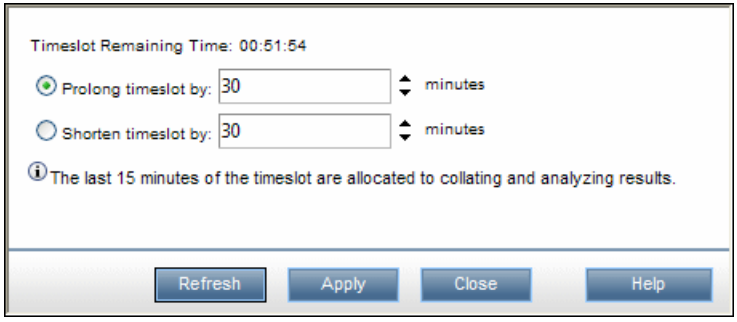
UI Elements (A-Z)	Description
Calculate Availability	Calculates the availability of the resources required for running the test, and refreshes the list of available timeslots.
Run	Uses the hosts reserved by the selected timeslot and runs the test. The Performance Center Dashboard opens displaying the Performance Test Run page.

UI Elements (A-Z)	Description
<Requested Resources link>	Open the Test Information box which displays the required test resources—Controller, and load generators and Vusers—as defined in the test.
<select timeslot grid>	When you click **Calculate Availability**, the grid is populated with a list of timeslots that can currently provide the requested resources for the run. You select a timeslot based on the result in the **Remarks** column: ➤ **NEW.** Indicates a new timeslot that can be created especially for this run. ➤ **RECOMMENDED.** Displayed when the test you are about to run is linked (without Autostart) to the timeslot. When the timeslot was reserved, all the resources needed for this test were reserved. It is therefore recommended to use this timeslot rather than creating a new one. ➤ **UPDATE REQUIRED**. Indicates that the timeslot can offer some of the resources needed for the test but you need to update the timeslot to include all the other required resources too. **Note:** The resource requiring the update is marked with an asterisk (*). For details about other fields displayed in this grid, see "Timeslots Module Fields" on page 134.

UI Elements (A-Z)	Description
Post-run action	The action to be taken when the test run is complete. ➤ **Do not collate results.** Frees the machines immediately after the performance test ends. When the run has finished, the run results are left on the load generators. You can analyze the results at a later stage from the Results ➤ **Collate.** When the run has finished, the run results are collected from all the load generators. This is recommended because collation of results takes only a few minutes, and can prevent loss of or inaccessibility to results in case any of your load generators becomes unavailable. ➤ **Collate and Analyze.** When the run has finished, the run results are collected and analyzed. Data analysis requires some time, depending on the size of the results file. If there is no timeslot available to include the data analysis, select the **Collate** option instead, and run late Analysis when a data processor becomes available. You run late Analysis from the Results tab. For user interface details, see "Results/Last Run Results Tab" on page 354. **Default value:** Collate
Run duration	The amount of time, in hours and minutes, that you need the resources reserved. This should be enough time to run the test and perform the post-run action that you select.
Use VUDs	Requests VUDs Vusers for the test rather than regular Vusers. For details about VUDs, see "HP ALM Performance Center Licenses Overview" on page 822.

Timeslot Duration Dialog Box

This page enables you to extend or shorten the current timeslot.



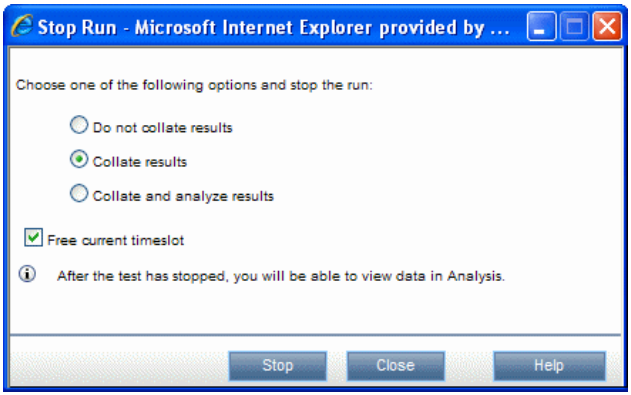
To access	During runtime, on the Performance Test Run page, click the **Timeslot Duration** button .
Relevant tasks	"How to Manage a Performance Test Run" on page 340

User interface elements are described below:

UI Elements (A-Z)	Description
Refresh	Refreshes the **Timeslot Remaining Time** information.
Prolong Timeslot by X minutes	Prolongs the timeslot duration by the selected number of minutes.
Shorten Timeslot by X minutes	Shortens the timeslot duration by the selected number of minutes.

Stop Run Dialog Box

This page enables you to stop a running performance test and to select a post-run collation option.



To access	During a test run, on the Performance Center Dashboard's Performance Test Run page, click the **Stop Run** button .
Relevant tasks	"How to Manage a Performance Test Run" on page 340

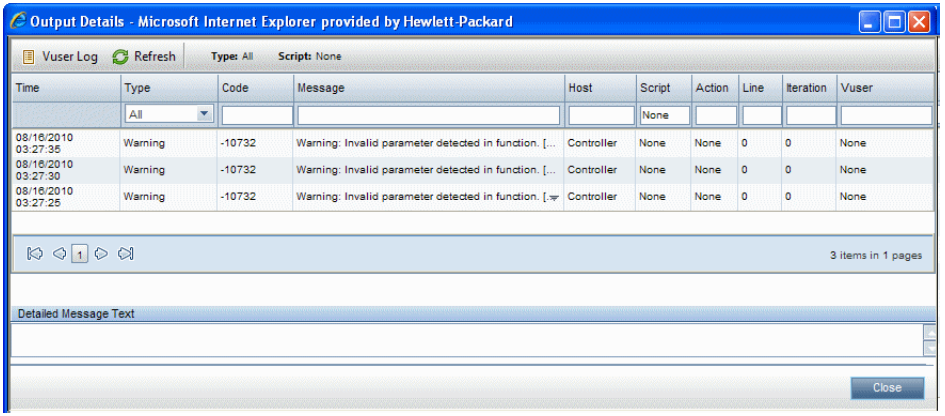
User interface elements are described below:

UI Elements (A-Z)	Description
Stop	Moves all running Vusers to the **Gradual Exiting** state.
Collate and analyze results	ALM Performance Center collates the run data from the load generators and generates analysis data. After data is collated, ALM Performance Center automatically deletes the temporary results from the load generators and controllers. You can display the results using analysis tools such as graphs and reports, or download the results for analysis on a local machine. This option takes the most time.

UI Elements (A-Z)	Description
Collate only	ALM Performance Center collates the run data from the load generators. After data is collated, ALM Performance Center automatically deletes the temporary results from the load generators. You can download the raw results from the Results tab, or manually analyze results at a later point from the Results tab. **Note:** This is the default setting.
Do not collate results	Frees the machines immediately after the test ends. You can collate and analyze results at a later point from the Results tab.
Free current timeslot	Frees the current timeslot once the test has stopped.

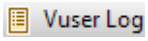
Output Details Dialog Box

This dialog box enables you to view details of messages that are received during a test run.



To access	On the Performance Test Run page, in the Details pane, click **Messages**. Then in the grid, click the number of messages for the message type whose details you want to view. For more details about the Messages view of the Details pane, see "Performance Test Run Page" on page 358.
Relevant tasks	"How to Manage a Performance Test Run" on page 340

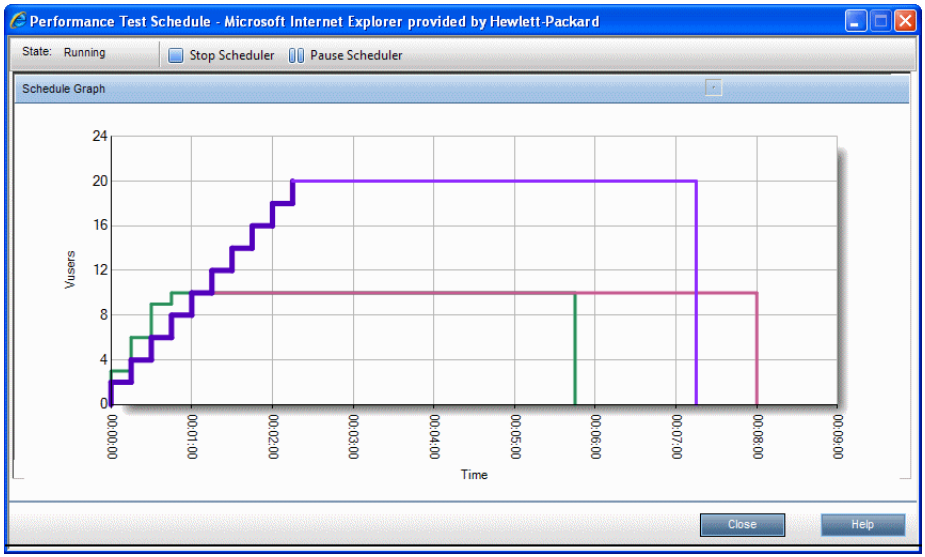
User interface elements are described below:

UI Elements (A-Z)	Description
	Opens the Vuser activity log, which enables you to view a list of messages per individual Vuser. The log contains the following information: ➤ **Activity log for Vuser.** The selected Vuser whose ID is being displayed. ➤ **Refresh.** Enables you to refresh the log. ➤ **Download log.** Enables you to download the log. ➤ **Log Message area.** Displays a list of all messages received for the selected Vuser. ➤ **Snapshot.** Generates a snapshot (a graphical representation of the Web page) of the point in the test run where an error occurred. Before using this feature, you must install the Snapshot Viewer on your desktop, and enable the **Show Snapshot on Error** option in the script's runtime settings. For more information on the runtime settings, see "Script Runtime Settings" on page 511.
	**Refresh.** Enables you to refresh the dialog box information.
Action	The action in the script where the message was generated.
Code	The message code.
Host	The host that generated the message.
Iteration	The iteration during which the message was generated.
Line Number	The line in the script where the message was generated.
Message	The received message.
Script	The script that generated the message.
Time	The time the message was generated.

UI Elements (A-Z)	Description
Type	The type of message. The possible message types are: ➤ **Notify.** Provides runtime information. ➤ **Error.** Usually indicates that the script failed. ➤ **Warning.** Indicates that the Vuser encountered a problem, but that the test continued to run. ➤ **Debug.** Sent only if the debugging feature is enabled in the Controller. To enable the feature, select **Tools** > **PC Project Settings** > **Controller Options** > **Debug Information**.
Vuser	The Vuser which generated the message.

Edit Scheduler Dialog Box

This dialog box enables you to edit scheduler settings during a performance test run.



To access	On the Performance Test Run page, click the **Design Groups and Scheduler** button. Then select **Edit Scheduler**.
Relevant tasks	"How to Manage a Performance Test Run" on page 340

User interface elements are described below:

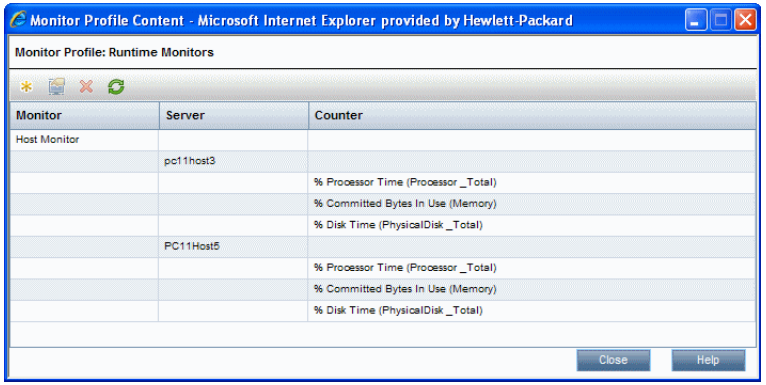
UI Elements (A-Z)	Description
Stop Scheduler	Stops the scheduler and enables it for editing.
Pause Scheduler	Pauses the scheduler.
Start Scheduler	Restarts the scheduler after editing.

UI Elements (A-Z)	Description
<edit scheduler section>	Enables you to edit a defined schedule. For more information, see "Scheduler Actions" on page 258.
Global/Groups Schedule	Displays whether the current schedule has been defined **by test** or **by group**. ➤ **Start Time.** Enter a delay time for the scheduler to restart after editing. To restart the scheduler immediately, leave this setting blank. ➤ **Wait.** (Groups schedule only) Select to initialize all Vuser groups together. ➤ **Group.** (Groups schedule only) Select individual groups to display and edit their schedules.
Schedule Graph	Provides a graphical representation of the defined schedule actions.
Status	Displays the current scheduler status.

Monitor Profile Content Dialog Box

This dialog box displays a list of monitors which are currently running during a performance test, and enables you to add, edit, and remove monitors during the run.

The monitors that are displayed are a combination of the of the monitors from all the monitor profiles that were associated to the test, as well as a set of 'host' monitors which are added automatically to every test for each host which is used in the test.



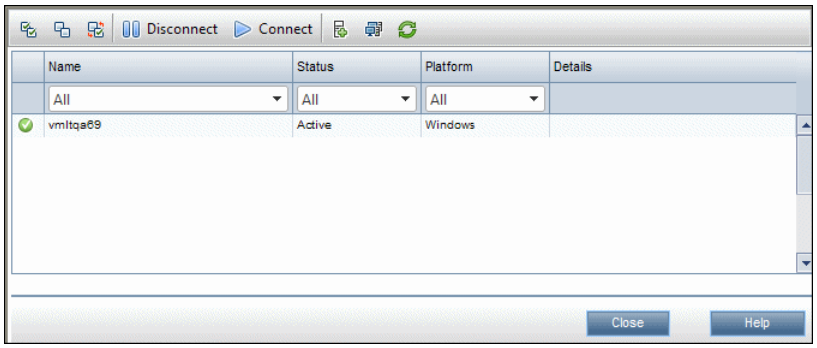
To access	On the Performance Test Run page, click the **Monitors** button , and select **Runtime Monitors**.
Important information	➤ Monitors which are defined as part of a monitor profile but fail to run do not appear in the list of monitors. ➤ Default host monitors cannot be modified during runtime.
Relevant tasks	"How to Manage a Performance Test Run" on page 340

User interface elements are described below:

UI Elements (A-Z)	Description
	**Add Monitor.** Click to add a monitor to the performance test. For more information about monitors, see "Add New Monitors Page" on page 81.
	**Edit Monitor.** Click to edit the selected monitor. The relevant monitor type page opens, enabling you to edit the monitor information.
	**Delete Selected Item.** Deletes the selected monitor.
	**Refresh Monitors List.** Refreshes the monitors list.
	**Check Out.** Opens the Check Out dialog box, enabling you to check out selected entities. For details, see the *HP Application Lifecycle Management User Guide*. **Available for**: Version-control-enabled projects only
	**Check In.** Opens the Check In dialog box, enabling you to check in selected entities. For details, see the *HP Application Lifecycle Management User Guide*. **Available for**: Version-control-enabled projects only
	**Undo Check Out.** Cancels the check out of selected entities and discards changes. To undo checkouts for entities checked out by other users, you must have the appropriate user permissions. For more information, refer to the *HP Application Lifecycle Management Administrator Guide*. When you undo a checkout, any changes you made to non-versioned fields while the entity was checked out are not cancelled and the new values remain. For details, see the *HP Application Lifecycle Management User Guide*. **Available for**: Version-control-enabled projects only

Load Generators Dialog Box

This dialog box enables you to view load generator status and machine utilization, connect and disconnect load generators, add load generators to the test, and to configure terminal sessions.



To access	On the Performance Test Run page, click the **Load Generators** button.
Relevant tasks	"How to Manage a Performance Test Run" on page 340

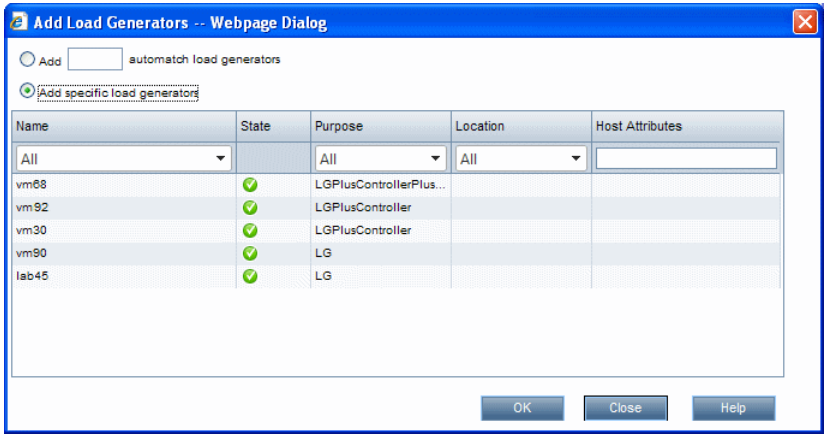
User interface elements are described below:

UI Elements (A-Z)	Description
	Select All. Selects all displayed load generators.
	Deselect All. Deselects all displayed load generators.
	Invert Selection. Inverts the current selection of load generators. That is, the non-selected load generators are selected, and the selected load generators are cleared.
	Disconnect. Disconnects the selected load generator for the performance test.
	Connect. Connects the selected load generator for the performance test.

UI Elements (A-Z)	Description
	**Add Load Generators.** Opens the Add Load Generators dialog box, which enables you to add load generators to the test. For user interface details, see "Add Load Generators Dialog Box" on page 387.
	**Terminal Session Settings.** Opens the Terminal Services dialog box, which enables you to configure terminal sessions for the load generator. For user interface details, see "Terminal Services Dialog Box" on page 320.
	**Refresh.** Refreshes the information displayed in the load generators dialog box.
Name	The load generator name.
Details	Load generator details.
Platform	The platform on which the load generator is running.
Status	The current status of the load generator. The possible statuses are: ➤ **Active.** The load generator is connected. ➤ **Busy.** The load generator is running Vusers. ➤ **Disconnecting.** The load generator is disconnecting. ➤ **Down.** The load generator is not connected. ➤ **Failed.** A connection with the load generator could not be established. ➤ **Ready.** The load generator is connected.

Add Load Generators Dialog Box

This dialog box enables you to add load generators to a running performance test.



To access	In the Load Generators dialog box, click the **Add Load Generators** button .
Relevant tasks	"How to Manage a Performance Test Run" on page 340
See also	Chapter 9, "Load Generator Distribution"

User interface elements are described below:

UI Elements (A-Z)	Description
Add X Automatch Load Generators	Enables you to add a specified number of automatch load generators.
Add Specific Load Generators	Enables you to add specific load generators. The load generator table lists the specific load generators which are available, displaying the following information for each load generator: ➤ **Name.** The load generator name. ➤ **State.** The current state of the load generator: **Operational**, **Non-Operational**, or **Unavailable**. ➤ **Purpose.** The purpose of the load generator, that is, **Controller**, **Load Generator, Data Processor**, or a combination of these. ➤ **Location.** The location of the load generator. ➤ **Host Attributes.** Select attributes for the load generator.

Monitor Over Firewall Dialog Box

This dialog box enables you to change the status of a monitor over firewall machine during a test run.

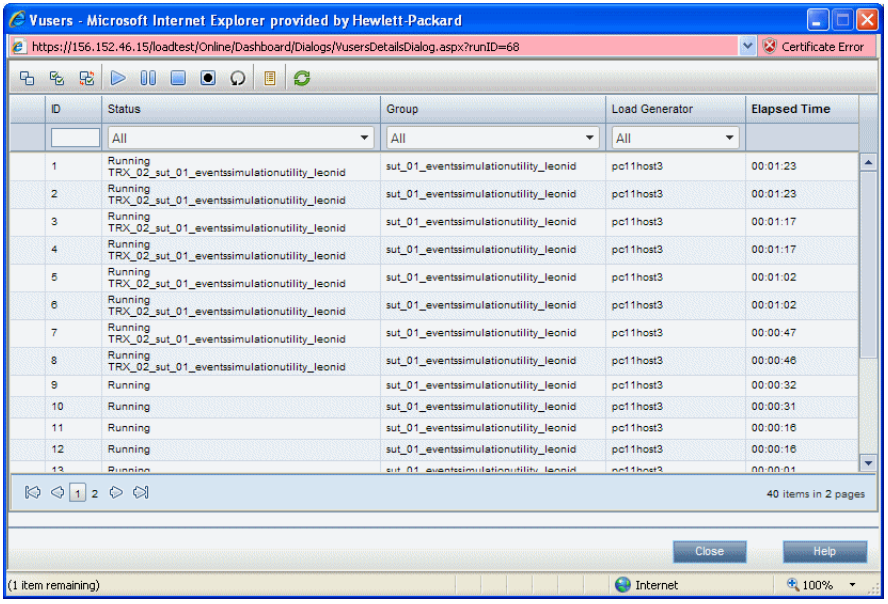
To access	On the Performance Test Run page, click the **Monitors** button  , and select **Monitor Over Firewall Agent**.
Relevant tasks	"How to Manage a Performance Test Run" on page 340

User interface elements are described below:

UI Elements (A-Z)	Description
	**Select All.** Selects all displayed monitor over firewall machines.
	**Deselect All.** Deselects all displayed monitor over firewall machines.
	**Invert Selection.** Inverts the current selection of monitor over firewall machines. That is, the non-selected machines are selected, and the selected machines are cleared.
	**Disconnect.** Disconnects the selected monitor over firewall machine for the performance test.
	**Connect.** Connects the selected monitor over firewall machine for the performance test.
	**Refresh.** Refreshes the information displayed in the monitor over firewall agent dialog box.

Vusers Dialog Box

This dialog box displays specific details for each Vuser in the performance test, and enables you to run or stop individual Vusers irrespective of their defined schedules.



To access	During Runtime, on the Performance Center Dashboard's Performance Test Run page, click the **Vusers Details** button .
Relevant tasks	"How to Manage a Performance Test Run" on page 340

User interface elements are described below:

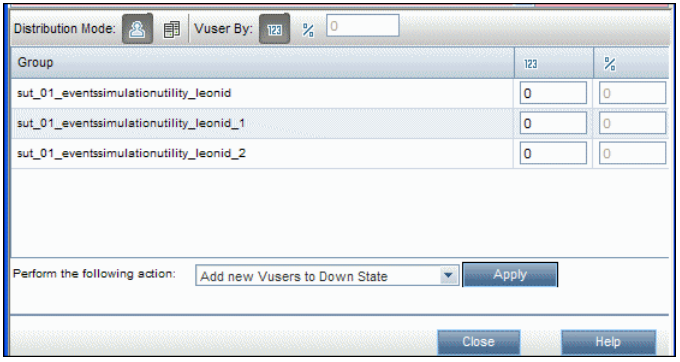
UI Elements (A-Z)	Description
	Select All. Selects all displayed Vusers.
	Deselect All. Deselects all selected Vusers.

UI Elements (A-Z)	Description
	**Invert Selection.** Inverts the current selection of Vusers. That is, the non-selected Vusers are selected, and the selected Vusers are cleared.
	**Run Selected Vusers.** Runs the selected Vusers.
	**Pause Selected Vusers.** Pauses the selected Vusers**.**
	**Stop Selected Vusers Gradually.** Stops the selected Vusers gradually. The Vusers complete the current iteration before stopping.
	**Stop Selected Vusers Immediately.** Stops the selected Vusers immediately.
	**Reset Selected Vusers.** Resets the selected Vusers to the Down state.
	**Show Selected Vusers Log.** Opens the Vuser Activity Log, which displays runtime information for the selected Vuser. The log displays the following information: ➤ **Activity log for Vuser.** The selected Vuser. ➤ **Refresh.** Refreshes the information displayed in the log. ➤ **Download log.** Enables you to download the log. ➤ **Close.** Closes the log. ➤ **Log Message.** Displays the logged Vuser messages. ➤ **Show snapshot.** Generates a snapshot of the point where an error occurred a test run. Before using this feature, you must install the snapshot viewer on your desktop, and enable the **Snapshot on Error** option in the Runtime Settings for the Vuser script. For more information on configuring the runtime settings, see "Script Runtime Settings" on page 511.
	**Refresh.** Refreshes the information displayed in the dialog box.
Elapsed Time	The amount of time the Vuser has been running.

UI Elements (A-Z)	Description
Group	Filters displayed Vusers by Vuser group.
ID	The Vuser's ID.
Load Generator	Filters displayed Vusers by load generators.
Status	Filters displayed Vusers by their current status.

Run Vusers Dialog Box

This dialog box enables you to initialize, run, or stop any number of Vusers irrespective of their defined schedules. In addition, you can add new Vusers to the performance test.



To access	On the Performance Test Run page, click the **Vuser Details** button .
Relevant tasks	"How to Manage a Performance Test Run" on page 340

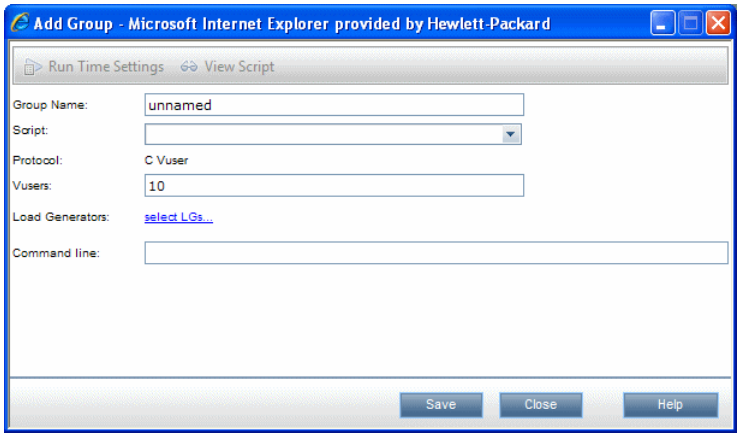
User interface elements are described below:

UI Elements (A-Z)	Description
Distribution Mode:	**by Vusers.** The Vusers being given an instruction are distributed according to Vuser groups.
Distribution Mode:	**by Load Generator.** The Vusers being given an instruction are distributed according to load generators.
Vuser By:	**by Number.** Enables you to give an instruction to a specific number of Vusers per Vuser group/load generator.
Vuser By:	**by Percentage.** Enables you to give an instruction to a specific number of Vusers, which are then distributed among the Vuser groups/load generators according to a percentage which you define. **Example:** If you choose to run an additional **200** Vusers, among three Vuser groups, **A**, **B**, and **C**, and you define the percentage distribution as **A = 75%**, **B = 20%**, and **C = 5%**, then the Vusers would be distributed as follows: **A.** 150 Vusers **B.** 40 Vusers **C.** 10 Vusers **Note:** When selecting this method, you enter the number of Vusers to run in the box adjacent to the **by Percentage** button.
	Enter the number of Vusers per Vuser group/load generator.
	Enter the percentage distribution per Vuser group/load generator.
Apply	Performs the selected instruction.
Group	Lists the Vuser groups in the test.

UI Elements (A-Z)	Description
Load Generator	Lists the load generators in the test.
Perform the following Action	Give the desired instruction to the defined number of Vusers. The possible actions are: ➤ **Add new Vusers to Down state.** Add the desired number of Vusers to the **Down** state. ➤ **Initialize Vusers from Down.** Initializes the desired number of Vusers currently in the **Down** state. ➤ **Run Vusers from Down.** Runs the desired number of Vusers currently in the **Down** state. ➤ **Run Vusers from Ready.** Runs the desired number of Vusers currently in the **Ready** state. ➤ **Stop Vusers.** Moves the desired number of Vusers from the **Run** state to the **Gradual Exiting** state. ➤ **Reset Vusers.** Moves the desired number of Vusers from the **Stopped** state to the **Down** state. **Note:** You cannot perform an action on more Vusers than are currently in a particular state. For example, if you define **10** Vusers and select **Initialize Vusers from Down**, but there are only **five** Vusers in the Down state, *only* those five Vusers are initialized.

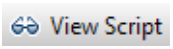
Add/Edit Groups Dialog Box

This dialog box enables you to add a Vuser group to a running performance test, or to edit Vuser group settings during a test run.



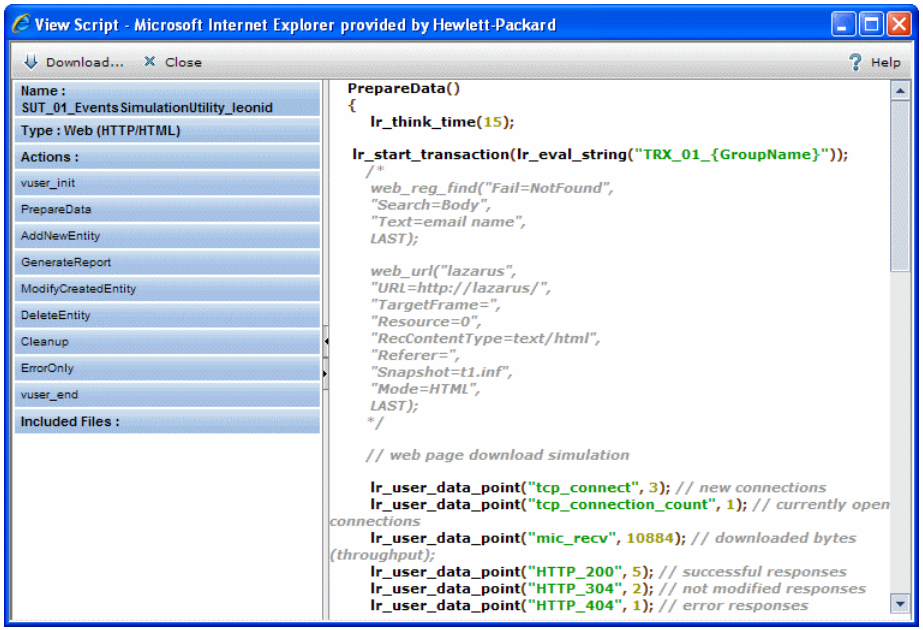
To access	➤ **When adding a Vuser group.** On Performance Test Run page, click the Design Groups and Scheduler button. Then select **Add Groups**. ➤ **When editing a Vuser group.** On the Performance Test Run page, on the Groups pane, place the mouse cursor over the name of the group you want to edit. Click the downward arrow that appears adjacent to the name, and select **Edit Group**.
Important information	To edit a Vuser group, all Vusers must be in the **inactive** state.
Relevant tasks	"How to Manage a Performance Test Run" on page 340

User interface elements are described below:

UI Elements (A-Z)	Description
	Enables you to view and change the runtime settings for the Vuser script.
	Opens the script in VuGen.
Command Line	Type the name and value of the parameter you want to send using the format, **<Parameter_Name> <value>**. For information about the command line parsing functions, or for details about including arguments on a command line, see the *HP LoadRunner Online Function Reference*, provided with HP Virtual User Generator.
Group Name	The name of the Vuser group.
Load Generators	The load generators on which the group is running.
Protocol	The Vuser script's protocol.
Script	The name of the Vuser script.
Vusers	The number of Vusers assigned to the group.

View Script Dialog Box

This dialog box enables you view the code for each action in a running vuser script.



To access	On the Performance Test Run page, on the Groups pane, place the mouse cursor over the name of a group. Click the downward arrow that appears adjacent to the name, and select **View Script**.
Relevant tasks	"How to Manage a Performance Test Run" on page 340

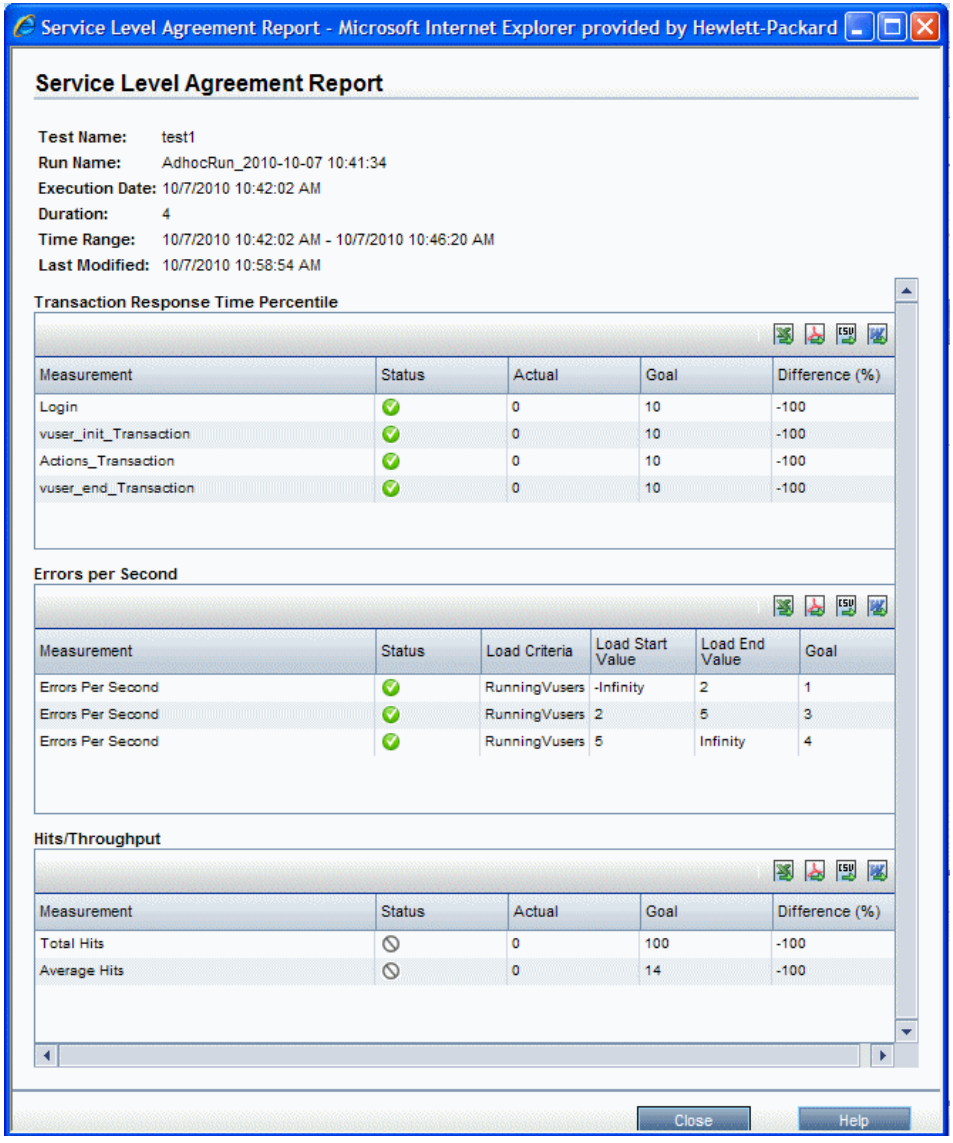
User interface elements are described below:

UI Elements	Description
Download	Enables you to download the script.
Name	The script's name.

UI Elements	Description
Type	The script type.
Actions	Lists the actions included in the script. Click on an action to view it's code in the right pane.
Included files	Displays files included in the script.

SLA Report

This report displays the post-run SLA statuses of the SLA goals defined for the performance test.



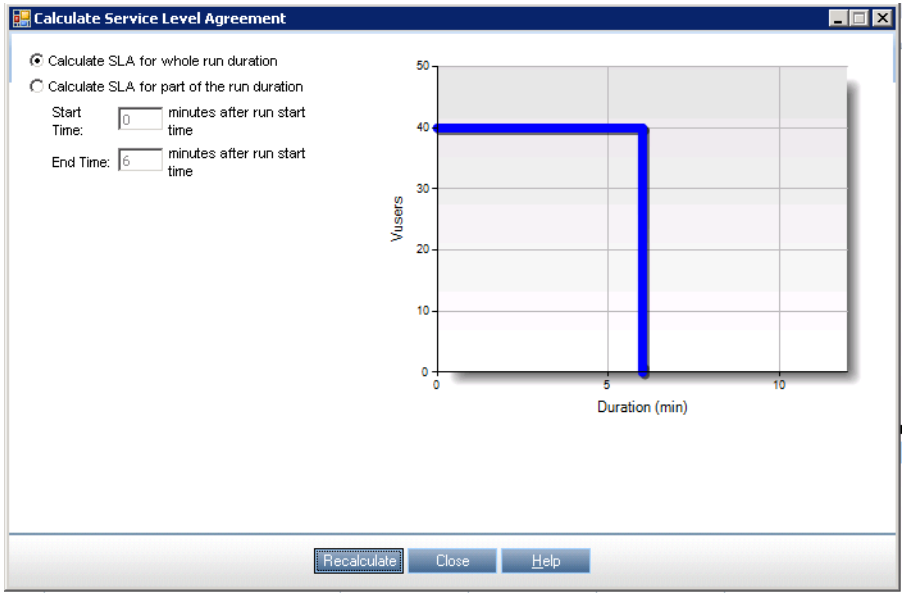
To access	On the ALM sidebar, under **Testing**, select **Test Lab**. Select the **Test Runs** tab. Use one of the following: ➤ In the information panel, in the **Results** tab, click the **SLA Report** button. ➤ In the left pane select a test set. Select the **Execution Grid** tab in the right pane. In the area below, in the **Last Run Results** tab, click the **SLA Report** button.
Important information	The SLA report is available only if SLAs were defined for the performance test.
Relevant tasks	"Analyzing Performance Test Results" on page 339
See also	"Service Level Agreements Overview" on page 266

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
	Export to Excel. Enables you to export the selected section of the SLA report to an Excel file.
	Export to PDF. Enables you to export the selected section of the SLA report to a .pdf file.
	Export to CSV. Enables you to export the selected section of the SLA report to a .csv file.
	Export to Word. Enables you to export the selected section of the SLA report to a Word file.
<Test run details>	The details of the performance test run to which to the SLA report data relates are displayed at the top of the report.
<SLA grids>	The results for each SLA are displayed in separate grids. **Tip:** Each set of results can be exported to Excel, Word, PDF, and CSV format.
<SLA status indicators>	. Indicates a failed SLA status. . Indicates a passed SLA status. . Indicates that there is no data about the SLA status.

Calculate Service Level Agreement Dialog Box

This dialog box enables you to change the test time range included in the Service Level Agreement (SLA).



To access	**1** On the ALM sidebar, under **Testing**, select **Test Lab**. **2** Select the **Test Runs** tab. **3** In the information panel, in the **Results** tab, click the **Recalculate SLA Report** button.
Important information	The Recalculate SLA button is available only if SLAs were defined for the performance test.
Relevant tasks	"Analyzing Performance Test Results" on page 339
See also	"Service Level Agreements Overview" on page 266

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
	Recalculates the SLA according to the defined information.
Calculate SLA for whole run duration	Calculates the SLA over the whole test run.
Calculate SLA for part of run duration	Calculates the SLA over part of the test run. Enter the desired **Start Time** and **End Time** over which to calculate the SLA.

16

WAN Emulation

This chapter includes:

Concepts

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Concepts

WAN Emulation Overview

HP Performance Center is integrated with third party software that enables you to accurately test point-to-point performance of WAN-deployed products under real-world network conditions. By installing this WAN emulation software on your load generator, you can introduce highly probable WAN effects such as latency, packet loss, and link settings. As a result, you can test your application in a more realistic environment that better represents its actual deployment.

You can create more meaningful results by configuring several load generators with the same unique set of WAN effects, and by giving each set a unique location name, for example, London. When viewing performance test results in Analysis, you can group metrics from different load generators according to their location names. For information on grouping metrics according to an emulated location name, see the section that deals with applying filter and sort criteria to graphs in the *HP LoadRunner Analysis User Guide*.

This section also includes:

- "Typical Network Emulation Settings" on page 405
- "Emulated Locations" on page 405
- "Excluding Machines from WAN Emulation" on page 406
- "Viewing WAN Emulation Monitors" on page 407

Typical Network Emulation Settings

The WAN Emulator allows you to emulate probable WAN effects over your network, thereby creating a more realistic performance test. The following table presents the most typical effects which you can configure:

Effect	Description
Latency	The **Latency** value you define represents the time, in milliseconds, that it takes an IP packet to cross the WAN. This is usually effected by geographical distance, the available bandwidth, the network load on the route between the two ends, and whether this is a terrestrial link or not.
Packet Loss	The **Packet Loss** value you define represents the chance of losing IP packets while data travels through a WAN. Packets can get lost due to link faults or due to extreme network load.
Bandwidth	The **Bandwidth** value you define represents your network's capacity to transfer data over the WAN.

Emulated Locations

To receive more meaningful results, you can configure groups of load generators to emulate conditions unique to specific geographic locations. For example, London and New York.

To view the results for each group of load generators individually in Analysis, you can group the results of the performance test by the emulated location name. In other words, for any graph in Analysis, all the results of the 'New York based' load generators can be grouped together, as can all the results of the 'London based' load generators, and so on.

Note: In cases where you have to configure more than one load generator per location, make sure that each load generator designated for a specific location is configured with the same settings.

For information on grouping Analysis graph data by emulated location name, see the section that deals with applying filter and sort criteria to graphs in the *HP Analysis User Guide*.

Excluding Machines from WAN Emulation

When a machine is excluded from the WAN Emulation, network traffic to that machine does not suffer any WAN effects and will not be included in the WAN Emulation results.

During a performance test run, machines, that if emulated, may affect the results of the actual performance test (for example, the Controller) must be excluded. Accordingly, the following machines are excluded by default:

- The Controller machine or the MI Listener and proxy server.
- The Diagnostics Commander server.
- The Performance Center server.
- The SiteScope server (configured to monitor Performance Center servers and hosts).

In addition to the machines which are excluded by default, the integrated third party software may provide an interface for excluding additional machines from the WAN Emulation.

Note: The option to exclude machines from the WAN Emulation might not be available. To check for the availability of this option, consult the relevant third party software documentation.

In addition to the machines which are excluded by default, the following are some additional situations where you should exclude machines from WAN Emulation:

- In a Multiprotocol performance test that includes a Web server and a database server; where information from the database server is not required as a part of the performance test. In such a case, you would exclude the database server.
- You may want to exclude all deployment and software upgrade servers.
- Where you run and store scripts on a shared network drive.

Viewing WAN Emulation Monitors

The WAN Emulation starts and stops automatically as you start and stop the performance test. WAN Emulation monitors are assigned automatically when the performance test run starts and WAN metrics are automatically collected during the performance test run. You can view the WAN metrics during the performance test run in the Windows Resources monitor.

If a load generator is connected over a firewall, you must add the monitors manually using the Monitor Over Firewall component. For information about how to add and configure a monitor over firewall machine, see the Test Resources section in the *HP Application Lifecycle Management User Guide*.

For details on how to integrate WAN Emulation into your performance test, see "How to Integrate WAN Emulation into a Performance Test" on page 408.

Tasks

How to Integrate WAN Emulation into a Performance Test

This task describes how to integrate WAN Emulation into your performance test and how to view the WAN metrics in Analysis.

To learn more about WAN Emulation, see "WAN Emulation Overview" on page 404.

1 Prerequisites

- Make sure that you have a properly designed performance test. For more information, see "How to Define a Performance Test Workload" on page 192.
- Make sure that the relevant third party components are installed on the following machines:
  - the Performance Center server
  - the load generators
  - the Controller

Note: You may also be required to install the third party software on additional components. For more information, see the relevant WAN emulation software installation documentation

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2 Configure WAN Emulation Settings

a **Enable WAN Emulation.** In the WAN Emulation Settings dialog box, select Enable WAN Emulation. For user interface details, see "WAN Emulation Settings Dialog Box" on page 410.

b **Determine emulated locations.** In the WAN Emulation Settings dialog box, determine emulated locations for the WAN Emulation.

c **Determine WAN Emulation settings for each load generator.** In the WAN Emulation Settings dialog box, click WAN Emulation Settings to open the third party software settings dialog box.

3 View WAN metrics in HP LoadRunner Analysis

WAN metrics are automatically collected during the performance test run.

You can view all the WAN metrics in the Windows Resources monitor, as well as in Analysis using all of the available analysis tools, including the option to group metrics by emulated location, and to correlate data such as response time with WAN metrics. For more information, see the *HP LoadRunner Analysis User Guide*.

Reference

WAN Emulation User Interface

This section includes:

➤ WAN Emulation Settings Dialog Box on page 410

WAN Emulation Settings Dialog Box

This dialog box enables you to enable WAN Emulation on selected load generators, define Emulated locations, and access the third party software settings pages.

To access	**1** In the **Testing** > **Test Plan** module, select a test, then click the **Test Design** tab. **2** Click the **Edit Test** button. **3** In the **Workload** tab, click the **WAN Emulation Settings** button.
Important information	This dialog box is only enabled if the relevant third party software is installed on one of the selected load generators.
Relevant tasks	"How to Integrate WAN Emulation into a Performance Test" on page 408

User interface elements are described below:

UI Elements (A-Z)	Description
WAN Emulation settings	Opens the third party software WAN Emulation Settings dialog box. For detailed information on configuring the WAN Emulation settings via the third party software components, see the relevant third party software documentation.
Restore	Restores any changes made in the dialog box.
Emulated Location	➤ **In the load generator list table:** Displays an emulated location that has been defined for the load generator. ➤ **In the <load generator name> WAN Emulation settings pane:** Enter an emulated location for the load generator. For more information, see the section that deals with Emulated Locations in "WAN Emulation Overview" on page 404.
Emulation	Displays whether WAN Emulation is enabled or disabled for the load generator.
Enable WAN Emulation	Select to enable WAN Emulation on the selected load generator.
Load Generator	A list of load generators assigned to the performance test.

Troubleshooting and Limitations

When configuring the WAN Emulator, be aware of the following limitations:

Load generator running on a UNIX platform

WAN emulation software integration may not be available on the UNIX platform. In this case, the following limitations apply:

- If you selected one of the manual load generator distribution methods for your performance test, then the option of running a WAN Emulation on the load generator will be disabled.
- If you selected one of the automatic load generator distribution methods, then the performance test will return an error message upon commencement.

Load generator that is also the Controller

- If you selected one of the manual load generator distribution methods for your performance test, then the option of running a WAN Emulation on the load generator will be disabled.
- If you selected one of the automatic load generator distribution methods, then we recommend that you disable the option of running Vusers on the Controller for the project. Otherwise, an error message appears when the performance test starts.

Removing Load Generators from the Performance Test

- If you remove a load generator using one of the automatic load generator distribution methods, then the most recently added load generator is removed, and any WAN Emulation settings configured on it will not apply to the performance test.
- If you remove a load generator using one of the manual load generator distribution methods, and subsequently re-add the load generator to the performance test, then any WAN Emulation settings that were defined on that load generator will be lost. To run WAN Emulation on that load generator, you must define the relevant settings again.

Part VI

Online Monitoring

17

Working with ALM Performance Center Online Monitors

This chapter includes:

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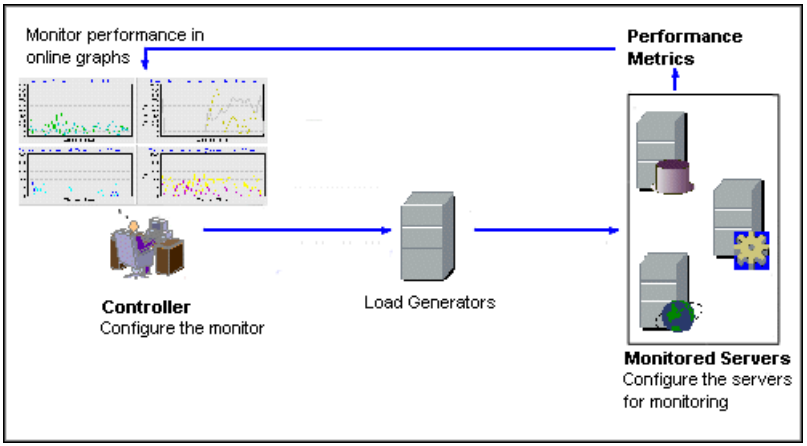
Concepts

Monitoring Process Overview

Before monitoring a performance test, you need to set up and configure the ALM Performance Center monitoring components. Each monitor has different configuration requirements that are explained in the specific monitoring chapters. The following diagram illustrates the ALM Performance Center monitoring process.



Before monitoring a server, perform the following steps:

- Configure the monitoring environment on the server machine (if necessary).
- Configure the monitor on the Controller machine.

For details, see "How to Set Up the Monitoring Environment – Workflow" on page 417.

Tasks

How to Set Up the Monitoring Environment – Workflow

This task describes how to set up the ALM Performance Center online monitoring environment. You specify the machines and measurements that the Controller will monitor during performance test execution in the ALM Test Resources module. During performance test execution, the collected measurement data appears in the online graphs.

1 Configure the monitoring environment on the server machine

To use the following monitors, you must first install or configure monitoring components on the server machine. For details about configuring the monitoring components, see the specific monitoring sections.

- Citrix
- J2EE & .NET Diagnostics
- Network Delay
- Oracle
- PeopleSoft (Tuxedo)
- SAPGUI
- Tuxedo
- UNIX

2 Configure the monitors on the Controller

To obtain performance data for a monitor, you need to configure the monitor (from the Controller), and indicate which statistics and measurements you want to monitor.

- For information about selecting the servers to monitor and selecting the measurements to monitor, see "How to Create and Configure Monitor Profiles" on page 75.
- For details about each monitor's default measurements, refer to the relevant reference section for the monitor.

Reference

Monitor Types

All of the monitors allow you to view a summary of the collected data at the conclusion of the performance test. Using LoadRunner Analysis, you can generate a graph for any of the monitors. For more information, see the *HP LoadRunner Analysis User Guide*.

The online monitors are divided into the following categories:

Monitor Type	Description
Web Resource Monitors	Provide information about the number of Web connections, throughput volume, HTTP responses, server retries, and downloaded pages at the Web servers during performance test run. For more information, see "Web Resource Monitors" on page 421.
Run-Time and Transaction Monitors	Display the transaction rate and response times, and the number and status of Vusers participating in the performance test, as well as the number and types of errors that the Vusers generate. For more information, see "Run-Time and Transaction Monitoring" on page 431.
System Resource Monitors	Measure the Windows, UNIX, Server, SNMP, and SiteScope resources used during a performance test run. For more information, see "System Resource Monitoring" on page 437.
Network Delay Monitors	Displays information about the network delays on your system. For more information, see "Network Delay Monitoring" on page 447.

Monitor Type	Description
Web Server Resource Monitors	Measure statistics related to the Microsoft IIS and Apache Web servers during the performance test run. For more information, see "Web Server Resource Monitoring" on page 459.
Web Application Server Resource Monitors	Measure statistics related to the Microsoft ASP application servers during the performance test run. For more information, see "Web Application Server Resource Monitoring" on page 465.
Database Server Resource Monitors	Measure statistics related to the SQL server, and Oracle databases during the performance test run. For more information, see "Database Resource Monitoring" on page 469.
ERP/CRM Server Resource Monitors	Measure statistics related to the SAPGUI and PeopleSoft (Tuxedo) servers during the performance test run. For more information, see "ERP/CRM Server Resource Monitoring" on page 479.
J2EE & .NET Diagnostics Monitors	Provide information to trace, time, and troubleshoot individual transactions through J2EE Web, application, and database servers. For more information, see the *HP Diagnostics User Guide*.
Application Deployment Solutions Monitors	Measures statistics related to the Citrix MetaFrame XP server during a performance run. For more information, see "Application Deployment Solution Monitoring" on page 497.
Middleware Performance Monitors	Measures statistics related to the Tuxedo server during a performance test run. For more information, see "Middleware Performance Monitoring" on page 489

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Web Resource Monitors

This chapter includes:

Concepts

Reference

Concepts

Web Resource Monitoring Overview

The Web Resource monitor enables you to analyze the following resources on the Web server during a performance test run: throughput, HTTP requests, downloaded pages, server retries, TCP/IP connections, and SSL Connections.

You can view the following resource monitor graphs during a test run:

Hits per Second Graph

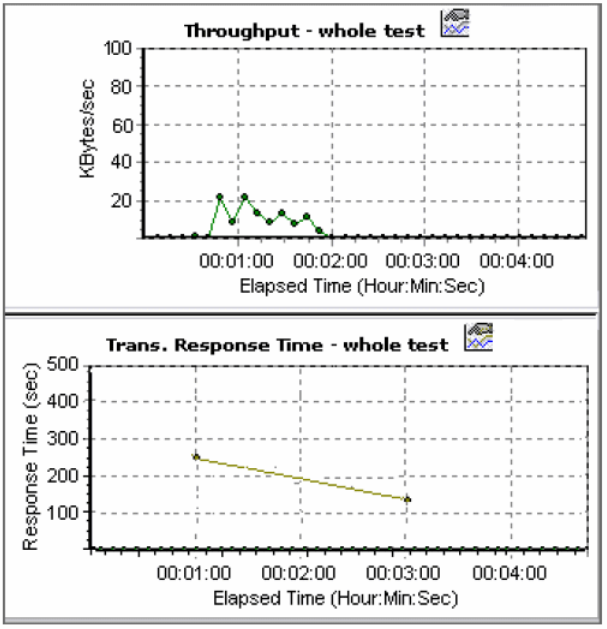
The **Hits Per Second** graph shows the number of hits (HTTP requests) to the Web server (y-axis) as a function of the elapsed time in the performance test (x-axis). This graph can display the whole step, or the last 60, 180, 600, or 3600 seconds. You can compare this graph to the Transaction Response Time graph to see how the number of hits affects transaction performance.

Throughput Graph

The **Throughput** graph shows the amount of throughput (y-axis) on the Web server during each second of the test run (x-axis). Throughput is measured in bytes and represents the amount of data that the Vusers received from the server at any given second. You can compare this graph to the Transaction Response Time graph to see how the throughput affects transaction performance.

In the following example, the Transaction Response time graph is compared with the Throughput graph. It is apparent from the graph that as the throughput decreases, the transaction response time also decreases. The peak throughput occurred at approximately 1 minute into the step. The highest response time also occurred at this time.

Example



HTTP Responses per Second Graph

The **HTTP Responses per Second** graph shows the number of HTTP status codes (y-axis)—which indicate the status of HTTP requests, for example, “the request was successful” or “the page was not found”—returned from the Web server during each second of the performance test run (x-axis).

The HTTP responses are grouped by status code. You can also group the results shown in this graph by script (using the "Group By" function) to locate scripts which generated error codes.

For a list of status codes and their explanations, see "HTTP Status Codes" on page 428.

Pages Downloaded per Second Graph

The **Pages Downloaded per Second** graph shows the number of Web pages (y-axis) downloaded from the server during each second of the test run (x-axis). This graph helps you evaluate the amount of load Vusers generate, in terms of the number of pages downloaded.

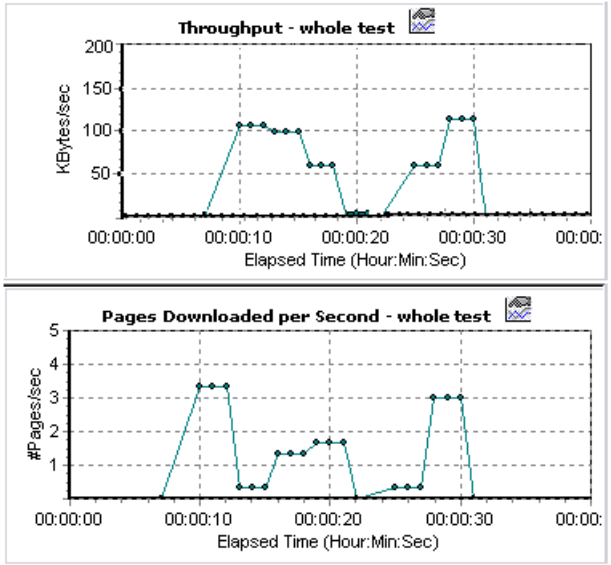
Note: To view the Pages Downloaded per Second graph, you must select **Pages per second (HTML Mode only)** from the script's run-time settings Preferences tab before running your performance test.

Like throughput, downloaded pages per second is a representation of the amount of data that the Vusers received from the server at any given second.

- The Throughput graph takes into account each resource and its size (for example, the size of each **.gif** file, the size of each Web page).
- The Pages Downloaded per Second graph takes into account simply the number of pages.

In the following example, the Throughput graph is compared with the Pages Downloaded per Second graph. It is apparent from the graph that throughput is not proportional to the number of pages downloaded per second. For example, between 15 and 16 seconds into the performance test, the throughput decreased while the number of pages downloaded per second increased.

Example



Retries per Second Graph

The **Retries Per Second** graph shows the number of attempted Web server connections (y-axis) as a function of the elapsed time in the performance test (x-axis).

A server connection is retried when:

- the initial connection was unauthorized
- proxy authentication is required
- the initial connection was closed by the server
- the initial connection to the server could not be made
- the server was initially unable to resolve the load generator's IP address

Connections Graph

The **Connections** graph shows the number of open TCP/IP connections (y-axis) at each point in time of the performance test (x-axis). One HTML page may cause the browser to open several connections, when links on the page go to different Web addresses. Two connections are opened for each Web server.

This graph is useful in indicating when additional connections are needed. For example, if the number of connections reaches a plateau, and the transaction response time increases sharply, adding connections would probably cause a dramatic improvement in performance (reduction in the transaction response time).

Connections per Second Graph

The **Connections Per Second** graph shows the number of new TCP/IP connections (y-axis) opened and the number of connections that are shut down each second of the performance test (x-axis).

This number should be a small fraction of the number of hits per second, because new TCP/IP connections are very expensive in terms of server, router and network resource consumption. Ideally, many HTTP requests should use the same connection, instead of opening a new connection for each request.

SSLs per Second Graph

The SSLs per Second graph shows the number of new and reused SSL Connections (y-axis) opened in each second of the performance test (x-axis). An SSL connection is opened by the browser after a TCP/IP connection has been opened to a secure server.

Because creating a new SSL connection entails heavy resource consumption, you should try to open as few new SSL connections as possible; once you have established an SSL connection, you should reuse it. There should be no more than one new SSL connection per Vuser.

If you set your run-time settings to simulate a new Vuser at each iteration (using the run-time settings **Browser Emulation** node), you should have no more than one new SSL connection per Vuser per iteration. Ideally, you should have very few new TCP/IP and SSL connections each second.

Reference

HTTP Status Codes

The following table displays a list of HTTP status codes. These codes appear in the HTTP Responses per Second Graph:

Code	Description	Code	Description
200	OK	406	Not Acceptable
201	Created	407	Proxy Authentication Required
202	Accepted	408	Request Timeout
203	Non-Authoritative Information	409	Conflict
204	No Content	410	Gone
205	Reset Content	411	Length Required
206	Partial Content	412	Precondition Failed
300	Multiple Choices	413	Request Entity Too Large
301	Moved Permanently	414	Request - URI Too Large
302	Found	415	Unsupported Media Type
303	See Other	416	Requested range not satisfiable
304	Not Modified	417	Expectation Failed
305	Use Proxy	500	Internal Server Error
307	Temporary Redirect	501	Not Implemented
400	Bad Request	502	Bad Gateway
401	Unauthorized	406	Not Acceptable
402	Payment Required	407	Proxy Authentication Required
403	Forbidden	503	Service Unavailable

Code	Description	Code	Description
404	Not Found	504	Gateway Timeout
405	Method Not Allowed	505	HTTP Version not supported

For more information on the above status codes and their descriptions, see http://www.w3.org/Protocols/rfc2616/rfc2616-sec10.html#sec10.

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Run-Time and Transaction Monitoring

This chapter includes:

Concepts

Concepts

Run-Time Graphs Overview

The **Run-Time** monitor provides information about the status of the Vusers participating in the performance test, and the number and types of errors that the Vusers generate. In addition, the Run-Time monitor provides the User-Defined Data Points graph, which displays the real time values for user-defined points in a Vuser script.

The Run-Time monitor is enabled by default—it automatically begins monitoring Vusers at the start of a performance test.

You can view the following Run-Time monitor graphs during a test run:

Running Vusers Graph

The monitor's **Running Vusers** graph provides information about the status of the Vusers running in the current performance test on all load generator machines. The graph shows the number of running Vusers, while the information in the legend indicates the number of Vusers in each state.

Color	Scale	Status	Max	Min	Avg	Std	Last
	1	Running	14	2	7.632653...	3.783389...	14
	1	Error	0	0	0	0	0
	1	Finished	0	0	0	0	0

The Status field of each Vuser displays the current status of the Vuser. The following table describes each Vuser status.

Status	Description
Running	The total number of Vusers currently running on all load generators.
Ready	The number of Vusers that completed the initialization section of the script and are ready to run.
Finished	The number of Vusers that have finished running. This includes both Vusers that passed and failed.
Error	The number of Vusers whose execution generated an error.

User-Defined Data Points Graph

The **User-Defined Data Points** graph displays the real-time values of user-defined data points. You define a data point in your Vuser script by inserting an **lr_user_data_point** function at the appropriate place (**user_data_point** for GUI Vusers and **lr.user_data_point** for Java Vusers).

```
Action1()
{
    lr_think_time(1);
    lr_user_data_point ("data_point_1",1);
    lr_user_data_point ("data_point_2",2);
    return 0;
}
```

For Vuser protocols that support the graphical script representations such as Web and Oracle NCA, you insert a data point as a user-defined step. Data point information is gathered each time the script executes the function or step.

By default, ALM Performance Center displays all of the data points in a single graph. The legend provides information about each data point. If desired, you can hide specific data points using the legend below the graphs.

You can also view data points offline, after the completion of the performance test. For more information, see the *HP LoadRunner Analysis User Guide*.

Error Statistics Graph

The monitor's **Error Statistics** graph provides details about the number of errors that accrue during each second of the test run. The errors are grouped by error source—for example, the location in the script or the load generator name.

Vusers with Errors Graph

The **Vusers with Errors** graph provides details about the number of Vusers that generate errors during test execution. The errors are grouped by error source.

Transaction Monitor Graphs Overview

The Transaction monitor displays the transaction rate and response time during a test run. The Transaction monitor is enabled by default—it automatically begins monitoring Vuser transactions at the start of a test run. To conserve resources, you can disable the Transaction monitor from the Controller.

You can view the following Transaction monitor graphs during a test run:

- The **Transaction Response Time** graph shows the average response time of transactions in seconds (y-axis) as a function of the elapsed time in the performance test (x-axis).
- The **Transactions per Second (Passed)** graph shows the number of successful transactions performed per second (y-axis) as a function of the elapsed time in the performance test (x-axis).
- The **Transactions per Second (Failed, Stopped)** graph shows the number of failed and stopped transactions per second (y-axis) as a function of the elapsed time in the performance test (x-axis).
- The **Total Transactions per Second (Passed)** graph shows the total number of completed, successful transactions per second (y-axis) as a function of the elapsed time in the performance test (x-axis).

Note:

- If there are no transactions defined in your Vuser script or if no transactions are being executed, no data will be displayed in the online monitor graphs.
- To generate Web Page diagnostics for each transaction, configure the Diagnostics options from the Controller.

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System Resource Monitoring

This chapter includes:

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Reference

Concepts

System Resource Monitors Overview

You use ALM Performance Center's System Resource monitors to monitor a machine's system resource usage during a performance test run and isolate server performance bottlenecks.

A primary factor in a transaction's response time is its system resource usage. Using the ALM Performance Center resource monitors, you can monitor the Windows, UNIX, SiteScope Server, and SNMP server on a machine during a test run, and determine why a bottleneck occurred on a particular machine.

The resource monitors are automatically enabled when you execute a test run. However, you must specify the machine you want to monitor and which resources to monitor for each machine. You can also add or remove machines and resources during the test run.

Windows Resource Monitoring

The Windows Resources monitor shows the Windows resources measured during the test run. Windows measurements correspond to the built-in counters available from the Windows Performance Monitor.

If you want to monitor a remote Windows server that does not use Windows domain security, you must authenticate the Controller on the remote Windows server. To authenticate the Controller, create an account, or change the password of the account used to log on to the Controller so that it matches the password and user name used to log on to the remote monitored Windows machine. When the remote Windows machine requests another machine's resources, it sends the logged-in user name and password of the machine requesting the resources.

UNIX Resource Monitoring

The UNIX Resources monitor shows the UNIX resources measured during the test run. This graph helps you determine the impact of Vuser load on the various system resources.

The UNIX kernel statistics measurements include those available by the **rstatd** daemon. For a description of the measurements, see "UNIX Resources Performance Counters" on page 442.

Note: You must configure an **rstatd** daemon on all UNIX machines being monitored. For information, refer to the UNIX *man* pages, or see "How to Set up the UNIX Monitoring Environment" on page 440.

SNMP Resource Monitoring

The SNMP Resource monitor shows statistics for a Windows or UNIX machine using the Simple Network Management Protocol (SNMP). The SNMP Resources monitor is available for monitoring any machine that runs an SNMP agent, using the Simple Network Management Protocol (SNMP).

SiteScope Resource Monitoring

The SiteScope Resources monitor graph shows the SiteScope resources measured during the test run. The SiteScope monitor can measure server, network, and processor performance counters. For detailed information on the performance counters that SiteScope can monitor, refer to the relevant SiteScope documentation.

Before setting up the SiteScope monitor, ensure that SiteScope has been installed on a server. You can install SiteScope on the same machine as the Controller, or on a dedicated server. If SiteScope is installed on a machine other than the Controller, verify that the SiteScope machine is accessible from the Controller machine.

Tasks

How to Set up the UNIX Monitoring Environment

This task describes how to configure the UNIX environment before setting up the UNIX monitor.

This task includes the following steps:

- "Verify whether the rstatd daemon is already configured" on page 440
- "Configure the rstatd daemon" on page 441
- "Configure the monitor for a UNIX machine over a firewall (optional)" on page 441
- "Configure the monitor measurements on the Controller" on page 441

1 Verify whether the rstatd daemon is already configured

The rstatd daemon might already be configured, because when a machine receives an rstatd request, the inetd on that machine automatically activates the rstatd.

- The **rup** command reports various machine statistics, including rstatd configuration. Run the following command on the UNIX machine to view the machine statistics:

  ```
  >rup host
  ```

- You can also use **lr_host_monitor** and see if it returns any relevant statistics.

  If the command returns meaningful statistics, the rstatd daemon is already configured and activated. If not, or if you receive an error message, the rstatd daemon is not configured.

2 Configure the rstatd daemon

If the rstatd daemon is not yet configured, follow these steps to configure it:

a On the UNIX machine, run the command: **su root**

b Go to **/etc/inetd.conf** and look for the rstatd row (it begins with the word rstatd). If it is commented out (with a #), remove the comment directive, and save the file.

c From the command line, run:

```
kill -1 inet_pid
```

where inet_pid is the pid of the inetd process. This instructs the inetd to rescan the **/etc/inetd.conf** file and register all daemons which are uncommented, including the rstatd daemon.

d Run **rup** again.

If the command still does not indicate that the rstatd daemon is configured, contact your system administrator.

3 Configure the monitor for a UNIX machine over a firewall (optional)

To monitor a UNIX machine over a firewall, you must run a UNIX utility called rpcinfo and identify the rstatd's port number.

Run **rpcinfo -p <hostname>**. You will receive a list of all RPC servers registered in the host's portmapper, along with the port number. This list will not change until rstatd is stopped and rerun.

Some firewalls allow you to open an RPC program number instead of a port. In such cases, open program 100001. If are prompted to include a version number, specify versions 3 and 4.

4 Configure the monitor measurements on the Controller

For task details, see "How to Create and Configure Monitor Profiles" on page 75.

For a description of the available UNIX monitor measurements, see "UNIX Resources Performance Counters" on page 442.

Reference

UNIX Resources Performance Counters

The following default measurements are available for the UNIX machine:

Measurement	Description
Average load	Average number of processes simultaneously in Ready state during the last minute
Collision rate	Collisions per second detected on the Ethernet
Context switches rate	Number of switches between processes or threads, per second
CPU utilization	Percent of time that the CPU is utilized
Disk rate	Rate of disk transfers
Incoming packets error rate	Errors per second while receiving Ethernet packets
Incoming packets rate	Incoming Ethernet packets per second
Interrupt rate	Number of device interrupts per second
Outgoing packets errors rate	Errors per second while sending Ethernet packets
Outgoing packets rate	Outgoing Ethernet packets per second
Page-in rate	Number of pages read to physical memory, per second
Page-out rate	Number of pages written to pagefile(s) and removed from physical memory, per second
Paging rate	Number of pages read to physical memory or written to pagefile(s), per second
Swap-in rate	Number of processes being swapped
Swap-out rate	Number of processes being swapped

Measurement	Description
System mode CPU utilization	Percent of time that the CPU is utilized in system mode
User mode CPU utilization	Percent of time CPU is utilized in user mode

Windows Resource Performance Counters

The following default measurements are available for Windows machines:

Object	Measurement	Description
System	**% Total Processor Time**	The average percentage of time that all the processors on the system are busy executing non-idle threads. On a multi-processor system, if all processors are always busy, this is 100%, if all processors are 50% busy this is 50% and if 1/4 of the processors are 100% busy this is 25%. It can be viewed as the fraction of the time spent doing useful work. Each processor is assigned an Idle thread in the Idle process which consumes those unproductive processor cycles not used by any other threads.
System	**File Data Operations/sec**	The rate at which the computer issues read and write operations to file system devices. This does not include File Control Operations.

Object	Measurement	Description
Processor	**% Processor Time (Windows 2000)**	The percentage of time that the processor is executing a non-idle thread. This counter was designed as a primary indicator of processor activity. It is calculated by measuring the time that the processor spends executing the thread of the idle process in each sample interval, and subtracting that value from 100%. (Each processor has an idle thread which consumes cycles when no other threads are ready to run). It can be viewed as the percentage of the sample interval spent doing useful work. This counter displays the average percentage of busy time observed during the sample interval. It is calculated by monitoring the time the service was inactive, and then subtracting that value from 100%.
System	**Processor Queue Length**	The instantaneous length of the processor queue in units of threads. This counter is always 0 unless you are also monitoring a thread counter. All processors use a single queue in which threads wait for processor cycles. This length does not include the threads that are currently executing. A sustained processor queue length greater than two generally indicates processor congestion. This is an instantaneous count, not an average over the time interval.
Memory	**Page Faults/sec**	This is a count of the page faults in the processor. A page fault occurs when a process refers to a virtual memory page that is not in its Working Set in the main memory. A page fault will not cause the page to be fetched from disk if that page is on the standby list (and hence already in main memory), or if it is in use by another process with which the page is shared.

Object	Measurement	Description
PhysicalDisk	**% Disk Time**	The percentage of elapsed time that the selected disk drive is busy servicing read or write requests.
Memory	**Pool Nonpaged Bytes**	The number of bytes in the nonpaged pool, a system memory area where space is acquired by operating system components as they accomplish their appointed tasks. Nonpaged pool pages cannot be paged out to the paging file. They remain in main memory as long as they are allocated.
Memory	**Pages/sec**	The number of pages read from the disk or written to the disk to resolve memory references to pages that were not in memory at the time of the reference. This is the sum of Pages Input/sec and Pages Output/sec. This counter includes paging traffic on behalf of the system cache to access file data for applications. This value also includes the pages to/from non-cached mapped memory files. This is the primary counter to observe if you are concerned about excessive memory pressure (that is, thrashing), and the excessive paging that may result.
System	**Total Interrupts/ sec**	The rate at which the computer is receiving and servicing hardware interrupts. The devices that can generate interrupts are the system timer, the mouse, data communication lines, network interface cards, and other peripheral devices. This counter provides an indication of how busy these devices are on a computer-wide basis. See also Processor:Interrupts/sec.

Object	Measurement	Description
Objects	**Threads**	The number of threads in the computer at the time of data collection. Notice that this is an instantaneous count, not an average over the time interval. A thread is the basic executable entity that can execute instructions in a processor.
Process	**Private Bytes**	The current number of bytes that the process has allocated that cannot be shared with other processes.

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Network Delay Monitoring

This chapter includes:

Concepts

Tasks

Reference

Concepts

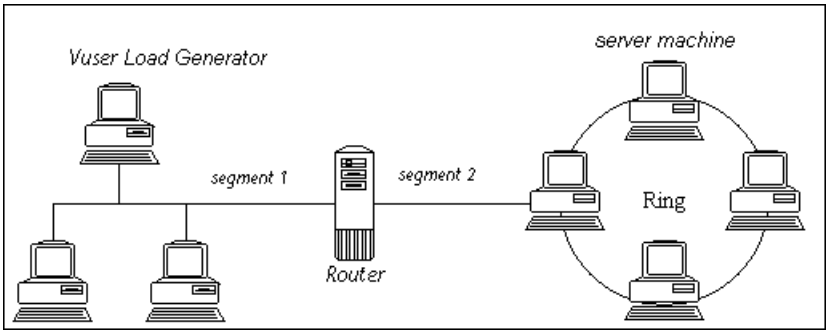
Network Monitoring Overview

Network configuration is a primary factor in the performance of applications. A poorly designed network can slow client activity to unacceptable levels.

You use Network monitoring to determine whether your network is causing a delay in the performance test. You can also determine the problematic network segment.

In a true Web or client/server system, there are many network segments. A single network segment with poor performance can affect the entire system.

The following diagram shows a typical network. To go from the server machine to the Vuser machine, data must travel over several segments.



The Network Delay Time monitor shows the delays for the complete path between the source and destination machines (for example the database server and Vuser host). The graph maps the delay as a function of the elapsed performance test time. Each defined path is represented by a separate line with a different color in the graph.

To measure network performance, the Network monitor sends packets of data across the network. When a packet returns, the monitor calculates the time it takes for the packet to go to the requested node and return. This time is the delay which appears in the Network Delay Time graph.

Note: The delays from the source machine to each of the nodes are measured concurrently, yet independently. It is therefore possible that the delay from the source machine to one of the nodes could be greater than the delay for the complete path between the source and destination machines.

- For information about how to set up the network monitoring environment, see "How to Set Up the Network Monitoring Environment" on page 450.
- For information about how to configure the UNIX source machine for network monitoring see, "How to Configure the UNIX Source Machine for Network Monitoring" on page 452.

Tasks

How to Set Up the Network Monitoring Environment

This task describes how to prepare your environment for network monitoring.

To lean more about network monitoring, see "Network Monitoring Overview" on page 448.

This task includes the following steps:

- "Prerequisites" on page 450
- "Configure the UNIX source machine - optional" on page 450
- "Configure the firewall between the source and destination machines - Optional" on page 451
- "Configure the Network monitor on the Controller" on page 451

1 Prerequisites

To enable network monitoring, you must install the Performance Center agent on the source machine. You do not have to install the Performance Center agent on the destination machine.

To run the Network monitor, you must have administrator privileges on the Windows source machine (unless you are using the ICMP protocol).

2 Configure the UNIX source machine - optional

You can run the Network monitor on UNIX source machines, using UDP or ICMP. Before running the Network monitor from a UNIX source machine, configure the source machine. For task details, see "How to Configure the UNIX Source Machine for Network Monitoring" on page 452.

3 Configure the firewall between the source and destination machines - Optional

If you are monitoring a network in which there are firewalls between the source and the destination machines, you must configure the firewalls to allow the network data packets to reach their destinations.

- If you are using the TCP protocol, the firewall that protects the destination machine should not block outgoing ICMP_TIMEEXCEEDED packets (packets that are sent outside the firewall from the machine). In addition, the firewall protecting the source machine should allow ICMP_TIMEEXCEEDED packets to enter, as well as TCP packets to exit.
- If you are using the ICMP protocol, the destination machine's firewall should not block incoming ICMP_ECHO_REQUEST packets, or outgoing ICMP_ECHO_REPLY and ICMP_ECHO_TIMEEXCEEDED packets. In addition, the firewall protecting the source machine should allow ICMP_ECHO_REPLY and ICMP_ECHO_TIMEEXCEEDED packets to enter, and ICMP_ECHO_REQUEST packets to exit.
- If you are using the UDP protocol, ensure that the UDP protocol can access the destination machine from the source machine. The destination machine's firewall should not block outgoing ICMP_DEST_UNREACHABLE and ICMP_ECHO_TIMEEXCEEDED packets. In addition, the firewall protecting the source machine should allow ICMP_DEST_UNREACHABLE and ICMP_ECHO_TIMEEXCEEDED packets to enter.

Note: To run the Network Delay monitor when there are firewalls between the Controller and the source machine, you must configure the Performance Center agent, MI Listener, and Network Delay monitor for monitoring over a firewall.

---

4 Configure the Network monitor on the Controller

For task details, see "How to Create and Configure Monitor Profiles" on page 75.

How to Configure the UNIX Source Machine for Network Monitoring

This task describes how to configure a UNIX source machine before running the network monitor.

To lean more about network monitoring, see "Network Monitoring Overview" on page 448.

This task includes the following steps:

- "Assign permissions where Performance Center is installed locally" on page 452
- "Assign permissions where Performance Center is installed on the network" on page 453
- "Connect to the Unix Source Machine Through RSH" on page 454
- "Connect to the Unix Source Machine Through the Agent" on page 454

1 Assign permissions where Performance Center is installed locally

Follow these steps to assign root permissions to the **merc_webtrace** process:

a Log in to the source machine as root.

b Type: **cd <performance center_installation>/bin** to change to the **bin** directory.

c Type: **chown root merc_webtrace** to make the root user the owner of the **merc_webtrace** file.

d Type: **chmod +s merc_webtrace** to add the s-bit to the file permissions.

e To verify, type **ls -l merc_webtrace**. The permissions should look like this: **-rwsrwsr-x**.

2 Assign permissions where Performance Center is installed on the network

In a Performance Center network installation, the **merc_webtrace** process is on the network, not on the source machine disk. The following procedure copies the **merc_webtrace** file to the local disk, configures **mdrv.dat** to recognize the process, and assigns root permissions to **merc_webtrace**:

a Copy **merc_webtrace** from <**performance center_installation**>/**bin** to anywhere on the local disk of the source machine. For example, to copy the file to the **/local/**<**performance center**> directory, type: cp /net/tools/performance center_installation/bin/merc_webtrace /local/<performance center>

Note: All of the source machines that use the same network installation must copy **merc_webtrace** to the identical directory path on their local disk (for example, /local/<performance center>), since all of them use the same **mdrv.dat**.

---

b Add the following line to the <**performance center_installation**>/**dat/mdrv.dat** file, in the [monitors_server] section:

ExtCmdLine=-merc_webtrace_path /local/xxx

c Log in to the source machine as root.

d Type: cd performance center_installation/bin to change to the **bin** directory.

e Type: chown root merc_webtrace to make the root user the owner of the **merc_webtrace** file.

f Type: chmod +s merc_webtrace to add the s-bit to the file permissions.

g To verify, type ls -l merc_webtrace. The permissions should look like: -rwsrwsr-x.

3 Connect to the Unix Source Machine Through RSH

Follow these instructions if the Controller is connected to the source machine through RSH (default connection mode). In this case you do not need to activate the agent daemon.

Before running the Network monitor the first time, you enter an encrypted user name and password in the Network monitor configuration file.

a On the Performance Center host machine, type cd <Performance Center installation>/bin to change the bin directory.

b Run **CryptonApp.exe**.

c In the **Password** box, type your RSH user name and password, separated by a vertical bar symbol. For example, myname|mypw.

d Click **Generate**. An encoded string is displayed in the Encoded string field.

e Click **Copy** to copy the encoded string to the clipboard.

f Add the following line to the **<performance center_installation>/dat/monitors/ndm.cfg** file, in the [hosts] section:

Host = <encrypted string copied from clipboard>

g Close and open the current performance test. ALM Performance Center will read the updated configuration file and recognize the source machine for monitoring.

4 Connect to the Unix Source Machine Through the Agent

Follow these instructions for activating agent daemon on the source machine if the Controller is not connected to the source machine through RSH.

a Type m_daemon_setup -install from the **<performance center_installation>/bin** directory.

b Make sure that the agent daemon is running whenever you activate the Network monitor.

c To stop the Network Delay Monitor agent daemon, type m_daemon_setup -remove.

Reference

Network Delay Monitoring User Interface

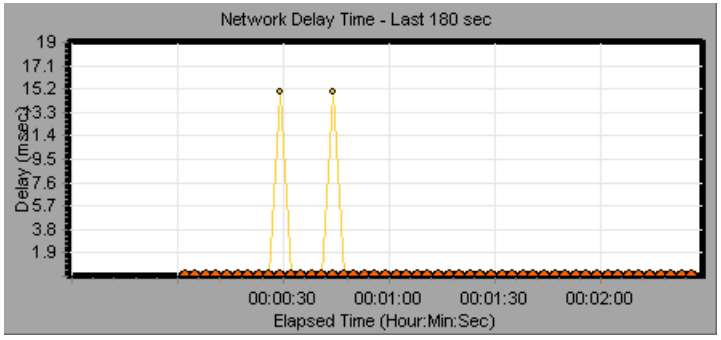
This section includes:

➤ Network Delay Time Graph on page 455

Network Delay Time Graph

The Network Delay Time graph shows the delay for the complete path between the source and destination machines (y-axis) as a function of the elapsed performance test time (x-axis).

Each path defined in the Add Destination Machines for Network Delay Monitoring dialog box is represented by a separate line with a different color in the graph.



Troubleshooting and Limitations

This section describes troubleshooting for the Network Delay monitor.

If monitoring is unsuccessful and ALM Performance Center cannot locate the source or destination machines, make sure that the specified machines are available to your machine. Perform a "ping" operation. At the command line prompt, type:

```
ping server_name
```

To check the entire network path, use the trace route utility to verify that the path is valid.

For Windows, type tracert <server_name>.

For UNIX, type traceroute <server_name>.

If the monitoring problem persists once you verify that the machines are accessible and that the network path is valid, perform the following procedures:

1. If you are using the TCP protocol, run **<performance center root folder>\bin\webtrace.exe** from the source machine to determine whether the problem is related to the Controller, or the WebTrace technology on which the Network Delay monitor is based. If you are using the UDP or ICMP protocols, the problem must be related to the Controller and not WebTrace, since these protocols are not WebTrace technology-based.
2. If you receive results by running **webtrace.exe**, the problem is related to the Controller. Verify that the source machine is not a UNIX machine, and contact the Customer Support Web site with the following information:
   - the Controller log file, **drv_log.txt**, located in the **temp** directory of the Controller machine.

- the **traceroute_server** log file, located on the source machine.
- the debug information located in the **TRS_debug.txt** and **WT_debug.txt** files in the path directory. These files are generated by adding the following line to the [monitors_server] section of the **<performance center root folder>\dat\mdrv.dat** file, and rerunning the Network monitor:

  ExtCmdLine=-traceroute_debug path

3 If you do not receive results by running **webtrace.exe**, the problem is related to the WebTrace technology, on which the Network Delay monitor is based. Perform the following procedures on the source machine:

- Verify that the **packet.sys** file (the Webtrace driver) exists in the **WINNT\system32\drivers** directory.
- Check whether a driver (such as "Cloud" or "Sniffer") is installed on top of the network card driver. If so, remove it and run WebTrace again.
- Verify that there are administrator permissions on the machine.
- Using ipconfig /all, check that only one IP address is assigned to the network card. WebTrace does not know how to handle multiple IP addresses assigned to the same card (IP spoofing).
- Check the number of network cards installed. Run webtrace –devlist to receive a list of the available network cards.
- If there is more than one card on the list, run webtrace -dev <dev_name> <destination>, where <dev_name> is one of the network card names shown in the list. If you discover that WebTrace is binding to the wrong card, you can use webtrace set_device <dev_name> to set a registry key that instructs WebTrace to use a specified card instead of the default one.
- Verify that the network card is of the Ethernet type.
- Contact the Customer Support Web site with the output of webtrace.exe –debug (for example, webtrace.exe –debug www.merc-int.com) and ipconfig /all on the machine.

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Web Server Resource Monitoring

This chapter includes:

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Concepts

Web Server Resource Monitoring Overview

Web Server Resource monitors provide you with information about the resource usage of the Microsoft IIS and Apache Web servers during performance test execution. To obtain this data, you need to activate the online monitor for the server and specify which resources you want to measure before executing the test.

For information about how to configure the monitors on the Controller, see "How to Set Up the Monitoring Environment – Workflow" on page 417.

Tasks

How to Change the Apache Default Server Properties

This task describes how to modify the Apache default server properties that are defined in the monitor configuration file.

1 Open the **apache.cfg** file in the **<performance center root folder>\dat\monitors** directory.

2 Edit the following parameters after the **Delimiter=:** statement:

InfoURL. Server statistics information URL

ServerPort. Server port number

SamplingRate. Rate (milliseconds) at which the monitor will poll the server for the statistics information. If this value is greater than 1000, ALM Performance Center will use it as its sampling rate. Otherwise, it will use the sampling rate defined in the Monitors tab of the Options dialog box.

3 Save and close the file.

Reference

Apache Performance Counters

The following table describes the measurements and server properties that can be monitored on the Apache Web server during the test run:

Measurement	Description
# Busy Servers	The number of servers in the Busy state
# Idle Servers	The number of servers in the Idle state
Apache CPU Usage	The percentage of time the CPU is utilized by the Apache server
Hits/sec	The HTTP request rate
KBytes Sent/sec	The rate at which data bytes are sent from the Web server

Microsoft IIS Performance Counters

The following table describes the measurements and server properties that can be monitored on the Microsoft IIS Web server during the test run:

Object	Measurement	Description
Web Service	**Bytes Sent/sec**	The rate at which the data bytes are sent by the Web service
Web Service	**Bytes Received/ sec**	The rate at which the data bytes are received by the Web service
Web Service	**Get Requests/sec**	The rate at which HTTP requests using the GET method are made. Get requests are generally used for basic file retrievals or image maps, though they can be used with forms.
Web Service	**Post Requests/sec**	The rate at which HTTP requests using the POST method are made. Post requests are generally used for forms or gateway requests.
Web Service	**Maximum Connections**	The maximum number of simultaneous connections established with the Web service
Web Service	**Current Connections**	The current number of connections established with the Web service
Web Service	**Current NonAnonymous Users**	The number of users that currently have a non-anonymous connection using the Web service
Web Service	**Not Found Errors/ sec**	The rate of errors due to requests that could not be satisfied by the server because the requested document could not be found. These are generally reported to the client as an HTTP 404 error code.
Process	**Private Bytes**	The current number of bytes that the process has allocated that cannot be shared with other processes.

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Web Application Server Resource Monitoring

This chapter includes:

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Web Application Server Resource Monitoring Overview

You use ALM Performance Center's Web Application Server Resource monitors to monitor Microsoft Active Server Pages servers during a test run and isolate application server performance bottlenecks.

The Microsoft Active Server Pages (ASP) monitor displays statistics about the resource usage on the ASP server during the test run.

Reference

MS Active Server Pages Performance Counters

The following table describes the default counters that can be monitored:

Measurement	Description
Errors per Second	The number of errors per second.
Requests Wait Time	The number of milliseconds the most recent request was waiting in the queue.
Requests Executing	The number of requests currently executing.
Requests Queued	The number of requests waiting in the queue for service.
Requests Rejected	The total number of requests not executed because there were insufficient resources to process them.
Requests Not Found	The number of requests for files that were not found.
Requests/sec	The number of requests executed per second.
Memory Allocated	The total amount of memory, in bytes, currently allocated by Active Server Pages.
Errors During Script Run-Time	The number of failed requests due to run-time errors.
Sessions Current	The current number of sessions being serviced.
Transactions/sec	The number of transactions started per second.

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Database Resource Monitoring

This chapter includes:

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Concepts

Database Resource Monitoring Overview

ALM Performance Center's Database Server Resource monitors measure database resource usage statistics for Oracle, or SQL Servers during a performance test run. You use these monitors to isolate database server performance bottlenecks.

The Oracle monitor displays information from Oracle V$ tables: Session statistics, V$SESSTAT, system statistics, V$SYSSTAT, and other table counters defined by the user in the custom query.

Before defining the monitoring measurements for the Oracle monitors in the Controller, you must set up the monitoring environment on the database server.

For details about the Oracle monitor configuration, see "How to Set Up the Oracle Monitoring Environment" on page 471.

Tasks

How to Set Up the Oracle Monitoring Environment

This task describes how to set up the monitor environment before monitoring an Oracle database server.

Note: If a problem occurs in setting up the Oracle environment, check the Oracle server to view the error messages.

This task includes the following steps:

1 Prerequisites

- Ensure that the Oracle client libraries are installed on the Controller machine.
- Verify that **%OracleHome%\bin** is included in the path environment variable. If it is not, add it.
- Ensure that the registries are updated for the version of Oracle that you are using and that they have the following key: **HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE**
- Ensure that you the Performance Center Server is installed in a directory whose path does not include any of the following characters: **( ) : ; * \ / " ~ & ? { } $ % | < > + = ^ [ ].**

➤ Verify that the Oracle server you want to monitor is up and running. Note that it is possible to monitor several Oracle database servers concurrently.

Note: Only the 32-bit Oracle client should be installed on the Controller machine running the Oracle monitor. If you have a 16-bit and a 32-bit Oracle client installation on the Controller machine, the 16-bit installation should be uninstalled.

---

2 Configure the Oracle client/server connection

Set the connection parameters so the Oracle client (Controller machine) can communicate with the Oracle server(s) you plan to monitor.

On the Controller machine, set the following configuration parameter either by editing the **tnsnames.ora** file in a text editor, or using the Oracle service configuration tool.

Example:

Start > Programs > Oracle for Windows NT > Oracle Net8 Easy Config

➤ a new service name (TNS name) for the Oracle instance

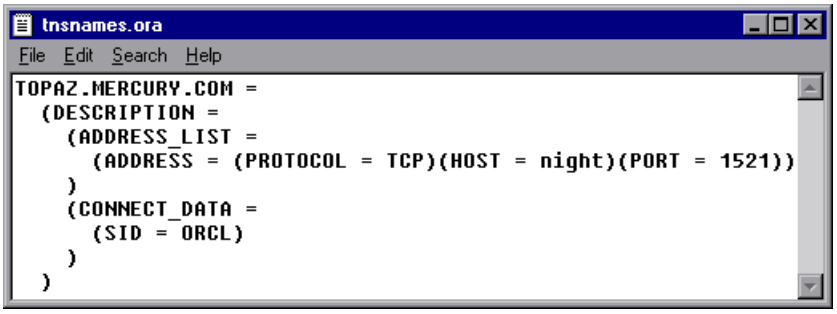
➤ TCP protocol

➤ the host name (name of monitored server machine)

➤ the port number (usually 1521)

➤ the database SID (the default SID is ORCL)

Example:



3 Connect to the monitored server machine and verify the connection

a Obtain a username and password for the service from your database administrator, and ensure that the Controller has database administrator privileges for the Oracle **V$** tables (V$**SESSTAT**, **V$SYSSTAT**, **V$STATNAME**, **V$INSTANCE**, **V$SESSION**).

b Verify connection with the Oracle server by performing **tns ping** from the Controller machine.

Note: There may be a problem connecting if the Oracle server is behind a DMZ/firewall that limits its communication to application servers accessing it.

---

c Run SQL*Plus from the Controller and attempt to log in to the Oracle server(s) with the desired username/password/server combination.

d Type **SELECT * FROM V$SYSSTAT** to verify that you can view the V$SYSSTAT table on the Oracle server. Use similar queries to verify that you can view the V$SESSTAT, V$SESSION, V$INSTANCE, V$STATNAME, and V$PROCESS tables on the server.

4 Modify the monitoring sample rate (optional)

To change the length of each monitoring sample (in seconds), edit the **dat\monitors\vmon.cfg** file in the Performance Center root folder. The default rate is 10 seconds.

The minimum sampling rate for the Oracle Monitor is 10 seconds. If you set the sampling rate at less than 10 seconds, the Oracle Monitor will continue to monitor at 10 second intervals.

5 Configure the Oracle monitor on the Controller

For task details, see "How to Create and Configure Monitor Profiles" on page 75.

Reference

Oracle Performance Counters

The following measurements are most commonly used when monitoring the Oracle server (from the V$SYSSTAT table):

Measurement	Description
CPU used by this session	The amount of CPU time (in 10s of milliseconds) used by a session between the time a user call started and ended. Some user calls can be completed within 10 milliseconds and, as a result, the start and end-user call time can be the same. In this case, 0 milliseconds are added to the statistic. A similar problem can exist in the operating system reporting, especially on systems that suffer from many context switches.
Bytes received via SQL*Net from client	The total number of bytes received from the client over Net8.
Logons current	The total number of current logons
Opens of replaced files	The total number of files that needed to be reopened because they were no longer in the process file cache.
User calls	Oracle allocates resources (Call State Objects) to keep track of relevant user call data structures every time you log in, parse, or execute. When determining activity, the ratio of user calls to RPI calls gives you an indication of how much internal work is generated as a result of the type of requests the user is sending to Oracle.
SQL*Net roundtrips to/ from client	The total number of Net8 messages sent to, and received from, the client.
Bytes sent via SQL*Net to client	The total number of bytes sent to the client from the foreground process(es).

Measurement	Description
Opened cursors current	The total number of current open cursors.
DB block changes	Closely related to consistent changes, this statistic counts the total number of changes that were made to all blocks in the SGA that were part of an update or delete operation. These are changes that generate redo log entries and hence will cause permanent changes to the database if the transaction is committed. This statistic is a rough indication of total database work and indicates (possibly on a per-transaction level) the rate at which buffers are being dirtied.
Total file opens	The total number of file opens being performed by the instance. Each process needs a number of files (control file, log file, database file) to work against the database.

SQL Server Performance Counters

The following table describes the default counters that can be monitored on version 6.5 of the SQL Server:

Measurement	Description
% Total Processor Time	The average percentage of time that all the processors on the system are busy executing non-idle threads. On a multi-processor system, if all processors are always busy, this is 100%, if all processors are 50% busy this is 50% and if 1/4 of the processors are 100% busy this is 25%. It can be viewed as the fraction of the time spent doing useful work. Each processor is assigned an Idle thread in the Idle process which consumes those unproductive processor cycles not used by any other threads.
% Processor Time	The percentage of time that the processor is executing a non-idle thread. This counter was designed as a primary indicator of processor activity. It is calculated by measuring the time that the processor spends executing the thread of the idle process in each sample interval, and subtracting that value from 100%. (Each processor has an idle thread which consumes cycles when no other threads are ready to run). It can be viewed as the percentage of the sample interval spent doing useful work. This counter displays the average percentage of busy time observed during the sample interval. It is calculated by monitoring the time the service was inactive, and then subtracting that value from 100%.
Cache Hit Ratio	The percentage of time that a requested data page was found in the data cache (instead of being read from disk).
I/O - Batch Writes/ sec	The number of 2K pages written to disk per second, using Batch I/O. The checkpoint thread is the primary user of Batch I/O.
I/O - Lazy Writes/sec	The number of 2K pages flushed to disk per second by the Lazy Writer.
I/O - Outstanding Reads	The number of physical reads pending.

Measurement	Description
I/O - Outstanding Writes	The number of physical writes pending.
I/O - Page Reads/sec	The number of physical page reads per second.
I/O - Transactions/ sec	The number of Transact-SQL command batches executed per second.
User Connections	The number of open user connections.

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ERP/CRM Server Resource Monitoring

This chapter includes:

Concepts

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Reference

Concepts

ERP/CRM Server Resource Monitoring Overview

You use ALM Performance Center's ERP/CRM server resource monitors to monitor ERP/CRM servers during a performance test run and isolate server performance bottlenecks.

- The PeopleSoft (Tuxedo) monitor displays statistics about the resource usage of a PeopleSoft (Tuxedo) server during the test run.
- The SAPGUI monitor displays statistics about the resource usage of an SAP R/3 system during the test run. You can use the SAPGUI monitor to view:
  - the number of configured instances for each SAP system
  - data for all application instances (not just the one you logged on to)
  - transactions used and the users that call them
  - number of users working on the different instances
  - performance history for recent periods of all instances
  - response time distribution
  - resource consumption for any application server
  - application server workload for the current day or for a recent period

Tasks

How to Set Up the PeopleSoft (Tuxedo) Resource Monitor

This task describes the working order for setting up the monitoring environment. If Tuxedo 7.1 or later is installed, you can monitor more than one PeopleSoft (Tuxedo) application server at a time. If Tuxedo 6.5 or earlier is installed, you can monitor only one PeopleSoft (Tuxedo) application server at a time.

This task includes the following steps:

- "Prerequisites" on page 481
- "Define the environment variables on the Controller machine" on page 482
- "Check the Workstation Listener (WSL) Process" on page 482
- "Configure the PeopleSoft (Tuxedo) monitor on the Controller" on page 482

1 Prerequisites

Ensure that a Tuxedo workstation client (not a native client), version 6.3 or later, is installed on the Controller machine.

Use a Tuxedo 6.x client if a Tuxedo 6.x server is used, and Tuxedo 7.1 or later client if a Tuxedo 7.1 or later server is used.

If you use a Tuxedo 6.5 or earlier server, you can still use a Tuxedo 7.1 or later client in order to monitor it, provided that you set the **WSINTOPPRE71** environment variable to **yes**.

Note: A Tuxedo workstation client communicates with the application server over the network, and is not required to run the Tuxedo application server on the same machine. A native client can only communicate with the Tuxedo application server if it is part of the relevant Tuxedo domain.

---

2 Define the environment variables on the Controller machine

a Set the **TUXDIR** variable to the Tuxedo installation directory (for example, **V:\environ\32\Tuxedo 8.0**).

b Add the Tuxedo **bin** directory to the **PATH** variable.

3 Check the Workstation Listener (WSL) Process

Ensure that the workstation listener (WSL) process is running. This enables the application server to accept requests from workstation clients.

The address and port number used to connect to the application server must match those dedicated to the WSL process.

Note: For information on configuring the WSL, refer to the BEA Tuxedo Web site.

---

4 Configure the PeopleSoft (Tuxedo) monitor on the Controller

For task details, see "How to Create and Configure Monitor Profiles" on page 75.

How to Set Up the SAPGUI Server Resource Monitor

This task describes the working order for setting up the monitoring environment.

Note: The SAPGUI monitor supports SAP server versions 3.1 to 4.6, regardless of the SAP R/3 server's operating system and the platform on which it is installed.

This task includes the following steps:

- "Prerequisites" on page 481
- "Enable the last minute load from the client" on page 484
- "Configure the SAPGUI Server Resource monitor on the Controller" on page 484

1 Prerequisites

Note: Once the SAPGUI monitor is activated on the Controller machine, you cannot record a SAPGUI protocol script on that machine.

- Install the SAPGUI for Windows 6.20 client on the Controller machine.
- Install the latest patch for the SAPGUI for Windows 6.20 client. The lowest supported level is patch 36. (SAPGUI patches can be downloaded from https://websmp104.sap-ag.de/patches. You will need a valid Service Marketplace username and password to access this site.)

2 Enable the last minute load from the client

From the SAPGUI client application, click **F6** to determine whether you can access the st03 transaction and query for **last minute load** information.

If this functionality is not already enabled, enable it from the SAP R/3 client on the Controller machine, using the username and password defined in the Controller.

3 Configure the SAPGUI Server Resource monitor on the Controller

For task details, see "How to Create and Configure Monitor Profiles" on page 75.

Reference

PeopleSoft (Tuxedo) Performance Counters

The following table describes the default counters that can be measured. It is recommended to pay particular attention to the following measurements: % Busy Clients, Active Clients, Busy Clients, Idle Clients, and all the queue counters for the APPQ/PSAPPSRV queue.

Monitor	Measurements
Machine	**% Busy Clients** - The percent of active clients currently logged in to the Tuxedo application server that are waiting for a response from the application server.
	Active Clients - The total number of active clients currently logged in to the Tuxedo application server.
	Busy Clients - The total number of active clients currently logged in to the Tuxedo application server that are waiting for a response from the application server.
	Current Accessers - The number of clients and servers currently accessing the application either directly on this machine or through a workstation handler on this machine.
	Current Transactions - The number of in use transaction table entries on this machine.
	Idle Clients - The total number of active clients currently logged in to the Tuxedo application server that are not waiting for a response from the application server.
	Workload Completed/second - The total workload on all the servers for the machine that was completed, per unit time.
	Workload Initiated/second - The total workload on all the servers for the machine that was initiated, per unit time.
Queue	**% Busy Servers** - The percent of active servers currently handling Tuxedo requests.

Monitor	Measurements
	Active Servers - The total number of active servers either handling or waiting to handle Tuxedo requests.
	Busy Servers - The total number of active servers currently busy handling Tuxedo requests.
	Idle Servers - The total number of active servers currently waiting to handle Tuxedo requests.
	Number Queued - The total number of messages which have been placed on the queue.
Server	**Requests/second** - The number of server requests handled per second.
	Workload/second -The workload is a weighted measure of the server requests. Some requests could have a different weight than others. By default, the workload is always 50 times the number of requests.
Workstation Handler (WSH)	**Bytes Received/sec** - The total number of bytes received by the workstation handler, per second.
	Bytes Sent/sec - The total number of bytes sent back to the clients by the workstation handler, per second.
	Messages Received/sec - The number of messages received by the workstation handler, per second.
	Messages Sent/sec - The number of messages sent back to the clients by the workstation handler, per second.
	Number of Queue Blocks/sec - The number of times the queue for the workstation handler blocked, per second. This gives an idea of how often the workstation handler was overloaded.

SAPGUI Performance Counters

The following table lists the most commonly monitored counters:

Measurement	Description
Average CPU time	The average CPU time used in the work process.
Average response time	The average response time, measured from the time a dialog sends a request to the dispatcher work process, through the processing of the dialog, until the dialog is completed and the data is passed to the presentation layer. The response time between the SAP GUI and the dispatcher is not included in this value.
Average wait time	The average amount of time that an unprocessed dialog step waits in the dispatcher queue for a free work process. Under normal conditions, the dispatcher work process should pass a dialog step to the application process immediately after receiving the request from the dialog step. Under these conditions, the average wait time would be a few milliseconds. A heavy load on the application server or on the entire system causes queues at the dispatcher queue.
Average load time	The time needed to load and generate objects, such as ABAP source code and screen information, from the database.
Database calls	The number of parsed requests sent to the database.
Database requests	The number of logical ABAP requests for data in the database. These requests are passed through the R/3 database interface and parsed into individual database calls. The proportion of database calls to database requests is important. If access to information in a table is buffered in the SAP buffers, database calls to the database server are not required. Therefore, the ratio of calls/requests gives an overall indication of the efficiency of table buffering. A good ratio would be 1:10.

Measurement	Description
Roll ins	The number of rolled-in user contexts.
Roll outs	The number of rolled-out user contexts.
Roll in time	The processing time for roll ins.
Roll out time	The processing time for roll outs.
Roll wait time	The queue time in the roll area. When synchronous RFCs are called, the work process executes a roll out and may have to wait for the end of the RFC in the roll area, even if the dialog step is not yet completed. In the roll area, RFC server programs can also wait for other RFCs sent to them.
Average time per logical DB call	The average response time for all commands sent to the database system (in milliseconds). The time depends on the CPU capacity of the database server, the network, the buffering, and on the input/output capabilities of the database server. Access times for buffered tables are many magnitudes faster and are not considered in the measurement.

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Middleware Performance Monitoring

This chapter includes:

Concepts

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Middleware Performance Monitoring Overview

A primary factor in a transaction's response time is the Middleware performance usage. ALM Performance Center's Middleware Performance monitors provide you with information about the Middleware performance usage of the Tuxedo server during performance test execution. To obtain performance data, you need to activate the online monitor for the server and specify which resources you want to measure before executing the performance test.

The Tuxedo monitor allows you to measure and view your Tuxedo server performance. It provides information about the host machine, workstation handler, and queue in a Tuxedo system. To run the Tuxedo monitor, you must install the Tuxedo client libraries on the machine you want to monitor.

Tasks

How to Set Up the Tuxedo Monitoring Environment

This task describes the working order for setting up the monitoring environment.

Note: If Tuxedo 7.1 or higher is installed on the Controller machine, more than one Tuxedo application server can be monitored at a time. However, if Tuxedo 6.5 or below is installed on the Controller machine, only one Tuxedo application server can be monitored at a time.

This task includes the following steps:

- "Prerequisites" on page 491
- "Define the Tuxedo Environment Variables" on page 492
- "Check the Workstation Listener (WSL) Process" on page 492
- "Configure the Tuxedo monitor on the Controller" on page 492

1 Prerequisites

Ensure that a Tuxedo workstation client (not a native client) is installed on the Controller machine. Use a Tuxedo 6.x client if a Tuxedo 6.x server is used, and Tuxedo 7.1 or above client if a Tuxedo 7.1 or above server is used.

If you use a Tuxedo 6.5 or earlier server, you can still use a Tuxedo 7.1 or later client to monitor it, provided that you set the WSINTOPPRE71 environment variable to “yes”.

Note: A Tuxedo workstation client communicates with the application server over the network, and is not required to run the Tuxedo application server on the same machine. A native client can only communicate with the Tuxedo application server if it is part of the relevant Tuxedo domain.

---

2 Define the Tuxedo Environment Variables

Define the Tuxedo environment variables on the Controller machine—set the TUXDIR variable to the Tuxedo installation directory (for example, V:\environ\32\Tuxedo8.0), and add the Tuxedo **bin** directory to the PATH variable.

3 Check the Workstation Listener (WSL) Process

Ensure that the workstation listener (WSL) process is running. This enables the application server to accept requests from workstation clients.

The address and port number used to connect to the application server must match those dedicated to the WSL process.

Note: For information on configuring the WSL, refer to the BEA Tuxedo Web site (http://edocs.beasys.com/tuxedo/tux81/rf5/rf5101.htm#1534543).

---

4 Configure the Tuxedo monitor on the Controller

For task details, see "How to Create and Configure Monitor Profiles" on page 75.

Reference

Tuxedo Performance Counters

The following table lists the available Tuxedo monitor measurements. It is recommended to pay particular attention to the following measurements: % Busy Clients, Active Clients, Busy Clients, Idle Clients, and all the queue counters for relevant queues:

Monitor	Measurements
Machine	**% Busy Clients** - The percent of active clients currently logged in to the Tuxedo application server that are waiting for a response from the application server.
	Active Clients - The total number of active clients currently logged in to the Tuxedo application server.
	Busy Clients - The total number of active clients currently logged in to the Tuxedo application server that are waiting for a response from the application server.
	Current Accessers - The number of clients and servers currently accessing the application either directly on this machine or through a workstation handler on this machine.
	Current Transactions - The number of in-use transaction table entries on this machine.
	Idle Clients - The total number of active clients currently logged in to the Tuxedo application server that are not waiting for a response from the application server.
	Workload Completed/second - The total workload on all the servers for the machine that was completed, per unit time.
	Workload Initiated/second - The total workload on all the servers for the machine that was initiated, per unit time.

Monitor	Measurements
Queue	**% Busy Servers** - The percent of active servers currently handling Tuxedo requests.
	Active Servers - The total number of active servers either handling or waiting to handle Tuxedo requests.
	Busy Servers - The total number of active servers currently busy handling Tuxedo requests.
	Idle Servers - The total number of active servers currently waiting to handle Tuxedo requests.
	Number Queued - The total number of messages which have been placed on the queue.
Server	**Requests/second** -The number of server requests handled per second
	Workload/second - Workload is a weighted measure of the server requests. Some requests could have a different weight than others. By default, the workload is always 50 times the number of requests.
Workstation Handler (WSH)	**Bytes Received/sec** - The total number of bytes received by the workstation handler, per second.
	Bytes Sent/sec - The total number of bytes sent back to the clients by the workstation handler, per second.
	Messages Received/sec - The number of messages received by the workstation handler, per second.
	Messages Sent/sec - The number of messages sent back to the clients by the workstation handler, per second.
	Number of Queue Blocks/sec - The number of times the queue for the workstation handler blocked, per second. This gives an idea of how often the workstation handler was overloaded.

Tuxedo tpinit.ini File

The **tpinit.ini** file is saved in the recorded script's directory. It contains information for connecting the Tuxedo monitor to the server. The client logon information is located in the Logon section of the **tpinit.ini** file.

In the following example of a **tpinit.ini** file, the Tuxedo monitor was configured for a server named psft1 using port 7000, and a client named bankapp. The logon user name was PS and the password was PS.

```
[Logon]
LogonServername=//psft1:7000
LogonUsrName=PS
LogonCltName=bankapp
LogonGrpName=
LogonPasswd=PS
LogonData=
```

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Application Deployment Solution Monitoring

This chapter includes:

Concepts

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Concepts

Application Deployment Solution Monitoring Overview

Using ALM Performance Center's Application Deployment Solution monitor, you can isolate server performance bottlenecks by monitoring the Citrix server during a performance test run.

ALM Performance Center's Citrix monitor provides you with information about the application deployment usage of the Citrix server during performance test execution. The Citrix monitor allows you to monitor the server performance statistics from Citrix servers. You can monitor multiple parameters (counters) with a single monitor instance. This allows you to watch server loading for performance, availability, and capacity planning.

To obtain performance data, you need to activate the online monitor for the server and specify which resources you want to measure before executing the performance test.

For information about how to set up the Citrix monitoring environment, see "How to Set up the Citrix Monitoring Environment" on page 499.

Tasks

How to Set up the Citrix Monitoring Environment

This task describes the working order for setting up the monitoring environment.

To learn more about application deployment solution monitoring, see "Application Deployment Solution Monitoring Overview" on page 498.

This task includes the following steps:

1 Prerequisites

- Make sure that Citrix Server has been installed and is running.
- If Citrix Server machine is running Windows 2000, make sure that the server machine is also running the Remote Registry service.
- Measurements that monitor instances are valid for the currently running Citrix session only. If you run this test again, you will need to reconfigure the measurements that are instance-oriented.

  To monitor the different instances, ensure that the server login and logout procedures are recorded in the **Vuser_init** and **Vuser_end** sections respectively, and not in the Action section of the script. For more information, see the *HP Virtual User Generator User Guide*.

2 Map the Network Drive

From the Controller machine, map a network drive to the Citrix server machine. This ensures that the required authentication is provided to the Controller to access the resource counters.

3 Launch PerfMon

Launch PerfMon from the Controller machine to enable the counters on the Citrix server. This allows you to monitor the same counters for the ICA Session object on the Citrix monitor.

4 Open the Connection with the Citrix Server

You can configure the Citrix monitor to view ICA Session object counters only if at least one session is being run on the Citrix server. If no “real” user has opened a connection with the Citrix server, you need to first initialize or run a Citrix Vuser against the server, and only then configure the Citrix Monitor and add the ICA Session counters. If you configure the Citrix monitor without first initializing or running a Citrix Vuser (or connecting to the Citrix server as a “real” user), you will not be able to view the ICA Session object.

5 Configure the Citrix monitor on the Controller

For task details, see "How to Create and Configure Monitor Profiles" on page 75.

Reference

Citrix MetaFrame Performance Counters

The following sections describe some of the counters that can be measured.

➤ "Non-Virtual Counters" on page 501

➤ "Virtual Channel Counters" on page 505

Non-Virtual Counters

The following table describes non-virtual counters:

Measurement	Description
% Disk Time	The percentage of elapsed time that the selected disk drive services read or write requests.
% Processor Time	The percentage of time that the processor executes a non-Idle thread. This counter is a primary indicator of processor activity. It is calculated by measuring the time that the processor spends executing the thread of the Idle process in each sample interval, and subtracting that value from 100%. (Each processor has an Idle thread which consumes cycles when no other threads are ready to run.) It can be viewed as the percentage of the sample interval spent doing useful work. This counter displays the average percentage of busy time observed during the sample interval. It is calculated by monitoring the time the service was inactive, and then subtracting that value from 100%.
File data Operations/sec	The rate that the computer issues Read and Write operations to file system devices. This does not include File Control Operations.

Measurement	Description
Interrupts/sec	The average number of hardware interrupts the processor receives and services per second. It does not include DPCs, which are counted separately. This value is an indirect indicator of the activity of devices that generate interrupts, such as the system clock, the mouse, disk drivers, data communication lines, network interface cards and other peripheral devices. These devices normally interrupt the processor when they have completed a task or require attention. Normal thread execution is suspended during interrupts. Most system clocks interrupt the processor every 10 milliseconds, creating a background of interrupt activity. This counter displays the difference between the values observed in the last two samples, divided by the duration of the sample interval.
Output Session Line Speed	This value represents the line speed from server to client for a session in bps.
Input Session Line Speed	This value represents the line speed from client to server for a session in bps.
Page Faults/sec	A count of the Page Faults in the processor. A page fault occurs when a process refers to a virtual memory page that is not in its Working Set in main memory. A Page Fault will not cause the page to be fetched from disk if that page is on the standby list, and hence already in main memory, or if it is in use by another process with whom the page is shared.

Measurement	Description
Pages/sec	The number of pages read from the disk or written to the disk to resolve memory references to pages that were not in memory at the time of the reference. This is the sum of Pages Input/sec and Pages Output/sec. This counter includes paging traffic on behalf of the system Cache to access file data for applications. This value also includes the pages to/from non-cached mapped memory files. This is the primary counter to observe if you are concerned about excessive memory pressure (that is, thrashing), and the excessive paging that may result.
Pool Nonpaged Bytes	The number of bytes in the Nonpaged Pool, a system memory area where space is acquired by operating system components as they accomplish their appointed tasks. Nonpaged Pool pages cannot be paged out to the paging file, but instead remain in main memory as long as they are allocated.
Private Bytes	The current number of bytes this process has allocated that cannot be shared with other processes.
Processor Queue Length	The instantaneous length of the processor queue in units of threads. This counter is always 0 unless you are also monitoring a thread counter. All processors use a single queue in which threads wait for processor cycles. This length does not include the threads that are currently executing. A sustained processor queue length greater than two generally indicates processor congestion. This is an instantaneous count, not an average over the time interval.
Threads	The number of threads in the computer at the time of data collection. Notice that this is an instantaneous count, not an average over the time interval. A thread is the basic executable entity that can execute instructions in a processor.

Measurement	Description
Latency – Session Average	This value represents the average client latency over the life of a session.
Latency – Last Recorded	This value represents the last recorded latency measurement for this session.
Latency – Session Deviation	This value represents the difference between the minimum and maximum measured values for a session.
Input Session Bandwidth	This value represents the bandwidth from client to server traffic for a session in bps.
Input Session Compression	This value represents the compression ratio for client to server traffic for a session.
Output Session Bandwidth	This value represents the bandwidth from server to client traffic for a session in bps.
Output Session Compression	This value represents the compression ratio for server to client traffic for a session.
Output Session Linespeed	This value represents the line speed from server to client for a session in bps.

Virtual Channel Counters

The following table describes virtual channel counters:

Measurement	Description
Input Audio Bandwidth	This value represents the bandwidth from client to server traffic on the audio mapping channel. This is measured in bps.
Input Clipboard Bandwidth	This value represents the bandwidth from client to server traffic on the clipboard mapping channel. This is measured in bps.
Input COM1 Bandwidth	This value represents the bandwidth from client to server traffic on the COM1 channel. This is measured in bps.
Input COM2 Bandwidth	This value represents the bandwidth from client to server traffic on the COM2 channel. This is measured in bps.
Input COM Bandwidth	This value represents the bandwidth from client to server traffic on the COM channel. This is measured in bps.
Input Control Channel Bandwidth	This value represents the bandwidth from client to server traffic on the ICA control channel. This is measured in bps.
Input Drive Bandwidth	This value represents the bandwidth from client to server traffic on the client drive mapping channel. This is measured in bps.
Input Font Data Bandwidth	This value represents the bandwidth from client to server traffic on the local text echo font and keyboard layout channel. This is measured in bps.
Input Licensing Bandwidth	This value represents the bandwidth from server to client traffic on the licensing channel. This is measured in bps.
Input LPT1 Bandwidth	This value represents the bandwidth from client to server traffic on the LPT1 channel. This is measured in bps.

Measurement	Description
Input LPT2 Bandwidth	This value represents the bandwidth from client to server traffic on the LPT2 channel. This is measured in bps.
Input Management Bandwidth	This value represents the bandwidth from client to server traffic on the client management channel. This is measured in bps.
Input PN Bandwidth	This value represents the bandwidth from client to server traffic on the Program Neighborhood channel. This is measured in bps.
Input Printer Bandwidth	This value represents the bandwidth from client to server traffic on the printer spooler channel. This is measured in bps.
Input Seamless Bandwidth	This value represents the bandwidth from client to server traffic on the Seamless channel. This is measured in bps.
Input Text Echo Bandwidth	This value represents the bandwidth from client to server traffic on the local text echo data channel. This is measured in bps.
Input Thinwire Bandwidth	This value represents the bandwidth from client to server traffic on the Thinwire (graphics) channel. This is measured in bps.
Input VideoFrame Bandwidth	This value represents the bandwidth from client to server traffic on the VideoFrame channel. This is measured in bps.
Output Audio Bandwidth	This value represents the bandwidth from server to client traffic on the audio mapping channel. This is measured in bps.
Output Clipboard Bandwidth	This value represents the bandwidth from server to client traffic on he clipboard mapping channel. This is measured in bps.
Output COM1 Bandwidth	This value represents the bandwidth from server to client traffic on the COM1 channel. This is measured in bps.

Measurement	Description
Output COM2 Bandwidth	This value represents the bandwidth from server to client traffic on the COM2 channel. This is measured in bps.
Output COM Bandwidth	This value represents the bandwidth from server to client traffic on the COM channel. This is measured in bps.
Output Control Channel Bandwidth	This value represents the bandwidth from server to client traffic on the ICA control channel. This is measured in bps.
Output Drive Bandwidth	This value represents the bandwidth from server to client traffic on the client drive channel. This is measured in bps.
Output Font Data Bandwidth	This value represents the bandwidth from server to client traffic on the local text echo font and keyboard layout channel. This is measured in bps.
Output Licensing Bandwidth	This value represents the bandwidth from server to client traffic on the licensing channel. This is measured in bps.
Output LPT1 Bandwidth	This value represents the bandwidth from server to client traffic on the LPT1 channel. This is measured in bps.
Output LPT2 Bandwidth	This value represents the bandwidth from server to client traffic on the LPT2 channel. This is measured in bps.
Output Management Bandwidth	This value represents the bandwidth from server to client traffic on the client management channel. This is measured in bps.
Output PN Bandwidth	This value represents the bandwidth from server to client traffic on the Program Neighborhood channel. This is measured in bps.
Output Printer Bandwidth	This value represents the bandwidth from server to client traffic on the printer spooler channel. This is measured in bps.

Measurement	Description
Output Seamless Bandwidth	This value represents the bandwidth from server to client traffic on the Seamless channel. This is measured in bps.
Output Text Echo Bandwidth	This value represents the bandwidth from server to client traffic on the local text echo data channel. This is measured in bps.
Output Thinwire Bandwidth	This value represents the bandwidth from server to client traffic on the Thinwire (graphics) channel. This is measured in bps.
Output VideoFrame Bandwidth	This value represents the bandwidth from server to client traffic on the VideoFrame channel. This is measured in bps.

Part VII

Runtime Settings Configuration

28

Script Runtime Settings

This chapter includes:

Concepts

Tasks

Reference

Concepts

Script Runtime Settings Overview

Before you run a performance test, you can configure the behavior of the Vuser scripts in the test using runtime settings. You can configure general settings and protocol-specific settings.

This section also includes:

➤ "General Runtime Settings Overview" on page 512

➤ "Protocol-Specific Runtime Settings Overview" on page 512

General Runtime Settings Overview

After you record a Vuser script, you can configure its runtime settings. The runtime settings define the way the script runs, such as delay between actions, the number of times to repeat an action, and the level of logging.

Configuring runtime settings allows you to emulate different kinds of user activity. For example, you can emulate a user who responds immediately to the server, or a user who stops and thinks before each response. You can also configure the runtime settings to specify how many times the Vuser should repeat a set of actions. The General runtime settings described in this chapter apply to all types of Vuser scripts.

For task details, see "How to Configure Runtime Settings" on page 513.

Protocol-Specific Runtime Settings Overview

Before replaying a Vuser script, you can configure its runtime settings. The runtime settings define the way the script runs, using settings that are specific for your particular environment.

Since runtime settings are protocol-specific, you will notice that not all runtime settings are available.

For task details, see "How to Configure Runtime Settings" on page 513.

Tasks

How to Configure Runtime Settings

This task describes how to open and configure runtime settings to define the way a script runs.

To learn more about runtime settings, see "Script Runtime Settings Overview" on page 512

To configure the runtime settings in a Vuser script:

1. On the ALM sidebar, under **Testing**, select **Test Plan**.
2. Right-click a performance test in the test plan tree and select **Edit Test**.
3. In the Workload tab, select a Vuser group and click **Edit Runtime Settings**  . The Edit Runtime Settings dialog box opens.
4. Select the runtime settings type to edit and define the required information. For user interface details, see Edit Runtime Settings Dialog Box on page 606.

   For a list of runtime settings types that relate to specific protocols, see "Protocol Specific Runtime Settings Types" on page 514.
5. Click **OK** to save the settings and close the dialog box.

Reference

Protocol Specific Runtime Settings Types

The following list shows the protocol-specific runtime settings.

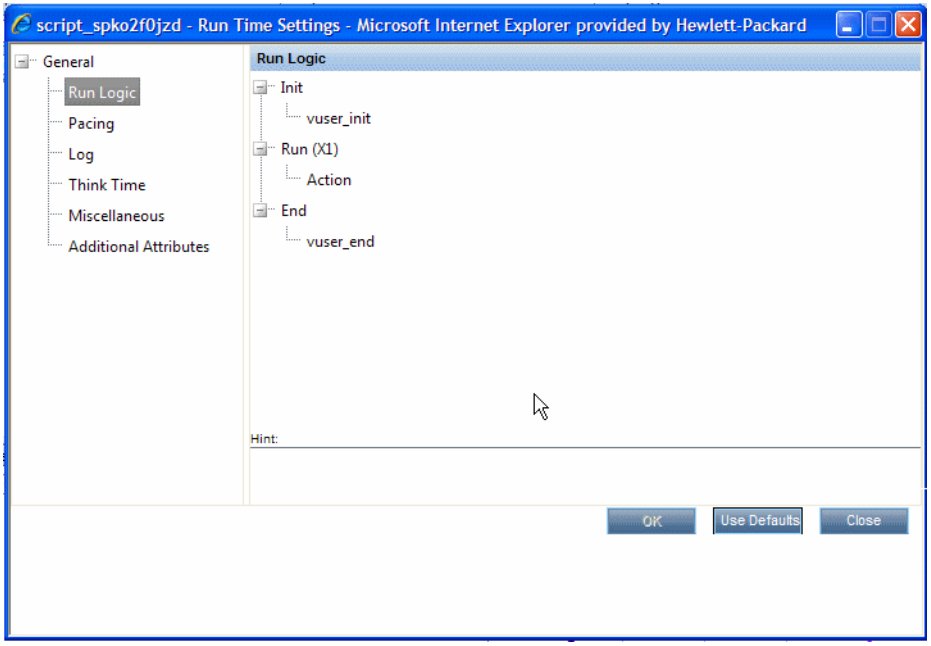
Protocol(s)/Category	Runtime Setting
Web Services / JMS	Advanced
Internet Protocols / Browser	Browser Emulation
Java / Java Environment Settings	Classpath Options
Oracle NCA / Oracle NCA	Client Emulation
Citrix ICA / Citrix	Configuration
Internet Protocols / Internet Protocol	Download Filter
WAP, MMS / WAP	Gateway
SAPGUI / SAPGUI	SAPGUI
Java / Java Environment Settings	Java VM
Microsoft .NET / .NET	.NET Environment
Internet Protocols / Internet Protocol	Preferences
Internet Protocols / Internet Protocol	Proxy
WAP, MMS / WAP	Radius
Terminal Emulation / RTE	RTE
MMS (Multimedia Messaging Service)	Server and Protocol
Internet Protocols, NCA / Network	Speed Simulation
Citrix ICA / Citrix	Timing

Runtime Settings User Interface

This section includes:

Edit Runtime Settings Dialog Box

This dialog box enables you to modify runtime settings in the scripts in the test.



To access	**1** On the ALM sidebar, under **Testing**, select **Test Plan**. **2** Right-click a performance test in the test plan tree and select **Edit Test**. **3** In the Workload tab, select a Vuser group and click **Edit Runtime Settings** .
Important information	If you do not edit the runtime settings, the script runs using the default runtime settings, or the last saved runtime settings if the script was recorded in VuGen.
Relevant tasks	"How to Configure Runtime Settings" on page 513
See also	➤ "Script Runtime Settings Overview" on page 512 ➤ *HP Virtual User Generator User Guide*

Edit Run Logic Settings

Every Vuser script contains three sections: **Init, Run,** and **End**. You can instruct a Vuser to repeat the **Run** section a specific number of times when you run the script. Each repetition is known as an **iteration**.

The **Init** and **End** sections of a Vuser script are not repeated when you run multiple iterations.

Within the **Run** section, you can organize your steps into separate actions. You do this when creating the script.

The Run Logic settings let you organize the actions and their sequence. You can also organize blocks that perform one or more actions.

Edit Pacing Settings

The Pacing runtime settings let you control the number of iterations and the time between them.

User interface elements are described below:

UI Elements	Description
Iteration Count	Specifies the number of times to repeat the script's **Run** section.
As soon as the previous iteration ends	The new iteration begins as soon as possible after the previous iteration ends.
After the previous iteration ends with a fixed delay of	Starts each new iteration at a fixed delay after the end of the previous iteration.

UI Elements	Description
After the previous iteration ends with a random delay of	Starts each new iteration at a random delay from the end of the previous iteration. You specify a range for the delay. When you run the script, the Execution Log shows the actual time the Vuser waited between the end of one iteration and the start of the next one.
At fixed or random intervals, every … [to …] seconds	You specify the time between iterations—either a fixed number of seconds or a range of seconds from the beginning of the previous iteration. For example, you can specify to begin a new iteration every 30 seconds, or at a random rate ranging from 30 to 45 seconds from the beginning of the previous iteration. Each scheduled iterations begins only when the previous iteration is complete. When you run the script, the Execution Log shows the time the Vuser waited between the end of one iteration and the start of the next one. The Execution Log also indicates if the delay could not be achieved, for example where it took the iteration eight seconds and the delay was seven seconds.

Log Settings

During execution, Vusers log information about themselves and their communication with the server. The log information is useful for debugging purposes.

The Log runtime settings let you disable logging or determine how much information is logged to the output—a **Standard** or **Extended** log.

User interface elements are described below:

UI Elements	Description
Disable logging	Disabling the log is useful when working with many Vusers. If you have tens or hundreds of Vusers logging their runtime information to disk, the system may work slower than normal. During development, enable logging so that you will have information about the replay. You should only disable logging after verifying that the script is functional. If you disable logging, it only affects automatic logging. Messages sent manually using message functions such as **lr_output_message**, are still issued.
Standard log	Creates a standard log of functions and messages sent during script execution to use for debugging. Disable this option for large performance testing scenarios or profiles. If the logging level is set to **Standard**, the logging mode is automatically set to **JIT logging** when adding it to the Controller host. If, however, the logging mode was disabled or set to **Extended**, then running it from a Controller host will not affect its logging settings.

UI Elements	Description
Extended log	Creates an extended log, including warnings and other messages. Disable this option for large performance tests. You can specify which additional information to add to the extended log using the Extended log options: ➤ **Parameter substitution.** Logs all parameters assigned to the script with their values. ➤ **Data returned by server.** Logs all data returned by the server. ➤ **Advanced trace.** Logs all of the functions and messages sent by the Vuser during the session. This option is useful when you debug a Vuser script.
Log Options	The Log runtime settings let you indicate when to send log messages to the log: **Send messages only when an error occurs** or **Always send messages**. During development, you can always send messages. Once you verify that your script is functional, you can enable logging for errors only. If you choose to send messages only when errors occur, also known as JIT, (Just in Time) messaging, you can set an advanced option, indicating the size of the log cache. The **Advanced** options for the Log runtime settings let you indicate the size of the log cache. The log cache stores raw data about the test execution, to make it available should an error occur. When the contents of the cache exceed the specified size, it deletes the oldest items. The default size is 1KB. When an error occurs (either an internal error or a programmed error using **lr_error_message**), VuGen places the contents of the cache into the log file and Execution Log tab. This allows you to see the events that led up to the error. The actual file size will be greater than the cache size. For example, if your cache size is 1KB, the log file size may be 50 KB. This is normal and only reflects the overhead required for formatting the raw data into readable text.

Think Time Settings

Vuser **think time** emulates the time that a real user waits between actions. For example, when a user receives data from a server, they may wait several seconds to review the data before responding. Vuser scripts use **lr_think_time** functions to emulate the think time delays.

The following recorded function indicates that the user waited eight seconds before performing the next action:

```
lr_think_time(8);
```

By default, when you run a Vuser script, the Vuser uses the think time values that were recorded into the script during the recording session. VuGen allows you to use the recorded think time, ignore it, limit it, or use a value related to the recorded time.

User interface elements are described below:

UI Elements	Description
Ignore think time	Replays the script ignoring all **lr_think_time** functions.
Replay the think time as recorded	Uses the value recorded. It is the argument that appears in the **lr_think_time** function. For example, lr_think_time(10) waits 10 seconds.
Multiply recorded value by	Uses a multiple of the recorded think time. This can increase or decrease the think time applied during playback. For example, if a think time of four seconds was recorded, you can instruct your Vuser to multiply that value by two, for a total of eight seconds. To reduce the think time to two seconds, multiply the recorded time by 0.5.

UI Elements	Description
Use random percentage of the recorded think time	Uses a random percentage of the recorded think time. You set a range for the think time value by specifying a range for the think time. For example, if the think time argument is 4, and you specify a minimum of 50% and a maximum of 150%, the lowest think time can be two (50%) and the highest value six (150%)
Limit think time to	Limits the think time's maximum value. You can use this option in conjunction with the other options.

Miscellaneous Settings

User interface elements are described below:

UI Elements	Description
Error Handling	Contains the following options: ➤ **Continue on Error.** Instructs Vusers to continue script execution when an error occurs. This option is turned off by default, indicating that the Vuser will exit if an error occurs. ➤ **Fail open transactions on lr_error_message.** Marks all transactions in which an **lr_error_message** function was issued, as **Failed**. The **lr_error_message** function is issued through a programmed **If** statement, when a certain condition is met. ➤ **Generate Snapshot on Error.** Generates a snapshot when an error occurs. You can see the snapshot by viewing the Vuser Log and double-clicking the line at which the error occurred. **Note:** It is not recommended to enable both the **Continue on Error** and **Generate Snapshot on Error** options in a performance test environment. This configuration may adversely affect the Vusers' performance.

UI Elements	Description
Multithreading	Vusers support multithread environments. The primary advantage of a multithread environment is the ability to run more Vusers per load generator. Only threadsafe protocols should be run as threads. The following multithreading options are available: ➤ **Run Vuser as a thread**. Enables multithreading. **Note:** The following protocols are not threadsafe: Sybase-Ctlib, Sybase-Dblib, Informix, Tuxedo, and PeopleSoft-Tuxedo. ➤ **Run Vuser as a process**. Disables multithreading and runs each Vuser as a separate process. **Note:** The Controller host uses a driver program (such as **mdrv.exe** or **r3vuser.exe**) to run your Vusers. If you run each Vuser as a process, then the same driver program is launched (and loaded) into the memory again and again for every instance of the Vuser. Loading the same driver program into memory uses up large amounts of RAM (random access memory) and other system resources. This limits the numbers of Vusers that can be run on any load generator.
Automatic Transactions	Instructs the Controller host to handle every step or action in a Vuser script as a transaction. The Controller assigns the step or action name as the name of the transaction. The following options are available: ➤ **Define each action as a transaction.** Disables automatic transactions per action. **Default:** Enabled. ➤ **Define each step as a transaction.** Enables automatic transactions per step. **Default:** Disabled. **Note:** If you disable automatic transactions, you can still insert transactions manually during and after recording.

Additional Attributes

You can use the additional attributes node to provide additional arguments to a Vuser script. The Additional Attributes settings apply to all types of Vuser scripts.

You specify command line arguments that you can retrieve at a later point during the test run using the **lr_get_attrib_string**. Using this node you can pass external parameters to prepared scripts.

User interface elements are described below:

UI Elements	Description
	**Add new attribute.** Adds a new attribute.
	**Delete attribute.** Deletes the selected attribute.
<Additional Attributes grid>	A list of the additional attributes and their values.
Description	A description of the selected additional attribute.

Advanced Settings

To use JMS as a transport for Web Service calls, there are several resources that need to be allocated and configured. Those resources include the JVM, JNDI initialization parameters, JMS resources, and timeout values.

ALM Performance Center lets you configure some of those resources through the runtime settings. You can set options in the area of VM (Virtual Machine), the JMS connections, and message timeouts.

User interface elements are described below:

UI Elements	Description
Use external VM	Enables you to select a VM (Virtual Machine) other than the standard one. If you disable this option, Vusers use the JVM provided with Performance Center.
JVM Home	The location of the external JVM. This should point to the JDK home directory, defined by JDK_HOME. Performance Center supports JDK 1.4 and above.
Classpath	The vendor implementation of JMS classes together with any other required supporting classes, as determined by the JMS implementation vendor.
Additional VM Parameters	Extra parameters to send to the JVM such as Xbootclasspath, and any parameters specified by the JVM documentation.
JNDI initial context factory	The fully qualified class name of the factory class that will create an initial context. Select a context factory from the list or provide your own.
JNDI provider	The URL string of the service provider. **Example:** Weblogic - t3://myserver:myport Websphere - iiop://myserver:myport
JMS connection factory	The JNDI name of the JMS connection factory. You can only specify one connection factory per script.
JMS security principal	Identity of the principal (for example the user) for the authentication scheme.
JMS security credentials	The principal's credentials for the authentication scheme.

UI Elements	Description
Number of JMS connections per process	The number of JMS connections per **mdrv** process or Vuser. All Vusers sharing a connection receive the same messages. **Default:** 1 **Maximum:** 50 Vusers. **Note:** The less connections per process, the better the performance.
Receive message timeout options	The timeout for received messages. The following options are available: ➤ **Indefinite wait.** Wait as long as required for the message before continuing. ➤ **No wait.** Do not wait for the Receive message, and return control to the script immediately. If there was no message in the queue, the operation fails. ➤ **Specify the timeout in seconds.** Manually specify a timeout value for the message. If the timeout expired and no message arrived, the operation fails. **Default:** No Wait

Browser Emulation Settings

You use the **Browser Emulation** settings to set the browser properties of your testing environment.

User interface elements are described below:

UI Elements	Description
Customize your browser	By default, the user-agent emulates the Microsoft Internet Explorer 5.5 browser agent. You can, however, instruct the script to emulate a different browser, that is compatible with Internet Explorer 5.5. This setting creates a **User-Agent** header that identifies the type and version of the browser.

UI Elements	Description
Simulate browser cache	Instructs the Vuser to simulate a browser with a cache. By default, cache simulation is enabled. When the cache is disabled, Vusers will ignore all caching functionality and download all of the resources for every request. Even if you disable the cache simulation, each resource is only downloaded once for each page, even if it appears multiple times. A resource can be an image, frame, or another type of script file. When running multiple Vusers, every Vuser uses its own cache and retrieves images from the cache. If you disable this option, all Vusers emulate a browser with no cache. You can also set the following browser cache options: ➤ **Cache URLs requiring content (HTML).** Cache only the URLs that require the HTML content. The content may be necessary for parsing, verification, or correlation. When you select this option, HTML content is automatically cached. This option is enabled by default. **Tip:** To decrease the memory footprint of the Vusers, disable this option, unless it is an explicit requirement for your test. ➤ **Specify URLs requiring content in addition to HTML page.** This setting lets you specify the URL content types other than HTML pages, that you want to store in the cache for verification purposes. For example, text/xml or image/gif. Separate multiple content types with a semicolon. ➤ **Check for newer versions of stored pages every visit to the page.** This setting instructs the browser to check for later versions of the specified URL, than those stored in the cache. When you enable this option, the "If-modified-since" attribute is added to the HTTP header. This option brings up the most recent version of the page, but also generates more traffic during the scenario or session execution. By default, browsers do not check for newer resources, and therefore this option is disabled.

UI Elements	Description
Download non HTML resources	Loads graphic images when accessing a Web page during replay. This includes both graphic images that were recorded with the page, and those which were not explicitly recorded along with the page. When real users access a Web page, they wait for the images to load. Therefore, enable this option if you are trying to test the entire system, including end-user time. To increase performance and not emulate real users, disable this option. **Tip:** Disable this option if you experience discrepancies in image checks, since some images vary each time you access a Web page (for example, advertiser banners).
Simulate a new user on each iteration	Resets all HTTP contexts between iterations to their states at the end of the **init** section. This setting allows the Vuser to more accurately emulate a new user beginning a browsing session. It deletes all cookies, closes all TCP connections (including keep-alive), clears the emulated browser's cache, resets the HTML frame hierarchy (frame numbering will begin from 1) and clears the user-names and passwords. This option is disabled by default. ➤ **Clear cache on each iteration.** Clears the browser cache for each iteration in order to simulate a user visiting a Web page for the first time. Disable this option if you want Vusers to use the browser's cache, simulating a user who recently visited the page.

Classpath Settings

The Classpath settings let you specify the location of additional classes that were not included in the system's CLASSPATH environment variable. You may need these classes to run Java applications and insure proper replay.

User interface elements are described below:

UI Elements	Description
Classpath Entries	Enter the path of additional classes that were not included in the system's CLASSPATH environment variable. Separate multiple entries with a semicolon.

Client Emulation Settings

The Oracle NCA Client Emulation runtime settings let you specify the communication parameters for your NCA client. You should configure the settings to accurately emulate your Oracle NCA environment.

User interface elements are described below:

UI Elements	Description
Socket mode	The communication to and from the client is performed on a socket level—not on the higher HTTP level. ➤ **Timeout (seconds):** The time that an Oracle NCA Vuser waits for a response from the server. The default value of -1 disables the timeout and the client waits indefinitely.
Pragma mode	In Pragma mode, communication is carried out in the Oracle-defined Pragma mode. This communication level, above the HTTP and Servlet levels, is characterized by the periodic sending of messages. In this mode, the client recognizes that the server cannot respond with data immediately. The server sends messages at given intervals until it is able to send the requested data. ➤ **Max Retries**. Indicates the maximum number of **IfError** messages the client will accept from the server before issuing an error. **IfError** messages are the periodic messages the server sends to the client, indicating that it will respond with the data as soon as it is able. ➤ **Retry Interval.** Defines the interval between retries in the case of **IfError** messages. ➤ **Include retry intervals in transaction.** Includes the interval between retry time, as part of the transaction duration time.

UI Elements	Description
Enable Heartbeat	You can enable or disable the heartbeat sent to the Oracle server. The heartbeat verifies that there is proper communication with the server. If you are experiencing a heavy load on the Oracle NCA server, disable the heartbeat. If you enable the heartbeat, you can set the frequency of how often heartbeat messages are sent to the server. In the Frequency box, you can define the frequency of the heartbeat signal. The default is 120 seconds. **Default:** Enabled
Forms Version	You can specify the version of the Oracle Forms server detected during recording. **Note:** Modify this setting only if the server was upgraded since the recording.
Diagnostic	This section lets you provide information about diagnostic modules for the database layer of Oracle Applications. ➤ **Application version.** The version of Oracle Application. This option is relevant when using Oracle Application—not a custom Oracle NCA application. It is only required when using Oracle database breakdown.

Configuration Settings

The Citrix Configuration settings relate to the screen latency, data compression, disk cache, and queuing of mouse movements. These settings, which will influence the load on the server, should correspond to the properties of your Citrix client. To view the client properties, select the icon representing the ICA connection in the Citrix Program Neighborhood, and select **Properties** from the right-click menu. Select the **Default Options** tab.

User interface elements are described below:

UI Elements	Description
SpeedScreen Latency Reduction	The mechanism used to enhance user interaction when the network speed is slow. You can turn this mechanism **on** or **off**, depending on the network speed. The **auto** option turns it on or off based on the current network speed. If you do not know the network speed, set this option to **Use Server Default** to use the machine's default.
Use data compression	Instructs Vusers to compress the transferred data. To enable this option, select the check box to the left of the option; to disable it, clear the check box. You should enable data compression if you have a limited bandwidth (enabled by default).
Use disk cache for bitmaps	Instructs Vusers to use a local cache to store bitmaps and commonly-used graphical objects. To enable this option, select the check box to the left of the option; to disable it, clear the check box. You should enable this option if you have a limited bandwidth (disabled by default).

UI Elements	Description
Queue mouse movements and keystrokes	Instructs Vusers to create a queue of mouse movements and keystrokes, and send them as packets to the server less frequently. This setting reduces network traffic with slow connections. Enabling this option makes the session less responsive to keyboard and mouse movements. To enable this option, select the check box to the left of the option; to disable it, clear the check box (disabled by default).
Sound quality	Specifies the quality of the sound: **Use server default**, **Sound off**, **High sound quality**, **Medium sound quality**, or **Low sound quality**. If the client machine does not have a 16-bit Sound Blaster-compatible sound card, select **Sound Off**. With sound support enabled, you will be able to play sound files from published applications on your client machine.

Download Filter Settings

The Download Filters runtime setting lets you specify the Web sites from which Vusers should download resources during replay. You can indicate either the sites to exclude or the sites to include. You control the allowed or disallowed sources, by specifying a URL, host name, or host suffix name.

User interface elements are described below:

UI Elements	Description
	**Add/Remove Addresses.** Enables you to add/remove addresses to/from the list of address list.
Include only addresses in list	Includes the addresses in the address list. The Vuser filters out resources from all Web sites except for those in the Include list.
Exclude addresses in list	Excludes the addresses in the address list. The Vuser downloads resources from all Web sites except for those specified in the list

UI Elements	Description
Type	The address type: **URL**, **Host**, or **Host Suffix**
Data	The address data. **Note:** Depending on the address type, be sure to enter the data as follows: ➤ **URL**. Enter a complete URL beginning with **http://** or **https://**. ➤ **Host.** Enter the name of the host machine with its domain, such as www.hp.com. ➤ **Host Suffix.** The common suffix for several host names, such as hp.com. This is useful when you have several Web sites on a common domain.

Gateway Settings

You use the **Gateway** link to set the WAP Gateway settings.

User interface elements are described below:

UI Elements	Description
Connection Options	The connection options specify the method that the Vuser uses to connect to the WAP gateway. ➤ **WAP Gateway.** Runs the Vusers accessing a Web server via a WAP Gateway. ➤ **HTTP Direct.** Runs the Vusers in HTTP mode, accessing a Web server directly. If you select the HTTP Direct connection mode, the remaining WAP Gateway options are not applicable.
Gateway Settings	If the Vusers connect through a gateway, the IP, Port, and WAP Versions options specify the Gateway connection. ➤ **IP.** The IP address of the gateway. ➤ **Port.** The port of the gateway. When running your Vusers through a WAP gateway, the Vusers automatically use default port numbers, depending on the selected mode. However, you can customize the settings and specify a custom IP address and port for the gateway. ➤ **WAP version.** The WAP version, **1.x (WSP)** or **2.0 (HTTP proxy)**. If you recorded in WAP 1.x (WSP), you can run the Vusers in either 1.x (WSP), or 2.0 (HTTP proxy) mode. If you recorded in WAP 2.0 (HTTP proxy), then you can only run the Vusers in the same mode. If you are running the script in WAP 1.x (WSP), you can specify several connection and advanced options.

UI Elements	Description
Gateway Connection Mode	The connection mode settings apply to WAP version 1.x (WSP) connections. ➤ **Connection-oriented Mode.** Sets the connection mode for the WSP session to Connection-Oriented. ➤ **Connectionless Mode.** Sets the connection mode for the WSP session to Connectionless. ➤ **Enable security.** Enables a secure connection to the WAP gateway.
Advanced Gateway Options	Open the **Advanced** option in the Gateway runtime settings to configure the WAP Capabilities and other advanced Gateway options. For details see "Advanced Gateway Options" below.

Advanced Gateway Options

User interface elements are described below:

UI Elements	Description
Confirm Push support	In CO mode, if a push message is received, this option instructs the Vuser to confirm the receipt of the message (disabled by default). For more information, see the *HP Virtual User Generator User Guide*.
Push support	Enables push type messages across the gateway (disabled by default).
CAPSessionResume	Enables requests for session suspend or resume.

UI Elements	Description
Acknowledge headers	Returns standard headers that provide information to the gateway. ➤ **Server SDU buffer size.** The largest transaction service data unit that may be sent to the server during the session. **Default:** 4000 ➤ **Client SDU buffer size.** The largest transaction service data unit that may be sent to the client during the session. **Default:** 400 ➤ **MethodMOR.** The number of outstanding methods that can occur simultaneously. ➤ **PushMOR.** The number of outstanding push transactions that can occur simultaneously. ➤ **BearerType.** The type of bearer used as the underlying transport. ➤ **Retrieve messages.** When a push messages is received, this option instructs the Vuser to retrieve the message data from the URL indicated in the push message. **Default:** Disabled **Default:** Disabled
Support Cookies	Provides support for saving and retrieving cookies. **Default:** Disabled
WTP Segmentation and Reassembly	Enables segmentation and reassembly (SAR) in WTP, Wireless Transport Protocol. **Default:** True ➤ **WTP Retransmission Time.** The time in seconds that the WTP layer waits before resending the PDU if it did not receive a response. **Default:** 5000

UI Elements	Description
WTLS Abbreviated Handshake	Use an abbreviated handshake instead of a full one, when receiving a redirect message. **Default:** False
WTLS Deffie Hellman	Use the Deffie Hellman encryption scheme for WTLS (Wireless Transport Layer Security) instead of the default scheme, RSA. **Default:** False ➤ **WTLS Deffie Hellman identifier.** An identifier for the Deffie Hellman encryption scheme. This identifier is required for the abbreviated handshake with the Operwave gateway that uses the Deffie Hellman encryption scheme. ➤ **Network MTU Size.** The maximum size in bytes, of the network packet. **Default:** 4096

SAPGUI Settings

The SAPGUI runtime settings let you set the general settings for a SAPGUI Vuser script. Performance Center uses these settings when running the script.

User interface elements are described below:

UI Elements	Description
Send status bar text	Send the text from the status bar to the log file.
Send active window title	Send the active window title text to the log file. The Performance runtime settings allow you to indicate whether or not to display the SAP client during replay.
Show SAP Client during replay	Shows an animation of the actions in the SAP client during replay. The benefit of displaying the user interface (UI) is that you can see how the forms are filled out and closely follow the actions of the Vuser. This option, however, requires additional resources and may affect the performance of your performance test.

UI Elements	Description
Take ActiveScreen snapshots during replay	Captures replay snapshots with the Control ID information for all active objects. ActiveScreen snapshots differ from regular ones, in that they allow you to see which objects were recognized by VuGen in the SAPGUI client. As you move your mouse across the snapshot, VuGen highlights the detected objects. You can then add new steps to the script directly from within the snapshot. It also allows you to add steps interactively from within the snapshot for a specific object. For more information, see the *HP Virtual User Generator User Guide*.
Advanced	Advanced options let you set a timeout for the **SAPfewgsvr.exe** process, save a snapshot on error, and configure Performance Center to use SAPlogon during replay. Each Vuser invokes a separate **SAPfewgsvr.exe** process during test execution. In some instances, the process stays active even after the replay session has ended. You can check the Windows Task Manager to see if the process is still active. The Advanced SAPGUI settings let you set a timeout for this application. When the timeout is reached, Performance Center closes any **SAPfewgsvr** processes not previously terminated. ➤ **Replay using running SAPlogon application**. Instructs the Vusers to use the SAPlogon application that is currently running for replay. ➤ **Set SAPfewgsvr application timeout**. Allows you to modify the **SAPfewgsvr.exe** process timeout. ➤ **Timeout to SAPfewgsvr.** The **SAPfewgsvr.exe** process timeout in seconds. **Default:** 300 seconds

Java Environment Settings

For Java scripts, you provide information about the Java virtual machine settings in the Java VM section.

User interface elements are described below:

UI Elements	Description
Use internal logic to locate JDK	Search the PATH, registry, and Windows folder for the JDK to use during replay.
Use specified JDK	Use the specified JDK during replay.
Using Xbootclasspath parameters	Replays the script with the Xbootclasspath /p option.
Load each Vuser using dedicated class loader	Load each Vuser using a dedicated class loader. This will allow you to use a unique namespace for each Vuser and manage their resources separately.

.NET Environment Settings

The .NET environment runtime settings let you specify information about the application, such as its base path and the location of its configuration file.

User interface elements are described below:

UI Elements	Description
AUT Application Base Path	The AUT (Application Under Test) base directory from which DLLs are loaded during replay. By default, during recording, all of the necessary DLLs are stored in the script's directory. Use this option to specify the location of any missing DLL files for the AUT. This is usually the installation path of the recorded application. **Note:** The AUT must be installed on the machine running the script. If you leave this box empty, the Vusers use the local script\bin directory as the application base directory during replay.

UI Elements	Description
AUT Configuration File	The file name of the recorded application's configuration file. Performance Center copies the AUT configuration file to the script\bin directory and loads the locally saved file. To specify a different location, use a full path. If you only specify a file name, and the file is not in the script\bin folder, the Vusers load it from the App base directory.
AppDomain Per Vuser.	Enables execution of each Vuser in a separate app domain (true by default). Running Vusers in separate App Domains enables each Vuser to execute separately without sharing static variables and prevents locking between them. ADO.NET providers deploy a feature called **connection pooling** which can significantly influence performance test accuracy. Whenever only one app domain is used for all Vusers, connection pooling is turned on—.NET Framework keeps the database connections open and tries to reuse them when a new connection is requested. Since many Vusers are executed in the context of a single application domain, they may interfere with one another. Their behavior will not be linear and that may decrease their accuracy. The default setting, **true**, allocates a separate connection pool for each Vuser. This means that there is connection pooling in the scope of each Vuser, but the Vusers will not interfere with one another. This setting provides more accuracy, but lower scalability. If you disable this option, you need to manually disable connection pooling for the database. For more information, the *HP Virtual User Generator User Guide*.

Preferences Settings

You use the **Internet Protocol Preferences** runtime Settings, to control the Vusers in the following areas:

- Image and Text Checks
- Generating Web Performance Graphs
- Advanced Web Runtime Options
- Additional Options for Internet Preferences

User interface elements are described below:

UI Elements	Description
Checks	The **Enable image and text checks** option allows the Vuser to perform verification checks during replay by executing the verification functions: **web_find** or **web_image_check**. This option only applies to test steps that were recorded in HTML-based mode. Vusers running with verification checks enabled, require additional memory.
Generate Web performance graphs	Collects data to create several Web Performance graphs: **Hits per Second and HTTP codes**, **Pages per Second,** and **Response Bytes per Second**. You view the graphs during test execution using the online monitors and after test execution using HP Analysis. You view the Component Breakdown graph after test execution using the Analysis. Select the types of graph data for the Vuser to collect. **Note:** If you do not use the Web Performance graphs, disable all graphs to conserve memory.

UI Elements	Description
Advanced	➤ **WinInet Replay.** Instructs Vusers to use the WinInet replay engine instead of the standard Sockets replay. There are two HTTP replay engines: Sockets-based (default) or WinInet based. The WinInet is the engine used by Internet Explorer and it supports all of the features incorporated into the IE browser. The limitations of the WinInet replay engine are that it is not scalable, nor does it support UNIX. In addition, when working with threads, the WinInet engine does not accurately emulate the modem speed and number of connections. The proprietary sockets-based replay is a lighter engine that is scalable for performance testing. It is also accurate when working with threads. The limitation of the sockets-based engine is that it does not support SOCKS proxy. If you are recording in that type of environment, use the WinInet replay engine. ➤ **File and line in automatic transaction names.** Creates unique transaction names for automatic transactions by adding file name and line number to the transaction name (enabled by default). **Note:** This option places additional information in the log file, and therefore requires more memory. ➤ **Non-critical item errors as warnings.** This option returns a warning status for a function which failed on an item that is not critical for performance testing, such as an image or Java applet that failed to download. This option is enabled by default. If you want a certain warning to be considered an error and fail your test, you can disable this option. You can set a content-type to be critical by adding it to the list of Non-Resources. For more information, see the *HP Virtual User Generator User Guide*. ➤ **Save snapshot resources locally.** Saves the snapshot resources to files on the local machine. This feature lets the runtime viewer create snapshots more accurately and display them quicker.

UI Elements	Description
Set Advanced Options	Enables you to set advanced options in the following areas: DNS caching, HTTP version, Keep-Alive HTTP connections, Accept server-side compression, Accept-Language headers, HTTP-request connect timeout, HTTP-request receive timeout, Network buffer size, and Step download timeout. For more information, see the relevant "Advanced Options for Internet Preferences - HTTP" below.

Advanced Options for Internet Preferences - HTTP

User interface elements are described below:

UI Elements	Description
HTTP version	Specifies which version HTTP to use: version 1.0 or 1.1. This information is included in the HTTP request header whenever a Vuser sends a request to a Web server.
Keep-Alive HTTP connections	Keep-alive is a term used for an HTTP extension that allows persistent or continuous connections. These long-lived HTTP sessions allow multiple requests to be sent over the same TCP connection. This improves the performance of the Web server and clients. The keep-alive option works only with Web servers that support keep-alive connections. This setting specifies that all Vusers that run the Vuser script have keep-alive HTTP connections enabled. **Default:** Enabled
Accept-Language request header	Provides a comma-separated list of accepted languages. For example, **en-us**, **fr**, and so on.

UI Elements	Description
HTTP errors as warnings	Issues a warning instead of an error upon failing to download resources due to an HTTP error. ➤ **HTTP-request connect timeout (seconds).** The time, in seconds, that a Vuser will wait for the connection of a specific HTTP request within a step before aborting. Timeouts provide an opportunity for the server to stabilize and respond to the user. **Note:** This timeout also applies to the time the Vuser will wait for a WAP connection, initiated by the **wap_connect** function. ➤ **HTTP-request receive timeout (seconds).** The time, in seconds, that a Vuser will wait to receive the response of a specific HTTP request within a step before aborting. Timeouts provide an opportunity for the server to stabilize and respond to the user. **Default:** 120 seconds ➤ **HTTP Keep-Alive timeout.** Enter the number of seconds to keep idle connections open.
Request Zlib Headers	Sends request data to the server with the **zlib** compression library headers. By default, requests sent to the server include the **zlib** headers. This option lets you emulate non-browser applications that do not include **zlib** headers in their requests. To exclude these headers, set this option to **No**. **Default:** Yes
Accept Server-Side Compression	Indicate to the server that the replay can accept compressed data. The available options are: **None** (no compression), **gzip** (accept gzip compression), **gzip, deflate** (accept gzip or deflate compression), and **deflate** (accept deflate compression). **Note:** By accepting compressed data, you may significantly increase the CPU consumption. The default is to accept **gzip, deflate** compression.

Advanced Options for Internet Preferences - General

User interface elements are described below:

UI Elements	Description
DNS caching	Instructs the Vuser to save a host's IP addresses to a cache after resolving its value from the Domain Name Server. This saves time in subsequent calls to the same server. In situations where the IP address changes, as with certain load balancing techniques, be sure to disable this option to prevent Vusers from using the value in the cache (enabled by default).
Convert from/to UTF-8	Converts received HTML pages and submitted data from and to UTF-8. You enable UTF-8 support in the recording options. For more information, see the *HP Virtual User Generator User Guide*. **Default:** No
Step timeout caused by resources is a warning	Issues a warning instead of an error when a timeout occurs due to a resource that did not load within the timeout interval. For non-resources, Performance Center issues an error. **Default:** Disabled
Parse HTML Content-Type	When expecting HTML, parse the response only when it is the specified content-type: **HTML**, **text\html**, **TEXT** any text, or **ANY**, any content-type. **Note:** text/xml is not parsed as HTML. The default is **TEXT**. The timeout settings are primarily for advanced users who have determined that acceptable timeout values should be different for their environment. The default settings should be sufficient in most cases. If the server does not respond in a reasonable amount of time, check for other connection-related issues, rather than setting a very long timeout which could cause the scripts to wait unnecessarily.

UI Elements	Description
Step download timeout (sec)	The time that the Vuser will wait before aborting a step in the script. This option can be used to emulate a user behavior of not waiting for more than x seconds for a page.
Network buffer size	Sets the maximum size of the buffer used to receive the HTTP response. If the size of the data is larger than the specified size, the server will send the data in chunks, increasing the overhead of the system. When running multiple Vusers from the Controller, every Vuser uses its own network buffer. This setting is primarily for advanced users who have determined that the network buffer size may affect their script's performance. **Default:** 12kB **Maximum size:** 0x7FFF FFFF
Print NTLM information	Prints information about the NTLM handshake to the standard log.
Print SSL information	Prints information about the SSL handshake to the standard log.
Max number of error matches issued as ERRORS	Limits the number of error matches issued as ERRORS for content checks using a LB or RB (left boundary or right boundary). This applies to matches where a failure occurs when the string is found (Fail=Found). All subsequent matches are listed as informational messages. **Default:** 10 matches.
Maximum number of META Refresh to the same page	The maximum number of times that a META refresh can be performed per page. **Default:** 2
ContentCheck values in UTF-8	Store the values in the ContentCheck XML file in UTF-8.

Advanced Options for Internet Preferences - Authentication

User interface elements are described below:

UI Elements	Description
Fixed think time upon authentication retry (msec)	Automatically adds a think time to the Vuser script for emulating a user entering authentication information (username and password). This think time will be included in the transaction time. **Default:** 0
Disable NTLM2 session security	Uses full NTLM 2 handshake security instead of the more basic NTLM 2 session security response. **Default:** 0
Use Windows native NTLM implementation	Use the Microsoft Security API for NTLM authentication instead of the indigenous one.
Enable integrated Authentication	Enable Kerberos-based authentication. When the server proposes authentication schemes, use **Negotiate** in preference to other schemes. **Default:** 0
Induce heavy KDC load	Do not reuse credentials obtained in previous iterations. Enabling this setting will increase the load on the KDC (Key Distribution Server). To lower the load on the server, set this option to **Yes** in order to reuse the credentials obtained in previous iterations. This option is only relevant when Kerberos authentication is used. **Default:** No

Advanced Options for Internet Preferences - Log

User interface elements are described below:

UI Elements	Description
Print buffer line length	Line length for printing request/response header/body and/or JavaScript source, disabling wrapping.
Print buffer escape only binary zeros	➤ **Yes.** Escape only binary zeros when printing request/response headers/body and/or JavaScript source. ➤ **No**. Escape any unprintable/control characters.

Advanced Options for Internet Preferences - Web (Click and Script) Specific

User interface elements are described below:

UI Elements	Description
Home Page URL	The URL of the home page that opens with your browser. **Default:** about:blank
DOM-based snapshots	Generates snapshots from the DOM instead of from the server responses. **Default:** Yes
Charset conversions by HTTP	Perform charset conversions by the 'Content-Type:....; charset=...' HTTP response header. Overrides 'Convert from /to UTF-8.'
Reparse when META changes charset	Reparse HTML when a META tag changes the charset. Effective only when **Charset conversions by HTTP** is enabled. **Auto** means reparsing is enabled only if it used in the first iteration.
Fail on JavaScript error	Fails the Vuser when a JavaScript evaluation error occurs. ALM issues a warning message only after a JavaScript error, but continuing to run the script. **Default: No**.

UI Elements	Description
Initialize standard classes for each new window project	When enabled, the script—the src compiled script, will not be cached.
Ignore acted on element being disabled	Ignore the element acted on by a Vuser script function being disabled.
Optimize timers at end of step	When possible, executes a setTimeout/setInterval/<META refresh> that expires at the end of the step before the expiration time. **Default:** Yes
Single setTimeout/ setInterval threshold (seconds)	Specifies an upper timeout for the window.setTimeout and window.setInterval methods. If the delay exceeds this timeout, these methods will not invoke the functions that are passed to them. This emulates a user waiting a specified time before clicking on the next element. **Default:** 5 seconds
Accumulative setTimeout/ setInterval threshold (seconds)	Specifies a timeout for the window.setTimeout and window.setInterval methods. If the delay exceeds this timeout, additional calls to window.setTimeout and window.setInterval will be ignored. The timeout is accumulative per step. **Default:** 30 seconds
Reestablish setInterval at end of step	**0** = No; **1** = Once; **2** = Yes.
History support	Enables support for the window.history object for the test run. The options are **Enabled**, **Disabled**, and **Auto**. The Auto option instructs Vusers to support the window.history object only if it was used in the first iteration. **Default:** Auto **Note:** By disabling this option, you improve performance.

UI Elements	Description
Maximum history size	The maximum number of steps to keep in the history list. **Default:** 100 steps
navigator.browserLanguage	The browser language set in the navigator DOM object's **browserLanguage** property. **Default:** The recorded value. **Note:** Scripts created with older recording engines, use **en-us** by default.
navigator.systemLanguage	The system language set in the navigator DOM object's **systemLanguage** property. **Default:** The recorded value. **Note:** Scripts created with older recording engines, use **en-us** by default.
navigator.userLanguage	The user language set in the navigator DOM object's **userLanguage** property. **Default:** The recorded value. **Note:** Scripts created with older recording engines, use **en-us** by default.
screen.width	Sets the width property of the screen DOM object in pixels. **Default:** 1024
screen.height	Sets the height property of the screen DOM object in pixels. **Default:** 768
screen.availWidth	Sets the availWidth property of the screen DOM object in pixels. **Default:** 1024
screen.availHeight	Sets the availHeight property of the screen DOM object in pixels. **Default:** 768

UI Elements	Description
Default block size for DOM memory allocations	Sets the default block size for DOM memory allocations. If the value is too small, it may result in extra calls to malloc, slowing the execution times. Too large a block size, may result in an unnecessarily big footprint. **Default:** 16384 bytes
Memory Manager for dynamically-created DOM objects	➤ **Yes.** Use the Memory Manager for dynamically-created DOM objects. ➤ **No.** Does not use the Memory Manager, for example when multiple DOM objects are dynamically created in the same document as under SAP. ➤ **Auto**—Use the protocol recommended. **Default:** Yes for all protocols except for SAP
JavaScript Runtime memory size (KB)	Specifies the size of the JavaScript runtime memory in kilobytes. **Default:** 256 KB
JavaScript Stack memory size (KB)	Specifies the size of the JavaScript stack memory in kilobytes (default is 32 KB). **Default:** 32 KB

Proxy Settings

You use the **Proxy** runtime Settings to set the proxy-related settings. The following proxy options are available in the runtime settings.

User interface elements are described below:

UI Elements	Description
No proxy	All Vusers should use direct connections to the Internet. This means that the connection is made without using a proxy server.
Obtain the proxy settings from the default browser	All Vusers use the proxy settings of the default browser from the machine upon which they are running.

UI Elements	Description
Use custom proxy	➤ **Use automatic configuration script.** Enables you to specify a JavaScript file (usually with a .**pac** extension) containing proxy assignment information. This script tells the browser when to access a proxy server and when to connect directly to the site, depending on the URL. In addition, it can instruct the browser to use a specific proxy server for certain addresses and another server for other addresses. Specify either a web location beginning with **http://**. For example, **http://hostname/proxy.pac**. ➤ **Use proxy server.** Select to supply actual proxy server details. ➤ **HTTP (Address of proxy to use).** The HTTP proxy server's IP address or name. ➤ **HTTP Port.** The HTTP port. ➤ **HTTPS (Address of proxy to use).** The HTTPS proxy server's IP address or name. ➤ **HTTPS Port.** The HTTPS port. ➤ **Use same server for all protocols.** Select to use same proxy server for all Internet protocols (HTTP, HTTPS) rather than specifying a specific server for secure sites. **Note:** You can specify one proxy server for all HTTP sites, and another proxy server for all HTTPS (secure) sites.

UI Elements	Description
Exceptions	When specifying proxy server information, you can specify that all Vusers use a specified proxy server. In such a case, if there are any URLs that you want Vusers to access directly, that is, without using the proxy server, type the list of these URLs in the Exceptions box. ➤ **Do not use proxy server for addresses beginning with.** Type the addresses you want to exclude from the proxy server. Use semicolons to separate entries. ➤ **Do not use proxy server for local (intranet) addresses.** Select this check box to exclude local addresses, such as those from an Intranet, from the proxy server.
Authentication	When specifying proxy server information, if the proxy server requires authentication for each Vuser, use this dialog box to type the relevant password and user name. ➤ **User Name.** The user name for Vusers to access the proxy server. ➤ **Password.** The password required by Vusers to access the proxy server.

Radius Settings

RADIUS (Remote Authentication Dial-In User Service) is a client/server protocol and software that enables remote access servers to communicate with a central server to authenticate dial-in users. It also authorize their access to the requested system or service.

RADIUS allows a company to maintain user profiles in a central database that all remote servers can share. It provides better security, allowing a company to set up a policy that can be applied at a single administered network point. Using a central service enables you to track usage for billing and store network statistics.

RADIUS has two sub-protocols:

➤ **Authentication.** Authorizes and controls user access.

➤ **Accounting.** Tracks usage for billing and for keeping network statistics.

For Vusers, the RADIUS protocol is supported for WSP replay for both of the Radius sub-protocols—authentication and accounting. You supply the dial-in information in the Radius runtime settings:

User interface elements are described below:

UI Elements	Description
Network Type	The accounting network type: GPRS (General Packet Radio Service) or CSD (Circuit-Switched Data).
IP Address	The IP address of the Radius server.
Authentication port number	The authentication port of the Radius server
Accounting port number	The accounting port of the Radius server
Secret Key	The secret key of the Radius server.
Connection Timeout (sec)	The time in seconds to wait for the Radius server to respond. **Default:** 120 seconds.
Retransmission retries	The number of times to retry after a failed transmission. **Default:** 0
Store attributes returned by the server to parameters	Allow Vusers to save attributes returned by the server as parameters, which can be used at a later time. **Default:** False
Radius client IP	Radius packets source IP, usually used to differentiate between packets transmitted on different NIC cards on a single load generator machine.

RTE Settings

Terminal Emulator runtime settings allow you to configure your TE Vusers so that they accurately emulate real users performing remote terminal emulation. You can configure settings for the number of connection attempts, device names, typing delay, and X-System synchronization.

User interface elements are described below:

UI Elements	Description
Maximum number of connection attempts	The **TE_connect** function is generated when you record a connection to a host. When you replay an RTE script, the **TE_connect** function connects the terminal emulator to the specified host. If the first attempt to connect is not successful, the Vuser retries a number of times to connect successfully. Details of each connection are recorded in the report file **output.txt**. Enter the maximum number of times that a Vuser will try to connect. **Default:** Vusers try to connect 5 times.
Use original device name	In certain environments, each session (Vuser) requires a unique device name. The **TE_connect** function generates a unique 8-character device name for each Vuser, and connects using this name. Select this option to connect using the device name that is contained within the com_string parameter of the **TE_connect** function. The original device name setting only applies to IBM block-mode terminals. **Default:** Selected

UI Elements	Description
Delay before typing	The delay setting determines how Vusers execute **TE_type** functions. ➤ **First key (milliseconds).** Specifies the amount of time that a Vuser waits before entering the first character in a string. ➤ **Subsequent key (milliseconds).** Specifies the amount of time that a Vuser waits between submitting successive characters. **Note:** If you type zero for both the first key and the subsequent key delays, the Vuser will send characters as a single string, with no delay between characters. You can use the **TE_typing_style** function to override the Delay settings for a portion of a Vuser script.
X-System synchronization	RTE Vuser scripts use the **TE_wait_sync** function for synchronization. You can set a timeout value and a stable-time value that applies to all **TE_wait_sync** functions. ➤ **Timeout (seconds).** When you replay a **TE_wait_sync** function, if the system does not stabilize before the synchronization timeout expires, the **TE_wait_sync** function returns an error code. To set the synchronization timeout, type a value (in seconds). **Default:** 60 seconds ➤ **Stable time (milliseconds).** After a Vuser executes a **TE_wait_sync** function, the Vuser waits until the terminal is no longer in the X-SYSTEM mode. After the terminal returns from the X-SYSTEM mode, the Vuser still monitors the system for a short time. This makes sure that the terminal has become stable, that is, that the system has not returned to the X-SYSTEM mode. Only then does the **TE_wait_sync** function terminate. To set the time that a Vuser continues to monitor the system after the system has returned from the X-SYSTEM mode, type a value (in milliseconds). **Default:** 1000 milliseconds.

Server and Protocol Settings

The following section describes the runtime settings specific to MMS (Multimedia Messaging Service) Vusers. These runtime setting allow you to configure the Server and Protocol settings.

User interface elements are described below:

UI Elements	Description
MMSC URL	The URL of the MMSC (Multimedia Messaging Center) server.
MMS Version	The version of the MMS protocol used by the script.
Timeout (seconds)	The time that the server waits for incoming messages. **Default:** 60 seconds.
SMSC IP	The IP address of the SMSC server used for sending MMS notifications over SMPP.
SMSC Port	The IP port of the SMSC server used for sending MMS notifications over SMPP.
Automatic WAP Connections	Defines when to connect and disconnect from a WAP gateway. This setting is only relevant when a WAP gateway is used. The possible values are: ➤ **Per Iteration.** Connect at the beginning of each iteration and disconnect at the end of each iteration. ➤ **Per Send or Receive.** Connect and disconnect at the beginning and end of each message. ➤ **None.** Do not use automatic WAP connections. **Default:** Per Iteration
Default Sender address	The default address sent in the Sender header. **Default:** +999999

Speed Simulation Settings

The Speed Simulation setting lets you emulate your network connection.

Using these settings, you select a bandwidth that best emulates the environment under test.

User interface elements are described below:

UI Elements	Description
Use maximum bandwidth	By default, bandwidth emulation is disabled and the Vusers run at the maximum bandwidth that is available over the network.
Use bandwidth	Indicate a specific bandwidth level for your Vuser to emulate. You can select a speed ranging from 14.4 to 512 Kbps, emulating analog modems, ISDN, or DSL.
Use custom bandwidth	Indicate a bandwidth limit for your Vuser to emulate. Specify the bandwidth in bits, where 1 Kilobit=1024 bits.

Timing Settings

The Citrix Timing runtime settings relate to the connect and waiting timeouts. These settings apply to the entire script. To set the waiting time for a specific section of the script, use the **Set Waiting Time** step in the Vuser script. The new waiting time applies from the point of insertion until the end of the script or the next **Set Waiting Time** step.

User interface elements are described below:

UI Elements	Description
Connect time	The time in seconds to wait idly at an established connection before exiting. **Default:** 180 seconds
Waiting time	The time in seconds to wait idly at a synchorinization point before exiting. **Default:** 60 seconds.
Typing rate	The delay in milliseconds between keystrokes.

Part VIII

My Performance Center

29

Personalizing Performance Center

This chapter includes:

Concepts

Tasks

Reference

Concepts

My Performance Center Overview

My Performance Center provides an interface specifically designed for facilitating execution of day-to-day performance testing activities. It allows you to create a personalized view of performance testing features. You can edit tests and test assets, as well as run and track test runs using My Performance Center.

For information about how to use My Performance Center, see "How to Work with My Performance Center" on page 565.

Tasks

How to Work with My Performance Center

This task describes the main performance testing actions that can be performed from within My Performance Center.

Note: To view a movie that demonstrates how use My Performance Center, select **Help** > **Product Feature Movies** in the ALM main window. Under **HP ALM Performance Center 11.00 Movies**, select **My Performance Center**.

To learn more about My Performance Center, see "My Performance Center Overview" on page 564.

- "Join a running performance test" on page 565
- "Run a performance test" on page 566
- "View and download performance test results" on page 566

Join a running performance test

1. Select **Perspectives** > **Performance Tests**.
2. In the Test Runs view, identify the currently running test you want to join. Currently running tests display the **Running** state and the run name appears as a link.

Tip: To view all currently running tests, add the Currently Running Tests view to a User Perspective.

---

3 Click the run name to join the test. The Performance Test Run page opens, enabling you to view and manage the test. For user interface details, see "Performance Test Run Page" on page 358.

Run a performance test

1 Select **Perspectives** > **Performance Test**s.

2 In the Performance Test Set view, select an instance of the test you want to run, and click **Run Test**. The Select Timeslot dialog box opens, enabling you to select a timeslot for the test run. For user interface details, see "Select Timeslot Dialog Box" on page 372.

3 Select an available timeslot and click **Run**. The Initializing Run page opens. The Initializing Run page displays the performance test initialization steps performed by ALM Performance Center, and the status for each step. If each step is completed successfully, the performance test starts running and the Performance Test Run page opens. For user interface details, see "Initializing Run Page" on page 348.

View and download performance test results

1 Select **Perspectives** > **Performance Test**.

2 In the Test Runs view, select the completed test run whose results you want to view. The results are displayed in the Test Run Results view.

3 To download result files, click **Download**.

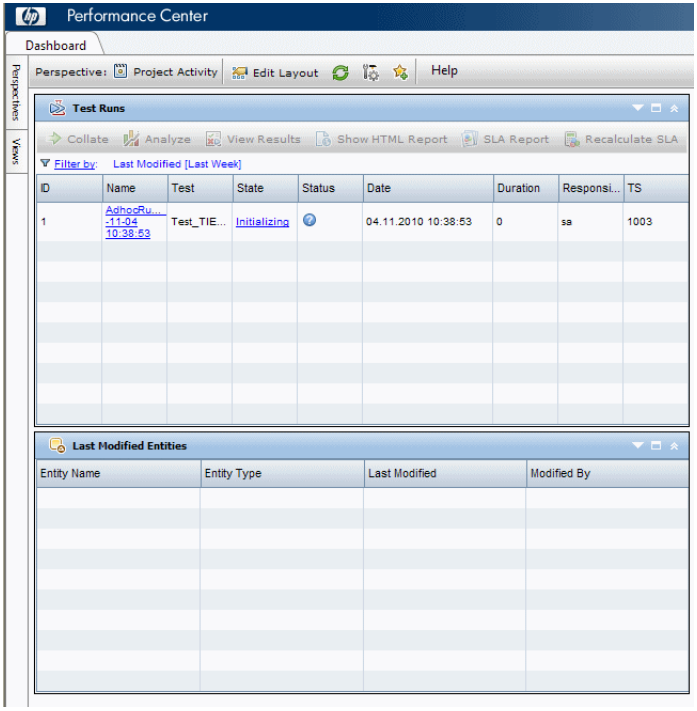
Reference

My Performance Center User Interface

This section includes:

My Performance Center Window

This section describes the My Performance Center window.



To access	**1** In your web browser, enter the Performance Center Server URL in the following format: http://<server name>/loadtest **2** Log in to your domain and project with your ALM credentials.
Important information	➤ If more than one Performance Center Server is installed in your system together with a load balancer, you should access My Performance Center by entering the load balancer's URL. Alternatively, you can also enter the server's defined internal URL. ➤ You must have the relevant permissions in order to login to My Performance Center. For more information, see the *HP Application Lifecycle Management Administrator Guide*.
Relevant tasks	"How to Work with My Performance Center" on page 565

User interface elements are described below:

UI Elements (A-Z)	Description
	**Edit Layout**. Enables you to drag and drop views.
	**Refresh.** Refreshes the current display.
	**Download Applications**. Opens the Download Applications window, enabling you to download standalone applications needed for working with ALM Performance Center.
	Open Menu. Opens a menu that contains the following options for managing the view: ➤  **Select Columns.** Enables you to select which columns to display in the view. ➤  **Refresh this View.** Refreshes the information displayed in the view. ➤  **Remove this View.** Removes the view.

UI Elements (A-Z)	Description
	**Show in Normal/Maximized View.** Alternates the view between normal and maximized.
	Minimizes or restores the view.
Perspectives	➤ **System Perspectives.** Enables you to select a predefined groups of views. The group of views are: ➤ **Project Activity.** Displays views related to project activity. ➤ **Performance Tests.** Displays views related to managing performance tests. ➤ **Test Resources.** Displays views related to managing test resources. ➤ **Trending.** Enables you to view performance trending information. ➤ **Lab Resources.** Displays views relating to managing lab resources. ➤ **Error Handling.** Displays views related to managing test errors. ➤ **Community.** Provides views that enable easy access to Performance Center RSS feeds, links to relevant groups and forums, and the product's Web site. ➤ **User Perspectives.** Enables you create a personalized group of views to suit your specific testing needs.
Views	Contains a list of the available views. For information about the available views, see "My Performance Center Views" on page 571.

My Performance Center Views

This section describes the views that are available in My Performance Center.

To access	In My Performance Center, select **Views**.
Important information	When a **System Perspective** is selected, the Views list is set to Read Only, and a check mark in the relevant check box identifies which views are included in the currently selected perspective. When creating a User Perspective, you use the check boxes to select which views to include in your perspective.

User interface elements are described below:

UI Elements (A-Z)	Description
AUT Hosts	Enables you to view and manage AUT hosts For more information about AUT Hosts, see "AUT Host Management" on page 861. **Appears in System Perspective:** Lab Resources
Currently Running Tasks	Enables you to keep track of currently running tasks in the system. **Appears in System Perspectives:** Project Activity, Error Handling
Event Log	Displays aa list of events generated for a specific test run selected in the Test Runs view. For more information about the Event Log, see "Initializing Run Page" on page 348. **Appears in System Perspective:** Error Handling **System Perspective filter.** Filter by date **User Perspective filters.** Filter by date, Filter by Related Test Runs

UI Elements (A-Z)	Description
Last Modified Entities	Enables you to keep track of changes to performance testing entities. **Appears in System Perspective:** Project Activity
Monitor Profiles	Enables you to create and manage existing monitor profiles. For more information about monitor profiles, see "Monitor Profiles" on page 73. **Appears in System Perspective:** Test Resources **System Perspective filter.** Filter by date **User Perspective filters.** Filter by date, Filter by Related Test Set
Performance Center Hosts	Enables you to view and manage Performance Center hosts. For more information about hosts, see "Lab Resource Management" on page 671. **Appears in System Perspectives:** Lab Resources Error Handling
Performance Test Set	Enables you to view and edit selected test instances within test sets. You can create, edit, rename, and remove test instances. You can also run tests directly from this view. For more details about working with test sets, see *HP Application Lifecycle Management User Guide*: . **Appears in System Perspective:** Performance Tests
Performance Trending	Enables you to create trend reports in order to identify performance improvements and regressions. For more information about trending, see "Trending" on page 575.

UI Elements (A-Z)	Description
Test Run Results	Displays result information for a test run selected in the Test Runs view. ➤ For information on viewing test runs and test run results, see *HP Application Lifecycle Management User Guide*. ➤ For information on managing test run results, see "Results/Last Run Results Tab" on page 354. **Appears in System Perspective:** Performance Tests **System Perspective filter.** Filter by date **User Perspective filter.** Filter by date
Test Runs	Enables you to view and manage results for individual test runs. ➤ For more information on viewing test runs and test run results, see *HP Application Lifecycle Management User Guide*. ➤ For information on managing test run results, see "Results/Last Run Results Tab" on page 354. **Appears in System Perspectives:** Project Activity, Performance Tests, Error Handling **System Perspective filter.** Filter by date **User Perspective filters.** Filter by date, Filter by Related Test Set
Timeslots	Enables you to view reserved timeslots for the project. For more information on timeslots, see "Reserving Timeslots" on page 95. **Appears in System Perspectives:** Project Activity, Performance tests, Lab Resources, Error Handling **System Perspective filter.** Filter by date **User Perspective filter.** Filter by date

UI Elements (A-Z)	Description
Topologies	Displays details about topologies defined in the system. For more information on topologies, see "Topologies" on page 45. **Appears in System Perspective:** Test Resources **System Perspective filter.** Filter by date **User Perspective filters.** Filter by date, Filter by Related Test Set
Topology Preview	Displays a preview of the topology defined in a performance test selected in the Performance Test Sets view. For more information on topologies, see "Topologies" on page 45.
VuGen Scripts	Enables you to view and upload VuGen scripts to ALM. For more information on managing scripts, see "VuGen Script Management" on page 37. **Appears in System Perspective:** Test Resources **System Perspective filter.** Filter by date **User Perspective filter.** Filter by date, Filter by Related Test Set

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Trending

This chapter includes:

Concepts

Reference

Concepts

Trend Reports Overview

The ALM Performance Center trend reports allow you to compare performance test run data over time, thereby giving you better visibility and control of your application's performance.

By comparing the same measurement in more than one instance of a test run, you can identify whether its performance trend is improving or regressing.

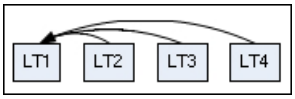
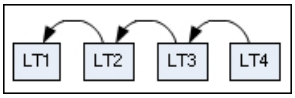
For example, if you were interested in the performance trend of the transaction response time measurement, the trend report clearly displays whether over several instances of a test run, this value has increased or decreased from one run to another - a performance regression or improvement respectively.

This section also includes:

- "Comparison Methods" on page 577
- "Trend Thresholds" on page 579
- "Custom Measurement Mapping" on page 580

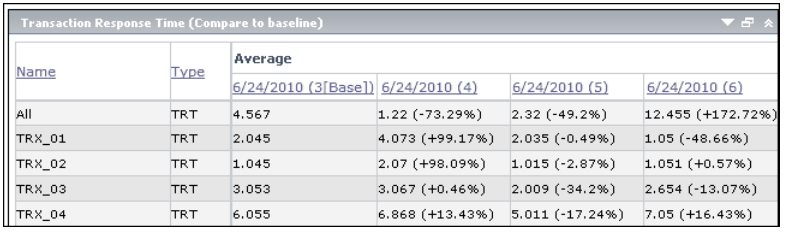
Comparison Methods

There are two methods of comparing measurements contained in a performance test run for the purposes of identifying performance trends: Compare to Baseline and Compare to Previous.

Comparison Method	Description
Compare to Baseline	You select one performance test run in the trend report and define it as the baseline. All measurements in the report are then compared to the measurements contained in the baseline. 
Compare to Previous	All measurements in a performance test are compared to the measurements in the performance test run that immediately precedes it in the report. 

It is important to understand the difference between the two comparison methods. The following example will illustrate how the same data can yield different results depending on the method you select.

As shown in the image below, the average Transaction Response Time measurement is being trended from four performance test runs: **3**, **4**, **5**, and **6**.



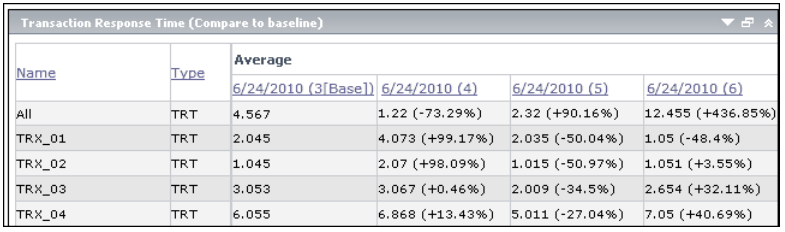
Transaction Response Time (Compare to baseline)

Name	Type	Average			
		6/24/2010 (3[Base])	6/24/2010 (4)	6/24/2010 (5)	6/24/2010 (6)
All	TRT	4.567	1.22 (-73.29%)	2.32 (-49.2%)	12.455 (+172.72%)
TRX_01	TRT	2.045	4.073 (+99.17%)	2.035 (-0.49%)	1.05 (-48.66%)
TRX_02	TRT	1.045	2.07 (+98.09%)	1.015 (-2.87%)	1.051 (+0.57%)
TRX_03	TRT	3.053	3.067 (+0.46%)	2.009 (-34.2%)	2.654 (-13.07%)
TRX_04	TRT	6.055	6.868 (+13.43%)	5.011 (-17.24%)	7.05 (+16.43%)

Performance test run (PT) **3** has been defined as the baseline (as indicated by the word **Base** in parentheses). The average transaction response times contained in the other performance test runs are compared to PT **3** only.

In PT **3**, the average transaction response time for **TRX_01** was **2.045**. The average transaction response time for the same transaction in PT **5** was **2.035**, which represents a slightly faster response time and therefore a slight improvement in the performance of this measurement. The percentage difference between the two figures is displayed in brackets, in this case **-0.49%**.

However, if the Compare to Previous comparison method was selected, then the average transaction response time in PT **5** would be compared not to PT **3**, but rather to PT **4** (since **4** precedes it in the table). The value for PT **4** is **4.073** while for PT **5** it's **2.035**, a percentage difference of **-50.04%**.



Transaction Response Time (Compare to baseline)

Name	Type	Average			
		6/24/2010 (3[Base])	6/24/2010 (4)	6/24/2010 (5)	6/24/2010 (6)
All	TRT	4.567	1.22 (-73.29%)	2.32 (+90.16%)	12.455 (+436.85%)
TRX_01	TRT	2.045	4.073 (+99.17%)	2.035 (-50.04%)	1.05 (-48.4%)
TRX_02	TRT	1.045	2.07 (+98.09%)	1.015 (-50.97%)	1.051 (+3.55%)
TRX_03	TRT	3.053	3.067 (+0.46%)	2.009 (-34.5%)	2.654 (+32.11%)
TRX_04	TRT	6.055	6.868 (+13.43%)	5.011 (-27.04%)	7.05 (+40.69%)

Using exactly the same data, the two comparison methods have yielded very different results. Only a slight improvement with the Compare to Baseline method (**-0.49%**), while a more significant improvement with the Compare to Previous method (**-50.04%**).

Trend Thresholds

To identify significant improvements or regressions in performance, you can define unique thresholds to track differentials between measurement being compared. If a differential exceeds a defined threshold, that value appears in a predetermined color, identifying it as an improvement, minor regression, or major regression.

For example, if you define an improvement threshold for comparing transaction response times as 50%, then any transaction response time that is 50% lower than that of the baseline or previous run (depending on the comparison method) will appear in the color you defined for improvements.

In the example below, the following performance thresholds for the transaction response time (TRT) measurement have been defined:

- **Improvement.** At least 90% decrease
- **Major Regression.** At least 50% increase

These threshold definitions mean that any performance improvements or regressions which exceeds these percentages will be displayed in color, making them more identifiable.

In the following table, the Compare to Previous comparison method is used.

Transaction Response Time (Compare to previous run)

Name	Type	Average		
		6/24/2010 (3[Base])	6/24/2010 (4)	6/24/2010 (5)
Action_Transaction	TRT	0.002	0.94 (+46900%)	0 (-100%)
All	TRT	0.002	0.311 (+15450%)	0 (-100%)

In the table above, we see that the value of the TRT measurement for the **Action_Transaction** in performance test run **4** is **46900%** higher than in performance test run **3** - a performance regression which far exceeds the defined threshold for major regressions. Therefore, the value appears in red, the default color for major regressions.

The corresponding value for performance test run **5** represents a **100%** improvement on performance test run **4.** Since this percentage exceeds the defined threshold for improvements, the value appears in green, the default color for improvements.

Custom Measurement Mapping

The Custom Measurement Mapping feature allows you to reconcile inconsistent transaction or monitor names between performance test runs, thereby allowing you to properly trend these measurements.

The following are two examples of when you would use the Custom Measurement Mapping feature:

➤ **Inconsistent transaction name**

You run a performance test that contains the transaction **BuyBook**. A while later you run the performance test again. However, in the time between the two performance test runs, the transaction name has been changed to **TRX_01_BuyBook**.

As a result of this inconsistent naming, you cannot obtain any trending information for this measurement, as Performance Center cannot recognize that the two transactions are actually the same, and compare them for trending purposes.

To overcome this problem, you map the two measurements (**BuyBook** and **TRX_01_BuyBook)** to a new third measurement which you create, for example **Buy_Book_mapped.** You add this new user-defined measurement to the trend report. Performance Center can then compare two instances of the **Buy_Book_mapped** transaction and give you meaningful trending information.

You can give the new transaction the same name as one of the current transactions. Additionally, you can configure the mapping so that all future instances of the transaction are automatically mapped to the new transaction name.

➤ **Inconsistent monitor name**

You want to compare your application's performance on different operating systems or when running against different Web/application servers.

You run the performance test once on a Windows platform, and then again on a UNIX platform. You then want to compare the CPU utilization between the two runs. However, each platform provides for a different name for this measurement, for example, **% Processor Time (Processor_Total)** in Windows and **CPU Utilization** in UNIX.

Performance Center cannot successfully obtain trending information for this measurement because the measurement names are different.

To overcome this problem, you map the two measurements (**% Processor Time (Processor_Total)** and **CPU Utilization**) to a third measurement which you create, for example **CPU_mapped.** You then add this new user-defined measurement to the trend report. Performance Center can then compare the two instances of the **CPU_mapped** transaction and give you meaningful trending information.

You can give the new monitor the same name as one of the current monitors. Additionally, you can configure the mapping so that all future instances of the monitor are automatically mapped to the new monitor name.

Reference

Trend by Quality Attributes Template - Trended Measurements

The following table shows which measurements are trended, and by which quality attribute the information is displayed when the Trend by Quality Attributes template is selected:

Quality Attribute	Trended Measurement
Performance	Transaction Response Time (compared to baseline). For more information on comparison methods, see "Comparison Methods" on page 577.
System Performance	CPU utilization Disk utilization Available memory
Availability	Transaction Summary (compared to baseline). For more information on comparison methods, see "Comparison Methods" on page 577.
Repeatability	Transaction Percentiles (compared to baseline). For more information on comparison methods, see "Comparison Methods" on page 577.
Stability	Errors Statistics Transaction Failures

Measurement Acronyms

The following table lists all the measurement acronyms that might be used in the trend report:

Data Type	Full Name	Initials
Vusers	Running Vusers	VU
Errors	Errors	ERR
Transactions	Transaction Response Time	TRT
	Transaction Per Second	TPS
	Transaction Summary	TRS
Web Resources	Hits per Second Throughput Connections	WEB
User defined data points	User Defined Data Points	UDP
System Resources	Windows Resources	WIN
	UNIX Resources	UNX
	Server Resources	SRVR
	SNMP	SNMP
	SiteScope	SiS
Firewalls	CheckPoint Firewall 1	FW
Web Server Resources	Apache	APA
	MS IIS	IIS
	iPlanet	PLA

Data Type	Full Name	Initials
Web Application Server Resources	Ariba	ARI
	ATG Dynamo	ATG
	BroadVision	BDV
	ColdFusion	CFU
	MS ASP	ASP
	Oracle Application Server	OAS
	SilverStream	SST
	Weblogic	WL
	Websphere	WS
Database Server Resources	DB2	DB2
	Oracle	ORA
	MS SQL	SQL
	Sybase	SYB
ERP/CRM Server Resources	SAP	SAP
	SAP Portal	SAPP
	SAP CCMS	CCMS
	SAP GUI	SAPU
	Siebel Web Server	SIEB
	Siebel Server Manager	SIEB
	PeopleSoft	PSFT
J2EE	Server Request	J2EE
.NET	Server Request	NET
Additional Components	COM+	COM
	.NET	NET

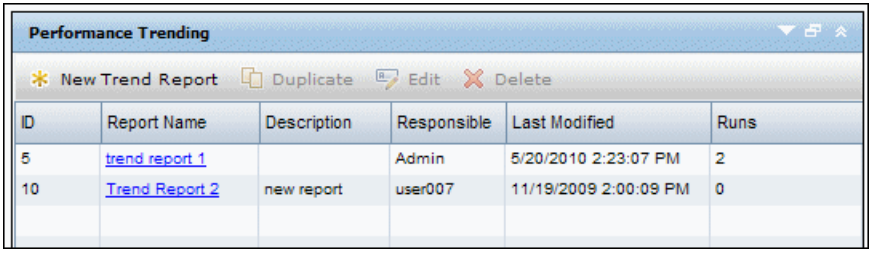
Data Type	Full Name	Initials
Application Deployment Solution	Citrix MetaFrame XP	CTRX
Middleware Performance	TUXEDO Resources	TUX
	IBM WebSphere MQ	MQ
Application Traffic Measurement	F5 BIG-IP	F5

Trend Reports User Interface

This section includes:

Performance Trending Page

This page enables you to manage trend reports. It displays a list of available reports, and enables you to create new reports, and to delete or duplicate existing reports.



To access	Use one of the following: ➤ On the ALM sidebar, under **Testing**, select **Test Lab**. Select the Test Runs tab, and on the toolbar, click the **Performance Trending** button . ➤ In My Performance Center, select **Perspective** > **Trending**. For more information, see "Personalizing Performance Center" on page 563.
Relevant tasks	"How to Manage a Performance Test Run" on page 340

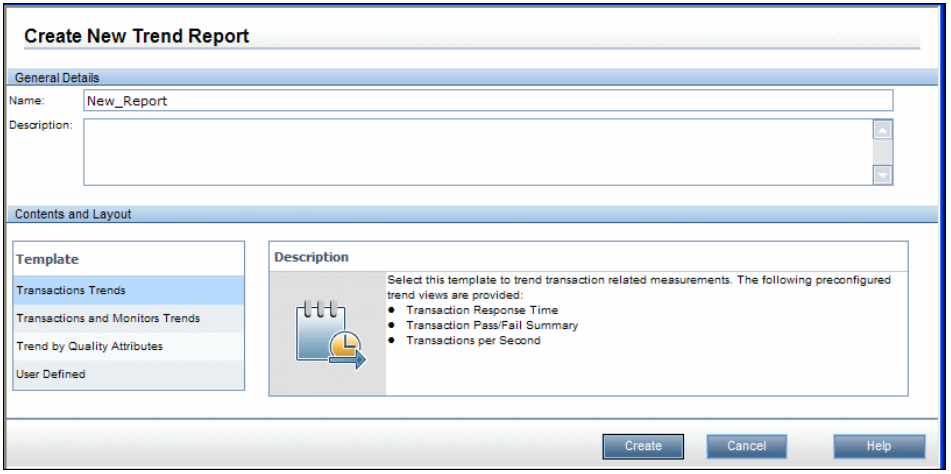
User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
<My Performance Center common UI elements>	For My PC menus and buttons, see "My Performance Center Window" on page 568.
New Trend Report	Opens the Trend Report creation page, which enables you to create trend reports.
Duplicate	Creates a duplicate of the selected report.

UI Elements (A-Z)	Description
	Enables you to edit the report details.
<Performance Trending table>	Displays a list of all available trend reports.
Description	A description of the report.
Last Modified	The date on which the report was last modified.
Responsible	The user who created the report
Report Name	The name of the report.
Runs	The number of trended runs contained in the report.

Create New Trend Report Page

This page enables you to create trend reports.



To access	**1** In My Performance Center, select **Perspectives** > **Trending**. **2** On the Performance Trending page, click the **New Trend Report** button .
Relevant tasks	"How to Manage a Performance Test Run" on page 340

General Details Pane

User interface elements are described below:

UI Elements (A-Z)	Description
Name	The name of the report.
Description	A description of the report.

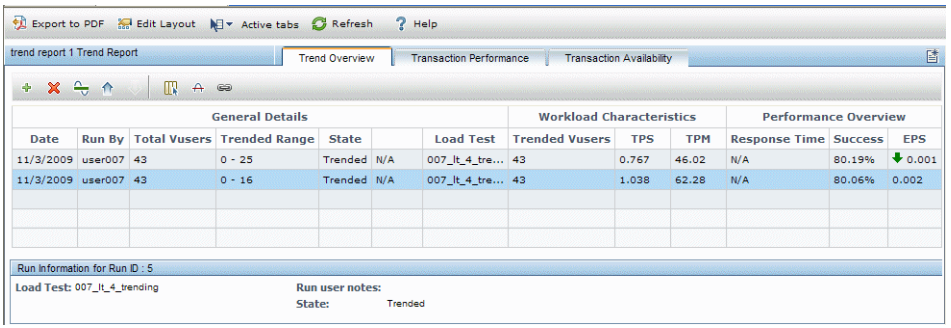
Contents and Layouts Pane

User interface elements are described below:

UI Elements (A-Z)	Description
Description	A description of the selected template.
Transaction Trends template	Provides trend views that display trending information for the following measurements: ➤ Transaction Response Time ➤ Transaction Pass/Fail Summary ➤ Transactions per Second
Transactions and Monitors Trends template	Provides trend views that display trending information for the following measurements: ➤ Transaction Response Time ➤ Transaction Summary ➤ System Resources (specifically: CPU utilization, Disk utilization, and Available memory
Trend by Quality Attributes template	Provides trend views that display trending information from the point of view of quality attributes. For a table which displays which measurements are trended and by which quality attribute, see "Trend by Quality Attributes Template - Trended Measurements" on page 582.
User Defined template	This template provides only the basic layout for the report with no further predefined tab or trend view configuration.

<Report Name> Trend Report

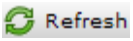
This page enables you to manage the test runs that are included in the report, as well as to manage the trend views which display the trending information.



To access	**1** In My Performance Center, select **Perspectives** > **Trending**. **2** On the Performance Trending page, in the Trend Reports grid, click the name of the report to open. The report opens as an additional tab on the My Performance Center Dashboard.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
Export to PDF	Exports the report to PDF format.
Edit Layout	Enables you to drag and drop trend views within a trend view tab.
Active tabs	Enables you to view tabs that are not currently displayed. **Note:** A maximum of five tabs can be displayed at one time.

UI Elements (A-Z)	Description
	Refreshes the information contained in the report.
	**Add a New Tab.** Adds a new tab to the report.
<Trend Views>	Trend views are display items that present trending information, and are contained within the <trend view tabs>. For more information, see "Trend Views" on page 596.
<Trend View tabs>	The <trend view tabs> contain the trend views and are defined by the template on which the report is based. For more information, see "Trend View Tabs" on page 595.
Trend Overview tab	The Trend Overview tab displays the test runs trended in the report, and provides options for managing the test runs. For more information, see "Trend Overview Tab" on page 591.

Trend Overview Tab

The Trend Overview tab is used for managing the information contained in the trend report.

To access	The Trend Overview tab is displayed by default when you access a <report name> Trend Report.
Important information	The Trend Overview tab is common to all trend reports, irrespective of which template is selected.
See also	"<Report Name> Trend Report" on page 590

User interface elements are described below:

UI Elements (A-Z)	Description
	**Add runs to trend report.** Opens the Select Test Runs to Trend Report dialog box. For user interface details, see "Select Test Runs to Trend Report Dialog Box" on page 606.
	**Remove run from trend report.** Remove test runs from the trend report.
	**Set run as baseline.** Sets the selected test run as the baseline run for comparing test runs. For more information on comparison methods, see "Comparison Methods" on page 577. **Note:** The first run which is added to the report is automatically defined as the baseline.
	**Move Run Up/Down.** Moves the selected test run up or down in the run order. Changing the position of the test run may have an effect on the comparison value when the Compare to previous method is selected. For more information on comparison methods, see "Comparison Methods" on page 577.
	**Customize Table Columns.** Customizes which columns appear in the Trended Runs table. For user interface details, see "Select Columns Dialog Box" on page 602.
	**Set Threshold.** Opens the Threshold Settings dialog box, which enables you to define the thresholds to be used for identifying performance improvements and regressions. For user interface details, see "Threshold Settings Dialog Box" on page 609.
	**Customize Measurement Mapping.** Opens the Custom Measurement Mapping dialog box, which enables you to define and customize mapped measurements. For user interface details, see "Custom Measurement Mapping Dialog Box" on page 611.

UI Elements (A-Z)	Description
<**Trended runs table**>	Displays information for all trended test runs in the report. It is divided into three section, **General Details**, **Workload Characteristics**, and **Performance Overview**.
General Details	Columns in this section display general information relating to the test run. For a list of the available fields under this section see **Customize Table Columns** above.
Performance Overview	Columns in this section contain information relating to the overall performance of your application. The purpose of this section is to provide you with basic overview trending information without having to open a trend view. The basic trend information is shown by upward or downward arrows that indicate performance improvements or regressions with regards the baseline only. For more information on comparison methods, see "Comparison Methods" on page 577. For a list of the available fields under this section see **Customize Table Columns** above.

UI Elements (A-Z)	Description
Run Information pane	Displays details for the selected test run. The following information is displayed: ➤ **Performance Test Set.** The test set from which the test was run. ➤ **Test.** The name of the test. ➤ **Comments.** Comments about the test run. ➤ **Run Date.** The date of the test run. ➤ **State.** The publish state of the run. Either **Trended** or **Not Trended**. If Not Trended, then the reason for this error appears in this field. A link appears to republish the run after you have fixed the error.
Workload Characteristics	Columns in this section are intended to display enough information in order for you to identify whether the test runs are similar enough in terms of workload, and therefore suitable for trending. The values displayed in this section are relevant only for the selected time range. Changing the selected time range will likely lead to different results. For more information on the Define Time Range filter, see "Select Test Runs to Trend Report Dialog Box" on page 606. For a list of the available fields under this section see **Customize Table Columns** above.

Trend View Tabs

A report tab can contain any number of trend views. The tabs are defined by the template on which the report is based, and which sets the name of the tab and automatically includes trend views that are related to it's name.

To access	**1** In My Performance Center, select **Perspectives** > **Trending**. **2** On the Performance Trending page, in the Trend Reports grid, click the name of the report to open. The report opens as an additional tab on the My Performance Center Dashboard. The trend view tabs are displayed by default.
Important information	The trend view tabs which appear by default depend on which template the report is based on.
See also	"<Report Name> Trend Report" on page 590

User interface elements are described below:

UI Elements (A-Z)	Description
<tab management menu>	Right-click a tab name to open the tab management menu, which contains the following options: ➤ **Add View to Tab.** Opens the Add Trend Views to Tab dialog box. For user interface details, see "Add Trend Views to Tab Dialog Box" on page 613. ➤ **Edit Tab Title.** Enables you to change the name of the tab. ➤ **Move Tab Left.** Moves the tab left in the tab order. ➤ **Move Tab Right.** Moves the tab right in the tab order. ➤ **Delete This Tab.** Deletes the tab and all of the trend views contained in it, from the report.
<Trend view>	A display item that presents trending information. For more information, see "Trend Views" on page 596.

Trend Views

A trend view is a display item that presents trending information for a particular performance metric, for example, transaction response time.

To access	**1** In My Performance Center, select **Perspectives** > **Trending**. **2** On the Performance Trending page, in the Trend Reports grid, click the name of the report to open. The report opens as an additional tab on the My Performance Center Dashboard. The trend view tabs are displayed by default. Trend Views are contained within the trend view tabs. The trend view tabs are displayed by default.
See also	"<Report Name> Trend Report" on page 590

Edit Trend View Menu

This menu contains options that enable you to edit the trend view's display and comparison settings.

To access	On the trend view, click the **Open edit menu** button .

User interface elements are described below:

UI Elements (A-Z)	Description
3D Mode (stacked bar chart view only)	Enables you to view the chart in 3D.
Color Trends (table view only)	Activates the trend report's threshold settings. For more information about thresholds, see "Trend Thresholds" on page 579.
Compare to baseline/previous (table view only)	Enables you to change the comparison method displayed in the trend view. For more information on comparison methods, see "Comparison Methods" on page 577.
Delete Trend View	Deletes the trend view.

UI Elements (A-Z)	Description
Do not show difference (table view only)	Enables you to hide value differentials between test runs. It is recommended to use this setting when exporting the report to a CSV format.
Edit Display Setting	Enables you to change the appearance of the trend view. The available settings are: ➤ **Table view.** This view is best suited for displaying comparisons between measurements. You can view threshold settings in this view only. For more information, see "Display Setting: Table" below. ➤ **Line graph view.** This view is best suited for displaying trending information graphically over a timeline. For more information, see "Display Setting: Line Graph" below. ➤ **Stacked bar chart view.** This view displays trending information graphically over a timeline. It is best suited for trending a small number of multiple measurements. For more information, see "Display Setting: Stacked" below.
Edit Trend View Title	Enables you to edit the trend view title.
Export to CSV (table view only)	Enables you to export the report to a CSV format.
Select Measurements	Opens the Measurements Configuration dialog box, which enables you to add measurement to the trend view. For user interface details, see "Measurements Configuration Dialog Box" on page 615.
Show difference as value/percentage (table view only)	Enables you to define how to display value differentials between test runs in the trend view - as values or as percentages.
Show Values (stacked bar chart view only)	Enables you to view the measurement values on the actual bar columns.

Display Setting: Table

This section explains the Table trend view display setting.

To access	**1** On the trend view, click the **Edit Menu** button . **2** Select **Edit Display Setting**. **3** In the Edit Display Setting dialog box, select **Table**.
Important information	You can view threshold settings in table view only.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
<Measurement value name>	The name of the measurement value being trended, for example, minimum, maximum, average, and so on.
<Measurement value>	The actual value of the measurement being trended, and it's comparison value, displayed per test run. For more information about comparison methods, see "Trend Reports Overview" on page 576.
Name	The name of the measurement being compared.
Type	The type of measurement being compared.

Display Setting: Line Graph

This section explains the Line Graph trend view display setting.

To access	**1** On the trend view, click the **Edit Menu** button . **2** Select **Edit Display Setting**. **3** In the Edit Display Setting dialog box, select **Line**.
Important information	➤ When you hold the cursor over the line graph, a tooltip appears displaying the exact amount of units for that measurement, correct to the nearest test run on the timeline. In other words, if you hold the cursor near the left point of the line graph, you see the value of the first test run. ➤ When you click a section in the line graph/ measurement in the legend, it becomes highlighted, as does the corresponding section in the legend/line graph.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
<graph slope>	The upward or downward slope of the line represents an upward or downward change in the measurement's unit. For example, a higher transaction response time (which is a performance regression), or a higher transactions per second value (which is a performance improvement).
<x-axis>	Lists the test runs according to their run date.
<y-axis>	The relevant unit of measurement. **Example:** For the Transaction Response Time measurement, the y-axis values represent seconds, while for the transactions per second measurement, the values represent the number of transactions.
B	Displays the measurement in bold.

UI Elements (A-Z)	Description
C	Displays the color of the measurement as it appears in the graph. Click the colored square in the column to select a different color for the measurement.
Function	Displays the value of the measurement being trended.
Name	The name of the measurement.
Scale	Indicates the scale of the measurement. When viewing information in the line graph view, you can adjust the scale of any measurement to make comparing measurements more meaningful. To change the scale of a measurement, click the value in the column and select the desired scale from the Set Scale box that opens. You can also apply the selected scale to all the measurements in the graph.
Type	Contains an acronym that identifies the measurement type. For a full list of available acronyms, see "Measurement Acronyms" on page 583.
V	Determines whether the measurement is visible. All measurements are displayed by default. Clear the check box to hide a measurement.

Display Setting: Stacked

This section explains the Stacked Bar Chart trend view display setting.

To access	**1** On the trend view, click the **Edit Menu** button . **2** Select **Edit Display Setting**. **3** In the Edit Display Setting dialog box, select **Stacked**.
Important information	➤ If different values are selected for the same measurement (for example, **Maximum** and **Average** transaction response times), then the measurements appear as stacked bars. That is, the values appear above each other for the bar that represents the transaction response time measurement for a specific test run. ➤ When you hold the cursor over a bar, a tooltip appears which displays the exact number of units for that measurement, correct for that test run. ➤ When you click a section in the bar chart/ measurement in the legend, it becomes highlighted, as does the corresponding section in the legend/bar chart.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
<bar height>	The height of the bar represents the change in the measurement's unit. For example, a higher transaction response time, which represents a performance regression, or a higher transactions per second value, which represents a performance improvement.
<x-axis>	Lists the test runs according to their run date.
<y-axis>	The relevant unit of measurement. **Example:** For the Transaction Response Time measurement, the y-axis values represent seconds, while for the transactions per second measurement, the values represent the number of transactions.

UI Elements (A-Z)	Description
C	Displays the color of the measurement as it appears in the graph. Click the colored square in the column to select a different color for the measurement.
Function	Displays the value of the measurement being trended.
Name	The name of the measurement.
Scale	Indicates the scale of the measurement. When viewing information in the line graph view, you can adjust the scale of any measurement to make comparing measurements more meaningful. To change the scale of a measurement, click the value in the column and select the desired scale from the Set Scale box that opens. You can also apply the selected scale to all the measurements in the graph.
Type	Contains an acronym that identifies the measurement type. For a full list of available acronyms, see "Measurement Acronyms" on page 583.
V	Determines whether the measurement is visible. All measurements are displayed by default. Clear the check box to hide a measurement.

Select Columns Dialog Box

This dialog box enables you to select columns to be displayed in the <report name> Trend Report's Trend Overview tab.

To access	On the <report name> Trend Report, select the **Trend Overview** tab, and click the **Customize table columns** button .
Important information	Due to space limitations, the names of the columns in the Trend Overview tab may differ from how they appear in this dialog box. In these cases, column names as they appear in the Trend Overview tab appear in parentheses.
See also	"<Report Name> Trend Report" on page 590

Select Columns for 'General Details' Section

User interface elements are described below:

UI Elements (A-Z)	Description
Test Name (Test)	The name of the test.
Project Name (Project)	The name of the project in which the test was run.
Publish State (State)	Indicates whether the test run was successfully added to the report or not, either **trended** or **not trended** respectively. A test run that was not successfully added appears in red and a tooltip displays the reason. **Note:** Displayed by default.
Run By	The name of the user who ran the test. **Note:** Displayed by default.
Run Date (Date)	The date of the load test run. **Note:** Displayed by default.
Run Duration (Duration)	The duration of the test run, in minutes. **Note:** Displayed by default.
Run ID	The run ID. **Note:** Displayed by default.
Total Vusers in Run (Total Vusers)	The number of Vusers in the test run, within the selected time range.
Trended Time Range (Trended Range)	The time range within the test run that is selected for trending.

Select Columns for 'Workload Characteristics' Section

User interface elements are described below:

UI Elements (A-Z)	Description
Hits per Second (HPS)	The average number of hits per second within the trended time range.
Passed Transactions per Minute (TPM)	The number of transactions that passed per minute of the test run within the selected time range. **Note:** Displayed by default.
Passed Transactions per Second (TPS)	The number of transactions that passed per second of the test run within the selected time range. **Note:** Displayed by default.
Throughput per Second (Throughput per Sec.)	The amount of throughput per second within the selected time range.
Total Hits (Hits)	The total number of hits per second within the trended time range.
Total Number of Transactions (Transactions)	The total number of transactions in the test run that passed, failed or stopped within the selected time range. **Note:** Displayed by default.
Total Throughput (Throughput)	The total throughput within the trended time range.
Total Vusers in Trended Range (Trended Vusers)	The maximum number of running Vusers within the trended time range. **Note:** Displayed by default.

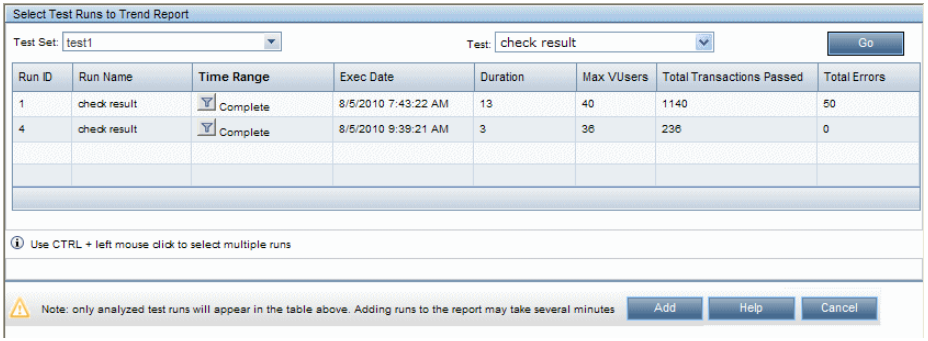
Select Columns for 'Performance Overview' Section

User interface elements are described below:

UI Elements (A-Z)	Description
Average Transaction Response Time (Response Time)	The weighted average transaction response time for all the transactions within the selected time range. **Note:** Displayed by default.
Errors per Second (EPS)	The average amount of errors per second within the selected time range. **Note:** Displayed by default.
Failed Transactions (Failed)	The actual amount of transactions that failed within the selected time range.
Passed Transactions (Passed)	The actual amount of transactions that passed within the selected time range.
Total Errors (Errors)	The total number of errors within the selected time range.
Transaction Success Rate (Success)	The percentage of the total amount of transactions that passed within the selected time range. **Note:** Displayed by default.

Select Test Runs to Trend Report Dialog Box

This dialog box enables you to add performance test runs to the report.



To access	**1** In My Performance Center, select **Perspectives** > **Trending**. **2** On the Performance Trending page, in the Trend Reports grid, click the name of the report to open. The report opens as an additional tab on the My Performance Center Dashboard. **3** On the <report name> Trend Report, select the **Trend Overview** tab, and click the **Add runs to trend report** button .
Important information	➤ In order to add performance test runs to the trend report, there must be a data processor present in your project pool. ➤ The process whereby ALM Performance Center extracts the performance test data from Analysis is very labor intensive on the data processor, and may take anywhere from several minutes to over an hour. It is recommended that you use a machine dedicated for this purpose. ➤ ALM Performance Center extracts the performance test data from Analysis using a granularity of 16 seconds. This value might be different from the defined granularity in Analysis, and may lead to slight variations when comparing values between Analysis and ALM Performance Center.

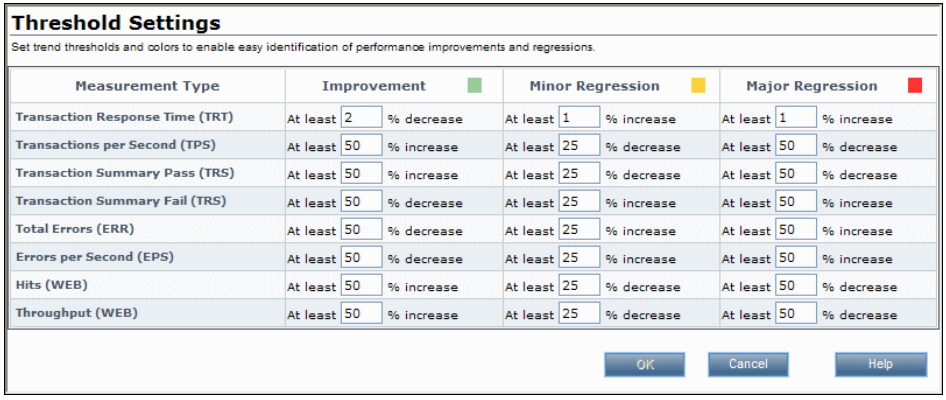
User interface elements are described below:

UI Elements (A-Z)	Description
Go	Populates the test runs table with all analyzed instances of the selected test.
Add	Adds the selected test runs to the trend report.
	**Time Range filter.** Opens the Define Time Range dialog box, which enables you to change the defined time range within a test run for trending purposes. In the Define Time Range dialog box, select one of the following options: ➤ **Trend Complete Run.** Makes all data collected from the beginning to the end of the test run available for trending. ➤ **Trend Part of Run**. Makes only part of the test run available for trending. Select the desired part of the run to trend by entering the start and end times in the **Start Time** and **End Time** boxes.
Duration	The duration (in minutes) of the test run.
Exec Date	The date of the test run.
Exec Time	The time of test run.
Max Vusers	The maximum number of running Vusers during the test run.
Run ID	The Run ID.
Run Name	The name of the test run.
Test	The tests contained in the selected test set.
Test Set	A list of available test sets from which to select test instances to trend.

UI Elements (A-Z)	Description
Time Range	The duration of the test run that is selected for trending. **Example:** If a test run's overall duration is 30 minutes, and the time range is defined as **0-15min**, then only the first 15 minutes of the test run will be considered for trending. **Default:** The whole test run in selected.
Total Errors	The total number of errors during the test run.
Total Transactions Passes	The total number of passed transaction during the test run.

Threshold Settings Dialog Box

This dialog box enables you to define which percentage differentials between measurement constitute significant improvements or regressions in performance.



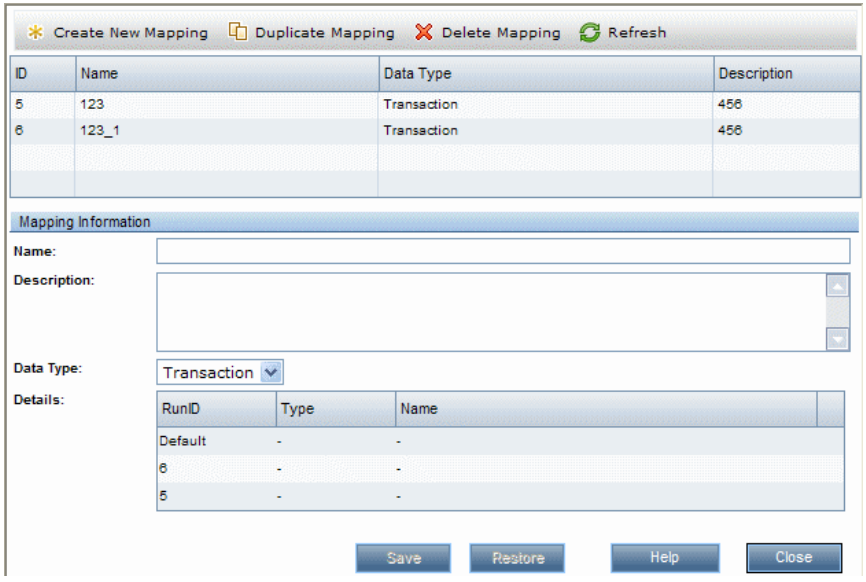
To access	**1** In My Performance Center, select **Perspectives** > **Trending**. **2** On the Performance Trending page, in the Trend Reports grid, click the name of the report to open. The report opens as an additional tab on the My Performance Center Dashboard. **3** On the <report name> Trend Report, select the **Trend Overview** tab, and click the **Set Thresholds** button .
Important information	The threshold definition and color settings are applied on a global level and hold true across all trend views in the report.

User interface elements are described below:

UI Elements (A-Z)	Description
Improvement	Enter the percentage differential that between instances of the measurement that will be considered an improvement in performance.
Major Regression	Enter the percentage differential that between instances of the measurement that will be considered a major regression in performance.
Measurement Type	The type of measurement.
Minor Regression	Enter the percentage differential that between instances of the measurement that will be considered a minor regression in performance.

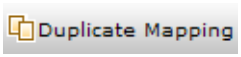
Custom Measurement Mapping Dialog Box

This dialog box enables you to map measurements with different names to a new single measurement which you create.



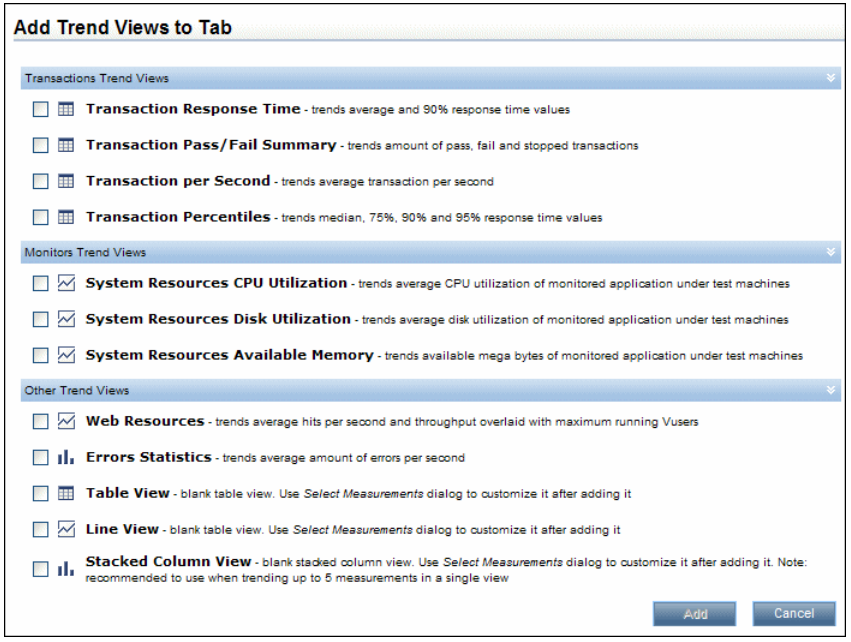
To access	
	1 In My Performance Center, select **Perspectives** > **Trending**. **2** On the Performance Trending page, in the Trend Reports grid, click the name of the report to open. The report opens as an additional tab on the My Performance Center Dashboard. **3** On the <report name> Trend Report, select the **Trend Overview** tab, and click the **Custom Measurement Mapping** button .

User interface elements are described below:

UI Elements (A-Z)	Description
	Opens the Add New Mapping dialog box, enabling you to create a new mapped measurement. In the Add New Mapping dialog box, enter the following information: ➤ **Name.** The name of the new mapped measurement. ➤ **Description.** A description of the new mapped measurement. ➤ **Data Type.** Select the measurement type: **Transaction**, **Monitor**, or **Other**.
	Creates a duplicate of the selected mapped measurement.
	Refreshes the mapped measurements table.
Date Type	The mapped measurement's data type.
Description	A description of the mapped measurement.
Details	A table which lists all the test runs in the trend report. The runs appear in the same order as they appear in the Trend Overview tab. Click in the **Type** and **Name** fields to select which measurements to map to the mapped measurement. The following fields appear in the table: ➤ **Run ID.** The test run ID. ➤ **Type.** The measurement type. ➤ **Name.** The measurement name. **Note:** When you use the **Default** option, all future instances of the measurement are automatically mapped to the current settings.
ID	The mapped measurement's ID.
Name	The mapped measurement's name.

Add Trend Views to Tab Dialog Box

This dialog box enables you to add trend views to a trend report.



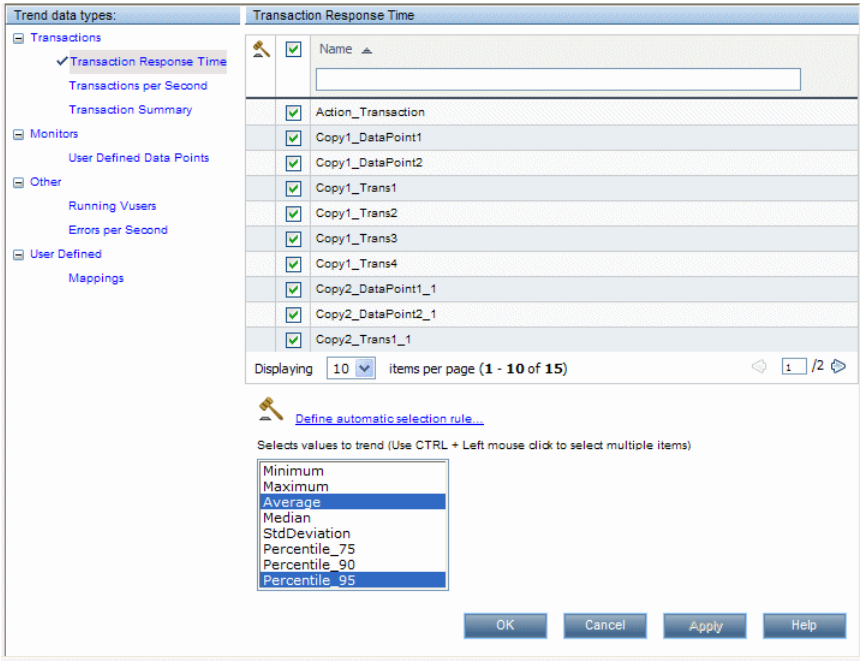
To access	
	1 In My Performance Center, select **Perspectives** > **Trending**. **2** On the Performance Trending page, in the Trend Reports grid, click the name of the report to open. The report opens as an additional tab on the My Performance Center Dashboard. **3** Select the desired trend view tab. **4** Click the **Tab Management Menu** button, and select Add Views to Tab.

User interface elements are described below:

UI Elements (A-Z)	Description
Monitors Trend Views	Trend measurements related to monitors.
Other Trend Views	Trend measurements other than transactions and monitor measurements (Web Resources and Error Statistics). Included in this section are three basic non-configured trend views, each one based on one of the trend view display options. You can select one of these trend views and customize it as desired.
Transaction Trend Views	Trend measurements related to transactions.

Measurements Configuration Dialog Box

Each trend view has a default set of measurements that it trends. This dialog box enables you to add additional measurements.



To access	
	1 In My Performance Center, select **Perspectives** > **Trending**. **2** On the Performance Trending page, in the Trend Reports grid, click the name of the report to open. The report opens as an additional tab on the My Performance Center Dashboard. The trend view tabs are displayed by default. Trend Views are contained within the trend view tabs. **3** On a trend view, select the menu button ,then select **Select Measurements**.

Trend Data Types Pane

The Trend Data Types pane contains a list of the measurements that are available for trending. Only measurements that contain data appear.

User interface elements are described below:

UI Elements (A-Z)	Description
Monitors	All monitor related measurements that contain data.
Others	All non-transaction/monitor measurements.
Transactions	All transactions that contain data.
User-Defined	This node appears only if you have mapped any measurements. For more information on mapped measurements, see "Trend Reports Overview" on page 576.

Measurement Selection Pane

User interface elements are described below:

UI Elements (A-Z)	Description
	**Rule.** This icon indicates that the measurement has already been selected using an automatic selection rule.
Define automatic selection rule	Opens the Automatic Selection Rule dialog box, which enables you use regular expressions to define a rule that automatically selects measurements to be included in the trend view. The automatic selection rule applies to measurements that are currently displayed in the trend report data, as well as any future measurements.
Name	The name of the available measurement.
Select values to trend	Displays the available values of the selected measurement which can be included in the trend view.

Part IX

Performance Center Administration

31

Performance Center Administration - Introduction

This chapter includes:

Concepts

Tasks

Reference

Concepts

Performance Center Administration Overview

Performance Center administration is performed in Lab Management. You must be a Performance Center administrator to perform these tasks.

Performance Center administrators are defined in the ALM Site Administration site. For details on how to create a Performance Center administrator user, see "How to Create Performance Center Administrators" on page 621.

Performance Center administration responsibilities include managing Performance Center lab resources, such as Performance Center hosts and hosts pools, creating and maintaining testing assets, and other administration tasks.

For details, see "How to Work with Performance Center Administration" on page 622.

Tasks

How to Create Performance Center Administrators

This task describes how to create a Performance Center administrator user, who is responsible for all **Performance Center administration** tasks in Lab Management and in Site Administration.

Note:

- This task is a prerequisite for the task, "How to Work with Performance Center Administration" on page 622.
- This task is performed in Site Administration. For details about logging in to and using Site Administration, refer to the *HP Application Lifecycle Management Administrator Guide*.

To create a Performance Center administrator user:

1. Log in to Site Administration.
2. In the **Site Users** tab, create a new user.
3. In the **Lab Management** tab, select the **Lab Management Users** tab.
4. Add the user you created in step 2, and select the **Project Administrator** option for the new user.

For Lab Management tab user interface details, see "Lab Management Tab" on page 627.

How to Work with Performance Center Administration

This section lists the tasks that a Performance Center administrator can perform.

This task includes the following steps:

Prerequisites

To perform any of these tasks, you must be a Performance Center administrator. For details on how to create a Performance Center administrator, see "How to Create Performance Center Administrators" on page 621.

Perform initial Performance Center configuration

Immediately after installing the Performance Center components, the relevant component's configuration tool opens, prompting you for initial configuration settings. If this configuration was skipped, you must configure the settings manually before you can start working with Performance Center.

For details, see "How to Initially Configure Performance Center" on page 635.

Create Performance Center projects and define project settings

You create projects in Site Administration, and define the limits and other settings for the project in Lab Management, in the Project Settings module. For details, see "How to Create a Performance Center Project" on page 640.

Manage and maintain Performance Center lab resources

You manage hosts, host pools, host locations, and relevant MI Listeners from the Lab Resources modules. For details, see "How to Manage Lab Resources" on page 674.

When you plan to perform maintenance tasks on the hosts—such as installing patches, rebooting hosts, and so on—it is recommended to reserve these hosts in timeslots. This way, you can be sure that they will be available for maintenance. For details, see "How to Reserve Maintenance Timeslots (Lab Management only)" on page 115.

View and manage performance test runs

The test runs from all the Performance Center in the system can be viewed and managed in Lab Management, in the Test Runs module. For details, see "Test Runs Module Window" on page 740.

View Performance Center usage reports

Performance Center usage reports provide you with an overall analysis of Performance Center site users, resource usage, concurrent resource usage vs. license limitations, timeslot usage, as well as resource usage by duration and runs. For details, see "How to View Reports and Set Report Filter Criteria" on page 751.

You can also export these reports to PDF and Excel format. For details, see "How to Export Reports to PDF or Excel Formats" on page 752.

Upload application patches

Before you can install application patches on Performance Center Servers and hosts, you must upload the patches to the system. For details, see "How to Upload Patches to ALM" on page 785.

Manage Performance Center Servers

You manage Performance Center Servers in Lab Management from the PC Servers module. For details, see "How to Manage Performance Center Servers" on page 799.

Manage Performance Center and Performance Center host licenses

You manage the Performance Center license and Performance Center host license in Lab Management from the Licenses module. For details, see "License Module Window" on page 827.

Manage Diagnostic Servers and Mediators

Integrating diagnostics modules with ALM enables monitoring and analysis of the performance of complex applications under test. For details on setting up the diagnostics modules, see Chapter 40, "Diagnostics Management."

Maintain system health

You track and maintain the health of the system in Lab Management, from the System Health module. For details, see "System Health Overview" on page 918.

Change the Performance Center system user

You use the System Identity Utility, installed on the Performance Center Server, to change the Performance Center system user on the Performance Center Server and hosts. For details, see "How to Change the System User" on page 898.

Update the Communication Security passphrase

You use the System Identity Utility, installed on the Performance Center Server, to update the Communication Security passphrase on the Performance Center Server and hosts. For details, see "How to Update the Communication Security Passphrase" on page 896.

Update the secure host communication settings

Initially, you define secure communication settings on each Performance Center host or standalone load generator using the Host Security Setup utility, installed locally on each host or load generator. For details, see "How to Configure Security Settings Locally on Hosts" on page 938.

To update these settings on all the hosts and load generators simultaneously, you can use the Host Security Manager, installed on the Performance Center Server. For details, see "How to Update Host Security Settings Remotely" on page 940.

Configure general Performance Center settings

You manage general Performance Center settings in Lab Management. On the masthead, select **Tools > Performance Center General Settings**. For user interface details, see "General Settings Dialog Box" on page 630.

Reference

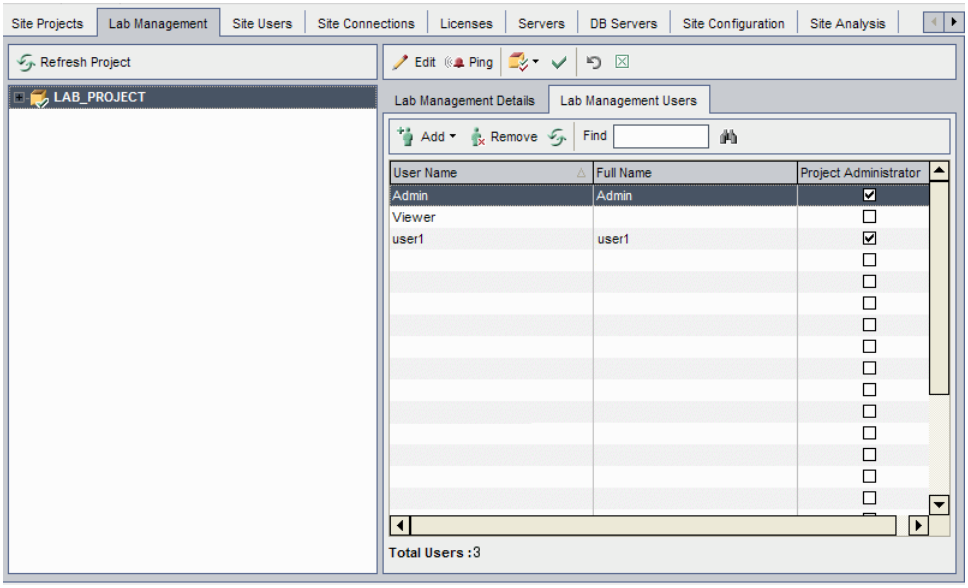
Performance Center Administration User Interface

This section includes:

Lab Management Tab

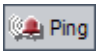
Lab Management is the area of ALM that enables all Performance Center administration, and is built in the LAB_PROJECT project.

The Lab Management tab in Site Administration enables you to manage LAB_PROJECT project details and define Lab Management users who are responsible for Performance Center administration tasks.



To access	In Site Administration, click the **Lab Management** tab.
Important information	The Lab Management tab is available only when the Performance Center extension is deployed on the ALM Platform.
Relevant tasks	"How to Create Performance Center Administrators" on page 621
See also	"Performance Center Administration Overview" on page 620

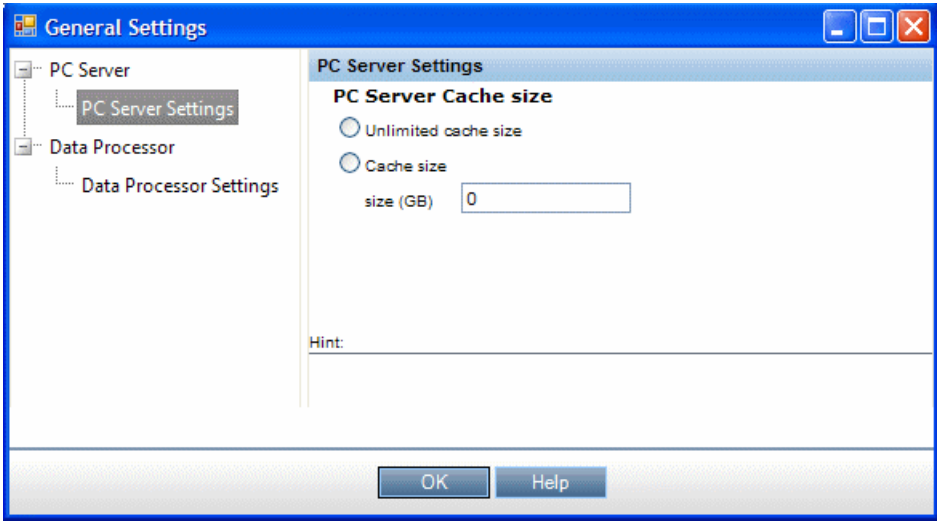
User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Edit Connection String.** Edits the connection string for Lab Management. For details on editing the connection string, refer to the *HP Application Lifecycle Management Administrator Guide*.
	**Ping Project.** Checks whether the project database is accessible from Site Administration.
	**Maintain Project.** Enables you to verify, repair, and upgrade projects. For details, see the *HP Application Lifecycle Management Administrator Guide*.
	**Activate/Deactivate Project.** When you deactivate LAB_PROJECT, users cannot log in to Lab Management. Any users currently connected to the project are forced to log out when you deactivate. LAB_PROJECT is not deleted from the server. In addition, users cannot connect to projects linked to LAB_PROJECT, and currently connected users are disconnected.
	**Restore Lab Project.** Restores access to LAB_PROJECT and adds it to the Lab Management tab in Site Administration. Restoring a LAB_PROJECT allows you to use only Performance Center projects that were created in the restored LAB_PROJECT. For more details on the restore process, refer to the *HP Application Lifecycle Management Administrator Guide*.
	**Remove Lab Project.** Removes LAB_PROJECT from the Lab Management tab in Site Administration. This does not delete LAB_PROJECT from the server and you can restore it if necessary. If the project is still active, you are prompted to deactivate it. Removing LAB_PROJECT deactivates all associated Performance Center projects. These projects can be enabled only by restoring this version of LAB_PROJECT.

UI Elements	Description
Lab Management Details tab	Enables you to view and edit LAB_PROJECT details for working with Lab Management. For more information on the viewing and editing project details, refer to the *HP Application Lifecycle Management Administrator Guide*.
Lab Management Users tab	Enables you to assign Lab Management users who are responsible for Performance Center administration. For more information, refer to the *HP Application Lifecycle Management Administrator Guide*.

General Settings Dialog Box

This dialog box enables you to define general settings for Performance Center.



To access	In Lab Management, on the ALM masthead select **Tools** > **Performance Center General Settings**
Important information	The settings defined here are general settings for all of the Performance Center system.
Relevant tasks	"How to Work with Performance Center Administration" on page 622
See also	"Performance Center Administration Overview" on page 620

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
PC Server > PC Server Settings page	Enables you to define Performance Center Server cache setting: ➤ **Unlimited cache size.** The Performance Center Server cache size is unlimited and the cache is not cleaned. ➤ **Cache size**. The Performance Center Server cache size in gigabytes.
Data Processor > Data Processor Settings page	Enables you to define data processor settings: ➤ **Data Processor Timeslot minimum length (minutes).** The minimum amount of time, in minutes, that a data processor timeslot should be allotted. ➤ **Timeout for pending data processor task (minutes).** The amount of time a data processing task should be allowed to remain in a pending state.

32

Initial Performance Center Configuration

This chapter includes:

Concepts

Tasks

Concepts

Initial Performance Center Configuration Overview

Immediately after installing the Performance Center Server and hosts, the relevant component's configuration tool opens, prompting you for initial configuration settings. If any parts of the configuration was skipped, you must configure the settings manually before you can start working with Performance Center.

You can perform the configuration by running the configuration tool on the relevant machine, or alternatively by defining the settings manually in Lab Management.

For details on running the relevant configuration tools, see the *HP ALM Performance Center Installation Guide*.

For details, on configuring the initial settings in Lab Management, see "How to Initially Configure Performance Center" on page 635.

Tasks

How to Initially Configure Performance Center

This task describes how to manually perform the initial configuration of the Performance Center Server and hosts in Lab Management.

This task includes the following steps:

1 Prerequisites

- The Performance Center Server and Performance Center hosts must be installed according to instructions provided in the *HP ALM Performance Center Installation Guide*.
- To perform any of these tasks, you must be a Performance Center administrator. For details on how to create a Performance Center administrator, see "How to Create Performance Center Administrators" on page 621.

2 Log into Lab Management

a Open your Web browser and type the ALM Platform URL in the following format:

```
http://<ALM Platform name>[<:port number>]/qcbin
```

b In the HP Application Lifecycle Management window that opens, click **Lab Management**.

c Enter your Performance Center Administrator user name and password and click **Login**.

3 Add the Performance Center Server(s) to ALM

On the Lab Management sidebar, under **Lab Settings**, select **PC Servers**, and add your Performance Center Server. For details on how to add a Performance Center Server, see "How to Manage Performance Center Servers" on page 799.

4 Add the Performance Center license and the host license

On the Lab Management sidebar, under **Lab Settings**, select **Licenses**.

Add the Performance Center license, and then the host license. For interface details, see "License Module Window" on page 827.

5 Add Performance Center hosts to the system

On the Lab Management sidebar, under **Lab Resources**, select **Hosts**. For user interface details, see "New Host Dialog Box (Lab Management Only)" on page 699.

33

Performance Center Project Settings

This chapter includes:

Concepts

Tasks

Reference

Concepts

Performance Center Project Settings Overview

Performance Center projects are ALM projects with the Performance Center project extension enabled. The project settings include:

- General project details
- Using IP addresses as targets for performance testing
- VUDs Vusers allocation to the project and usage
- Timeslot settings for the project
- Controller settings for the project

For task details, see "How to Create a Performance Center Project" on page 640.

This section also includes:

- "Using Target IP Addresses" on page 639

Using Target IP Addresses

Target IP addresses are assigned so that the addresses of all hosts on a given network share a common prefix. The common prefix defines the network portion of the IP address, and the remainder defines the host portion (also referred to as the local portion).

The term network in this context refers to a logical network which might span one or more physical networks. The network portion of an IP address identifies a site and the local portion identifies a single host at that site.

Using Subnet Masks

A site using subnet addressing must specify a 32-bit subnet mask for each network. Each bit in the subnet mask is set to 1 if the network treats the corresponding bit in the IP address as part of the network address or 0 if it treats the corresponding bit in the IP address as part of the host ID.

Consider, for example, the subnet mask

```
11111111 11111111 0000000 0000000
```

(or in decimal form, 255.255.0.0). This subnet mask specifies that the first two octets identify the network and the last two octets identify the host on that network.

The subnet mask 255.255.255.255 (or in binary form, 11111111 11111111 11111111 11111111), which you add when defining individual IP addresses, specifies that all four octets in the IP address identify the network and host as if there were no subnet mask. In practice, this means that null will use the exact IP address to target performance tests.

Tasks

How to Create a Performance Center Project

This task describes how to create a Performance Center project. You create Performance Center projects in Site Administration, and define project settings in Lab Management.

Note:

- This task is part of a higher level task. For details, see "How to Work with Performance Center Administration" on page 622.
- **Product Feature Movie.** To view a movie that demonstrates how to create a performance testing project, select **Help** > **Product Feature Movies** in the ALM main window. Under **HP ALM Performance Center 11.00 Movies** select **Project Setup**.

This task includes the following steps:

1 Log in to Site Administration

Open your Web browser and type the ALM Platform URL in the following format:

```
http://<ALM Platform name>[<:port number>]/qcbin
```

In the HP Application Lifecycle Management window, click **Site Administration**.

Enter your Site Administrator user name and password and click **Login**.

2 Create a project domain - optional

Click the **Create Domain** button and enter a name for the new domain, and click **OK**.

3 Create project administrator users

a Select the **Site Users** tab, and click the **New User** button. The New User dialog box opens.

b Enter the details of the project administrator user, and click **OK**.

c Select the user, click **Password** and enter the password. Click **OK**.

For more details, see *HP Application Lifecycle Management Administrator Guide*.

4 Create a new project

a Click the **Site Projects** tab, and select the domain in which you want to create the project.

b Click the **Create Project** button, and follow the steps to create the project. When prompted:

- Add the project administrator users you created above.
- **HP ALM**: Select **Performance Center Project Extension**.

For more details, see *HP Application Lifecycle Management Administrator Guide*.

5 Assign more project administrators to the project - optional

To add additional project administrators:

a Click the **Site Projects** tab.

b In the **Projects** list on the left, select the project you created.

c In the right pane, click the **Project Users** tab.

d Add another user, and select **Project Administrator**.

6 Define the project's settings

Performance Center projects are created with default settings which you can modify if desired. You define the project settings in Lab Management as follows:

a Log into Lab Management with your Performance Center administrator user name and password.

b On the Lab Management sidebar, under **Lab Settings**, select **Project Settings**.

c Define at least the following settings: Host limit, Vuser limit, and Concurrent Run limit

For user interface details, see "Project Settings Details Dialog Box" on page 650.

Note: Project administrators can view the project settings in the project in ALM, and can modify some of the project settings. To access the project settings in ALM, on the ALM masthead, select **Tools** > **PC Project Settings**.

---

7 Add and customize the project users

This step is performed by the project administrator. For details, see *HP Application Lifecycle Management Administrator Guide*.

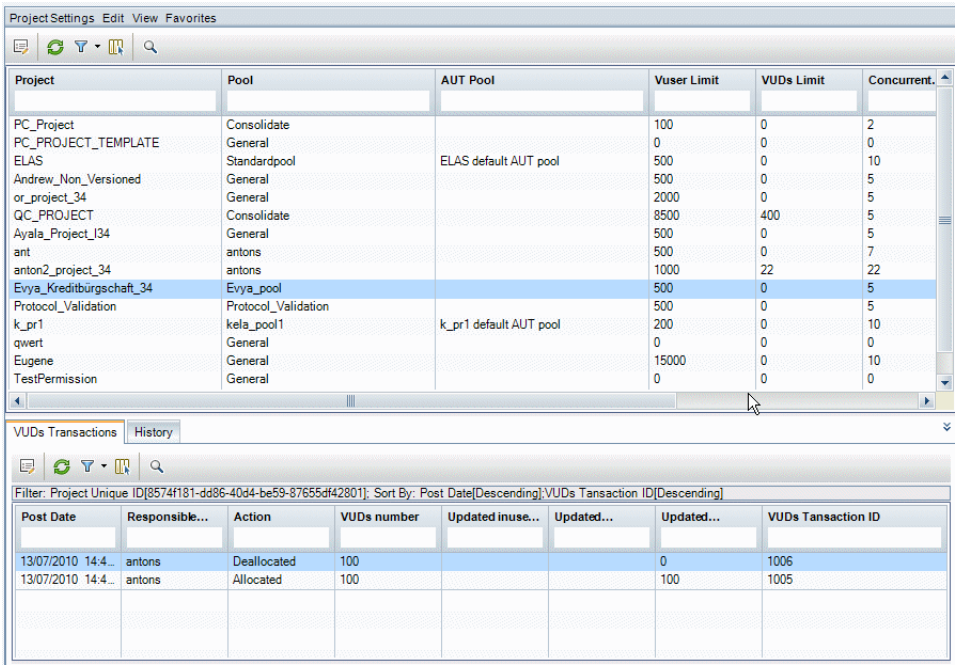
Reference

Performance Center Project Settings User Interface

This section includes:

Project Settings Module (Lab Management only)

This module enables you to view and manage all of the Performance Center projects and their settings.



To access	On the Lab Management sidebar, under **Lab Settings**, select **Project Settings**.
Important Information	This module displays a list of all of the Performance Center projects in ALM. Alternatively, you can access project settings from within a particular project.
Relevant tasks	"How to Create a Performance Center Project" on page 640
See also	"Performance Center Project Settings Overview" on page 638

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
<Project Settings module common UI elements>	➤ **Project Settings module fields.** For field definitions, see "Project Settings Module Fields" on page 645. ➤ **Project Settings module menus and buttons.** For command and button descriptions, see "Project Settings Module Menus and Buttons" on page 646. ➤ **ALM main menu and sidebar.** For details on the Tools menu, Help menu and sidebar, see the *HP Application Lifecycle Management User Guide*.
<Project Settings grid>	Displays a list of the Performance Center projects in ALM and their project settings.
VUDs transactions tab	Displays the VUDs transactions in each projects. For details, see "VUDs Transactions Page" on page 654.
History tab	Lists changes made to the currently selected project. For more details, see the *HP Application Lifecycle Management User Guide*.

Project Settings Module Fields

This section describes the Project Settings module fields:

Field	Description
AUT Pool	The project's AUT host pool.
Concurrent Run Limit	The maximum number of concurrent test runs allowed within a project.
Diagnostics Server	The Diagnostics Server defined for the project.
Domain Name	The domain in which the project was created.
Host Limit	The total number of hosts (Controller + load generators) reserved for a timeslot may not exceed this limit.

Field	Description
ID	The project's ID.
Pool	The project's host pool.
Project	The name of the project.
VUDs Consumed	The number of VUDs consumed by the project.
VUDs Limit	The maximum number of VUDs available to the project.
VuGen Working Mode	The mode to use to upload scripts from VuGen: ➤ **Runtime Files mode.** Uploads only the necessary files to replay the script correctly. ➤ **User Defined mode.** Uploads any available files including thumbnails images.
Vuser Limit	The maximum number of Vusers a project can run at once. The total number used by all of the project's concurrent performance tests must not exceed this limit.

Project Settings Module Menus and Buttons

The Project Settings module enables you to view and manage Performance Center project settings in ALM.

To access	➤ **Performance Center administrator**: On the Lab Management sidebar, under **Lab Settings**, select **Project Settings.** ➤ **Project administrator**: In ALM, on the masthead, select **Tools** > **Performance Center Project Settings**.
Important information	If you are a project administrator, you can view the project settings. You can also modify some of the settings.

Menus and toolbars of the Project Settings module are described below:

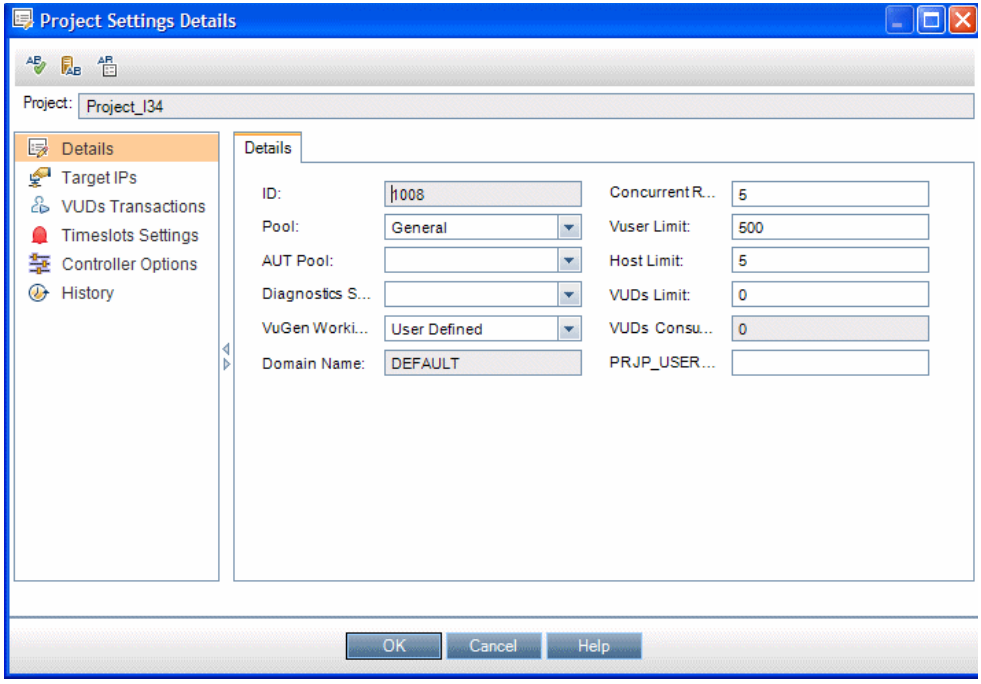
UI Elements (A-Z)	Where	Description
 **Project Settings Details**	Project Settings and <right-click menu>	Opens the Project Settings Details dialog box, enabling you to view and edit details of the selected project.
Add to Favorites	Favorites	Opens the Add Favorite dialog box, enabling you to add a favorite view to your private or the public folder. For details, see the *HP Application Lifecycle Management User Guide*.
Copy URL	Project Settings and <right-click menu>	Copies a selected project and pastes its URL as a link. The project itself is not copied. Instead, you can paste the address into another location, such as an email or a document. Clicking the link opens up ALM and takes you to the project file or folder. If you are not already logged in, ALM first prompts for login details.
Export	Project Settings and <right-click menu>	Opens the Export Grid Data dialog box, enabling you to export the project settings in the grid as a text file, Microsoft Excel worksheet, Microsoft Word document, or HTML document. Choose one of the following options: ➤ **All.** Exports all project settings in the grid. ➤ **Selected.** Exports selected project settings in the grid.

UI Elements (A-Z)	Where	Description
 **Find**	View	Opens the Find dialog box, enabling you to search for project settings in the module. For details about search options, see the *HP Application Lifecycle Management User Guide*.
Go to Project Settings	Project Settings	Opens the Go To Project Settings dialog box, enabling you to find a specific project settings record by its ID number.
Grid Filters	View and <right-click menu>	Enables you filter the data according to an entry in the filter box. For details about filtering options, see the *HP Application Lifecycle Management User Guide*.
Information Panel	View and <right-click menu>	Shows/Hides the Information Panel in the lower area of the module.
Organize Favorites	Favorites	Opens the Organize Favorites dialog box, enabling you to organize the list of favorite views by changing properties or deleting views. For details, see the *HP Application Lifecycle Management User Guide*.
Private	Favorites	Lists the favorite views that are accessible only to the user who created them.
Public	Favorites	Lists the favorite views that are accessible to all users.
 **Refresh All**	View	Refreshes the grid so that it displays the most up-to-date information.
Replace	Edit and <right-click menu>	In the Project Details grid, opens the Replace dialog box, enabling you to replace a field value in the grid. For more details, see the *HP Application Lifecycle Management User Guide*.

UI Elements (A-Z)	Where	Description
 **Select Columns**	View	Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For more details, see the *HP Application Lifecycle Management User Guide*. For details about the project setting fields, see "Project Settings Module Fields" on page 645.
 **Set Filter/Sort**	View	Enables you to filter and sort the project settings in the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For more details, see the *HP Application Lifecycle Management User Guide*.
Updated Selected	Edit and <right-click menu>	Opens the Update Selected dialog box, enabling you to update a field value for a multiple selection in the grid. For more details, see the *HP Application Lifecycle Management User Guide*.

Project Settings Details Dialog Box

This dialog box enables you to configure settings for a Performance Center project.



To access	**In Lab Management:** **1** On the sidebar, under **Lab Settings**, select **Project Settings**. **2** Right-click a project in the grid, and select **Project Settings Details**. **In ALM:** On the ALM masthead, select **Tools** > **Performance Center Project Settings**.
Important information	The Controller Options page is available only when logged in to a particular project. You cannot set Controller options in Lab Management.

Relevant tasks	"How to Create a Performance Center Project" on page 640
See also	"Performance Center Project Settings Overview" on page 638

Common Elements

Common user interface elements are described below (unlabeled elements are shown in angle brackets):

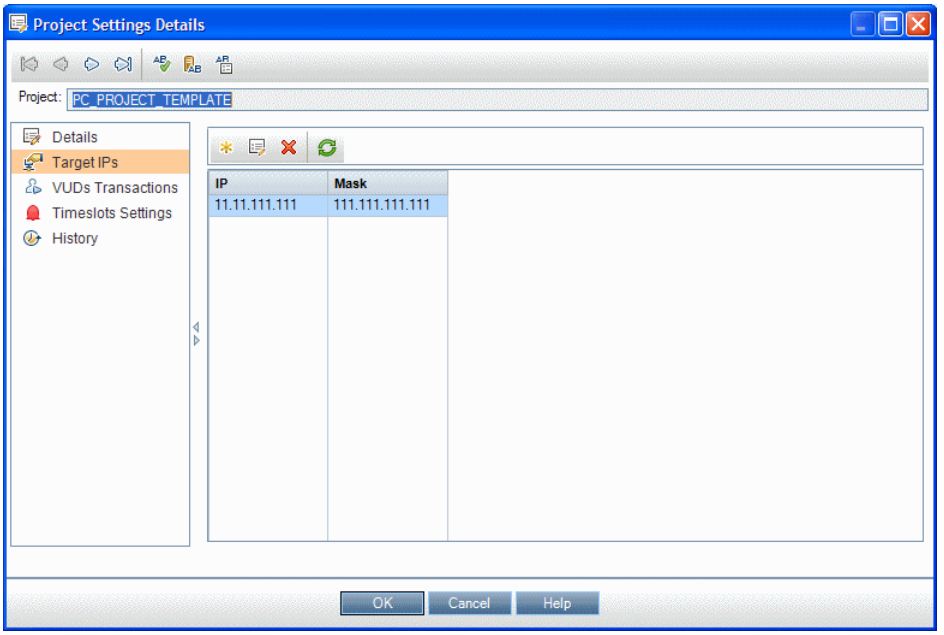
UI Elements	Description
	**First/Previous/Next/Last Entity.** Enables you to browse through the list of projects. **Available in:** Lab Management only
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Project	The name of the project.

Details Page

This page displays the general details about the selected project. For details, see "Project Settings Module Fields" on page 645.

Target IPs Page

This page enables you to define IP addresses to use as targets for performance testing.



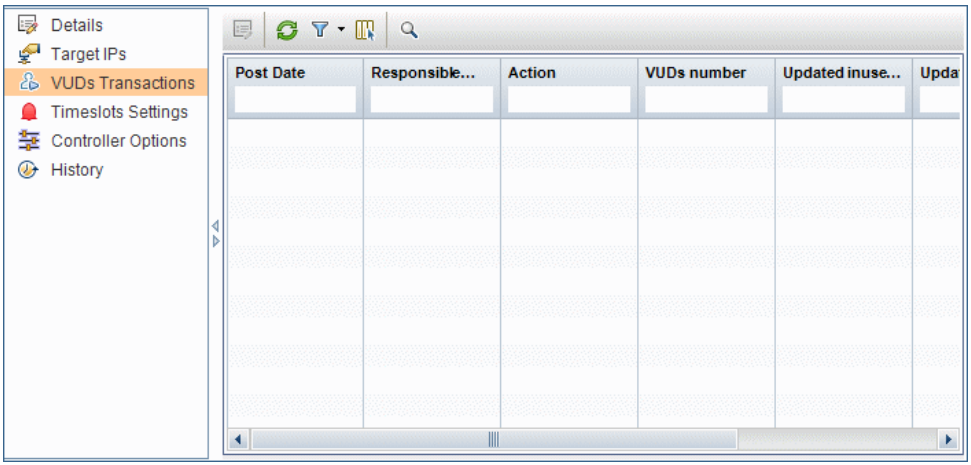
Important Information	Target IP can be defined on Performance Center hosts only, and not on standalone load generators.
Relevant tasks	"How to Create a Performance Center Project" on page 640
See also	"Using Target IP Addresses" on page 639

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**New.** Opens the New Target IP dialog box, enabling you to define an IP to use a target for performance testing.
	**Edit.** Opens the Target IP Details dialog box, enabling you to view and edit details of the selected target IP.
	**Delete.** Enables you to delete the selected target IPs.
	**Refresh.** Refreshes the grid so that it displays the most up-to-date information.
IP	A target IP address.
Mask	A 32-bit subnet mask for each network.

VUDs Transactions Page

This page enables you to follow the VUDs transactions in your projects.



User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
Action	The VUDs action performed. For details about the possible actions, see "VUDs Actions" below.
In Use by Run ID	The ID of the test run that is currently running the VUDs.
Owner Run ID	The ID of the test run that originally issued the VUDs.
Post Date	The date that the transaction occured.
Responsible user name	The user, or automaed system process responsible for the transaction.
Token Unique ID	Identifies all actions that belong to the same transaction. **Example:** In one regular run that uses VUDs, there are 3 Actions: Issued, Pending, and Expired. Each of these actions will have different transaction ID, but the same Token ID.

UI Elements (A-Z)	Description
Updated inuse VUDs	The current number of VUDs that are running as a result of the transaction.
Updated Pending VUDs	The current number of VUDs that are in the Pending state as a result of the transaction.
Updated project limit	The project's VUDs limit as a result of the transaction.
VUDs number	The amount of VUDs involved in the Action.
VUDs Tansaction ID	The action ID.

VUDs Actions

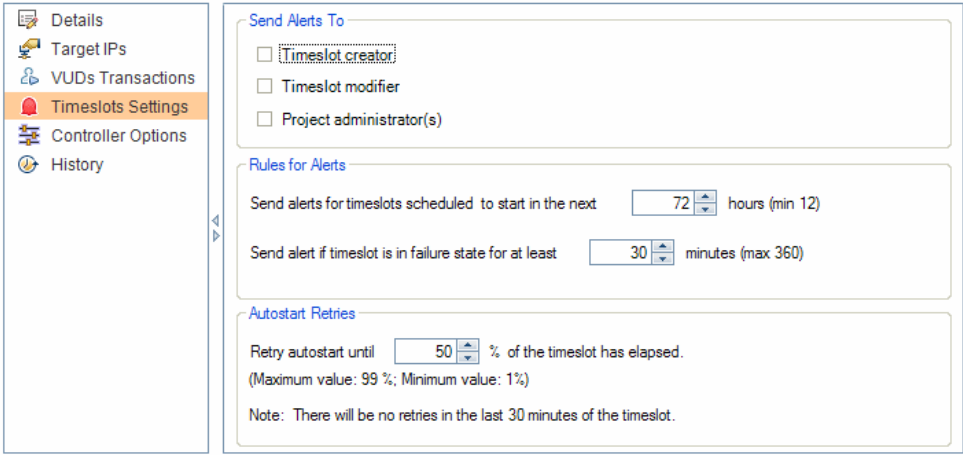
The following table lists the possible VUDs actions.

UI Elements (A-Z)	Description
Allocated	VUDs added to the project's VUDs limit by the administrator.
Deallocated	VUDs removed from the project's VUDs limit by the administrator.
Expired	VUD's removed from the license after their 24 hour active period has ended. **Note:** VUDs that are involved in a performance test that exceeds 24 hours continue to run until completion before expiring.
Issued	VUDs added to a performance test. **Notes:** ➤ All VUDs involved in a performance test are considered to be issued from the start of the test, irrespective of whether they have started running or not. ➤ The amount of issued VUDs decreases the project's VUDs limit accordingly. ➤ All unused VUDs are returned to the project's VUDs limit at the conclusion of the test.

UI Elements (A-Z)	Description
Pending	VUDs which have completed a test run but are still available for further use as their 24 hour active period has not yet ended.
Refunded	VUDs which were issued but not used in the test. These VUDs are returned to the project's VUDs limit and may be reissued at a later date.
Reused	Running VUDs that that are taken from VUDs in the Pending state. **Note:** ALM Performance Center first reuses VUDs in the Pending state before issuing new VUDs. For example, assume you define a performance test that includes **100** VUDs, where the current project limit is **200**, and where **25** VUDs are currently in the Pending state. ALM Performance Center first resues the **25** Pending VUDs and only issues **75** from the license. The new limit will be **125**.

Timeslot Settings Page

This page enables you to configure timeslot settings.



User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Send Alerts To	The users who should receive a timeslot alert: ➤ **Timeslot creator.** The user who reserved the timeslot. ➤ **Timeslot modifier.** The user who last modified the timeslot. ➤ **Project administrators.** Administrators of the project in which the timeslot was reserved.
Rules for Alerts	The conditions under which timeslot alerts are sent (both conditions must hold): ➤ **Send alerts for timeslots scheduled to start in the next <XX> hours.** Sends an alert when a timeslot is XX hours within its due time to start. **Default value:** 72 hours **Minimum value:** 12 hours ➤ **Send alert if timeslot is in failure state for at least <XX> minutes.** Sends an alert when the timeslot has been invalid for XX minutes. **Default value:** 30 minutes **Maximum value:** 360 minutes (6 hours)
Autostart Retries	If a performance test linked to a timeslot is scheduled to autostart but does not start running, the system continues to try to autostart the test until it starts running successfully. The **Autostart Retries** option enables you to specify when the system should **stop trying** to autostart the test. In any event, retries are stopped if there are 30 minutes or less left of the timeslot. **Default value:** 50%, that is the system stops retries when half the timeslot has elapsed. **Maximum value:** 99%; **Minimum value:** 1% **Note:** The system tries to restart a performance test up to three times.

Controller Options Page

This page enables you to configure global Controller options for your Performance Center project.

Note: This page is available only when logged in to a particular Performance Center project. You cannot set Controller options in Lab Management.

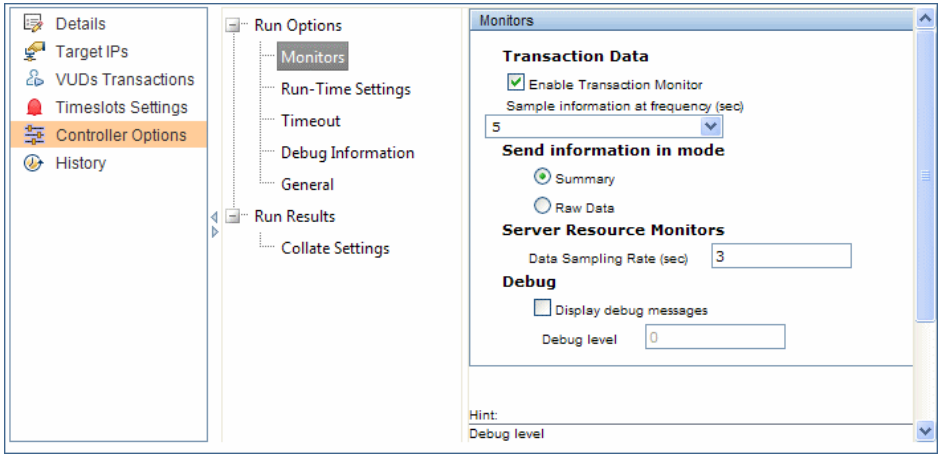
For details, see "Project Settings > Controller Options Page" on page 659.

History Page

This page lists changes made to the project. For more details, see the *HP Application Lifecycle Management User Guide*.

Project Settings > Controller Options Page

This page enables you to configure global Controller options for your Performance Center project.



To access	On the ALM masthead, select **Tools** > **PC Project Settings**. In the Project Settings Details dialog box that opens, select **Controller Options**. **Note:** This page is accessible only from the project itself, and not from Lab Management.
Important information	The Controller is the manager of a performance test. The Controller receives the scripts, their runtime settings, and a list of the load generators to use. The Controller issues instructions to the load generators including which scripts to run, how many Vusers to run per script, and the timing at which to start running the Vusers. During the performance test, the Controller displays online monitoring information. At the conclusion of the test run, the Controller collates the data for analysis. Before you run a performance test, you can configure load generator and Vuser options for all your performance tests in the project. Although the default settings correspond to most environments, you can modify the settings to customize the test behavior. The settings apply to all future test runs in the project and generally only need to be set once. The settings apply globally to all the load generators in a performance test.
Relevant tasks	"How to Create a Performance Center Project" on page 640
See also	"Performance Center Project Settings Overview" on page 638

Run Options > Monitors

Enables you to activate the Transaction monitor, configure the behavior of the transaction data, and set the data sampling rate, debugging, and frequency settings for the online monitors.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Transaction Data	Configures the behavior of data for the Transaction, Data Point, and Web Resource online graphs. ➤ **Enable Transaction Monitor.** Select this option to activate the online Vuser Transaction monitor to begin monitoring transactions at the start of a test run. **Sample information at frequency <>.** Select the frequency, in seconds, at which the online monitor samples the data to produce the Transaction, Data Point, and Web Resource online graphs. The higher the frequency, the less network traffic there is. The data is averaged for the frequency period defined, and only one value is sent to the Controller. **Default value:** 5 seconds. **Examples:** ➤ For a small test, use a frequency of 1. ➤ For a large test, use a frequency of 3 - 5. **Note:** You cannot modify these settings during a test run; you must stop the test run before deactivating the monitor or changing its frequency.

UI Elements	Description
Send information in mode	Specifies how to send data back to the Controller. ➤ **Summary.** Sends a summary of the transaction data back to the Controller. ➤ **Raw Data.** Sends all the transaction data back to the Controller in raw form. Sending raw data saves time because the data does not need to be processed. **Note:** When Raw Data is selected, the volume of data being transferred to the Controller may cause more network traffic. If the transfer speed is significant to you, select **Summary**.
Server Resource Monitors	Configures the behavior of the Server Resource monitors. ➤ **Data Sampling Rate.** The period of time (in seconds) between consecutive data sampling. By default, the online monitor samples the data at intervals of three seconds. If you increase the sampling rate, the data is monitored less frequently. This setting applies to all graphs. **Notes:** ➤ The sampling rate configured here is applied to all server monitors that you subsequently activate. It is not applied to server monitors that have already been activated. To apply the new sampling rate to activated server monitors, save your performance test and reopen it. ➤ Each type of monitor has a different minimum sampling rate. If the default sampling rate, or the rate set here is less than a monitor's minimum sampling rate, the monitor samples data at its minimum sampling rate. For example, the minimum sampling rate for the Oracle Monitor is 10 seconds. If the data sampling rate is set here at less than 10 seconds, the Oracle Monitor continues to monitor data at 10 second intervals.

UI Elements	Description
Debug	➤ **Display Debug Messages.** The online monitor provides debugging capabilities. Select this option to display the debug messages in the Output window. ➤ **Debug level.** For the Network monitor, you can indicate the debug (detail) level of messages sent to the log, ranging from 1-9.

Run Options > Run-Time Settings

Enables you to specify runtime settings for your test relating to Vuser quotas, stopping Vusers, and random sequence seed, to prevent system overload, and to control the way in which Vusers stop running.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Vusers Quota	Vuser quotas prevent your system from overloading. The Vuser quotas apply to Vusers on all load generators. ➤ **Number of Vusers that may be initialized simultaneously on all load generators.** Limits the number of Vusers initialized at one time (when you send an Initialize command). **Default value:** 999

UI Elements	Description
When Stopping Vusers	Controls the way Vusers stop running when you manually stop a test run: ➤ **Wait for the current iteration to end before stopping.** (Default option) The Vuser completes the iteration it is running before stopping. The Vusers move to the **Gradual Exiting** status and exit the test run gradually. ➤ **Wait for the current action to end before stopping.** The Vuser completes the action it is running before stopping. The Vusers move to the **Gradual Exiting** status and exit the test run gradually. ➤ **Stop immediately.** The Vusers stop running immediately, moving to the **Exiting** status and exit the test run immediately.
Random advance mode of file type parameter	➤ **Use random sequence with seed.** Enables you to set a seed number for random sequencing. Select this option if you discover a problem during the test run and want to repeat the test using the same sequence of random values. ➤ **Use seed <#>.** Each seed value represents one sequence of random values used for test execution. Whenever you use this seed value, the same sequence of values is assigned to the Vusers in the test. This setting applies to parameterized Vuser scripts using the Random method for assigning values from a data file. It also affects the random percentage of recorded think time (see information about the Run-Time Settings dialog box in the *HP Virtual User Generator User Guide*).

Run Options >Timeout

Enables you to set timeouts for various Performance Center commands. When a command is issued by the Controller, you can set a maximum time for the load generator or Vuser to execute the command. If the command is not completed within the time limit, the Controller issues an error message.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Command Timeout (seconds)	**Enable timeout checks.** Enables load generator and Vuser timeout checks described below. **Note:** If this option is not selected, ALM waits an unlimited time for the load generators to connect and disconnect, and for the Initialize, Start Vusers, Duration, and Stop Vusers actions to be executed.
Load Generator	Load generator timeout limits: ➤ **Connect operation (sec).** The amount of time (in seconds) that elapses before connecting to any load generator. If a connection is not successful within this time, the status of the load generator changes to **Failed**. **Default connection timeout:** 30 seconds ➤ **Disconnect operation (sec).** The amount of time that elapses before disconnecting from any load generator. The load generator does not disconnect within this time, the status of the load generator changes to **Failed**. **Default disconnection timeout:** 120 seconds

UI Elements	Description
Vusers	Vuser timeout limits: ➤ **Init stage (sec).** The timeout value for the Initialize action. **Default time limit:** 180 seconds ➤ **Run stage (sec).** The timeout value for the Start Vusers action. **Default time limit:** 120 seconds ➤ **Pause stage (sec).** The timeout value for the Duration action. **Default time limit:** 120 seconds ➤ **Stop stage (sec).** The timeout value for the Stop Vusers action. **Default time limit:** 120 seconds **Note:** Calculations consider the number of active Vusers and their influence on the timeout values. For example, 1000 Vusers trying to initialize take much longer than 10 Vusers. An internal value is added to the specified timeout value based on the number of active Vusers.

Run Options > Debug Information

Enables you to select the type of information to trace during a test run. According to the selection here, trace files are created and are used to gather information for debugging purposes.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Enable the following traces	The trace flags related to performance testing problems that you are encountering: ➤ **General.** Performs a general trace during the test run. ➤ **File Transfer.** Traces problems with the transfer of files during the test run. ➤ **Incoming communication.** Traces incoming communication during the test run. ➤ **Outgoing communication.** Traces outgoing communication during the test run. **Note:** The Performance Center agent and the Controller create some temporary files that collect information such as the parameter file sent to the Vuser, the output compilation file, and the configuration file. The Performance Center agent files are saved in **brr** folders in the **TMP** or **TEMP** directory of the agent machine. The Controller files are saved in **lrr** folders in the **TMP** or **TEMP** directory of the Controller machine. At the end of the test run, all of these files are automatically deleted.

Run Options > General

Enables you to select a mode for allocating multiple IP addresses when IP spoofing is enabled.

See also	"Test Options Dialog Box" on page 219

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Multiple IP Address Mode	The Controller can allocate an IP address one of the following ways: ➤ **IP address allocation per process.** Allocates IP addresses per process. ➤ **IP address allocation per thread.** Allocates IP addresses per thread, resulting in a more varied range of IP addresses in a test run. **Examples:** ➤ Web Vusers require IP address allocation per process. ➤ WinSock Vuser IP addresses can be allocated per thread or per process.

Run Results > Collate Settings

Enables you to specify behavior related to collation of the run results.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Output Message Database	➤ **Add output.mdb to RawResults.zip if it is smaller than RawResults.zip size (MB).** Collator process adds **output.mdb** to **RawResults.zip** only if it is smaller in size than the **RawResults.zip** file size specified. ➤ **Always exclude output.mdb from RawResults.zip.** Collator process always excludes **output.mdb** from **RawResults.zip**.
Timeout	➤ **Collate timeout in minutes.** The maximum amount of time the collate process should continue running without progress. ➤ **Diagnostics collate timeout in minutes**. The maximum amount of time the collate process should continue running without progress when collating results with Diagnostics data.

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Lab Resource Management

This chapter includes:

Concepts

Tasks

Reference

Concepts

Lab Resources Overview

The Lab Resource modules enable you to manage the lab resources needed for performance testing. These resources include:

Resource	Description
Hosts	Performance Center hosts are used to control and run Vusers, and to process data collected during a performance test. A host can be designated as a Controller, load generator, or data processor. ➤ **Controller.** A host used to manage a performance test. During a test run, the Controller issues instructions to the load generators including which scripts to run, how many Vusers to run per script, and when to start and stop running them. There is only one Controller per performance test. ➤ **Load generator.** A host on which Vusers run during a performance test. There can be any number of load generators for a given test. ➤ **Data processor.** Used for processing and publishing data gathered during a test run. **Notes:** ➤ To provide greater flexibility (especially where resources are scarce), you can allocate a host with dual purposes as a Controller and load generator. In general, this is not a recommended practice and is only appropriate for tests that have a very small number of Vusers. When allocating hosts, the system tries to use single function hosts before dual-purpose Controller + load generator host. ➤ Although it is possible to set a host as a Controller and a data processor, it is recommended to set up a separate host for data processing. ➤ A host that is located over a firewall or is a UNIX host can be used as a load generator only.

Resource	Description
Host Pools	A host pool is a groups of hosts. Each project has one host pool. When managing a host pool, it is important to understand the total available resources. The pool must contain at least one Controller, one load generator, and one data processor. Because hosts can have dual functionality, it is recommended that a pool contains, among the other hosts, at least one host that can be dedicated fully for Controller functionality
Host Locations	When selecting hosts for performance testing, their locations might be taken into consideration because hosts can be located across a wide physical area. Hosts located over a firewall can be designated as load generators only
MI Listeners	MI Listeners serve as routers between the Controller and the Performance Center Agent, thus enabling you to run Vusers over a firewall, and collect server monitor data and application diagnostics data over a firewall. The MI Listener receives data from the Performance Center Agent at regular intervals. During the course of the test run, the Controller takes the data from the MI Listener to process as runtime data. For detailed information about configuring Performance Center to work with firewalls, see the section about working with firewalls in the *HP ALM Performance Center Installation Guide*.

For details about managing lab resources, see "How to Manage Lab Resources" on page 674.

Tasks

How to Manage Lab Resources

This section describes how to manage lab resources needed for designing and running performance tests.

Note:

- This task is part of a higher-level task. For details, see "How to Work with Performance Center Administration" on page 622.
- Lab resources are managed in Lab Management.
- Performance Center hosts can be viewed, and the host status can be modified, in the projects themselves.
- **Product Feature Movie.** To view a movie that demonstrates how to set up the lab resources required for running a performance test, select **Help > Product Feature Movies** in the ALM main window. Under **HP ALM Performance Center 11.00 Movies**, select **Lab Resources**.

This task describes how to:

Add lab resources

Before you design and run tests, you must add the required resources to ALM. These include the hosts (Controllers, load generators, and data processors), the host pools to which the hosts belong, the location of the hosts, and MI Listeners for hosts that are located over a firewall. For an overview on lab resources, see "Lab Resources Overview" on page 672.

Before adding Performance Center hosts, ensure the following:

- Performance Center hosts were installed according to the instructions provided in the *HP ALM Performance Center Installation Guide*.
- If a host you are adding is in a remote location, make sure that the location was added in the **Lab Resources** > **Locations** module.
- If a host you are adding is over a firewall, it communicates with the Performance Center server through an MI Listener. Make sure that the MI Listener was added in the **Lab Resources** > **MI Listeners** module.

Tip: You can use the Import Hosts feature to import a list of hosts from an Excel file into ALM. For details, see "Import host data from Excel" below.

To add a lab resource:

- In Lab Management, under **Lab Resources**, select the relevant resource module, and click the **New <Resource>** button.

Note: Fields marked with an asterisk (*) are mandatory. For details per module, see "Lab Resource Module Fields" on page 689.

Import host data from Excel

You can import a list of hosts from an Excel file (.xls or .csv) into ALM.

1 Ensure that the Excel file is set up so that the columns can be recognized and mapped by the Import feature.

- The first row of the Excel file must contain the field names, or corresponding logical names, that appear in the table below. (Logical names are not case sensitive.)

  Some fields are mandatory, others are required or optional.

  - **Mandatory** indicates a field that **must** appear in the Excel file. If you omit this field, the import fails. If you omit a value in one of the rows of this field's column, the import of that specific row fails.
  - **Required** indicates a field that **should** appear in the Excel file. If you omit this field, the code adds the field with the default value for all rows. If you include the field, but omit a value in one of the rows of this column, the code adds the default value for that row.
  - **Optional** indicates a field does not have to appear in the Excel file. Omitting this field has no effect on the import procedure.

- Fields representing virtual, reference, and invalid fields are ignored.
- Empty columns are allowed.

Set up the columns and values in the file as follows:

Field name	Logical Name	Value	Field for
HOST_NAME Mandatory	**Name**	Any string	The valid name of the host machine.
HOST_ PURPOSE Mandatory	**Purpose**	➤ Controller ➤ Load Generator ➤ Data Processor	The purpose of the Performance Center host. **Note:** This can be any combination of the three options. Options should be separated with a semicolon without spaces. **Example:** Controller;Data Processor
HOST_STATE Required	**Status**	➤ Operational ➤ Non-Operational ➤ Unavailable **Default:** Operational	The host state
HOST_ INSTALLATION Required	**Installation**	➤ Windows Host ➤ Unix Load Generator ➤ Windows Standalone LG **Default:** Windows Host	The type of host installation. **Note:** There is a double space in: ➤ "Windows<*space*><*space*>Host" ➤ "Unix<*space*><*space*>Load Generator"
HOST_ PRIORITY Required	**Priority**	➤ 1-Lowest Priority ➤ 2, 3 … 8 ➤ 9-Highest Priority **Default:** 5	The priority of the host

Field name	Logical Name	Value	Field for
HOST_SSL_ ENABLED Required	**Enable SSL**	➤ Y ➤ N **Default:** N	SSL-enabled
HOST_ USERNAME Optional	**Username**	Any string	The user name for logging in to the host
HOST_ PASSWORD Optional	**Password**	Any string	The user password for logging in to the host
HOST_ DOMAIN Optional	**Domain**	Any string	The host domain
HOST_ DESCRIPTION Optional	**Description**	Any string	Host description

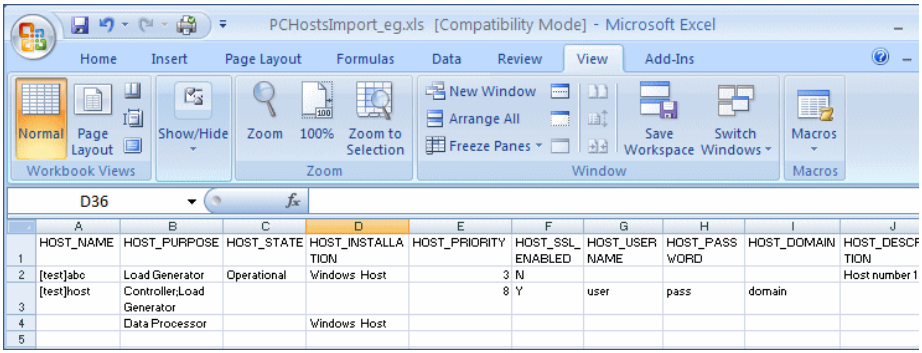
The fields specified in the table below must not be included in the Excel file. During the import of each host, these fields are assigned default values.

Field name	Default value assigned
Belongs to pools	General
Location	Default
MI Listener	None

Note: If data for these fields is included in the Excel file, the data is ignored. Default values that are not relevant for a particular host must be modified manually in the Hosts module.

Example:

The following image illustrates an Excel file set up with the following AUT hosts: **[test]abc**, **[test]host**, and a third host whose name was not provided.



2 Import the Performance Center hosts:

a On the Lab Management sidebar, under **Lab Resources**, select **Hosts**.

b In the Hosts module, select **Hosts** > **Import**.

c Browse to the Excel file containing the hosts, and click **Open**.

At the end of the import process, a report displays the import results, and the imported hosts are listed in the Hosts module. Hosts that are not imported successfully, must be added manually.

Modify/View lab resource details

To modify or view a lab resource's details, in the relevant lab resource module, right-click the resource in the grid and select **<Resource> Details**. See "Lab Resource Modules User Interface" on page 684.

Check host connections to Performance Center servers

On the Lab Management sidebar, under **Lab Resources**, select **Hosts**. Right-click a host in the grid, and select **Check Host**.

The Task Manager opens, and the overall result of each check performed on the host, **Passed** or **Failed, is** displayed.

You can view the progress of the host check in the Hosts module's **Check Host Status** tab.

Based on the purpose and location of the host, the following checks are performed on the host:

Check Performed	Load Generator Host				Controller Host	Data Processor Host
	Regular	UNIX	Stand-alone	OFW		
Ping to Host	Yes	Yes	Yes	N/A	Yes	Yes
Installed Patches	Yes	N/A	N/A	N/A	Yes	Yes
Services	Yes	N/A	N/A	N/A	Yes	Yes
Performance	Yes	N/A	N/A	N/A	Yes	Yes
Over Firewall Status	N/A	N/A	N/A	Yes	N/A	N/A

Alternatively, you can perform the above checks, together with an additional connectivity check from the host to a particular URL. Right-click a host in the grid, select **Check Connectivity to URL**, and enter the URL.

Examples:

- Regular URL: http://www.website.com
- Machine name: machine22 or http://machine22

Reboot hosts

To reboot a host, on the Lab Management sidebar, under **Lab Resources,** select **Hosts**. Right-click the host in the grid that you want to reboot, and select **Reboot Host**.

Install patches on hosts

Notes:

- To install patches on a host, you first need to have uploaded the patches to ALM. For details, see "How to Upload Patches to ALM" on page 785.
- Patches can be installed on a host only when the host state is **idle**.

On the Lab Management sidebar, under **Lab Resources**, select **Hosts**. Right-click the host in the grid on which to install the patch and select **Install Patch**.

For user interface details, see "Select Patch to Install Dialog Box" on page 713.

Reconfigure hosts

Reconfiguring a host resets the host license, the Performance Center system user (IUSR_METRO), and the Communication Security passphrase on the host machine.

To reconfigure a host, on the Lab Management sidebar, under **Lab Resources,** select **Hosts**. Right-click the host in the grid that you want to reconfigure, and select **Reconfigure Host**.

End processes on a host

To end a process on a host, on the Lab Management sidebar, under **Lab Resources,** select **Hosts**. Select a host, and in the **Processes** tab, select the process and click the **Kill Process** button.

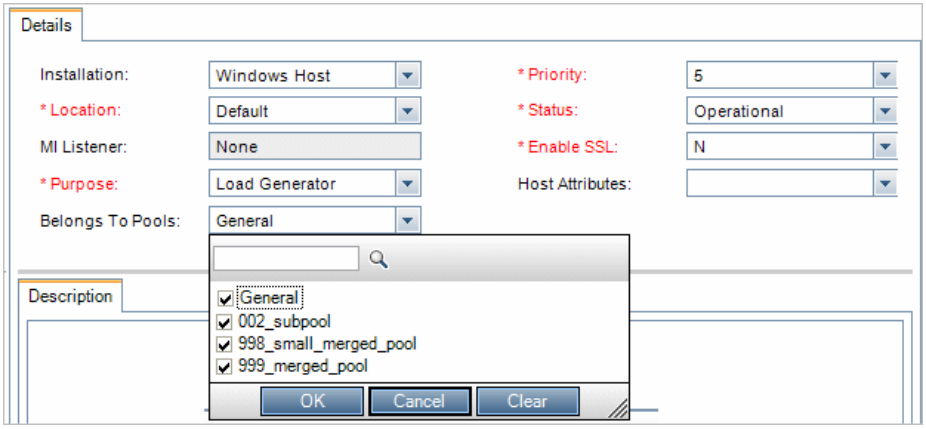
Link hosts to host pools

You can populate host pools with hosts in one of the following ways:

- Hosts module: You can link a host to one or more host pools.
- Host Pools module: You can link one or more hosts to a particular host pool.

To link a host to one or more host pools:

1. On the Lab Management sidebar, under **Lab Resources**, select **Hosts**:
2. Right-click a host in the grid, and select **Host Details**.
3. Click the down arrow adjacent to **Belongs to Pools**, and select pools in which to include the host, and click **OK**.



To link one or more hosts to a host pool:

1. On the Lab Management sidebar, under **Lab Resources**, select **Host Pools**.
2. Select a host pool in the grid.

3. In the **Linked Hosts** tab, click **Add Hosts to Pool** and select hosts to add to the pool, and click **Add**.

Reference

Lab Resource Modules User Interface

This section includes:

Lab Resource Module Menus and Buttons

The Lab Resource modules enable you to manage lab resources.

To access	On the Lab Management sidebar, under **Lab Resources**, select **<Resource>.**
Important information	➤ Resources are managed in Lab Management. Only a user with administrator privileges can manage these resources. ➤ Non-administrator users can view host details and host pool details belonging their projects, and can reconfigure and reboot hosts as well as check host connectivity on hosts. ➤ This help page relates to all of the resource modules: ➤ Hosts ➤ Host Pools ➤ Host Locations ➤ MI Listeners All resources are generically referred to as <Resource>.
Relevant tasks	"How to Manage Lab Resources" on page 674

Common menus and toolbars of the lab resource modules are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Where	Description
 **<Resource> Details**	<Resource> and right-click menu	Opens the <Resource> Details dialog box, enabling you to view and edit details of the selected resource.
Add to Favorites	Favorites	Opens the Add Favorite dialog box, enabling you to add a favorite view to your private or the public folder. For details, see the *HP Application Lifecycle Management User Guide*.

UI Elements (A-Z)	Where	Description
 **Copy URL**	<Resource> and <right-click menu>	Copies a selected resource and pastes its URL as a link. The resource itself is not copied. Instead, you can paste the address into another location, such as an email or a document. Clicking the link opens up ALM and takes you to the resource file or folder. If you are not already logged in, ALM first prompts for login details.
 **Delete**	Edit and <right-click menu>	Deletes the resource selected in the grid. **Note:** You cannot delete an MI Listener that is being used by a host.
Export	<Resource> and <right-click menu>	Opens the Export All Grid Data dialog box, enabling you to export the resources in the grid as a text file, Microsoft Excel worksheet, Microsoft Word document, or HTML document. Choose one of the following options: ➤ **All.** Exports all resources in the grid. ➤ **Selected.** Exports selected resources in the grid.
 **Find**	View	Opens the Find dialog box, enabling you to search for a resource in the module. For details about search options, see the *HP Application Lifecycle Management User Guide*.

UI Elements (A-Z)	Where	Description
 **Go to <Resource>**	<Resource>	Opens the Go To <Resource> dialog box, enabling you to find a specific resource by its ID number. You can only go to resources that are in the current filter.
Grid Filters	View and <right-click menu>	Enables you filter the data according to an entry in the filter box. For details about filtering options, see the *HP Application Lifecycle Management User Guide*.
Import (Hosts module only)	Hosts	Enables you to import a list of Performance Center hosts from an Excel file (.xls or .csv) into ALM (.xls or .csv format).
Information Panel	View and <right-click menu>	Shows/Hides the Information Panel in the lower area of the module.
 **New <Resource>**	<Resource>	Enables you to add a resource. **Note:** For Hosts, this is available in Lab Management only.
Organize Favorites	Favorites	Organizes your favorite views. For details, see the *HP Application Lifecycle Management User Guide*.
Private	Favorites	Lists the favorite views that are accessible only to the user who created them.
Public	Favorites	Lists the favorite views that are accessible to all users.
 **Refresh All**	View	Refreshes the grid so that it displays the most up-to-date information.

UI Elements (A-Z)	Where	Description
Replace	Edit and <right-click menu>	In the <Resource> grid, opens the Replace dialog box, enabling you to replace a field value in the grid. For more details, see the *HP Application Lifecycle Management User Guide*.
 **Select Columns**	View	Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For details, see the *HP Application Lifecycle Management User Guide*. For details about the resource fields, see "Lab Resource Module Fields" on page 689.
 **Set Filter/Sort**	View	Enables you to filter and sort the resources in the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For more details, see the *HP Application Lifecycle Management User Guide*.
Updated Selected	Edit and <right-click menu>	Opens the Update Selected dialog box, enabling you to update a field value for a multiple selection in the grid. For more details, see the *HP Application Lifecycle Management User Guide*.

Lab Resource Module Fields

This section described the fields in the Lab Resources modules.

It includes:

Host Fields

This section describes the Performance Center host fields:

Field (A-Z)	Description
Active Timeslot ID	The ID of the timeslot for which this host is reserved, and which is now open.
Belongs to Pools	The host pools to which the host is assigned. Host pools enable you to control which hosts are allocated to which projects. When allocating hosts for a test, the system allocates hosts from the project's host pool.
Configuration Last Check	The last configuration check performed.
Connectivity Last Check	The last connectivity check performed.
Description	A description of the host.

Field (A-Z)	Description
Enable SSL	Relevant for Load Generator hosts located over a firewall only. Indicates whether the load generator is to communicate with the Controller via SSL (Secure Socket Layer) or not. **Note:** The load generator uses SSL to communicate with the Controller during runtime only. For non runtime functionality (including collating results), the load generator does not use SSL as the communication protocol.
Host Attributes	The attributes of the host. **Example:** Memory, strength, installed components **Tip:** You can customize the host attributes. For details, see "Load Generator Attribute Customization" on page 224.
Host ID	The ID of the host.
Host State	The current activity on the host. ➤ **Idle.** Indicates that the host is not being used. ➤ **Installing.** Indicates that a patch is being installed on the host. ➤ **Rebooting.** Indicates that the host is rebooting. ➤ **<Run states>.** Indicates the state of the host during a performance test run. ➤ **<Data processing states>.** Indicates the state of the host during a data processing task.
Installation	Indicates the type of host installation. For a standalone installation of the load generator, select **Windows Standalone LG**. **Note:** You cannot modify this field for an existing host.
Installation Last Check	The last installation check performed.
Last Run Timeslot ID	The ID of the timeslot during which a performance test ran or data processing occurred on the host.

Field (A-Z)	Description
Location	The location of the host. For example, locations can be defined according to physical areas. The location also determines whether the host is located over a firewall. If so, you need to select an MI Listener that will enable data collection.
MI Listener	For hosts located over a firewall, the IP address or name of the MI Listener that enables data collection.
Name	The fully qualified domain name or IP address of the host that was assigned when creating the host.
Password	The password of the Performance Center system user on the host machine. **Default:** P3rfoRm@1nce **Note:** ➤ The Performance Center system user name and password are displayed only for UNIX hosts and for any hosts that were migrated from earlier versions of Performance Center. ➤ The system user name and password of newly added Windows hosts (details are not displayed here) are the same as the system user name and password of the rest of the Performance Center·system.
Performance Last Check	The last performance check performed.
Priority	A rank assigned to the host. The higher the priority you give the host, the more likely the host will be allocated to a test. There are a number of criteria to consider when assigning priority. The main considerations are whether the host is a dedicated machine or a shared resource, and the type of hardware installed on the machine.

Field (A-Z)	Description
Purpose	The functionality that the host can provide: ➤ Controller ➤ Load generator ➤ Data processor **Note**: ➤ If the host machine is located over a firewall or is a UNIX machine, it can function as a **load generator** only. ➤ If you selected **Windows Standalone LG** as the installation option, **Load Generator** is automatically selected as the purpose for the host and the other options are disabled.
Status	The status of the host. An indicator is displayed next to the host name, according to its current status. The possible statuses are: ➤ **Operational.** The host machine is up and running. ➤ **Non-operational.** The host machine is down. ➤ **Unavailable**. There is no information available about the status of the host.
User Name	The name of the Performance Center system user on the host machine. **Default:** IUSR_METRO **Note:** ➤ The Performance Center system user name and password are displayed only for UNIX hosts and for any hosts that were migrated from earlier versions of Performance Center. ➤ The system user name and password of newly added Windows hosts (details are not displayed here) are the same as the system user name and password of the rest of the Performance Center·system.

Check Host Status Fields

The following fields are displayed in the Check Host Status page:

Field (A-Z)	Description
Actual Value	Actual value resulting from the host connectivity check.
Category	The areas in which the Check Host feature checks the host: ➤ Configuration ➤ Connectivity ➤ Installation ➤ Performance
Check	The sub-areas in which the Check Host feature checks the hosts. For example, sub-areas if the Performance check are Processor, Memory, System,
Check Date	The date the host was checked.
Check Result ID	The ID of each step of the host check.
Error	If an error occurred during the check, displays the error.
Expected Value	Value expected to result from the host check.
Status	Indicates whether the host check passed or failed.

Host Pool Fields

This section describes the host pool fields:

Field (A-Z)	Description
C+LG Hosts	The number of "Controller+load generator" hosts in the host pool.
Controller Hosts	The number of Controller hosts in the host pool.
Description	A description of the host pool.
DP Hosts	The number of data processor hosts in the host pool.
LG Hosts	The number of load generator hosts in the host pool.

Field (A-Z)	Description
Pool ID	The ID of the host pool.
Pool Name	The name of the host pool. **Note:** The name may contain up to 255 characters, excluding spaces, periods, and any of the following characters: : ; * \ / ” ~ & ? { } $ % | < > + = ^ [ ] ( )
Total Hosts	The total number of hosts (Controllers, load generators, data processors, and "Controller + load generators") in the host pool.

Host Location Fields

This section describes the host location fields:

Field (A-Z)	Description
Description	A description of the host location.
Location ID	The ID of the host location.
Location Name	The name of the host location. The name should have a logical connection to the host location
Over Firewall	Indicates whether the host location is over a firewall or not.

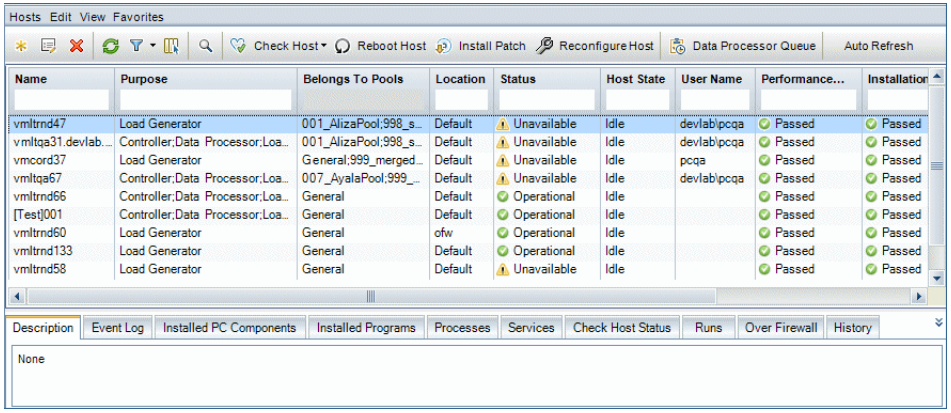
MI Listener Fields

This section describes the MI Listener fields:

Field (A-Z)	Description
Description	A description of the MI Listener.
MI Listener ID	The ID of the MI Listener.
MI Listener IP	The IP address of the MI Listener. **Note:** If you have two different IP addresses for the same MI Listener—one for internal communication with the Controller and a second for public communication with a load generator located over a firewall—enter the **internal IP address** here. Enter the public IP address in the **MI Listener Name** field (see below).
MI Listener Name	The name of the MI Listener. **Note:** If you have two different IP addresses for the same MI Listener—one for internal communication with the Controller and a second for public communication with a load generator located over a firewall—enter the **public IP address** here. Enter the internal IP address in the **MI Listener IP** field (see above).
Purpose	The role designated to the MI Listener: ➤ Diagnostics data collection over a firewall ➤ Monitoring over a firewall ➤ Running Vusers over a firewall

Hosts Module

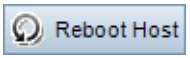
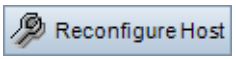
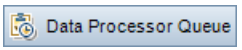
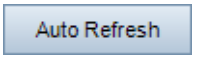
This module enables you to view and manage Performance Center hosts.



To access	On the sidebar, under **Lab Resources**, select **Hosts**.
Important Information	**Lab Management:** The Hosts module displays a list of all of the Performance Center hosts in ALM. **Project:** The Hosts module displays a list of all of the Performance Center hosts in the project's host pool.
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	Checks connectivity between the selected host and other machines in the system.
	Performs the same checks as the **Check Host** button, as well as connectivity to any given URL.

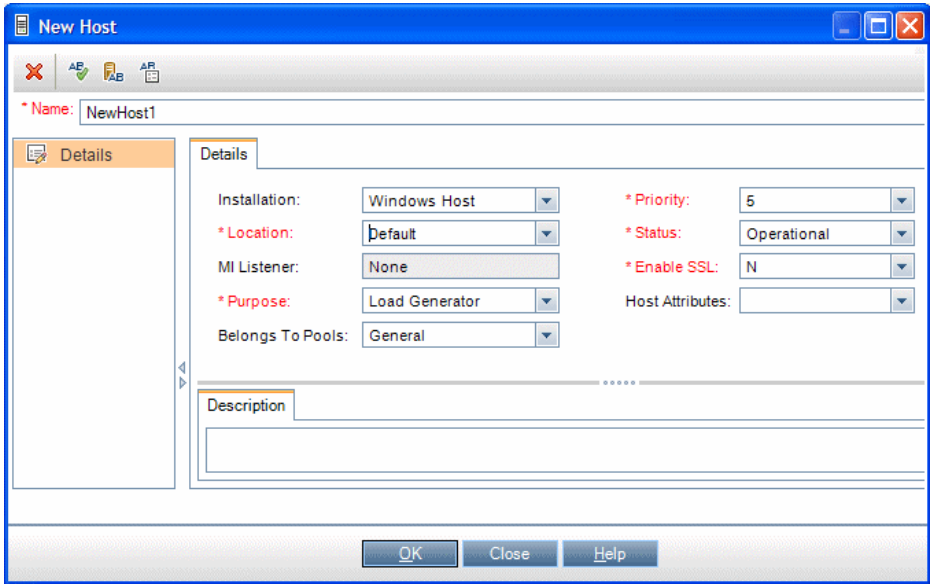
UI Elements	Description
	Enables you to remotely reboot host machines. **Note:** ➤ You cannot reboot Controller and load generator hosts while they are in the **Running** state. You can only reboot these hosts when they are idle. ➤ You cannot reboot a UNIX load generator host.
	Opens the Install Patch dialog box, enabling you to select patches to install on the selected hosts. For details, see "Select Patch to Install Dialog Box" on page 713. **Notes:** ➤ You cannot use the Install Patch feature on Controller and load generator hosts if they are in the **Running** state. You can only install patches when these hosts are idle. ➤ You should use this feature to install Performance Center certified patches only. **Available in:** Lab Management only.
	Resets the following on the selected host machine: ➤ Host license ➤ System user (IUSR_METRO) ➤ Communication Security passphrase **Note:** You can reconfigure only one host at a time. **Available in:** Lab Management only.
	Opens the Data Processor Queue window, enabling you to view the pending data processing requests.
	Refreshes the grid automatically every 5 seconds.
<Hosts module common UI elements>	➤ **Host module fields.** For field definitions, see "Host Fields" on page 689. ➤ **Host module menus and buttons.** For command and button descriptions, see "Lab Resource Module Menus and Buttons" on page 685.

UI Elements	Description
<Hosts grid>	Displays a list of the Performance Center hosts in ALM.
Description tab	Describes the currently selected host. **Tip:** Right-clicking in this area displays a toolbar for formatting and spell checking the text.
Event Log tab	Displays detailed information about the tasks performed on the selected host, the action status, and a description of any errors. For details, see "Event Log" on page 351.
Installed PC Components tab	Displays a list of the Performance Center components installed on the host machine, including versions and patches. To refresh the grid, click  .
Installed Programs tab	Displays a list of all of the programs installed on the host machine. Details include the version, the publisher of the software, and the date it was installed in the host machine. To refresh the grid, click  .
Processes tab	Displays detailed information about the processes and resource usage of the selected host. For details, see "Processes Page" on page 704.
Services tab	Displays the services running on the host machine. For details, see "Services Page" on page 706.
Check Host Status tab	Displays the status of each step of the host checks. To see host check status details, right click a line in the Check Host Status tab, and select **Check Hosts Status Details**. For details, see "Check Host Status Fields" on page 693.
Runs tab	Displays detailed information about test runs performed on the selected host. For details, see "Test Runs Module Window" on page 740.

UI Elements	Description
Over Firewall tab	For hosts over a firewall, enables you configure advanced over-firewall settings. For details, see "Over Firewall Page" on page 710.
History tab	Lists changes made to the currently selected host. For more details, see the *HP Application Lifecycle Management User Guide*.

New Host Dialog Box (Lab Management Only)

This dialog box enables you to add a Performance Center host to ALM.



To access	**1** On the Lab Management sidebar, under **Lab Resources**, select **Hosts**. **2** In the Hosts module, click the **New Host** button.
Important information	You can add new hosts in Lab Management only.

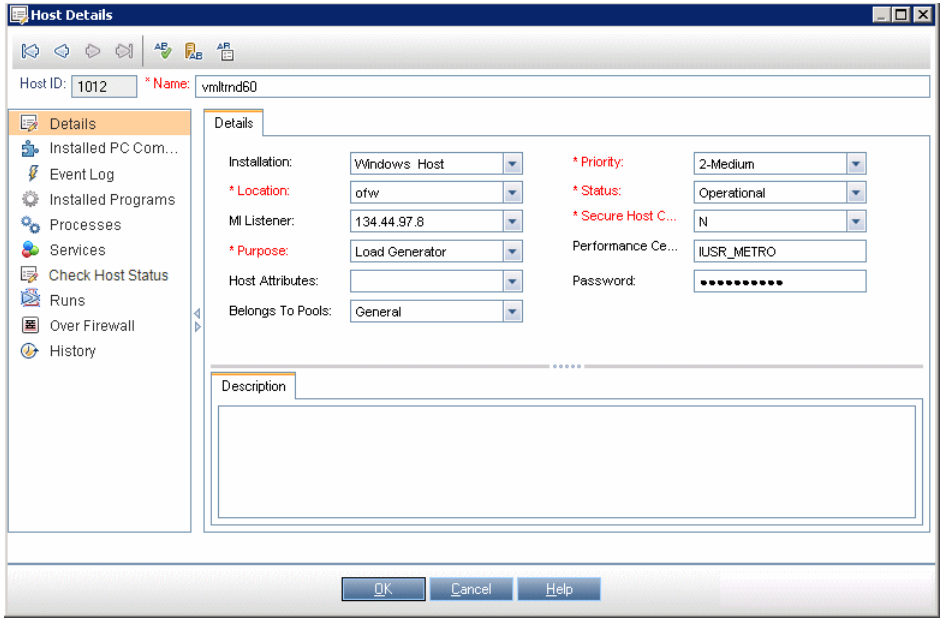
Relevant tasks	➤ "How to Initially Configure Performance Center" on page 635 ➤ "How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Clear All Fields.** Clears the data.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Name	The name for the new host. **Tip:** Give the host a meaningful name. This can be derived from the location, purpose, type, identity, or operating system of the host. The more information that is provided with the name, the easier it is to use and maintain the system. Make sure that the name is easy to remember and not too long.
Details	Required fields are marked with an asterisk (*) and are displayed in red. For details on the available host fields, see "Host Fields" on page 689.

Host Details Dialog Box

This dialog box displays details about a selected Performance Center host.



To access	**1** On the sidebar, under **Lab Resources**, select **Hosts**. **2** Right-click a host in the grid and select **Host Details**.
Important information	This dialog box is available both in Lab Management and in ALM.
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

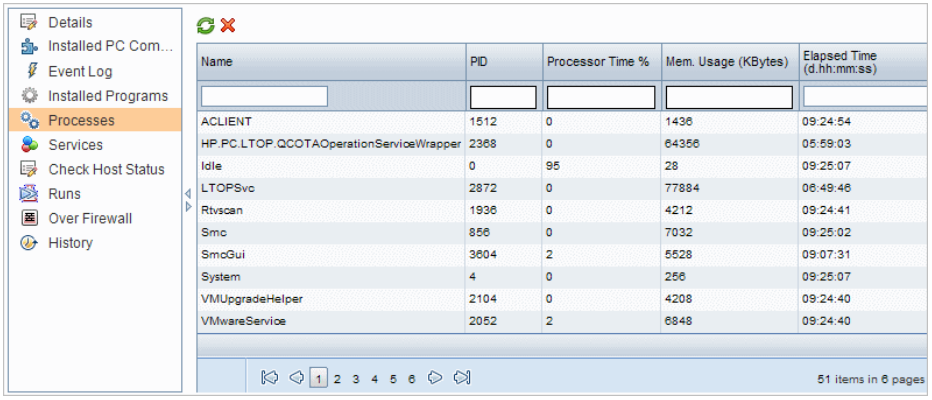
User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**First/Previous/Next/Last Entity.** Enables you to browse through the list of hosts.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Host ID	The ID of the host.
Name	The name of the host.
Details	Details the currently selected host. For details on the available fields, see "Host Fields" on page 689.
Installed PC Components	Displays a list of the Performance Center components installed on the host machine, including version and patches. **Note:** Use the navigation bar at the bottom of the page to view all the entries.
Event Log	Displays detailed information about the tasks performed on the selected host, the action status, and a description of any errors. For details, see "Event Log" on page 351.
Installed Programs	Displays a list of all of the programs installed on the host machine. Details include the version, the publisher of the software, and the date it was installed in the host machine. **Note:** Use the navigation bar at the bottom of the page to view all the entries.

UI Elements	Description
Processes	Displays detailed information about the processes and resource usage of the selected host. For details, see "Processes Page" on page 704. **Note:** Use the navigation bar at the bottom of the page to view all the entries.
Services	Displays the services running on the host machine. For details, see "Services Page" on page 706. **Note:** Use the navigation bar at the bottom of the page to view all the entries.
Check Hosts Status	Displays the status of each step of the host checks. To see host check status details, right click a line in the Check Host Status tab, and select **Check Host Status Details**. For details, see "Check Host Status Fields" on page 693.
Runs	Displays detailed information about test runs performed on the selected host. For details, see "Test Runs Module Window" on page 740. **Note:** Use the navigation bar at the bottom of the page to view all the entries.
Over Firewall	For hosts over a firewall, enables you configure advanced over-firewall settings. For details, see "Over Firewall Page" on page 710.
History	Lists changes made to the currently selected host. For more details, see the *HP Application Lifecycle Management User Guide*.

Processes Page

This page displays detailed information about the processes and resource usage of the selected host.



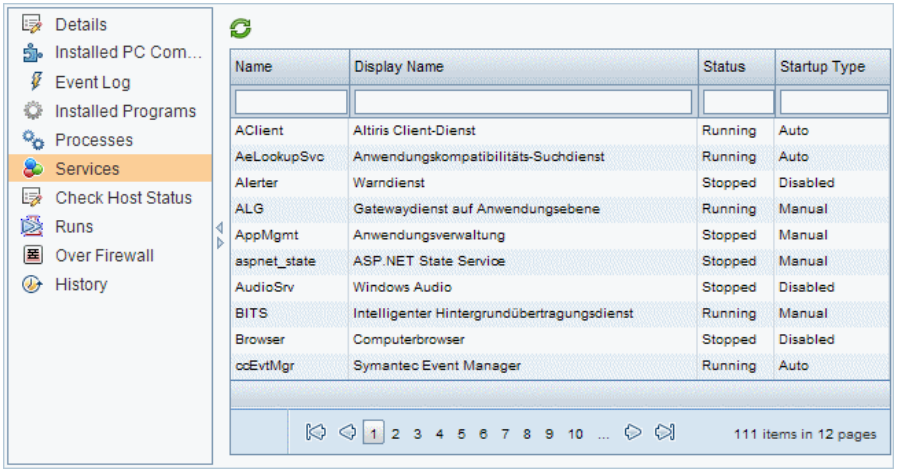
To access	➤ **From the Hosts module:** On the sidebar, under **Lab Resources**, select **Hosts**. In the information panel, select **Processes**. ➤ **From the Host Details dialog box:** On the sidebar, under **Lab Resources**, select **Hosts**. Right-click a host and select **Host Details.** In the Host Details dialog box, select **Processes**.
Important information	ALM is unable to display processes and resource usage information for UNIX machines or Windows Standalone Load Generators.
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Refresh.** Refreshes the grid so it displays the most up-to-date information.
	**Kill Process.** Ends the process selected in the grid. **Notes:** ➤ **Hosts module.** Kill Process permissions are required to end the selected process. ➤ **Performance Center Servers module.** A user with Viewer permissions has the ability to end the selected process.
<Processes grid>	Displays the following details about the processes: ➤ **Name.** The name of the process. ➤ **PID.** The process ID. ➤ **Processor Time (%).** The percentage of processor time used by the process. ➤ **Memory Usage (KBytes).** The amount of memory (in kilobytes) used by the process. ➤ **Elapsed Time (d.hh:mm:ss).** The amount of elapsed time since the start of the process, where **d** is the number of days and **hh:mm:ss** is the number of hours, minutes, and seconds that have elapsed.
<Navigation area>	Located at the bottom of the page, enables you to navigate through the pages of entries in the grid. The total number of entries is displayed on the right of the navigation area.

Services Page

This page displays the services on the selected host.



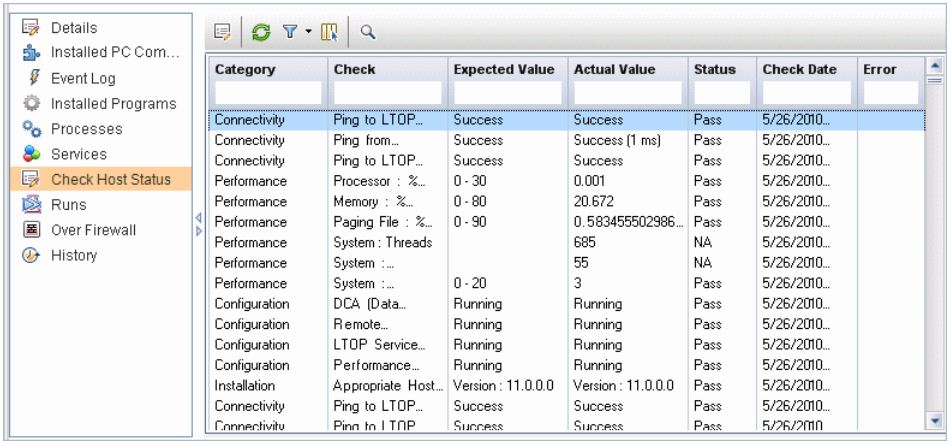
To access	➤ **Hosts module:** On the sidebar, under **Lab Resources**, select **Hosts**. In the information panel, select **Services**. ➤ **Host Details dialog box:** On the sidebar, under **Lab Resources**, select **Hosts**. Right-click a host and select **Host Details.** In the Host Details dialog box, select **Services**.
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Refresh.** Refreshes the grid so it displays the most up-to-date information.
Name	The name of the service.
Display Name	The full name of the service.
Status	The status of the service: **Running** or **Stopped**.
Startup Type	The way the service is set to start up: ➤ **Auto.** Service starts up automatically. ➤ **Disabled.** Service is disabled. ➤ **Manual.** Service must be started manually.
<Navigation area>	Located at the bottom of the page, enables you to navigate through the pages of entries in the grid. The total number of entries is displayed on the right of the navigation area.

Check Host Status Page

This page displays the status of checks on the selected host.



To access	➤ **From the Hosts module:** On the sidebar, under **Lab Resources**, select **Hosts**. Select a host, and in the information panel, select **Check Host Status**. ➤ **From the Host Details dialog box:** On the sidebar, under **Lab Resources**, select **Hosts**. Right-click a host and select **Host Details.** In the Host Details dialog box, select **Check Host Status**.
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
	**Check Host Status Details.** Opens the Check Host Status Details dialog box, enabling you to view each check's details. For field details, see "Check Host Status Fields" on page 693.
	**Refresh.** Refreshes the grid so it displays the most up-to-date information.
	**Set Filter/Sort.** Enables you to filter and sort the grid. Any currently applied filters or sorting orders are displayed below the toolbar.For details, see the *HP Application Lifecycle Management User Guide*.
	**Select Columns.** Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For details, see the *HP Application Lifecycle Management User Guide*.
	**Find.** Opens the Find dialog box, enabling you to search for a check. For details, see the *HP Application Lifecycle Management User Guide*.
<Check Host Status grid>	Displays the status of the host checks. Click  to select columns to display in the grid. For details about the fields, see "Check Host Status Fields" on page 693.

Over Firewall Page

This page displays communication settings between the load generator host and the MI Listener, and enables you to configure advanced over-firewall settings for the selected load generator host.

To access	➤ **From the Hosts module:** On the sidebar, under **Lab Resources**, select **Hosts**. In the information panel, select **Over Firewall**. ➤ **From the Host Details dialog box:** On the sidebar, under **Lab Resources**, select **Hosts**. Right-click a host and select **Host Details.** In the Host Details dialog box, select **Over Firewall**.
Important information	This page will displays information if the host's location is defined to be over a firewall. A host over a firewall can be used only as a load generator host.
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

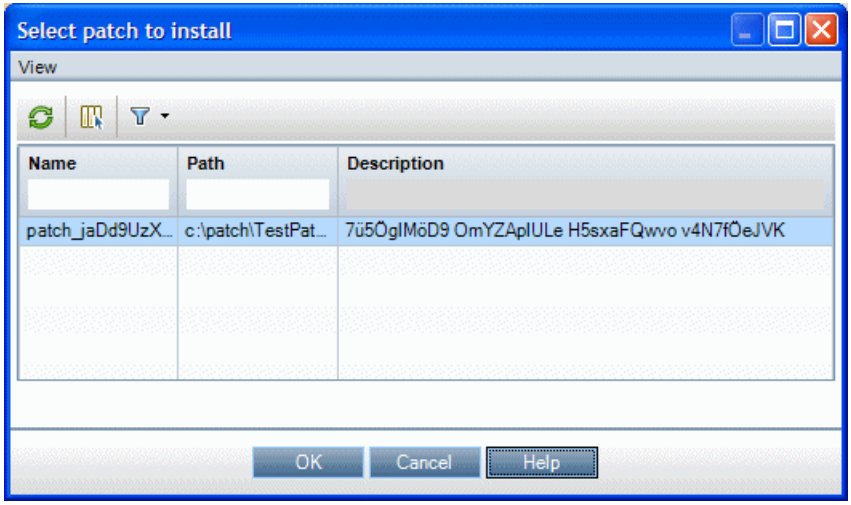
UI Elements (A-Z)	Description
Connection Timeout (seconds)	The length of time the agent should to wait before retrying to connect to the MI Listener machine. If zero, the connection is kept open from the time the agent is run. **Default**: 20 seconds **Note:** This is a required field.
Connection Type - TCP/HTTP	Select either **TCP** or **HTTP**, depending on the configuration you are using. **Default:** TCP

UI Elements (A-Z)	Description
HTTP	HTTP settings for the HTTP connection type: ➤ **Proxy Name.** The name of the proxy server. This field is mandatory if the **Connection Type** option is set to **HTTP.** ➤ **Proxy Port.** The proxy server connection port. This field is mandatory if the **Connection Type** option is set to **HTTP.** ➤ **Proxy Username.** The user name of a user with connection rights to the proxy server. ➤ **Proxy password.** The password of the user with connection rights to the proxy server. ➤ **Proxy domain.** The user's domain if defined in the proxy server configuration. This option is required only if NTLM is used.
MI Listener Password	The password needed to connect to the MI Listener machine.

UI Elements (A-Z)	Description
MI Listener User Name	The user name needed to connect to the MI Listener machine.
Use secure connection	Enables connection using the Secure Sockets Layer protocol. **Default:** Disabled ➤ **Check server certificates.** Authenticates the SSL certificates that are sent by the server. Select **Medium** to verify that the server certificate is signed by a trusted Certification Authority. Select **High** to verify that the sender IP matches the certificate information. This setting is available only if **Use Secure Connection** is set to **True**. ➤ **Private Key password.** The password that may be required during the SSL certificate authentication process. This option is relevant only if the **Client Certificate Owner** option is enabled. ➤ **Use client certificate.** Enable to load the SSL certificate (if required by the server to allow the connection to be made). This option is relevant only if the Use Secure Connection option is enabled. **Default:** Disabled

Select Patch to Install Dialog Box

This dialog box enables you to install patches on Performance Center hosts.



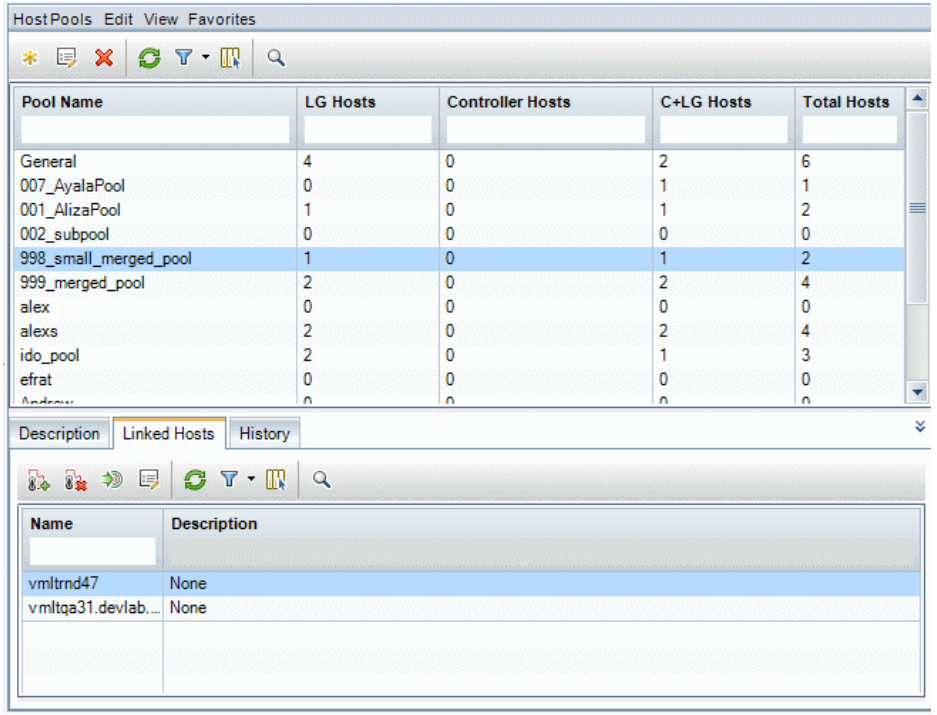
To access	**1** On the Lab Management sidebar, under **Lab Resources**, select **Hosts**. **2** Right-click the host grid and select **Install Patch**. **Tip:** You can install a patch on multiple hosts simultaneously. To select multiple hosts, hold down the Ctrl key on your keyboard while selecting the hosts.
Important information	➤ You can install patches in Lab Management only. ➤ To install patches on a host, the patches first need to have been uploaded to ALM. For details, see "How to Upload Patches to ALM" on page 785.
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
<Patches grid>	Displays the patches available in ALM to install on the selected host.

Host Pools Module

This module enables you to view and manage host pools.



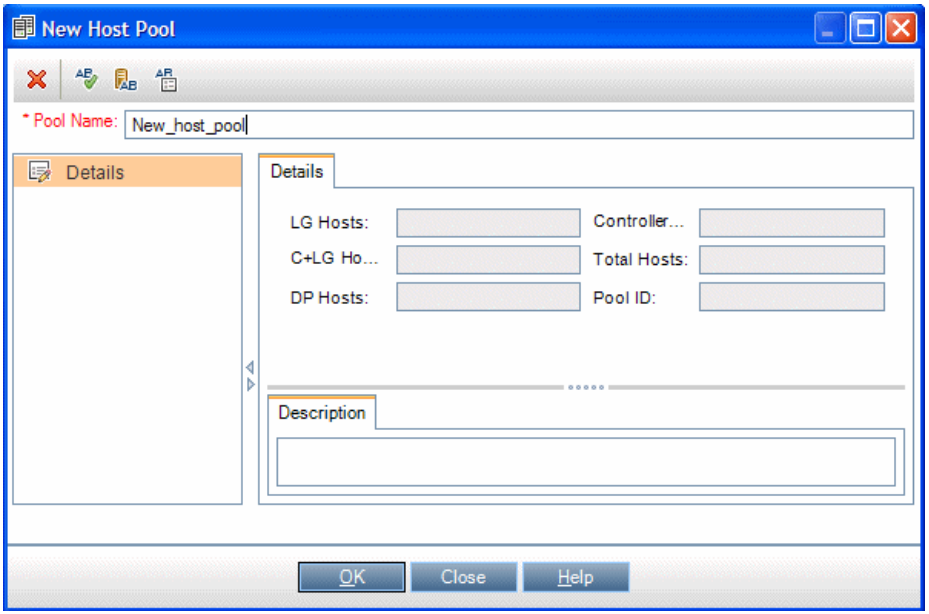
To access	On the Lab Management sidebar, under **Lab Resources**, select **Host Pools**.
Important Information	A host pool is a groups of hosts. Each project has one host pool. When managing a host pool, it is important to understand the total available resources. The pool must contain at least one Controller, one load generator, and one data processor. Because hosts can have dual functionality, it is recommended that a pool contains, among the other hosts, at least one host that can be dedicated fully for Controller functionality.
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
<Host Pools module common UI elements>	➤ **Host Pools module fields.** For field definitions, see "Host Pool Fields" on page 693. ➤ **Host Pools module menus and buttons.** For command and button descriptions, see "Lab Resource Module Menus and Buttons" on page 685.
<Host Pools grid>	Displays a list of the host pools defined in ALM.
Description tab	Describes the currently selected host pool. **Tip:** Right-clicking in this area displays a toolbar for formatting and spell checking the text.
Linked Hosts tab	Enables you to add hosts to the selected pool and remove hosts from the pool. For details, see "Linked Hosts Page" on page 720.
History tab	Lists changes made to the currently selected host pool. For more details, see the *HP Application Lifecycle Management User Guide*.

New Host Pool Dialog Box

This dialog box enables you to add a host pool to ALM.



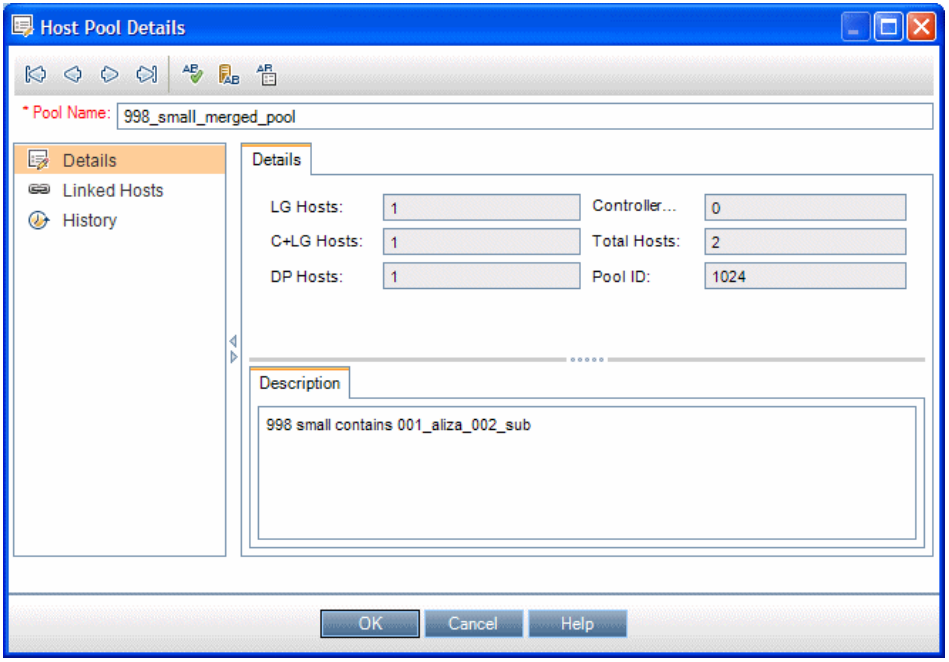
To access	**1** On the Lab Management sidebar, under **Lab Resources**, select **Host Pools**. **2** In the Host Pools module, click the **New Host Pool** button.
Important information	Each project has one host pool which must contain at least one Controller, one load generator, and one data processor host.
Relevant tasks	➤ "How to Initially Configure Performance Center" on page 635 ➤ "How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Clear All Fields.** Clears the data.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Pool Name	The name for the new host pool.
Details	Required fields are marked with an asterisk (*) and are displayed in red. For details on the available host pool fields, see "Host Pool Fields" on page 693.

Host Pool Details Dialog Box

This dialog box displays details about a selected host pool.



To access	**1** On the Lab Management sidebar, under **Lab Resources**, select **Host Pools**. **2** Right-click a host pool in the grid and select **Host Pool Details**.
Important information	A host pool is a groups of hosts. Each project has one host pool. When managing a host pool, it is important to understand the total available resources. The pool must contain at least one Controller, one load generator, and one data processor. Because hosts can have dual functionality, it is recommended that a pool contains, among the other hosts, at least one host that can be dedicated fully for Controller functionality.

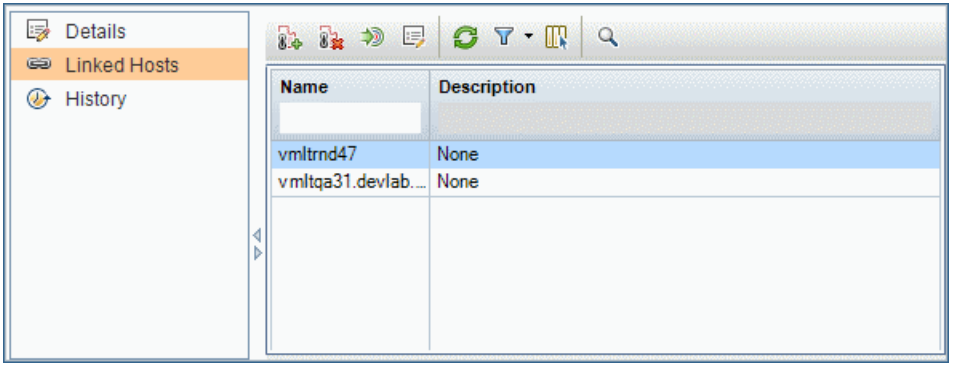
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**First/Previous/Next/Last Entity.** Enables you to browse through the list of host pools.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Pool Name	The name of the host pool.
Details	Details the selected host pool. For details on the available fields, see "Host Pool Fields" on page 693.
Linked Hosts	Enables you to add hosts to the selected pool and remove hosts from the pool. For details, see "Linked Hosts Page" on page 720.
History	Lists changes made to the currently selected host pool. For more details, see the *HP Application Lifecycle Management User Guide*.

Linked Hosts Page

This page enables you to add hosts to a host pool, and remove hosts from a pool.



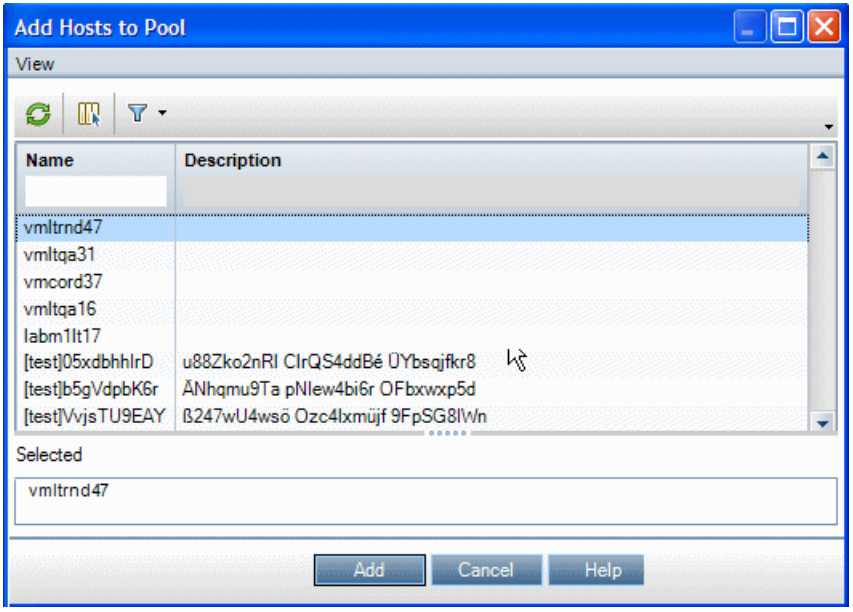
To access	➤ **From the Host Pools module:** On the Lab Management sidebar, under **Lab Resources**, select **Host Pools**. In the information panel, select **Linked Hosts**. ➤ **From the Host Pool Details dialog box:** On the Lab Management sidebar, under **Lab Resources**, select **Host Pools**. Right-click a host pool and select **Host Pool Details.** In the Host Pool Details dialog box, select **Linked Hosts**.
Important information	The Linked Hosts page enables you to link multiple hosts to a host pool. Alternatively, you can link a single host to multiple host pools from the **Belongs To Pools** field in the host's details. For details, see "Host Fields" on page 689.
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Add Hosts to Pool.** Opens the Add Hosts to Pool dialog box, enabling you to select hosts to add to the host pool. For details, see "Add Hosts to Pool Dialog Box" on page 722.
	**Remove Host.** Removes the selected hosts from the host pool.
	**Go to Host.** Displays the selected linked host in the Hosts module.
	**Host Details.** Opens the Host Details dialog box, enabling you to view details about the selected linked host. For details, see "Host Details Dialog Box" on page 701.
	**Refresh All.** Refreshes the grid so it displays the most up-to-date information.
	**Set Filter/Sort.** Enables you to filter and sort the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For details, see the *HP Application Lifecycle Management User Guide*.
	**Select Columns.** Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For details, see the *HP Application Lifecycle Management User Guide*.
	**Find.** Opens the Find dialog box, enabling you to search for a host. For details, see the *HP Application Lifecycle Management User Guide*.
<Linked Hosts grid>	Lists the hosts that belong to the host pool.

Add Hosts to Pool Dialog Box

This page enables you to select hosts to add to a host pool.



To access	➤ **From the Host Pools module:** On the Lab Management sidebar, under Lab Resources, select **Host Pools**. In the information panel, select Linked Hosts and click the **Add Hosts to Pool** button. ➤ **From the Host Pool Details dialog box:** On the Lab Management sidebar, under **Lab Resources**, select **Host Pools**. Right-click a host pool and select **Host Pool Details.** In the Host Pool Details dialog box, select **Linked Hosts** and click the **Add Hosts to Pool** button.
Important information	Alternatively, you can link a single host to multiple host pools from the **Belongs To Pools** field in the host's details. For details, see "Host Fields" on page 689.

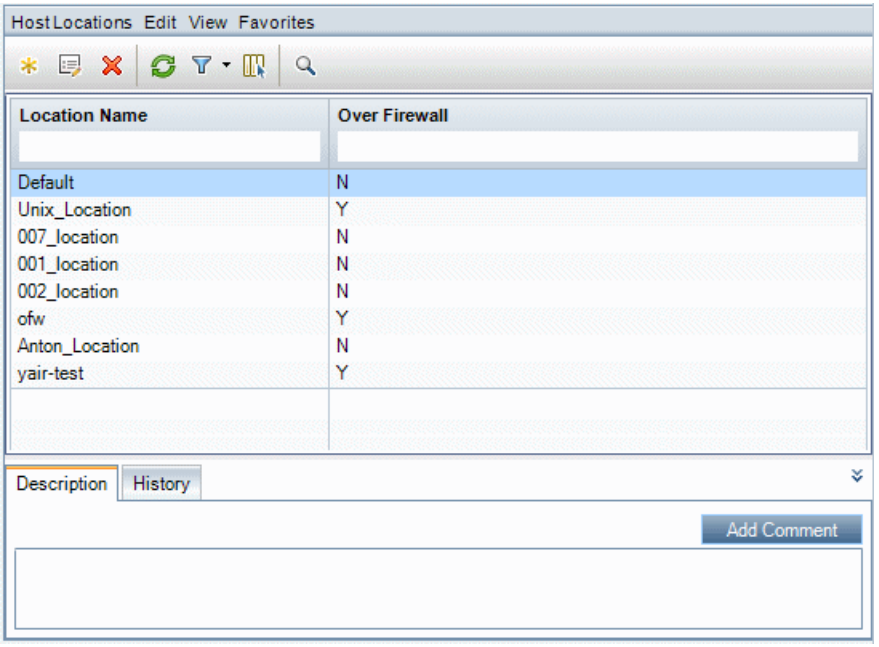
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Refresh All.** Refreshes the grid so it displays the most up-to-date information.
	**Select Columns.** Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For details, see the *HP Application Lifecycle Management User Guide*.
	**Set Filter/Sort.** Enables you to filter and sort the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For details, see the *HP Application Lifecycle Management User Guide*.
	Adds the selected hosts to the host pool.
<Hosts grid>	Lists the hosts available to add to the host pool.
Selected	Displays the hosts selected to add to the pool.

Locations Module

This module enables you to view and manage host locations.



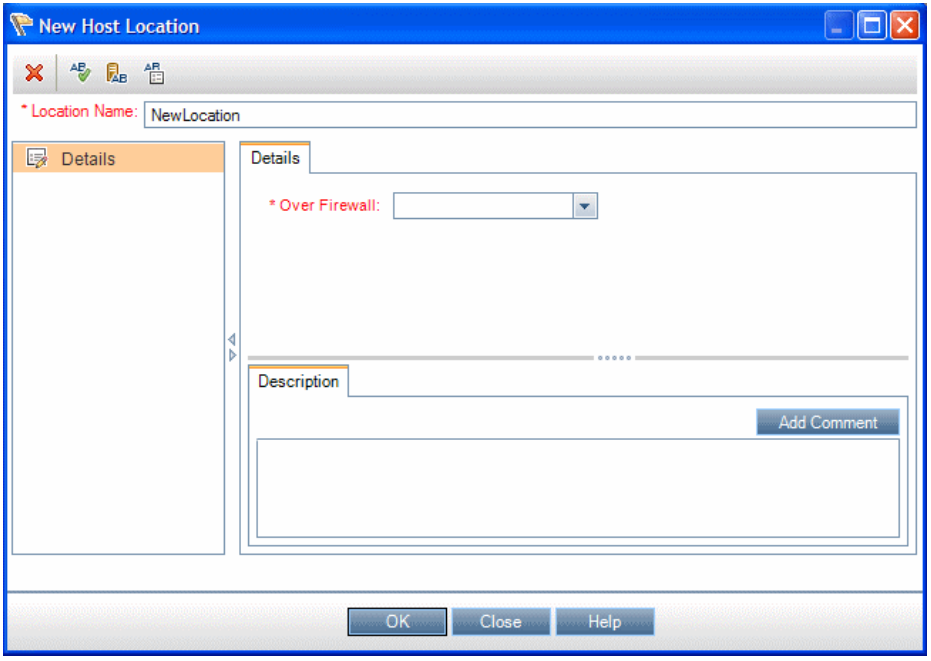
To access	On the Lab Management sidebar, under **Lab Resources**, select **Locations**.
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
<Locations module common UI elements>	➤ **Locations module fields.** For field definitions, see "Host Location Fields" on page 694. ➤ **Locations module menus and buttons.** For command and button descriptions, see "Lab Resource Module Menus and Buttons" on page 685.
<Host Locations grid>	Displays a list of the host locations defined in ALM.
Description tab	Describes the currently selected host location. **Tip:** Right-clicking in this area displays a toolbar for formatting and spell checking the text.
History tab	Lists changes made to the currently selected host location. For more details, see the *HP Application Lifecycle Management User Guide*.

New Host Location Dialog Box

This dialog box enables you to add a host location to ALM.



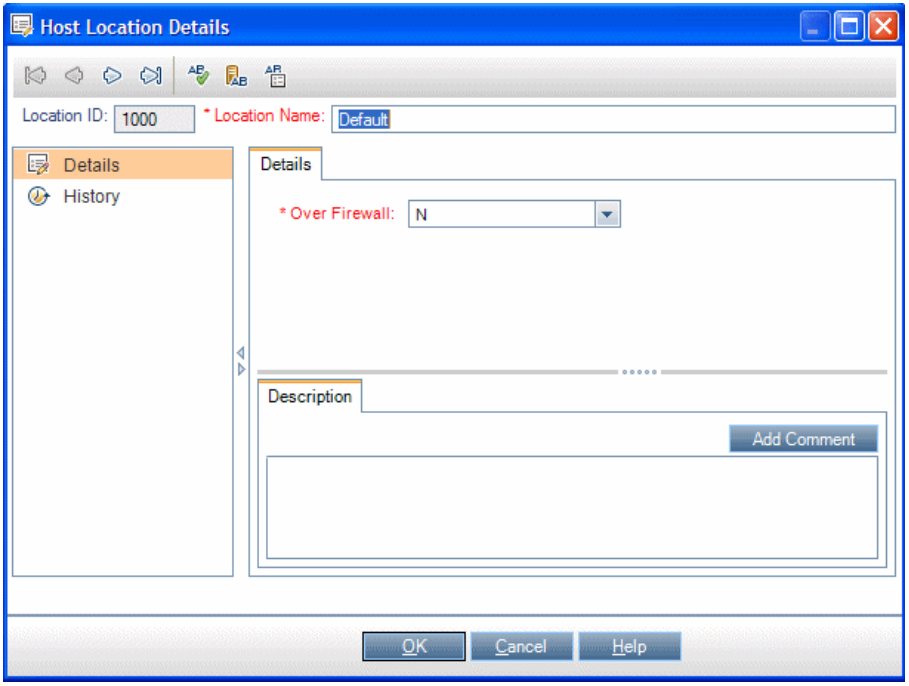
To access	**1** On the Lab Management sidebar, under **Lab Resources**, select **Locations**. **2** In the Host Locations module, click the **New Host Location** button.
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Clear All Fields.** Clears the data.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Location Name	The name for the new host location.
Details	Required fields are marked with an asterisk (*) and are displayed in red. For details on the available host location fields, see "Host Location Fields" on page 694.

Host Location Details Dialog Box

This dialog box displays details about a selected host location.



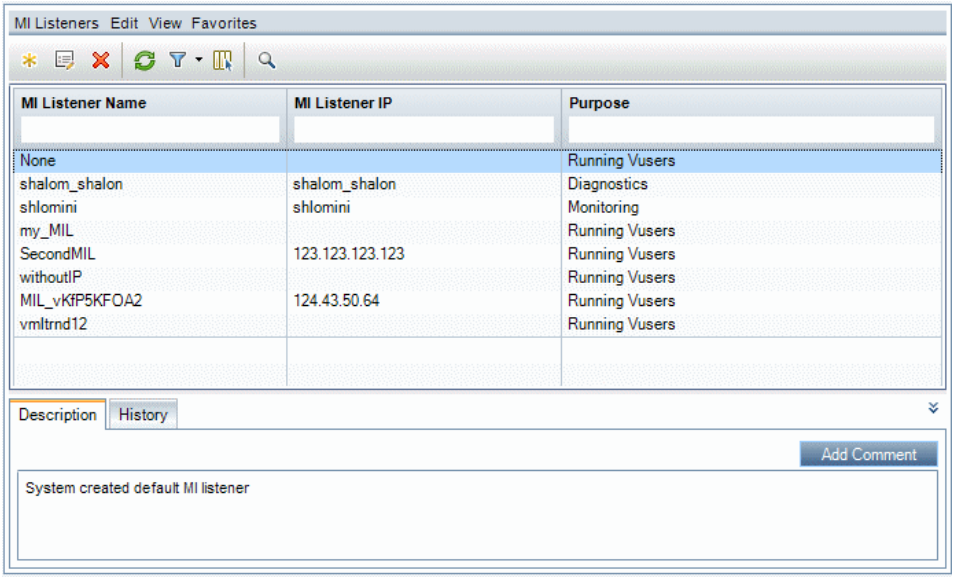
To access	**1** On the Lab Management sidebar, under **Lab Resources**, select **Locations**. **2** Right-click a location in the grid and select **Host Location Details**.
Important information	Host locations must be defined before you can select them in a host's details.
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**First/Previous/Next/Last Entity.** Enables you to browse through the list of host locations.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Location ID	The ID of the host location.
Location Name	The name of the host location.
Details	Details the currently selected host location. For details on the available fields, see "Host Location Fields" on page 694.
History	Lists changes made to the currently selected host location. For more details, see the *HP Application Lifecycle Management User Guide*.

MI Listeners Module

This module enables you to view and manage MI Listeners in ALM. MI Listeners enable running Vusers over a firewall and collecting server monitor data and application diagnostics data over a firewall.



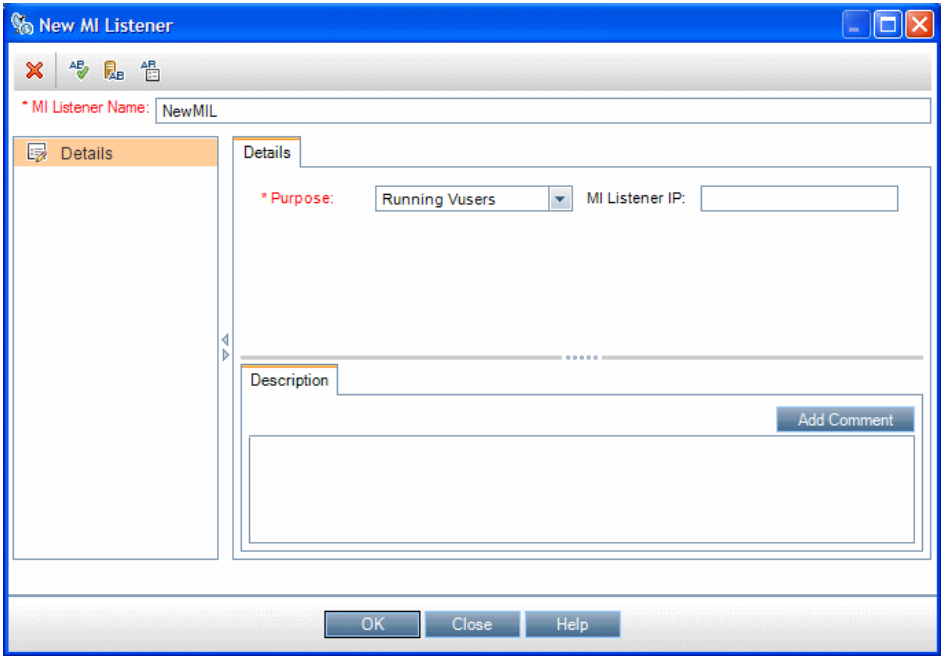
To access	On the Lab Management sidebar, under **Lab Resources**, select **MI Listeners**.
Important Information	➤ For detailed information about configuring Performance Center to work with firewalls, see the section about working with firewalls in the *HP ALM Performance Center Installation Guide*. ➤ If an MI Listener is being used by a host, it cannot be deleted.
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
<MI Listeners module common UI elements>	➤ **MI Listeners module fields.** For field definitions, see "MI Listener Fields" on page 695. ➤ **MI Listeners module menus and buttons.** For command and button descriptions, see "Lab Resource Module Menus and Buttons" on page 685.
<MI Listeners grid>	Displays a list of the MI Listeners in ALM.
Description tab	Describes the currently selected MI Listener. **Tip:** Right-clicking in this area displays a toolbar for formatting and spell checking the text.
History tab	Lists changes made to the currently selected MI Listener. For more details, see the *HP Application Lifecycle Management User Guide*.

New MI Listener Dialog Box

This dialog box enables you to add an MI Listener to ALM.



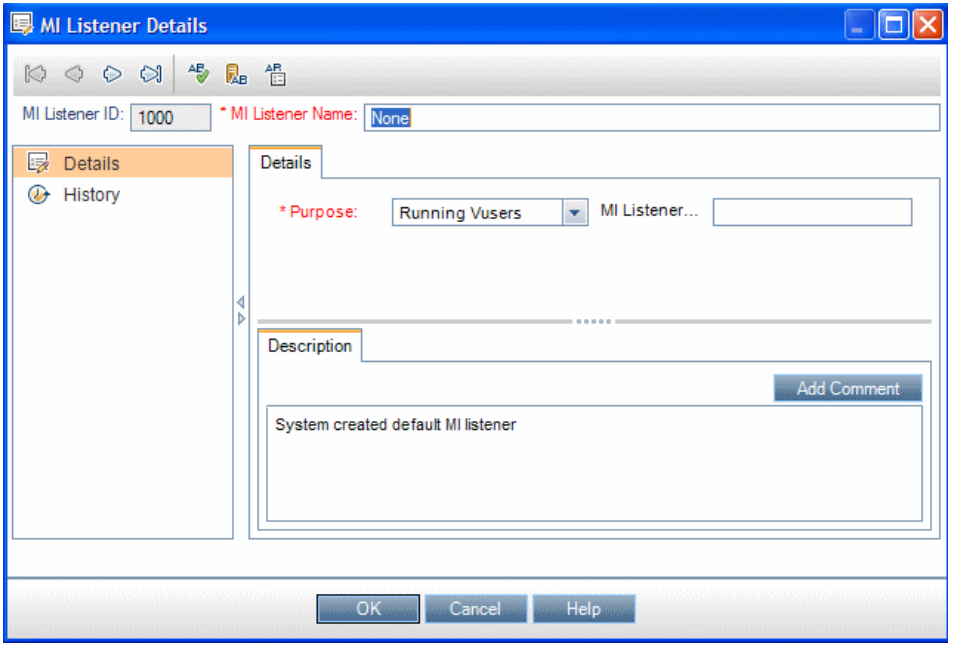
To access	**1** On the Lab Management sidebar, under **Lab Resources**, select **MI Listeners**. **2** In the MI Listeners module, click the **New MI Listener** button.
Important information	MI Listeners enable running Vusers over a firewall and collecting server monitor data and application diagnostics data over a firewall.
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Clear All Fields.** Clears the data.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
MI Listener Name	The name for the new MI Listener.
Details	Required fields are marked with an asterisk (*) and are displayed in red. For details on the available MI Listener fields, see "MI Listener Fields" on page 695.

MI Listener Details Dialog Box

This dialog box displays details about the selected MI Listener.



To access	**1** On the Lab Management sidebar, under **Lab Resources**, select **MI Listeners**. **2** Right-click an MI Listener in the grid and select **MI Listener Details**.
Important information	MI Listeners enable running Vusers over a firewall and collecting server monitor data and application diagnostics data over a firewall.
Relevant tasks	"How to Manage Lab Resources" on page 674
See also	"Lab Resources Overview" on page 672

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
	**First/Previous/Next/Last Entity.** Enables you to browse through the list of MI Listeners.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
MI Listener ID	The ID of the MI Listener.
MI Listener Name	The name of the MI Listener.
Details	Details the currently selected MI Listener. For details on the available fields, see "MI Listener Fields" on page 695.
History	Lists changes made to the currently selected MI Listener. For more details, see the *HP Application Lifecycle Management User Guide*.

Troubleshooting and Limitations

This section describes troubleshooting and limitations for lab resources.

➤ **Resource Failure.** When running a test on the set of allocated hosts, if any of the hosts fail, the status of the hosts changes from **Operational** to **Non-operational**, and an error log describing the problem is sent to the Event Log.

You can try to fix the problem according to the description in the error log, then change the status back to **Operational**. If the host is still not operational, the status automatically returns to **Non-operational** in the next test run.

If the Resource Recovery task and the OFW Status Update task (for hosts over a firewall) are enable in the **Lab Management** > **System Health** > **Maintenance Tasks tab**, Performance Center automatically detects host resource failure and attempts to restore the host to the **Operational** status.

35

Test Runs

This chapter includes:

Concepts

Reference

Concepts

Test Runs Module Overview

The Test Runs module displays information for all test runs across all projects in the system. It enables you to view detailed information relating to the run state of the test, the Vusers involved, as well as host and timeslot information. You can also drilldown and view details of specific events for each test via the Event Log.

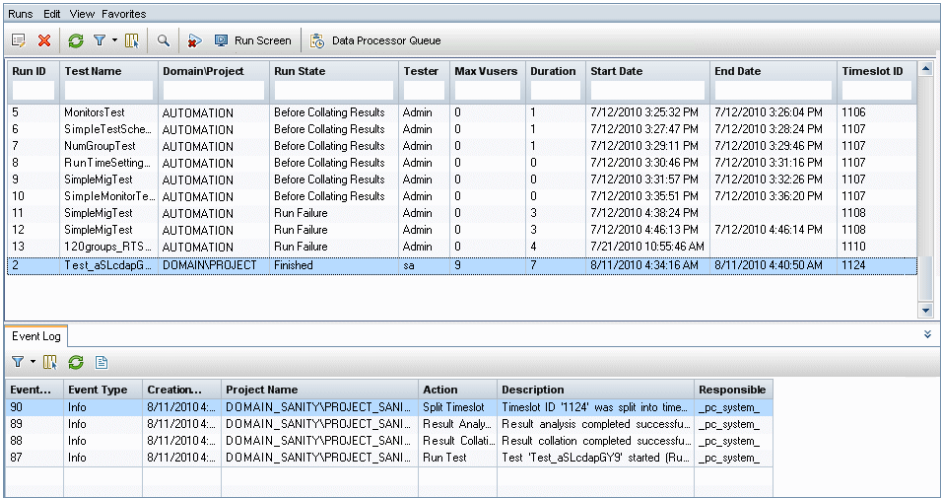
Reference

Test Runs User Interface

This section includes:

Test Runs Module Window

This module displays information for individual test runs across all projects in the system.



To access	On the Lab Management sidebar, under **Lab Usage**, select **Test Runs**.
Relevant tasks	"How to Manage a Performance Test Run" on page 340

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
<Test Runs module common UI elements>	➤ **Test Runs module fields.** For field definitions, see "Test Runs Module Fields" on page 741. ➤ **Test Runs module menus and buttons.** For command and button descriptions, see "Test Runs Module Menus and Buttons" on page 743. ➤ **ALM main menu and sidebar.** For details on the Tools menu, Help menu and sidebar, see the *HP Application Lifecycle Management User Guide*.
<Test Runs grid>	Displays a list of test runs across all projects, displaying detailed information for each test run.
<Information panel>	Located in the lower area of the module. Displays the Event Log tab. For more information, see "Initializing Run Page" on page 348.

Test Runs Module Fields

The following fields are available in the Test Runs module:

Field	Description
Average Vusers	The average number of concurrently running Vusers during the run.
Controller	The Controller involved in the test run.
Domain/Project	The test's domain and project
Duration	The time, in minutes, that the test took to run. **Note:** You should not manually edit this field.
End Date	The end date of the run. **Note:** You should not manually edit this field.

Field	Description
Exec date	The start date of the run. **Note:** You should not manually edit this field.
Exec time	The start time of the run. **Note:** You should not manually edit this field.
Involved Vusers	The number of Vusers that were intitialized at least once during the run.
Load Generators	The load generators involved in the test run.
Max Vusers	The maximum number of concurrently running Vusers during the run.
Project ID	The test's project ID.
Run ID	The identification number of the test run. This number is automatically generated by the system when the load test starts running
Run Name	The test run name.
Run State	The state of the test run. If a test is stuck in a particular state, you can change it.
Temp Results Directory Path	The path of the directory where the test results are temporarily stored.
Test Name	The name given to the test when it was created.
Tester	The name of the user running the test.
Consume VUDs	The number of VUDs used in the test run.
Timeslot ID	The ID of the test run timeslot.

Test Runs Module Menus and Buttons

This section describes the menus and buttons available in the Test Runs module.

To access	On the Lab Management sidebar, under **Lab Usage**, select **Test Runs.**

Common menus and toolbars of the Test Runs module are described below:

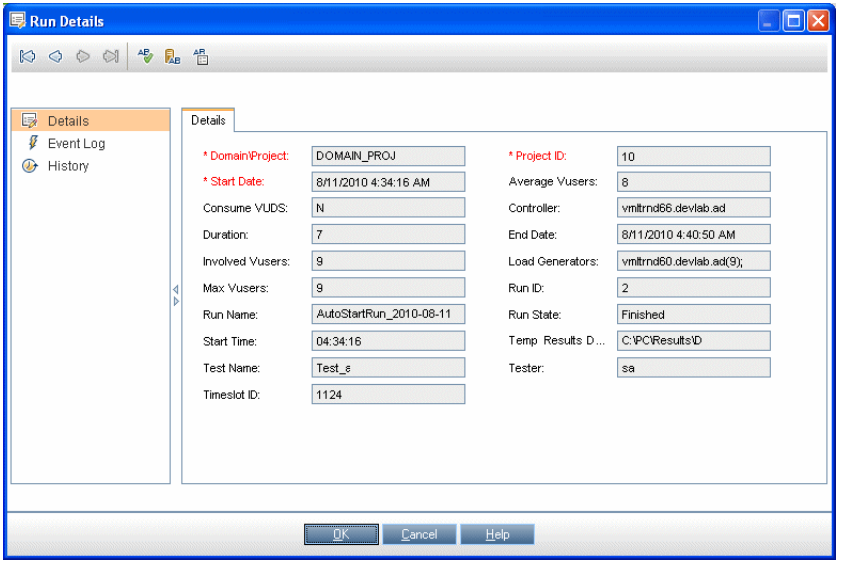
UI Elements (A-Z)	Where	Description
 **Abort Run**	<right-click menu>	Stops a currently running performance test. **Note:** Only enabled when the selected test run is in the **Initializing**, **Running** or **Stopping** states.
Add to Favorites	Favorites	Opens the Add Favorite dialog box, enabling you to add a favorite view to your private or the public folder. For details, see the *HP Application Lifecycle Management User Guide*.
 **Copy URL**	Runs and <right-click menu>	Copies a selected test run and pastes its URL as a link. The test run itself is not copied. Instead, you can paste the address into another location, such as an email or a document. Clicking the link opens up ALM and takes you to the test run file or folder. If you are not already logged in, ALM first prompts for login details.
 **Delete**	Edit and <right-click menu>	Deletes the selected test run. **Note:** Only enables when the selected test run is not in one of the active states.

UI Elements (A-Z)	Where	Description
 **DP Queue**	<right-click menu>	If you analyze a test run after it has run, or recalculate the SLA, or add the test run to a trend report, then the action is added to a data processing queue, enabling you to see when the action will be performed.
 **Find**	View	Opens the Find dialog box, enabling you to search for test runs in the module. For details about search options, see the *HP Application Lifecycle Management User Guide*.
 **Go to Run**	Runs	Opens the Go To Run dialog box, enabling you to find a specific test run by its ID number. You can only go to test runs that are in the current filter.
 **Go to Timeslot**	<right-click menu>	Opens the Timeslots module, displaying the timeslot for the selected test run.
Grid Filters	View and <right-click menu>	Enables you filter the data according to an entry in the filter box. For details about filtering options, see the *HP Application Lifecycle Management User Guide*.
Information Panel	View and <right-click menu>	Shows/Hides the Information Panel in the lower area of the module.
Organize Favorites	Favorites	Opens the Organize Favorites dialog box, enabling you to organize the list of favorite views by changing properties or deleting views. For details, see the *HP Application Lifecycle Management User Guide*.

UI Elements (A-Z)	Where	Description
Private	Favorites	Lists the favorite views that are accessible only to the user who created them.
Public	Favorites	Lists the favorite views that are accessible to all users.
 **Refresh All**	View	Refreshes the grid so that it displays the most up-to-date information.
 **Run Details**	Runs and <right-click menu>	Opens the Run Details dialog box, enabling you to view and edit details of the selected test run.
 **Run Screen**	<right-click menu>	Opens the Performance Test Run screen, enabling you to view and manage the test run. For more information, see "Performance Test Run Page" on page 358. **Note:** Only enabled when test run is in the **Running** state.
 **Select Columns**	View	Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For more details, see the *HP Application Lifecycle Management User Guide*. For details about the test run fields, see "Test Runs Module Fields" on page 741.
 **Set Filter/Sort**	View	Enables you to filter and sort the test runs in the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For more details, see the *HP Application Lifecycle Management User Guide*.

Run Details Dialog Box

This dialog box displays test run details.



To access	**1** On the Lab Management sidebar, under **Lab Settings**, select **Lab Usage**. **2** Right-click a test run in the grid, and select **Run Details**.
Relevant task	"How to Manage a Performance Test Run" on page 340

User interface elements are described below:

UI Elements (A-Z)	Description
	**First/Previous/Next/Last Entity.** Enables you to browse through the list of projects.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Details	Displays the details of the selected test run. For more details, see "Test Runs Module Fields" on page 741.
Event Log	Lists the events that occurred during the selected test run. For more details, see "Event Log" on page 351.
History	Lists changes made to the selected test run. For more details, see the *HP Application Lifecycle Management User Guide*.

36

Usage Reports

This chapter includes:

Concepts

Tasks

Reference

Concepts

Usage Reports Overview

The ALM Performance Center Usage Reports provide you with an overall analysis of Performance Center site users, resource usage, concurrent resource usage vs. license limitations, timeslot usage, as well as resource usage by duration and runs.

The following table provides a description of each report:

Report	Description
Resource Summary	Provides aggregate data regarding the way projects used the various resources of the system.
Concurrency vs. License	Provides details of concurrent resource usage per project, as well as information regarding how system resources were used within license limitations.
Timeslot Usage	Provides information about the reservation and usage of resources associated with timeslots.
Resource by Duration	Provides general information about the usage of your system resources over the selected time frame. You can view statistics for total usage by project, or per user within a project.
Resource by Runs	Provides general information about the test runs. You can view statistics for total usage by project, or per user within a project.
VUDs License Usage per Project	Provides information about VUD usage per day for each selected project.
Daily VUDs License Usage	Provides information about VUD usage per day, aggregated across all projects.

For information about how to view the reports, see "How to View Reports and Set Report Filter Criteria" on page 751.

Tasks

How to View Reports and Set Report Filter Criteria

This task describes how to view the Usage Reports and how to set their filter criteria. The filter criteria defines which projects are to be included in the reports and over which time frame to display results.

Note: This task is part of a higher-level task. For details, see "How to Work with Performance Center Administration" on page 622.

To learn more about ALM Performance Center reports, see "Usage Reports Overview" on page 750.

1 Select the desired report to view

In Lab Management, select **Lab Usage** > **Usage Reports** to view the ALM Performance Center reports tree. From the tree, select the desired report to view.

For a description of each report's user interface elements, see "Usage Reports User Interface" on page 754.

2 Filter the projects to include in the report

Perform the following steps:

a Click the **Select Projects** button adjacent to the Projects box.

b In the Project Selection dialog box, use the arrow buttons to select single or multiple projects from the **Available projects** list.

Note: You must select at least one project to generate a report.

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3 Select the desired time range for the report

Select the desired time frame for the report from the **Time Frame** drop down list. In addition to the given options, you can set a custom time frame.

For an explanation of the given time frames, see "Usage Report Time Frames" on page 753.

4 Update the report to reflect the new filter settings

Click **Generate.** The report displays the information for the selected projects and time frame.

How to Export Reports to PDF or Excel Formats

The following task describes how to export a Performance Center report to either PDF or Excel format.

Note: This task is part of a higher-level task. For details, see "How to Work with Performance Center Administration" on page 622.

Export a report to PDF

➤ To export a report to a PDF file, click the Export to PDF icon in the upper right corner of the report.

Export a report to an editable Excel file

➤ To export a report to an editable Excel file, click the Export to Excel icon in the upper right corner of the report.

Reference

Usage Report Time Frames

The following table provides an explanation of the time frames available for report selection.

Time Frame	Explanation
Today	From 00.00 to 23.59 of the current day
Yesterday	From 00.00 to 23.59 of the previous day
This week	From Monday to Sunday of the current week
Previous week	From Monday to Sunday of the previous week
This month	From beginning to end of the current calendar month
Previous month	From beginning to end of the previous calendar month
This quarter	The current quarter
Previous quarter	The previous quarter
This year	From January to December of the current year
Previous year	From January to December of the previous year

Usage Reports User Interface

This section includes:

Project Selection Dialog Box

This dialog box enables you to select projects to be included in the reports.

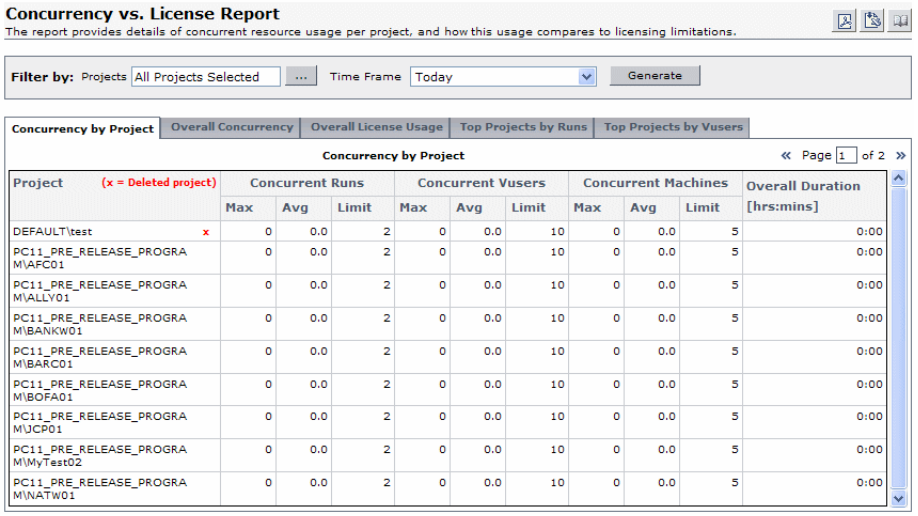
To access	In any of the reports, click the **Select Projects** button ... adjacent to the Projects box.
Important information	At least one project must be selected in order to generate a report.
Relevant tasks	"How to View Reports and Set Report Filter Criteria" on page 751

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
	Filters the **Available projects** list. The filter supports partial text entries.
	Click to select or deselect individual projects respectively.
	Click to select or deselect all projects respectively.
Available projects list	Projects that are available for selection.
Selected projects list	The projects that have already been selected. **Default:** All the available projects are automatically selected.

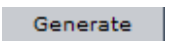
Concurrency vs. License Report

The Concurrency vs. License Report provides details of concurrent resource usage per project, as well as information regarding how system resources were used within license limitations.



To access	**1** Select **Lab Reports** > **Usage Reports** **2** In the list of Usage Reports, select **Concurrency vs. License**
Relevant tasks	"How to View Reports and Set Report Filter Criteria" on page 751

User interface elements are described below:

UI Elements (A-Z)	Description
	**Export to PDF/Excel.** Click to export the report to PDF or Excel format.
	Generates the report.

UI Elements (A-Z)	Description
Concurrency by Project tab	Contains a table that displays concurrent resource usage information for each selected project. For more information, see "Concurrency by Project Table" on page 758.
Filter by: Projects	Click the browse button by this field to select which project to include in the report.
Filter by: Time Frame	Select the desired time frame for the report. For an explanation of the given time frames, see "Usage Report Time Frames" on page 753.
Overall Concurrency tab	Contains a table that displays concurrent resource usage information aggregated over all selected projects, as well as aggregated over all projects in the system. For more information, see "Overall Concurrency Table" below.
Overall License Usage tab	Contains a graph that displays maximum and average Runs and Vuser usage as a percentage of the Performance Center license limitations, allowing the administrator to determine the percentage of the Performance Center license that is actually used. The usage is aggregated over all selected projects, as well as aggregated over all projects in the system. For more information, see "Overall License Usage Graph" below.

UI Elements (A-Z)	Description
Top Projects by Runs tab	Contains a graph that displays the maximum and average number of concurrent runs per project as a percentage of the project limit, which is defined in the project settings (**Lab Settings** > **Project Settings**). This helps the administrator identify those projects that run most efficiently within their given limitations. For more information, see "Top Projects by Runs Graph" below.
Top Projects by Vusers tab	Contains a graph that displays the maximum and average number of concurrent running Vusers per project as a percentage of the project limit, which is defined in the project settings (**Lab Settings** > **Project Settings**). This helps the administrator identify those projects that run most efficiently within their given limitations. For more information, see "Top projects by Vusers Graph" below.

Concurrency by Project Table

Important Information	You can sort the table according to the values of any column. The arrow in the heading displays whether the column is sorted in ascending or descending order. Click the column heading to reverse the order.

User interface elements are described below:

UI Elements (A-Z)	Description
Concurrent Machines - Avg	The average number of concurrent running machines (controllers and load generators) in all of the project's concurrent test runs.
Concurrent Machines - Limit	The maximum number of concurrent running machines allowed for this project as defined in the project settings (**Lab Settings** > **Project Settings**).

UI Elements (A-Z)	Description
Concurrent Machines - Max	The maximum number of concurrent running machines (controllers and load generators) in all of the project's concurrent test runs.
Concurrent Runs - Avg	The average number of concurrent test runs for the project. For the purposes of this report, a single test run is considered a concurrent run.
Concurrent Runs - Limit	The maximum number of concurrent runs allowed for this project as defined in the project settings (**Lab Settings** > **Project Settings**). For the purposes of this report, a single test run is considered a concurrent run.
Concurrent Runs - Max	The maximum number of concurrent test runs for the project. For the purposes of this report, a single test run is considered a concurrent run.
Concurrent Vusers - Avg	The average number of concurrent running Vusers in all of the project's concurrent test runs.
Concurrent Vusers - Limit	The maximum number of concurrent running Vusers allowed for this project as defined in the project settings (**Lab Settings** > **Project Settings**).
Concurrent Vusers - Max	The maximum number of concurrent running Vusers in all of the project's concurrent test runs.
Overall Duration	The total time tests were run in the project. This value shows the actual amount of time the system was used to run load tests, and not concurrent duration.
Project	The project name. Deleted projects are also included in the report and are indicated with a red x.

Overall Concurrency Table

Important Information	You can sort the table according to the values of any column. The arrow in the heading displays whether the column is sorted in ascending or descending order. Click the column heading to reverse the order.

User interface elements are described below:

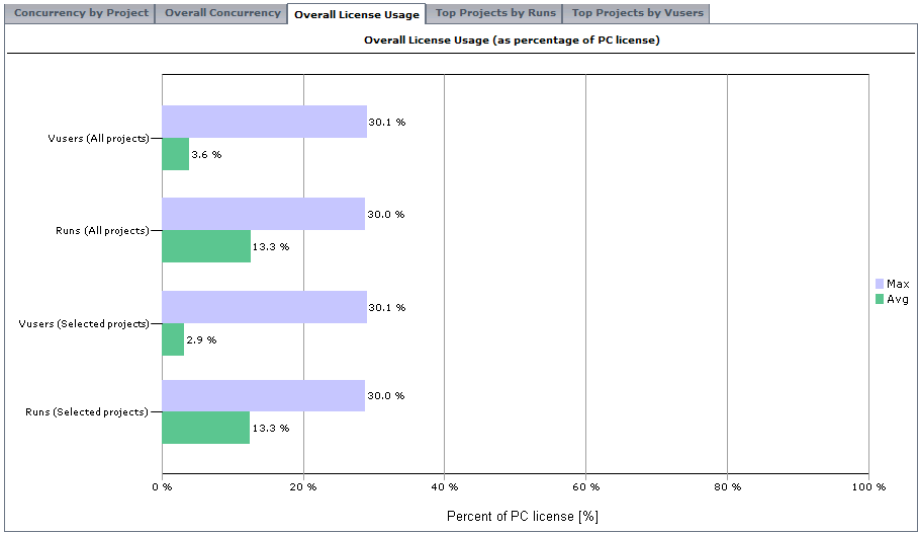
UI Elements(A-Z)	Description
Concurrent Machines Avg	The average number of concurrent running machines.
Concurrent Machines Max	The maximum number of concurrent running machines.
Concurrent Runs Avg (License %)	The average number of concurrent runs. The value in brackets is the average number of concurrent runs as a percentage of the Performance Center license.
Concurrent Runs Max (License %)	The maximum number of concurrent runs. The value in brackets is the maximum number of concurrent runs as a percentage of the Performance Center license.
Concurrent Runs PC License	The maximum number of concurrent runs allowed by the Performance Center license.
Concurrent Vusers Avg (License %)	The average number of concurrent running Vusers. The value in brackets is the average number of concurrent running Vusers as a percentage of the project Performance Center license.
Concurrent Vusers Max (License %)	The maximum number of concurrent running Vusers. The value in brackets is the maximum number of concurrent running Vusers as a percentage of the Performance Center license.
Concurrent Vusers PC License	The maximum number of concurrent running Vusers allowed by the Performance Center license.
Overall Duration	The total time tests were run aggregated over all the projects.
Project	**All Projects** or **Selected Projects**.

Overall License Usage Graph

X-axis	Maximum and average percentage of Performance Center license being used.
Y-axis	Vuser and runs usage aggregated over all projects as well as only selected projects.

Example

In the following example the maximum number of Vusers for all projects in the system used just 30.1% of the Performance Center license, while the average number of Vusers for all projects used just 3.6% of the license. This tells the administrator that a significant portion of the Performance Center license is not being used.

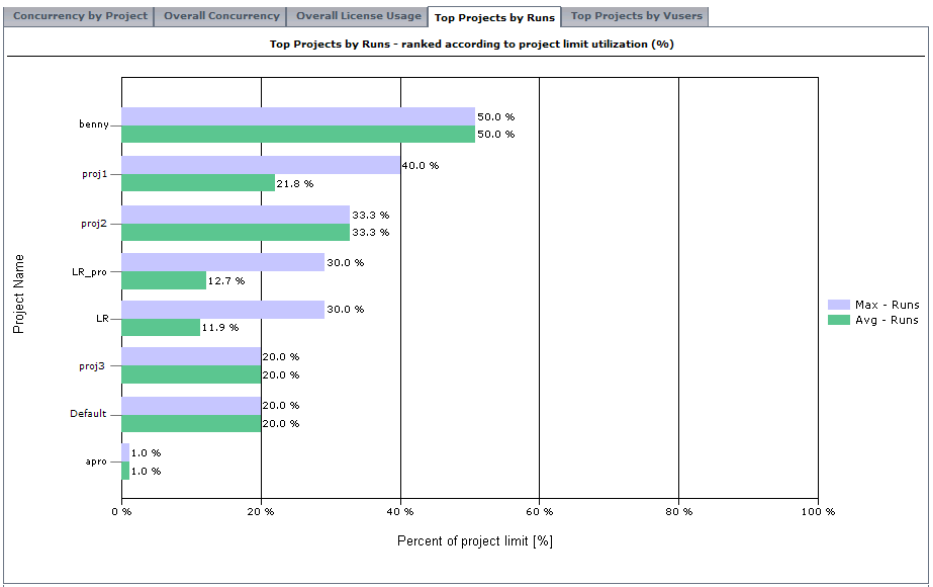


Top Projects by Runs Graph

Important Information	In most circumstances, the graph displays information for up to ten selected projects. If there is more than one selected project with the same number of maximum concurrent runs, all these projects are displayed. In that case, more than ten projects might be displayed.
X-axis	Maximum and average percentage of allowed concurrent runs being used
Y-axis	Projects displayed in descending order according to the maximum number of concurrent runs.

Example

In the following example the Max - Runs value for the project **LR_pro** is 30%. This means that the maximum number of concurrent runs for this project reached 30% of its limit. The Avg - Runs value for this project shows that the average number of concurrent runs reached 12.7% of its limit. These values tell the administrator that a significant portion of the project's defined limit of concurrent runs is not being utilized.

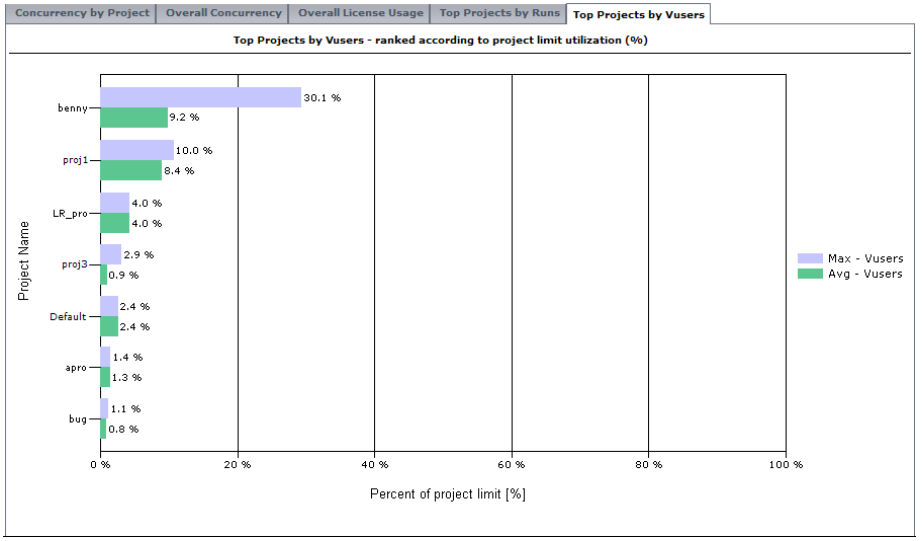


Top projects by Vusers Graph

Important Information	In most circumstances, the graph displays information for up to ten selected projects. If there is more than one selected project with the same number of maximum concurrent runs, all these projects are displayed. In that case, more than ten projects might be displayed.
X-axis	Maximum and average percentage of allowed concurrent running Vusers being used
Y-axis	Projects displayed in descending order according to the maximum number of concurrent running Vusers.

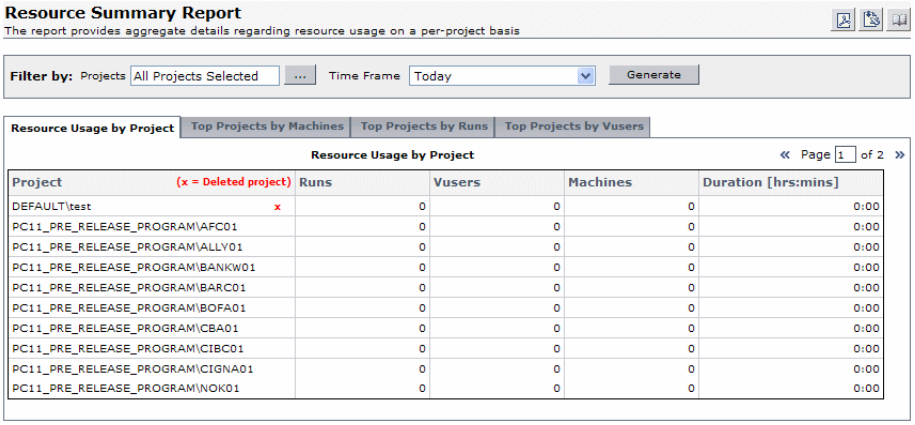
Example

In the following example, the Max - Vusers value for the project **proj1** is 10%. This means that the maximum number of concurrent running Vusers for this project reached 10% of its limit. The Avg - Vusers value for this project shows that the average number of concurrent running Vusers reached 8.4% of its limit. These values tell the administrator that a significant portion of the project's defined limit of concurrent running Vusers is not being utilized.



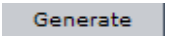
Resource Summary Report

The Resource Summary Report provides aggregate data regarding the way projects used the various resources of the system.



To access	**1** Select **Lab Reports** > **Usage Reports** **2** In the list of Usage Reports, select **Resource Summary**
Relevant tasks	"How to View Reports and Set Report Filter Criteria" on page 751

User interface elements are described below:

UI Elements (A-Z)	Description
	**Export to PDF/Excel.** Click to export the report to PDF or Excel format.
	Generates the report.
Filter by: Projects	Click the browse button by this field to select which project to include in the report.
Filter by: Time Frame	Select the desired time frame for the report. For an explanation of the given time frames, see "Usage Report Time Frames" on page 753.

UI Elements (A-Z)	Description
Resource Usage by Project tab	Contains a table that provides resource usage information for each selected project. For more information, see "Resource Usage by Project Table" below.
Top Projects by Machines tab	Contains a graph which displays the number of machines used per project, aggregated over all the runs. **X-axis.** The number of machines used per project. **Y-axis.** Projects displayed in descending order according to the number of machines used. **Important information.** In most circumstances, the graph displays information for up to ten selected projects. If there is more than one selected project with the same number of maximum concurrent runs, all these projects are displayed. In that case, more than ten projects might be displayed.
Top Projects by Runs tab	Contains a graph that displays the number of test runs per project. **X-axis.** The number of test runs per project. **Y-axis.** Projects displayed in descending order according to the number of test runs. **Important information.** In most circumstances, the graph displays information for up to ten selected projects. If there is more than one selected project with the same number of maximum concurrent runs, all these projects are displayed. In that case, more than ten projects might be displayed.
Top Projects by Vusers tab	Contains a graph that displays the number of Vusers per project, aggregated over all the runs. **X-axis.** The number of Vusers per project. **Y-axis.** Projects displayed in descending order according to the number of Vusers.

Resource Usage by Project Table

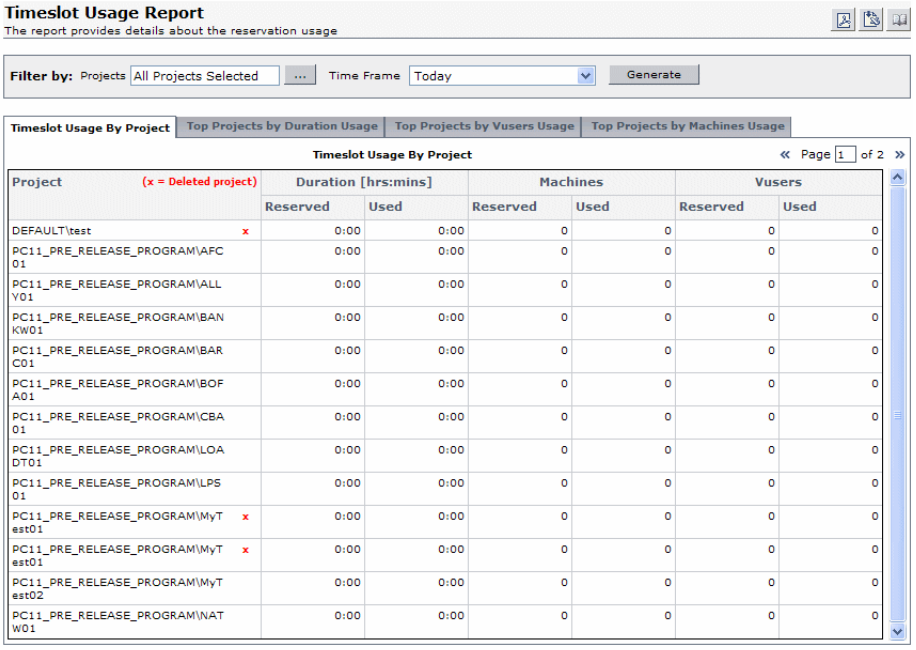
Important information	You can sort the table according to the values of any column. The arrow in the heading displays whether the column is sorted in ascending or descending order. Click the column heading to reverse the order.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
Duration	The total time tests were run in the project.
Machines	The total number of machines that were used in the project, aggregated over all the runs.
Project	The project name. Deleted projects are also included in the report and are indicated by a red x.
Runs	The total number of test runs in the project, aggregated over all the tests.
Vusers	The total number of Vusers in the project, aggregated over all the runs.

Timeslot Usage Report

The Timeslot Usage Report provides information about the reservation and usage of resources associated with timeslots.



Timeslot Usage Report
The report provides details about the reservation usage

Filter by: Projects: All Projects Selected ... Time Frame: Today Generate

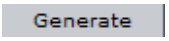
Timeslot Usage By Project | Top Projects by Duration Usage | Top Projects by Vusers Usage | Top Projects by Machines Usage

Timeslot Usage By Project « Page 1 of 2 »

Project (x = Deleted project)	Duration [hrs:mins]		Machines		Vusers	
	Reserved	Used	Reserved	Used	Reserved	Used
DEFAULT\test x	0:00	0:00	0	0	0	0
PC11_PRE_RELEASE_PROGRAM\AFC01	0:00	0:00	0	0	0	0
PC11_PRE_RELEASE_PROGRAM\ALLY01	0:00	0:00	0	0	0	0
PC11_PRE_RELEASE_PROGRAM\BANKW01	0:00	0:00	0	0	0	0
PC11_PRE_RELEASE_PROGRAM\BARC01	0:00	0:00	0	0	0	0
PC11_PRE_RELEASE_PROGRAM\BOFA01	0:00	0:00	0	0	0	0
PC11_PRE_RELEASE_PROGRAM\CBA01	0:00	0:00	0	0	0	0
PC11_PRE_RELEASE_PROGRAM\LOADT01	0:00	0:00	0	0	0	0
PC11_PRE_RELEASE_PROGRAM\LPS01	0:00	0:00	0	0	0	0
PC11_PRE_RELEASE_PROGRAM\MyTest01 x	0:00	0:00	0	0	0	0
PC11_PRE_RELEASE_PROGRAM\MyTest01 x	0:00	0:00	0	0	0	0
PC11_PRE_RELEASE_PROGRAM\MyTest02	0:00	0:00	0	0	0	0
PC11_PRE_RELEASE_PROGRAM\NATW01	0:00	0:00	0	0	0	0

To access	**1** Select **Lab Reports** > **Usage Reports** **2** In the list of Usage Reports, select **Timeslot Usage**
Relevant tasks	"How to View Reports and Set Report Filter Criteria" on page 751

User interface elements are described below:

UI Elements (A-Z)	Description
	**Export to PDF/Excel.** Click to export the report to PDF or Excel format.
	Generates the report.
Filter by: Projects	Click the browse button by this field to select which project to include in the report.
Filter by: Time Frame	Select the desired time frame for the report. For an explanation of the given time frames, see "Usage Report Time Frames" on page 753.
Timeslot Usage by Project tab	Contains a table that displays reservation and usage information for duration, machines, and Vusers per project. For more information, see "Timeslot Usage by Project Table" on page 770.
Top Projects by Duration Usage tab	Contains a graph that displays reservation and usage information for timeslot duration per project. It allows the administrator to see which projects most efficiently use their reserved duration. **X-axis.** The total amount of reserved and used duration for each project. **Y-axis.** Projects displayed in descending order according to their duration usage. **Important information.** In most circumstances, the graph displays information for up to ten selected projects. If there is more than one selected project with the same number of maximum concurrent runs, all these projects are displayed. In that case, more than ten projects might be displayed.

UI Elements (A-Z)	Description
Top Projects by Machines Usage tab	Contains a graph that displays reservation and usage information for timeslot machines per project. It allows the administrator to see which projects most efficiently use their reserved number of machines. **X-axis.** The total amount of reserved and used machines for each project. **Y-axis.** Projects displayed in descending order according to their Vusers usage. **Important information.** In most circumstances, the graph displays information for up to ten selected projects. If there is more than one selected project with the same number of maximum concurrent runs, all these projects are displayed. In that case, more than ten projects might be displayed.
Top Projects by Vusers Usage tab	Contains a graph that displays reservation and usage information for timeslot Vusers per project. It allows the administrator to see which projects most efficiently use their reserved number of Vusers. **X-axis.** The total amount of reserved and used Vusers for each project. **Y-axis.** Projects displayed in descending order according to their machines usage. **Important information.** In most circumstances, the graph displays information for up to ten selected projects. If there is more than one selected project with the same number of maximum concurrent runs, all these projects are displayed. In that case, more than ten projects might be displayed.

Timeslot Usage by Project Table

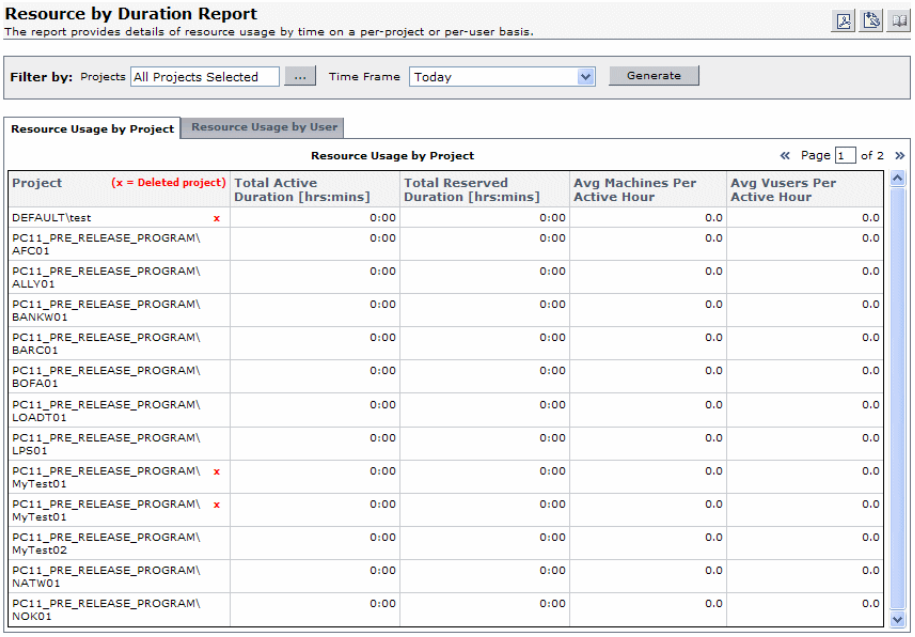
Important information	You can sort the table according to the values of any column. The arrow in the heading displays whether the column is sorted in ascending or descending order. Click the column heading to reverse the order.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
Duration Reserved	The amount of time reserved for the project.
Duration Used	The amount of time used within the project.
Machines Reserved	The number of machines reserved for the project.
Machines Used	The number of machines used in the project.
Project	The project name. Deleted projects are also included in the report and are indicated by a red x.
Vusers Reserved	The number of Vusers reserved for the project.
Vusers Used	The number of Vusers used in the project.

Resource by Duration Report

The Resource by Duration Report provides general information about the usage of your system resources over the selected time frame. You can view statistics for total usage by project, or per user within a project.



Resource by Duration Report
The report provides details of resource usage by time on a per-project or per-user basis.

Filter by: Projects: All Projects Selected ... Time Frame: Today Generate

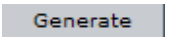
Resource Usage by Project | Resource Usage by User

Resource Usage by Project « Page 1 of 2 »

Project (x = Deleted project)	Total Active Duration [hrs:mins]	Total Reserved Duration [hrs:mins]	Avg Machines Per Active Hour	Avg Vusers Per Active Hour
DEFAULT\test x	0:00	0:00	0.0	0.0
PC11_PRE_RELEASE_PROGRAM\ AFC01	0:00	0:00	0.0	0.0
PC11_PRE_RELEASE_PROGRAM\ ALLY01	0:00	0:00	0.0	0.0
PC11_PRE_RELEASE_PROGRAM\ BANKW01	0:00	0:00	0.0	0.0
PC11_PRE_RELEASE_PROGRAM\ BARC01	0:00	0:00	0.0	0.0
PC11_PRE_RELEASE_PROGRAM\ BOFA01	0:00	0:00	0.0	0.0
PC11_PRE_RELEASE_PROGRAM\ LOADT01	0:00	0:00	0.0	0.0
PC11_PRE_RELEASE_PROGRAM\ LPS01	0:00	0:00	0.0	0.0
PC11_PRE_RELEASE_PROGRAM\ MyTest01 x	0:00	0:00	0.0	0.0
PC11_PRE_RELEASE_PROGRAM\ MyTest01 x	0:00	0:00	0.0	0.0
PC11_PRE_RELEASE_PROGRAM\ MyTest02	0:00	0:00	0.0	0.0
PC11_PRE_RELEASE_PROGRAM\ NATW01	0:00	0:00	0.0	0.0
PC11_PRE_RELEASE_PROGRAM\ NOK01	0:00	0:00	0.0	0.0

To access	**1** Select **Lab Reports** > **Usage Reports** **2** In the list of Usage Reports, select **Resource Usage by Duration**
Relevant tasks	"How to View Reports and Set Report Filter Criteria" on page 751

User interface elements are described below:

UI Elements (A-Z)	Description
	**Export to PDF/Excel.** Click to export the report to PDF or Excel format.
	Generates the report.
Filter by: Projects	Click the browse button by this field to select which project to include in the report.
Filter by: Time Frame	Select the desired time frame for the report. For an explanation of the given time frames, see "Usage Report Time Frames" on page 753.
Resource Usage by Project tab	Contains a table that displays resource usage per project over the selected time frame. For more information, see "Resource Usage by Project Table" below.
Resource Usage by User tab	Contains a table that displays resource usage per user. For more information, see "Resource Usage by User Table" below.

Resource Usage by Project Table

Important information	You can sort the table according to the values of any column. The arrow in the heading displays whether the column is sorted in ascending or descending order. Click the column heading to reverse the order.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
Avg Machines per Active Hour	The average number of machines used per active hour. **Note:** An active hour refers to the actual running time of your tests within the selected time frame.
Avg Vusers per Active Hour	The average number of running Vusers per active hour. **Note:** An active hour refers to the actual running time of your tests within the selected time frame.
Project	The project name. Deleted projects are also included in the report and are indicated by a red x.
Total Active Duration	The total time tests were run during reserved timeslots. **Note:** Active Duration refers to the actual running time of your tests within the selected time frame.
Total Reserved Duration	The total time reserved, in the Timeslots page, by the project.

Resource Usage by User Table

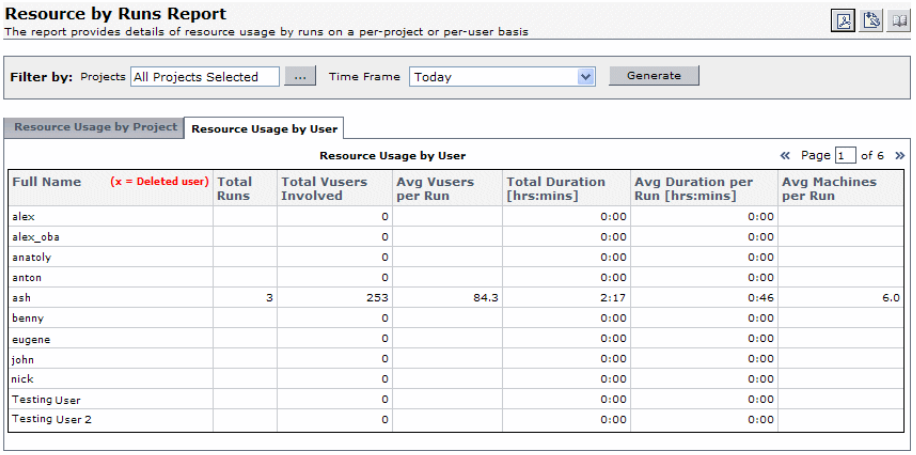
Important information	➤ Only users with privileges in the selected projects are shown. ➤ You can sort the table according to the values of any column. The arrow in the heading displays whether the column is sorted in ascending or descending order. Click the column heading to reverse the order.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
Avg Hosts per Active Hour	The average number of hosts used per active hour. **Note:** An active hour refers to the actual running time of your tests within the selected time frame.
Avg Vusers per Active Hour	The average number of running Vusers per active hour. **Note:** An active hour refers to the actual running time of your tests within the selected time frame.
Full Name	The name of the user. Deleted users are also included in the report.
Total Active Duration	The total time tests were run during reserved timeslots. **Note:** Active Duration refers to the actual running time of your tests within the selected time frame.
Total Reserved Duration	The total time reserved, in the Timeslots page, by the user.

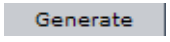
Resource Usage by Runs Report

The Resource Usage by Runs Report provides general information about the test runs. You can view statistics for total usage by project, or per user within a project.



To access	**1** Select **Lab Reports** > **Usage Reports** **2** In the list of Usage Reports, select **Resource Usage by Runs**
Relevant tasks	"How to View Reports and Set Report Filter Criteria" on page 751

User interface elements are described below:

UI Elements (A-Z)	Description
	**Export to PDF/Excel.** Click to export the report to PDF or Excel format.
	Generates the report.
Filter by: Projects	Click the browse button by this field to select which project to include in the report.

UI Elements (A-Z)	Description
Filter by: Time Frame	Select the desired time frame for the report. For an explanation of the given time frames, see "Usage Report Time Frames" on page 753.
Resource Usage by Project tab	Contains a table that displays test run statistics per project over the selected time frame. For more information, see "Resource Usage by Project Table" below.
Resource Usage by User tab	Contains a table that displays test run statistics per user. For more information, see "Resource Usage by User Table" below.

Resource Usage by Project Table

Important information	➤ Details of all runs with any amount of duration, even retries of a single run, are included in the table. ➤ You can sort the table according to the values of any column. The arrow in the heading displays whether the column is sorted in ascending or descending order. Click the column heading to reverse the order.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
Avg Duration per Run	The average time used for the listed runs.
Avg Machines per Run	The average number of machines used per run.
Avg Vusers per Run	The average number of Vusers used per run.
Project	The project name. Deleted projects are also included in the report and are indicated by a red x.
Total Duration	The total time used by the listed runs.

UI Elements (A-Z)	Description
Total Runs	The total number of runs in the project.
Total Vusers Involved	The total number of Vusers in the project.

Resource Usage by User Table

Important information	➤ Runs of users that have been deleted from the system, or who no longer have any privileges, are also included in the table. ➤ Details of all runs with any amount of duration, even retries of a single run, are included in the table. ➤ You can sort the table according to the values of any column. The arrow in the heading displays whether the column is sorted in ascending or descending order. Click the column heading to reverse the order.

User interface elements are described below (unlabeled elements are shown in angle brackets):

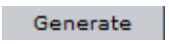
UI Elements (A-Z)	Description
Avg Duration per Run	The average time used for the listed runs.
Avg Machines per Run	The average number of machines used per run.
Avg Vusers per Run	The average number of Vusers used per run.
Full Name	The name of the user. Deleted users are also included in the report.
Total Duration	The total time used by the listed runs.
Total Runs	The total number of runs associated with the user.
Total Vusers Involved	The total number of Vusers associated with the user.

VUDs License Usage per Project Report

The VUDs License Usage per Project Report provides information about VUD usage per day for each selected project.

To access	**1** Select **Lab Reports** > **Usage Reports** **2** In the list of Usage Reports, select **VUDs License Project Usage**
Relevant tasks	"How to View Reports and Set Report Filter Criteria" on page 751

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
	**Export to PDF/Excel.** Click to export the report to PDF or Excel format.
	Generates the report.
Filter by: Projects	Click the browse button by this field to select which project to include in the report.
Filter by: Time Frame	Select the desired time frame for the report. For an explanation of the given time frames, see "Usage Report Time Frames" on page 753.
VUDs per Project tab	Contains a table that provides information about daily VUD usage per selected project. For more information see "VUDs per Project Table" below.
VUDs Transactions tab	Contains a table that provides information about VUDs per transactions. For more information, see "VUDs Transactions Table" on page 780.

VUDs per Project Table

Important information	➤ Details of all runs with any amount of duration, even retries of a single run, are included in the table. ➤ You can sort the table according to the values of any column. The arrow in the heading displays whether the column is sorted in ascending or descending order. Click the column heading to reverse the order.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
Allocated	The amount of VUDs that were allocated to the project at the start of the day.
Consumed	The amount of VUDs that were consumed during the day.
Date	The date for which VUD usage information is shown.
New Value	The amount of VUDs that were remaining at the end of the day.
Project	The name of the project.

VUDs Transactions Table

Important information	➤ Details of all runs with any amount of duration, even retries of a single run, are included in the table. ➤ You can sort the table according to the values of any column. The arrow in the heading displays whether the column is sorted in ascending or descending order. Click the column heading to reverse the order.

User interface elements are described below (unlabeled elements are shown in angle brackets):

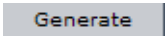
UI Elements (A-Z)	Description
Action	The current state of the VUDs.
Date	The date for which VUD information is displayed.
In Use	The number of VUDs that are currently running.
New VUDs Limit	The number of VUDs that are currently available to the project.
Pending	The number of VUDs that are available for running.
Project	The project name. Deleted projects are also included in the report and are indicated by a red x.
Run ID	The run ID.
Test Name	The performance test name.
Unique ID	A unique ID that identifies VUDs from their issue to their expiration.
User	The user that performed the transaction.
Value	The amount of VUDs that are in the state indicated in the **Action** column.

Daily VUDs License Usage Report

The Daily VUDs License Usage Report provides overall VUD usage information aggregated for all projects for a specific day.

To access	**1** Select **Lab Reports** > **Usage Reports** **2** In the list of Usage Reports, select **Daily VUDs License Site Usage**
Relevant tasks	"How to View Reports and Set Report Filter Criteria" on page 751

User interface elements are described below:

UI Elements (A-Z)	Description
	**Export to PDF/Excel.** Click to export the report to PDF or Excel format.
	Generates the report.
Daily VUDs Usage tab	Contains a table that displays daily VUD usage information. For more information, see "Daily VUDs Usage Table" below.
Filter by: Time Frame	Select the desired time frame for the report. For an explanation of the given time frames, see "Usage Report Time Frames" on page 753.

Daily VUDs Usage Table

Important information	➤ Details of all runs with any amount of duration, even retries of a single run, are included in the table. ➤ You can sort the table according to the values of any column. The arrow in the heading displays whether the column is sorted in ascending or descending order. Click the column heading to reverse the order.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
Added	The amount of VUDs that were added on the day.
Consumed	The amount of VUDs that were used on the day.
Date	The date for which VUD usage information is shown.
New Value	The amount of VUDs that were remaining at the end of the day.

Troubleshooting and Limitations

When viewing the Usage reports in a resolution of 1024x768, to see all user interface controls, collapse the ALM modules and/or the reports selection tree.

37

Patch Management

This chapter includes:

Concepts

Tasks

Reference

Concepts

Patches Overview

ALM Performance Center allows you to upload a patch to the system and to then install the patch on the appropriate host or server.

Tasks

How to Upload Patches to ALM

This task describes how to upload patches to ALM Performance Center.

Note: This task is part of a higher-level task. For details, see "How to Work with Performance Center Administration" on page 622.

To upload a patch:

1 On the Lab Management sidebar, under **Lab Settings**, select **Patches**.

2 Click the **New Patch** button. The Select Patch dialog box opens, enabling you to select a patch (.msp/.msi) to upload.

3 Click **Open**. The New Patch dialog box opens.

4 Enter the details for the new patch and click **OK**. The patch is added to the system and appears in the Patches grid.

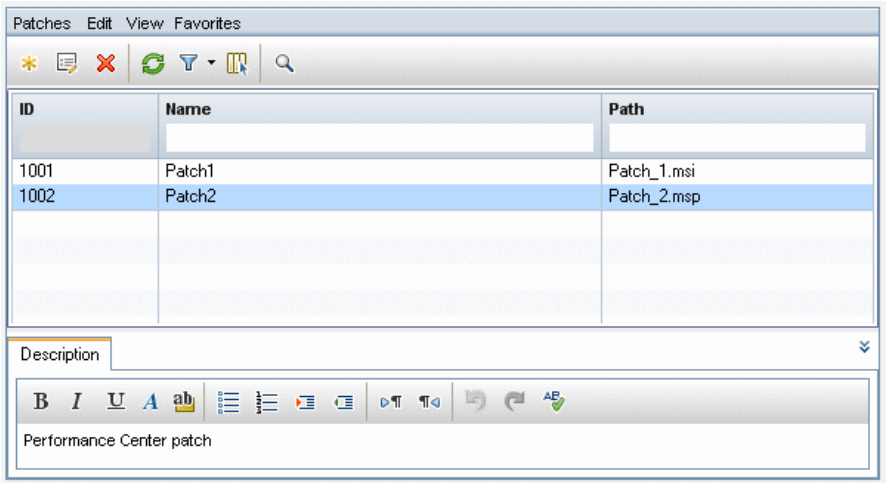
Reference

Patch Management User Interface

This section includes:

Patches Module Window

This module enables you to view and upload patches.



To access	On the Lab Management sidebar, under **Lab Settings**, select **Patches**.
Relevant tasks	"How to Upload Patches to ALM" on page 785
See also	➤ "How to Manage Lab Resources" on page 674 ➤ "How to Manage Performance Center Servers" on page 799

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
<Information panel>	Located in the lower area of the module. Displays a description about the patch selected in the grid.
<Patches grid>	Displays a list of the patches that have been uploaded to ALM Performance Center.
<Patches module common UI elements>	➤ **Patches module fields.** For field definitions, see "Patches Module Fields" on page 788. ➤ **Patches module menus and buttons.** For command and button descriptions, see "Patches Module Menus and Buttons" on page 789. ➤ **ALM main menu and sidebar.** For details on the Tools menu, Help menu and sidebar, see the *HP Application Lifecycle Management User Guide*.

Patches Module Fields

This section describes the Patches module fields:

Field	Description
Description	Displays a description of the selected patch.
ID	The patch ID.
Name	The patch name.
Path	The patch path.

Patches Module Menus and Buttons

This section describes the menus and buttons available in the Patches module.

To access	On the Lab Management sidebar, under **Lab Settings**, select **Patches.**

User interface elements are described below:

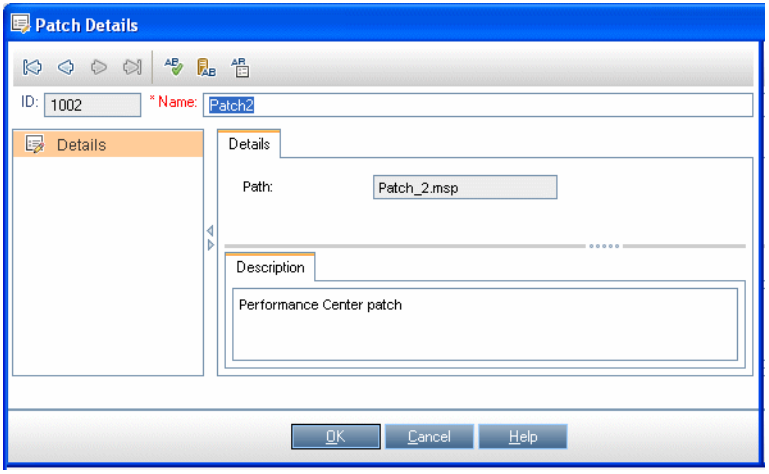
UI Elements (A-Z)	Where	Description
Add to Favorites	Favorites	Opens the Add Favorite dialog box, enabling you to add a favorite view to your private or the public folder. For details, see the *HP Application Lifecycle Management User Guide*.
 **Copy URL**	Patches and <right-click menu>	Copies a selected patch and pastes its URL as a link. The patch itself is not copied. Instead, you can paste the address into another location, such as an email or a document. Clicking the link opens up ALM and takes you to the patch file or folder. If you are not already logged in, ALM first prompts for login details.
Export	Patches and <right-click menu>	Opens the Export Grid Data dialog box, enabling you to export the patches in the grid as a text file, Microsoft Excel worksheet, Microsoft Word document, or HTML document. Choose one of the following options: ➤ **All.** Exports all project settings in the grid. ➤ **Selected.** Exports selected project settings in the grid.

UI Elements (A-Z)	Where	Description
 **Find**	View	Opens the Find dialog box, enabling you to search for patches in the module. For details about search options, see the *HP Application Lifecycle Management User Guide*.
 **Go to Patch**	Patches	Opens the Go To Patch dialog box, enabling you to find a specific patch by its ID number. You can only go to patches that are in the current filter.
Grid Filters	View and <right-click menu>	Enables you filter the data according to an entry in the filter box. For details about filtering options, see the *HP Application Lifecycle Management User Guide*.
Information Panel	View and <right-click menu>	Shows/Hides the Information Panel in the lower area of the module.
 **New Patch**	Patches	Opens the Select Patch dialog box, which enables you to select a patch to upload.
Organize Favorites	Favorites	Opens the Organize Favorites dialog box, enabling you to organize the list of favorite views by changing properties or deleting views. For details, see the *HP Application Lifecycle Management User Guide*.
 **Patch Details**	Patches and <right-click menu>	Opens the Patch Details dialog box, enabling you to view and edit details of the selected patch.
Private	Favorites	Lists the favorite views that are accessible only to the user who created them.
Public	Favorites	Lists the favorite views that are accessible to all users.

UI Elements (A-Z)	Where	Description
 **Refresh All**	View	Refreshes the grid so that it displays the most up-to-date information.
Replace	Edit and <right-click menu>	In the Project Details grid, opens the Replace dialog box, enabling you to replace a field value in the grid. For more details, see the *HP Application Lifecycle Management User Guide*.
 **Select Columns**	View	Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For more details, see the *HP Application Lifecycle Management User Guide*. For details about the patches fields, see "Patches Module Fields" on page 788.
 **Set Filter/Sort**	View	Enables you to filter and sort the patches in the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For more details, see the *HP Application Lifecycle Management User Guide*.
Updated Selected	Edit and <right-click menu>	Opens the Update Selected dialog box, enabling you to update a field value for a multiple selection in the grid. For more details, see the *HP Application Lifecycle Management User Guide*.

Patch Details Dialog Box

This dialog box enables you to view details of a patch in ALM.



To access	On the Lab Management sidebar, under **Lab Settings**, select **Patches**.
Relevant tasks	"How to Upload Patches to ALM" on page 785
See also	➤ "How to Manage Lab Resources" on page 674 ➤ "How to Manage Performance Center Servers" on page 799

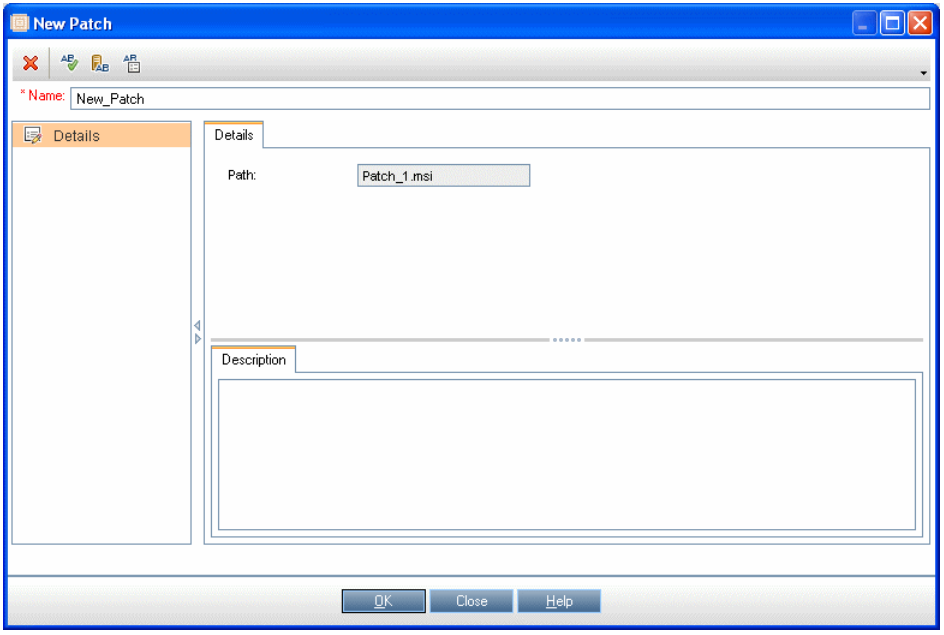
User interface elements are described below:

UI Elements (A-Z)	Description
	**First/Previous/Next/Last Entity.** Enables you to browse through the list of projects.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.

UI Elements (A-Z)	Description
	**Spelling Options.** Enables you to configure how to check the spelling.
Details	For field definitions, see "Patches Module Fields" on page 788.

New Patch Dialog Box

This dialog box enables you to add new Performance Center patches.



To access	**1** On the Lab Management sidebar, under **Lab Settings**, select **Patches**. **2** Click the **New Patch** button. The Select Patch dialog box opens. **3** Navigate to the location of the patch, and click **Open**.
Relevant tasks	"How to Upload Patches to ALM" on page 785

User interface elements are described below:

UI Elements (A-Z)	Description
	**Clear All Fields.** Clears all data in the dialog box.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Details	Lists Patches fields. Required fields are displayed in red. For details on the available fields, see "Patches Module Fields" on page 788. **Tip:** Clicking in the **Description** field on this page displays a toolbar for formatting and spell checking the text.
Name	Type a name for the new patch. **Syntax exceptions:** A server name cannot include the following characters: \ / : " ? < > | * % '

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Performance Center Servers

This chapter includes:

Concepts

Tasks

Reference

Concepts

Performance Center Servers Overview

Performance Center Servers contain information and resources needed for Performance Center functionality. Managing servers involves monitoring the server status, editing server information, and checking server performance.

Performance Center Servers conduct lab management, test design, run operations, and the user interface services for these operations. The online Web pages create a heavy load on the Performance Center Server. Using built-in **load balancers**, calls to and from the ALM Platform are balanced among the Performance Center Servers in a round-robin fashion.

Note: Load balancing requires that at least two Performance Center Servers are installed in your system.

For details on managing Performance Center servers, see "How to Manage Performance Center Servers" on page 799.

Tasks

How to Manage Performance Center Servers

This task describes the various options for managing the Performance Center Servers.

Note: This task is part of the following higher-level tasks:

- "How to Initially Configure Performance Center" on page 635
- "How to Work with Performance Center Administration" on page 622

To learn more about Performance Center Servers, see "Performance Center Servers Overview" on page 798.

- "Add a server" on page 799
- "Check server connections to Performance Center hosts" on page 800
- "Reboot a server" on page 800
- "Install a patch on a server" on page 801

Add a server

1 In Lab Management, select **Lab Settings** > **PC Servers**.

2 Click the **New PC Server** button.

3 In the New PC Server dialog box, enter the required information. For user interface details, see "New Performance Center Server Dialog Box" on page 813.

Check server connections to Performance Center hosts

On the Lab Management sidebar, under **Lab Resources**, select **PC Servers**. Right-click a server in the grid, and select **Check Server** > **Check Server**.

The Task Manager opens, and the overall result of each check performed on the server, **Passed** or **Failed, is** displayed.

You can view the progress of the server check in the PC Servers module's **Check Host Status** tab.

The following checks are performed:

- **Ping to Host.** The Performance Center server pings the selected host machines.
- **Ping URL.** The selected host pings the listed URL.

Alternatively, you can perform the above checks, together with an additional connectivity check from the server to a particular URL. Right-click a server in the grid, select **Check Server** > **Check Connectivity to URL**, and enter the URL.

Examples:

- Regular URL: http://www.website.com
- Machine name: machine22 or http://machine22

Reboot a server

On the Lab Management sidebar, under **Lab Settings,** select **PC Servers**. Right-click the server in the grid that you want to reboot, and select **Reboot Server**.

Install a patch on a server

Note: To install patches on a server, patches first need to have been uploaded to the ALM. For details, see "How to Upload Patches to ALM" on page 785.

On the Lab Management sidebar, under **Lab Settings**, select **PC Servers**. Right-click the server in the grid on which to install the patch and select **Install Patch**.

Tip: You can install a patch on multiple servers simultaneously. To select multiple servers, hold down the CTRL key on your keyboard while selecting the servers.

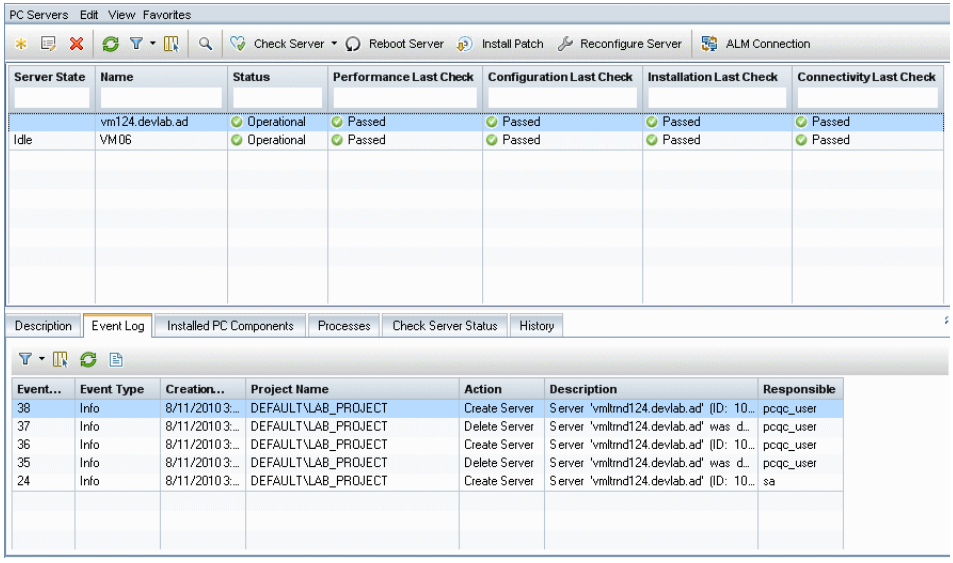
Reference

Performance Center Servers Module User Interface

This section includes:

Performance Center Servers Module Window

The Performance Center Servers Module window enables you to manage Performance Center servers.



To access	On the Lab Management sidebar, under **Lab Settings**, select **PC Servers**.
Relevant tasks	"How to Manage Performance Center Servers" on page 799

User interface elements are described below:

UI Elements (A-Z)	Description
<PC Servers Module common UI elements>	➤ **PC Servers Fields.** For field definitions, see "Performance Center Servers Module Fields" on page 809. ➤ **PC Servers Menus and Buttons.** For command and button descriptions, see "Performance Center Servers Module Menus and Buttons" on page 805. ➤ **ALM main menu and sidebar.** For details on the Tools menu, Help menu and sidebar, see the *HP Application Lifecycle Management User Guide*.
<grid filters>	Located under each column name. Displays the filter that is currently applied to a column. If the filter box is empty, no filter is currently applied to the column. Type directly into the box, or click the box to display the Browse button, which opens the Select Filter Condition dialog box. For more details, see the *HP Application Lifecycle Management User Guide*.
<servers grid>	Displays a list of the Performance Center servers.
<Information panel>	Located in the lower area of the module. Displays information about the server selected in the grid.
Description tab	Describes the currently selected server. Click in the text box to display a toolbar for formatting and spell checking the text.
Event Log tab	Displays detailed information about the tasks performed on the selected server, the action status, and a description of any errors. For details, see "Initializing Run Page" on page 348.
Installed PC Components tab	Displays a list of the Performance Center components installed on the server machine, including version and patches. To refresh the grid, click  .

UI Elements (A-Z)	Description
Processes tab	Displays detailed information about the processes and resource usage of the selected server. For details, see "Processes Page" on page 815.
Check Server Status tab	Displays the status of each step of the server checks. To see check server status details, right click a line in the tab, and select **Check Server Status Details**. For details, see "Check Server Status Page" on page 817.
History tab	Lists changes made to the currently selected host. For more details, see the *HP Application Lifecycle Management User Guide*.

Performance Center Servers Module Menus and Buttons

This section describes the menus and buttons available in the Performance Center Servers module.

To access	On the Lab Management sidebar, under **Lab Settings**, select **PC Servers**.
Relevant tasks	"How to Manage Performance Center Servers" on page 799

User interface elements are described below:

UI Elements (A-Z)	Menu	Description
	PC Servers	Checks connectivity between the selected server and other machines in the system.
	PC Servers and <right-click menu>	Enables you to remotely reboot the selected server.

UI Elements (A-Z)	Menu	Description
	PC Servers and <right-click menu>	Opens the Install Patch dialog box, enabling you to select patches to install on the selected server.
	PC Servers and <right-click menu>	Enables you to define the internal and external ALM Platform URL. The internal URL is used by all Performance Center components to connect to the ALM Platform. The URL must be in the following format: http://<alm_platform>:<port> **Example:** http://myalm:8080 **Note:** For SSL connectivity the ALM Platform internal URL must begin with **https**, for example: https://myalm:443
	PC Servers and <right-click menu>	Resets the system information on the selected server. For example, internal/external URLs, user identity, and so on.
 **Copy URL**	PC Servers	Copies the selected server and pastes its URL as a link. The server itself is not copied. Instead, you can paste the address into another location, such as an email or a document. Clicking the link opens up ALM and takes you to the resource file or folder. If you are not already logged in, ALM first prompts for login details.
 **Delete**	Edit and <right-click menu>	Deletes the selected server in the grid.

UI Elements (A-Z)	Menu	Description
Export	PC Servers and <right-click menu>	Opens the Export Grid Data dialog box, enabling you to export the servers in the grid as a text file, Microsoft Excel worksheet, Microsoft Word document, or HTML document. Choose one of the following options: ➤ **All.** Exports all servers in the grid. ➤ **Selected.** Exports selected servers in the grid.
 **Find**	View	Opens the Find dialog box, enabling you to search for server in the module. For details, see the *HP Application Lifecycle Management User Guide*.
 **Go to PC Server**	PC Servers	Opens the Go To PC Servers dialog box, enabling you to find a specific server by its ID number. You can only go to servers that are in the current filter.
Grid Filters	View	Enables you filter the data according to an entry in the filter box. For details about filtering options, see the *HP Application Lifecycle Management User Guide*.
Information Panel	View	Shows/Hides the Information Panel in the lower area of the module.
 **New PC Server**	PC Servers	Enables you to add a PC Server.

UI Elements (A-Z)	Menu	Description
 **PC Server Details**	PC Servers and <right-click menu>	Opens the PC Servers Details dialog box, displaying details of the selected server. For more information, see "Performance Center Server Details Dialog Box" on page 811.
 **Refresh All**	View	Refreshes the grid so that it displays the most up-to-date information.
Replace	Edit and <right-click menu>	In the PC Servers grid, opens the Replace dialog box, enabling you to replace a field value in the grid. For more details, see the *HP Application Lifecycle Management User Guide*.
 **Select Columns**	View	Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For more details, see the *HP Application Lifecycle Management User Guide*. For details about the PC Servers fields, see "Performance Center Servers Module Fields" on page 809.
 **Set Filter/Sort**	View	Enables you to filter and sort the servers in the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For more details, see the *HP Application Lifecycle Management User Guide*.
Updated Selected	Edit	Opens the Update Selected dialog box, enabling you to update a field value for a multiple selection in the grid. For more details, see the *HP Application Lifecycle Management User Guide*.

Performance Center Servers Module Fields

This section describes the Performance Center Servers module fields.

To access	On the Lab Management sidebar, under **Lab Settings**, select **PC Servers**.
Relevant tasks	"How to Manage Performance Center Servers" on page 799

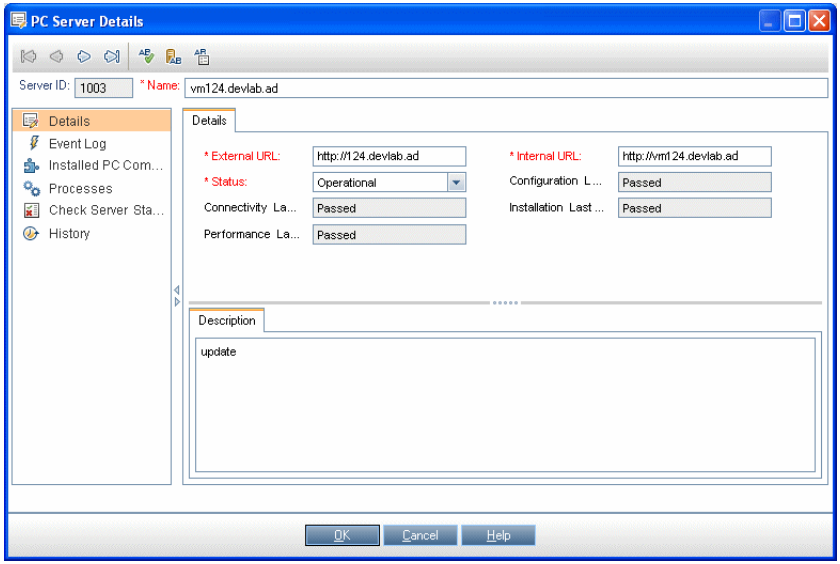
User interface elements are described below:

UI Elements (A-Z)	Description
Configuration Last Check	Displays whether the last configuration check passed or failed.
Connectivity Last Check	Displays whether the last connectivity check passed or failed.
Description	A description of the Performance Center Server.
External URL	The URL used to connect to the Performance Center Server from an external source. **Note:** For SSL connectivity add a Performance Center server using the following format for the external URL: https://<pc_server> **Example:** https://mypcs:443
Installation Last Check	Displays whether the last installation check passed or failed.
Internal URL	The URL used for all internal communication between the Performance Center Server and the ALM Platform, as well as for load balancing.
Name	The server name that you assign when you configure a new server.
Performance Last Check	Displays whether the last performance check passed or failed.
Server ID	The server ID.

UI Elements (A-Z)	Description
Server State	The current state of the server. The possible states are: ➤ **Idle.** The server is idle. ➤ **Installing patch.** The installation patch is being installed on the server, and the server is temporarily unavailable. ➤ **Rebooting.** The server is rebooting and is temporarily unavailable. **Default:** Idle
Status	The current server status. The possible statuses are: ➤ **Operational**. The server is working. ➤ **Non-operational**. The server is not working. ➤ **Unavailable**. The server is not available.

Performance Center Server Details Dialog Box

The PC Servers Details dialog box enables you to view and update a single server.



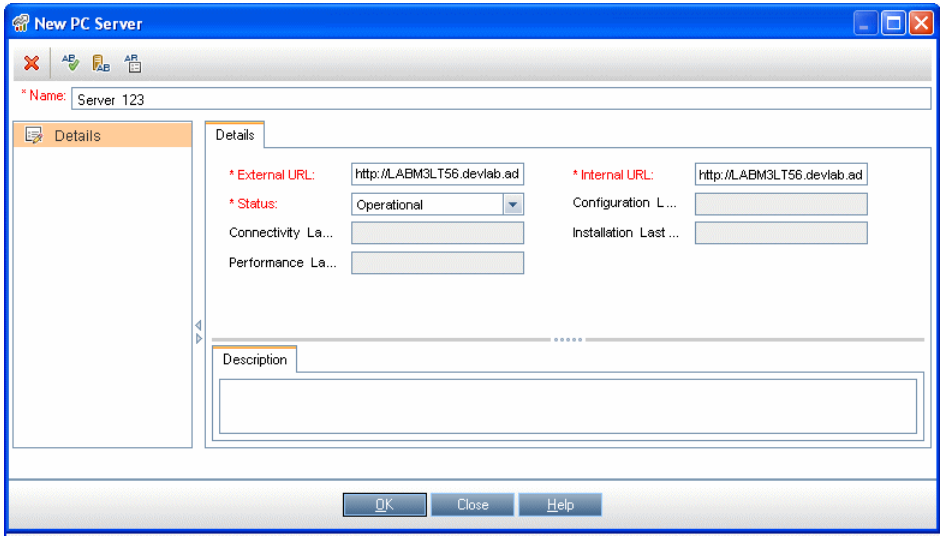
To access	**1** On the Lab Management sidebar, under **Lab Settings**, select **PC Servers**. **2** Right-click a server and select **PC Server Details**.
Relevant tasks	"How to Manage Performance Center Servers" on page 799

User interface elements are described below:

UI Elements (A-Z)	Description
	**First/Previous/Next/Last Entity.** Enables you to browse through the list of servers.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Details	Details the currently selected server. For details on the available fields, see "Performance Center Servers Module Fields" on page 809.
Event Log	Displays detailed information about the tasks performed on the selected server, the action status, and a description of any errors. For details, see "Initializing Run Page" on page 348.
History	Lists changes made to the currently selected server. For more details, see the *HP Application Lifecycle Management User Guide*.
Installed PC Components	Displays a list of the Performance Center components installed on the server machine, including version and patches. To refresh the grid, click  .
Processes	Displays detailed information about the processes and resource usage of the selected server. For details, see "Processes Page" on page 815.
Server Check Status	Displays the status of each step of the server checks. To see server check status details, right click a line in the tab, and select **Server Check Status Details**. For details, see "Check Server Status Page" on page 817.

New Performance Center Server Dialog Box

This dialog box enables you to add new Performance Center servers.



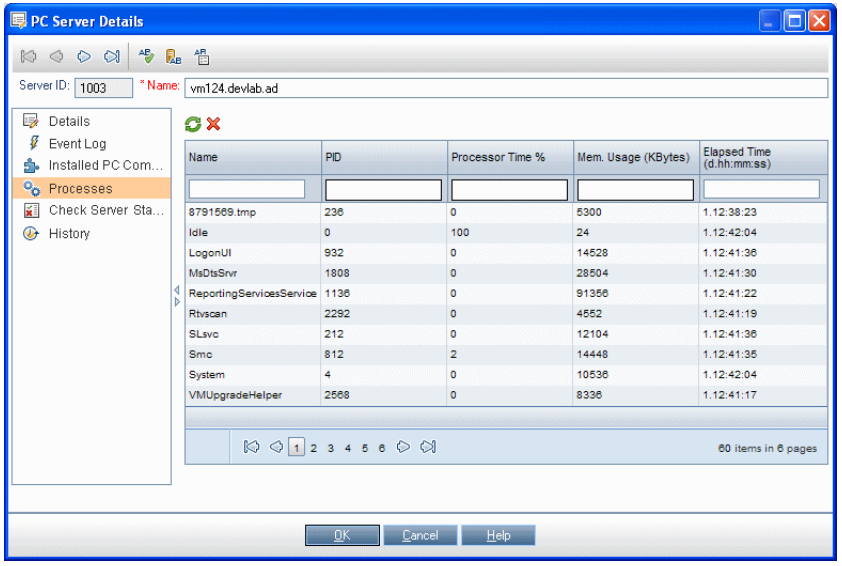
To access	**1** On the Lab Management sidebar, under **Lab Settings**, select **PC Servers**. **2** Click the **New PC Server** button .
Relevant tasks	"How to Manage Performance Center Servers" on page 799

User interface elements are described below:

UI Elements (A-Z)	Description
	**Clear All Fields.** Clears all data in the dialog box.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Details	Lists PC Server fields. Required fields are displayed in red. For details on the available fields, see "Performance Center Servers Module Fields" on page 809. **Tip:** Clicking in the **Description** field on this page displays a toolbar for formatting and spell checking the text.
Name	Type a name for the new server. **Syntax exceptions:** A server name cannot include the following characters: \ / : " ? < > | * % '

Processes Page

This page displays detailed information about the processes and resource usage of the selected server.



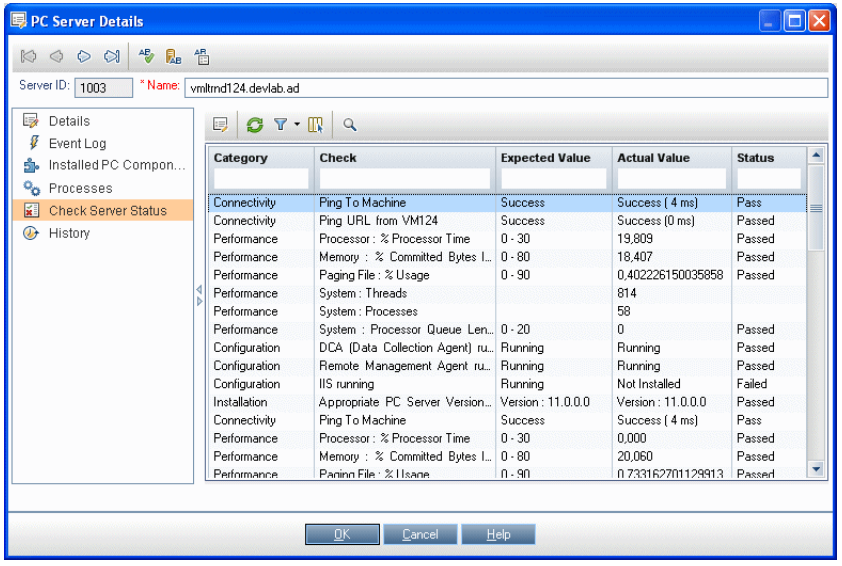
To access	➤ **From the PC Servers module:** On the Lab Management sidebar, under **Lab Settings**, select **PC Servers**. In the information panel, select **Processes**. ➤ **From the PC Servers Details dialog box:** On the Lab Management sidebar, under **Lab Settings**, select **PC Servers**. Right-click a server and select **Server Details.** In the PC Server Details dialog box, select **Processes**.
Relevant tasks	"How to Manage Performance Center Servers" on page 799
See also	"Performance Center Servers Overview" on page 798

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Refresh.** Refreshes the grid so it displays the most up-to-date information.
	**Kill Process.** Ends the process selected in the grid. **Notes:** ➤ **Hosts module.** Kill Process permissions are required to end the selected process. ➤ **Performance Center Servers module.** A user with Viewer permissions has the ability to end the selected process.
<Processes grid>	Displays the following details about the processes: ➤ **Name.** The name of the process. ➤ **PID.** The process ID. ➤ **Processor Time (%).** The percentage of processor time used by the process. ➤ **Memory Usage (KBytes).** The amount of memory (in kilobytes) used by the process. ➤ **Elapsed Time (d.hh:mm:ss).** The amount of elapsed time since the start of the process, where **d** is the number of days and **hh:mm:ss** is the number of hours, minutes, and seconds that have elapsed.
<Navigation area>	Located at the bottom of the page, enables you to navigate through the pages of entries in the grid. The total number of entries is displayed on the right of the navigation area.

Check Server Status Page

This page displays the status of each step of the server checks.



To access	➤ **From the PC Servers module:** On the Lab Management sidebar, under **Lab Settings**, select **PC Servers**. In the information panel, select **Check Server Status**. ➤ **From the PC Servers Details dialog box:** On the Lab Management sidebar, under **Lab Settings**, select **PC Servers**. Right-click a server and select **PC Server Details.** In the PC Server Details dialog box, select **Check Server Status**.
Relevant tasks	"How to Manage Performance Center Servers" on page 799
See also	"Performance Center Servers Overview" on page 798

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
	**Check Server Status Details.** The following fields are displayed: ➤ **Actual Value.** Actual value resulting from the server connectivity check. ➤ **Check.** The sub-areas in which the Check Server feature checks the servers. ➤ **Check Result ID.** The ID of each step of the server check. ➤ **Expected Value.** Value expected to result from the server check. ➤ **Category.** The areas in which the Check Server feature checks the server: Configuration, Connectivity, Installation, and Performance. ➤ **Check Date.** The date the server was checked. ➤ **Error.** If an error occurred during the check, displays the error. ➤ **Status.** Indicates whether the server check passed or failed.
	**Refresh.** Refreshes the page.
	**Set Filter/Sort.** Enables you to filter and sort the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For details, see the *HP Application Lifecycle Management User Guide*.
	**Select Columns.** Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For details, see the *HP Application Lifecycle Management User Guide*.
	**Find.** Opens the Find dialog box, enabling you to search in the grid. For details, see the *HP Application Lifecycle Management User Guide*.

UI Elements (A-Z)	Description
<Check Server Status grid>	Displays the status of the server checks. Click  to select columns to display in the grid.
Actual Value	Actual value resulting from the server connectivity check.
Category	The areas in which the Check Server feature checks the Server: ➤ Configuration ➤ Connectivity ➤ Installation ➤ Performance
Check	The sub-areas the Check Server feature checks. For example, sub-areas in the Performance check are Processor, Memory, System,
Check Date	The date the server was checked.
Check Result ID	The ID of each step of the server check.
Error	If an error occurred during the check, displays the error.
Expected Value	Value expected to result from the server check.
Status	Indicates whether the server check passed or failed.

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Performance Center Licensing

This chapter includes:

Concepts

Reference

Concepts

HP ALM Performance Center Licenses Overview

Licenses Definition Process

To work with HP ALM Performance Center, each of the following licenses must be defined:

ALM License

The ALM license defines the number of concurrent users in ALM. The ALM license is configured as part of the ALM installation process and is managed in Site Administration. For more information about the ALM license, see the *HP Application Lifecycle Management Administrator Guide*.

Performance Center and Host Licenses

There are two licenses that are specific to ALM Performance Center:

- **Performance Center license.** Defines the number of concurrent runs per performance test, as well as Vuser limits. For more information about the Performance Center license, see "Performance Center License Overview" below.
- **Host license.** A license which is automatically installed on the host as you add the host to ALM. It defines the limits of Vuser use per protocol on the host.

The Performance Center and Host licenses are configured directly after installation of the Performance Center Server. For configuration details, see the *HP ALM Performance Center Installation Guide*.

If this configuration was skipped, you can configure the Performance Center and Host licenses manually. For more information, see "License Module Window" on page 827.

Performance Center License Overview

There are two types of Performance Center licenses: Perpetual and VUD.

Perpetual License

There are two types of Perpetual licenses:

Type	Definition
Regular	The standard Performance Center license. It is limited by the total number of concurrent runs and Vusers, and may have an expiration date.
Additive	A license that is added to a regular license. It increases the concurrent runs and Vuser limits of the regular license, but does not affect an expiration date.

VUD-Based License

A Virtual User Day (VUD) license provides you with a specified number of Vusers (VUDs) that you can run an unlimited number of times within a 24 hour period (the Virtual User Day).

At the end of a Virtual User Day, the remaining number of licensed VUDs is calculated by subtracting the number of used VUDs, or in the case of concurrent usage, the maximum number of concurrent running VUDs, from the total number of licensed VUDs.

For example, a user has a license that allows him to run 1,000 VUDs. He creates a performance test that requires 200 Vusers and runs for 45 minutes. He runs the test at 8:00am, 10:00am, 2:00pm, and at 4:00pm. In each case, the test finishes before the next one begins. Because there is no concurrent Vuser usage, he can re-use the same 200 VUDs for each test run, meaning that at the end of the 24-hour period, only 200 VUDs are deducted from the license, leaving 800 for future use.

However, if the user starts the second run at 8:30am, the first test is still running run before the second test initializes. This overlap requires 400 Vusers to run concurrently (200 for each test). At the end of the day, 400 VUDs are deducted from the license, because that is the highest number of concurrent Vusers. The total left for future use is 600 VUDs.

Notes:

- You can run VUDs on HP developed protocols, with the exception of: COM/DCOM, VB Com, VB Vuser, VB Script Vuser, VB.NET Vuser, and VB.NET Template.
- You cannot run VUDs on SDK protocols.
- You cannot run VUDs on a GUI Vuser script, such as WinRunner and QuickTest Professional scripts.
- When using a VUD based Performance Center license, a Host license is not relevant.

Reference

Host License Types

The following table displays a list of available host license types. To learn more about host licenses, see "HP ALM Performance Center Licenses Overview" on page 822.

License Type	Description
Permanent	The license never expires.
Time Limited	The license is limited by a start date and an expiration date.
Temporary	A Time Limited license that is granted for a predefined number of days after product installation.
Plugged	The license requires a dongle.

Host License Vuser Types

The following table displays a list of the available host license Vuser types.

Vuser Type	Description
<bundle type> Bundle	Each bundle contains a collection of protocols. When you select a protocol bundle, this dialog box displays a list of included protocols.
Global	The global license lets you run all Vuser types, provided you stay within the global or total limit. The number following Global indicates the total number of Vusers purchased.

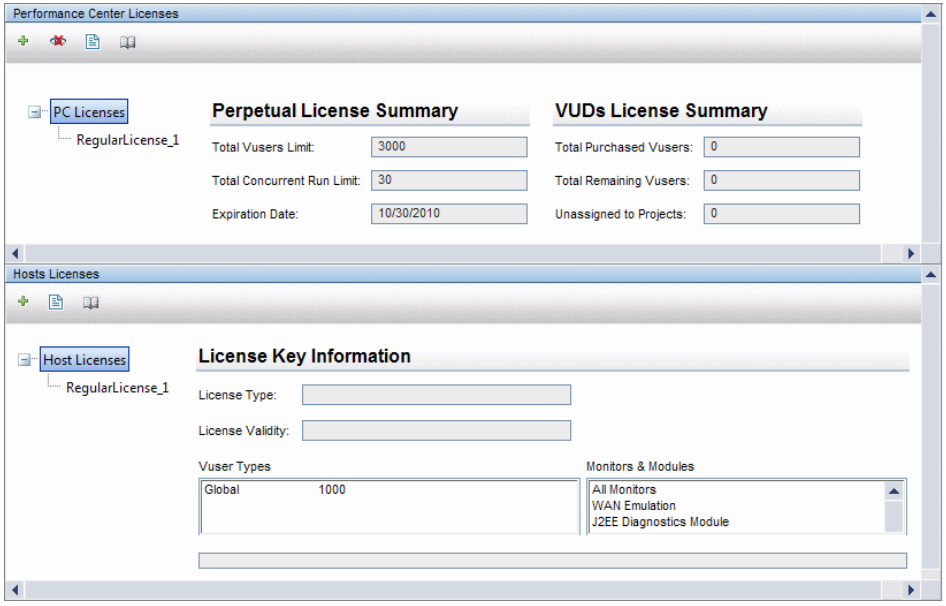
Performance Center Licensing User Interface

This section includes:

➤ License Module Window on page 827

License Module Window

This page enables you to view summaries of your perpetual and VUD-based licenses, as well as host license information.



To access	On the Lab Management sidebar, under **Lab Settings,** select **License.**
Relevant tasks	➤ "How to Work with Performance Center Administration" on page 622 ➤ "How to Initially Configure Performance Center" on page 635
See also	"HP ALM Performance Center Licenses Overview" on page 822

Performance Center Licenses Area

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
	**Add PC License.** Click to add a Performance Center license. **Note:** You can only add a Performance Center license if you have the required permissions.
	**Show All Licenses/Hide All Obsolete Licenses.** Click to display all Performance Center licenses or to remove obsolete licenses in the left pane.
	**Licenses Details.** Click to open the Licenses Details dialog box which displays the following information: ➤ **Date Assigned.** The date the license was added to the system. ➤ **License Key.** The license key. ➤ **Type.** The license type. **Note:** You can only view license details if you have the required permissions.
<Available licenses list>	A list in the left-hand pane that lists all current perpetual and VUD-based licenses. Select a license to view specific details on the right.
PC Licenses	Select to display summary information for all perpetual and VUD-based licenses. The information is displayed in the adjacent pane on the right.
Perpetual License Summary	Displays summary information for all perpetual licenses. **Note:** Only displayed when **PC Licenses** in the upper left pane in selected.
VUDs License Summary	Displays summary information for all VUD-based licenses. **Note:** Only displayed when **PC Licenses** in the upper left pane in selected.

Hosts License Area

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
	**Add Host License.** Adds a host license. **Note:** You can only add host licenses if you have the required permissions.
	**Licenses Details.** Click to open the Licenses Details dialog box which displays the following information: ➤ **Date Assigned.** The date the license was added. ➤ **License Key.** The license key. ➤ **Type.** The license type. **Note:** You can only view host license details if you have the required permissions.
<Available licenses list>	A list in the left-hand pane that lists all current host licenses. Select a license to view specific details on the right.

UI Elements (A-Z)	Description
Host Licenses	A list of available host licenses keys. Select a license key to view its information in the **License Key Information** pane.
License Key Information pane	Displays information for a selected license. The following information is displayed: ➤ **License Type.** The type of license available for the license key you selected. For a list of the available license types, see "Host License Types" on page 825. ➤ **License Validity.** The time limitation of the selected license key. ➤ **Vuser Types.** A list of Vuser protocols available for the selected license key, or a list of protocol bundles for the new licensing implementation. For a list of the available host license Vuser types, see "Host License Vuser Types" on page 826. ➤ **Monitors and Modules.** The online monitors available for the selected license key, and the modules included in the license. For example, Diagnostics for J2EE/.NET. If **All Monitors** is displayed in the list, it means that your license enables you to work with all the Controller online monitors. When you select **All Monitors**, the unlabelled box at the bottom of the License Key Information pane displays a list of included monitors.

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Diagnostics Management

This chapter includes:

Concepts

Tasks

Reference

Concepts

J2EE/.NET Diagnostics Overview

The HP Diagnostics integration with HP Application Lifecycle Management (ALM) allows you to monitor and analyze the performance of Java 2 Enterprise Edition (J2EE), .NET-connected, SAP, Oracle, and other complex environments.

During a performance test, you can drill down into HP Diagnostics data for the whole test or for a particular transaction. After the test, you can use HP LoadRunner Analysis to analyze offline diagnostics data generated during the test.

Monitoring Server Requests

When configuring a performance test to use J2EE/.NET Diagnostics, you can instruct ALM to capture a percentage of server requests which occur outside the context of any Vuser transaction.

The benefit of enabling this functionality is that calls into a back-end VM can be captured even in the case where:

- The probe is not capturing RMI calls
- RMI calls cannot be captured (perhaps because an unsupported application container is being used)
- The application uses some other mechanism for communications between multiple VMs

For more information about working with diagnostics for J2EE and .NET, see the *HP Diagnostics User Guide*.

ERP/CRM Diagnostics Overview

The following sections provide an overview of ERP/CRM diagnostics.

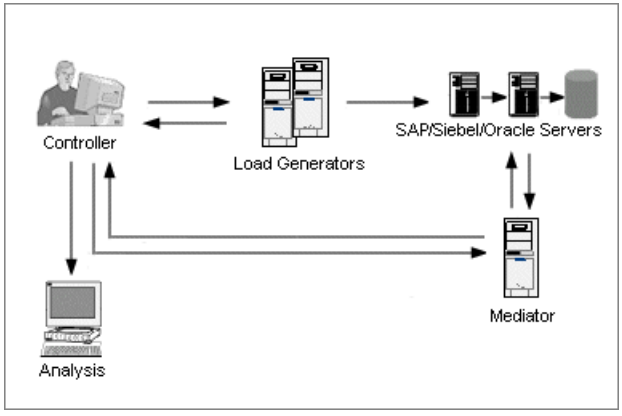
Understanding ERP/CRM Diagnostics

During a performance test, the ALM diagnostics modules trace, time, and troubleshoot individual transactions across the Web, application, and database servers. You can drill down from a slow end-user transaction all the way to the bottlenecked method or SQL statement. The ALM Performance Center diagnostics modules enable organizations to:

- Rapidly isolate application components that have a significant impact on end-user experience
- Provide developers with precise data on how to make performance improvements

ERP/CRM Diagnostics Modules Architecture

ERP/CRM Diagnostics architecture, as shown in the diagram below, is comprised of the following components:



- **ERP/CRM Mediator.** The ERP/CRM Mediator (“Mediator”) gathers and correlates offline transaction data from the Web, database, and application servers. For information on installing the Mediator, see the *HP ALM Performance Center Installation Guide*.

- **Controller.** Before test execution, the Controller transfers all server information to the Mediator and distributes the percentage of users that will participate in the monitoring. After test execution, the Controller collects the aggregated transaction data files from the Mediators and collates the results. Results are transferred to the Siebel diagnostics, SAP diagnostics, or Oracle DB results directory.

  If you do not want to collate the information right after the load test, you can perform collation at a later time.

  The files are then transferred to the results directory per diagnostics type as follows:

  - Siebel results are transferred to the **\sbl_bd** directory.
  - Oracle 11i results are transferred to the **\ora_bd** directory.
  - SAP results are transferred to the **\sap_bd** directory.

- **Load Generator.** When you execute a load test, the Controller distributes each Vuser to a load generator, and the load generator executes the Vuser script.

- **Analysis.** Displays detailed diagnostics graphs and reports. For more information about the diagnostics graphs, see the *HP LoadRunner Analysis User Guide*.

Connecting the Mediator to a Remote Server

When you set up the ERP/CRM Diagnostics modules, you define a server to monitor by entering the user name of the server where trace/log files are stored. This section explains how the Mediator connects to the server when it is a remote Windows or UNIX server.

Connecting to a Remote Windows Server

When monitoring a remote Windows server, the Mediator attempts to connect to the server using the configuration details which you enter in the <diagnostics type> Server Configuration Dialog Box during the diagnostics configuration process. This configuration should give administrator permissions to the remote machine.

Connecting to a Remote UNIX Server

When monitoring a remote UNIX server, the Mediator supports the remote shell connection type. For more information on remote shell connections, see the section that describes verifying the UNIX load generator installation in the *HP Application Lifecycle Management Installation Guide*.

Siebel and Siebel DB Diagnostics Overview

Siebel Diagnostics are split into the following modules:

- **Siebel Diagnostics Module.** Enables you to break down Siebel transactions into layers, areas, sub-areas, servers, and scripts. You can also view the transaction chain of calls and call stack statistics to track the percentage of time spent on each part of the transaction. Siebel-Web Vusers support Siebel Diagnostics.
- **Siebel DB Diagnostics Module.** Helps you rapidly identify and resolve database performance problems. You can view the SQLs for each transaction, identify the problematic SQL queries of each script, and identify at which point problems occurred. Siebel-Web Vusers support Siebel DB Diagnostics.

Note: Siebel Diagnostics (Siebel Application Response Measurements) supports Siebel application servers versions 7.53 and 7.7.

For information on how to pre-configure the Siebel/Siebel DB Diagnostics modules, see "How to Pre-Configure Siebel/Siebel DB Diagnostics" on page 840.

Oracle 11i Diagnostics Overview

Oracle 11i Diagnostics helps pinpoint performance problems on Oracle NCA systems. The diagnostics information drills down from the transaction to the SQL statements, and to the SQL stages of each statement. Oracle NCA Vusers support Oracle 11i Diagnostics.

For information on how to pre-configure the Oracle 11i Diagnostics module, see "How to Pre-Configure Oracle 11i Diagnostics" on page 845.

SAP Diagnostics Overview

SAP Diagnostics enables you to pinpoint the root cause of a certain problem (i.e. DBA, Network, WAS, Application, OS/HW) quickly and easily, and engage with the relevant expert only, without having to present the problem to a whole team of people.

The following table outlines the supported versions and required Kernel patches for the SAP Application Server and the SAPGUI Client:

For information on how to configure the SAP Diagnostics module, see "How to Pre-Configure SAP Diagnostics" on page 847.

Server-side Data Collection

SAP Diagnostics is based on SAP Distributed Statistical Records (DSR). For each dialog step performed on application server, a statistical record is generated, which includes information such as response time components, database statistics, RFC times, and so on.

The Diagnostics Mediator is responsible for collecting diagnostics data from the server during a performance test.

Vuser Coloring

SAP Diagnostics allows replaying the SAPGUI protocol. You set the percentage of colored Vusers in the Configuration dialog (up to 100% allowed). Coloring of SAPGUI users creates no overhead on the Application server.

Tasks

How to Add ERP/CRM Mediators

This task describes how to add diagnostics servers and mediators in order to work with J2EE/.NET and ERP/CRM diagnostics.

Note: This task is part of a higher-level task. For details, see "How to Work with Performance Center Administration" on page 622.

---

1 Prerequisite

Make sure that the mediator is installed in the same LAN as the monitored server. For information on installing the ERP/CRM Mediator, see the *HP ALM Performance Center Installation Guide*.

2 Add and configure the mediator

a On the Lab Management sidebar, under **Lab Settings,** select **Diagnostics.**

b Select the **ERP/CRM Diagnostics** tab.

c Click the **New Diagnostics Mediator** button , and enter the required information. For user interface details, see "Diagnostics Module Fields" on page 856.

How to Add HP Diagnostics Servers

This task describes how to add an HP Diagnostics server to allow you to monitor and analyze J2EE/.NET environments.

Note: This task is part of a higher-level task. For details, see "How to Work with Performance Center Administration" on page 622.

---

1. On the Lab Management sidebar, under **Lab Settings**, select **Diagnostics**.
2. Select the **J2EE/.NET Diagnostics** tab.
3. Click the **New Diagnostics Server** button , and enter the required information. For user interface details, see "Diagnostics Module Fields" on page 856.
4. Under **Lab Settings**, select **Project Settings.** Right-click the relevant project and select **Project Settings Details**. Add the relevant server information in the **Diagnostics Server** field.

Note: To ensure that diagnostics data is available online, make sure that the time on the diagnostics server is synchronized with its probes.

How to Pre-Configure Siebel/Siebel DB Diagnostics

This task describes the pre-configuration steps to be performed by the ALM administrator which allow the performance tester to enable and run Siebel diagnostics.

Note: This task is part of a higher-level task. For details, see "How to Work with Performance Center Administration" on page 622.

This task includes the following steps:

1 Prerequisite

Make sure that the ERP/CRM mediator is installed and configured. For more information, see "How to Add ERP/CRM Mediators" on page 838.

2 If connecting to a UNIX server with a remote shell (RSH/RCP) connection

- Verify that the RSH and RCP daemons are running on the UNIX server.
- Verify that the UNIX user has permission to run remote shell commands. To check this, type the following at the DOS command prompt:

```
rsh <server machine name> -l <UNIX user login name> -n <command>
```

Example:

```
rsh my_unix -l my_name -n “cd ~;pwd”
```

Note: You can use only RSH commands that work from the DOS command prompt window.

➤ Verify that no output is generated after executing the RSH command.

Note: You should not generate output from the **.login**, **.profile**, and **.cshrc** files (for example, by **echo**, or in any other way, including commands that generate output indirectly, such as **biff**). Where an existing user generates output in the RSH step that cannot be deleted, you should create a new user that does not generate output, and who has permissions to run RSH and RCP commands on the server machine.

---

3 Configure the server machine to enable diagnostics

To configure Siebel application and Web servers for diagnostics data collection:

a Enable Siebel Diagnostics on all Siebel application and Web servers involved in the test.

Set the environment variable on the Siebel server to:

```
SIEBEL_SarmEnabled=true
```

Then restart the server.

b Optimize the server performance settings.

You change the maximum memory caching and file size using the following variables:

```
SIEBEL_SarmMaxMemory= <bytes>
SIEBEL_SarmMaxFileSize = <bytes>
```

The **SIEBEL_SarmMaxMemory** value controls the size of the buffer that Siebel keeps in the memory before writing the information to the Siebel log files. You can improve server performance by increasing the parameter value. However, information from the end of the run will be missing from the Analysis graphs.

We recommend the following settings:

➤ **SIEBEL_SarmMaxMemory**

Value	Number of Vusers
5000	Less than 20 (low loads)
1000000	More than 100 (high loads)

➤ **SIEBEL_SarmMaxFileSize**

Value	Number of Vusers
5000000	Less than 20 (low loads)
25000000	More than 100 (high loads)

If more than one Siebel log file is generated on the server every 10 seconds, you should increase the **SIEBEL_SarmMaxFileSize**.

c Generate a list of Siebel Server IDs.

On the Siebel server, open a command window and run the following command:

```
<Siebel bin directory>\srvrmgr /u <username> /p <password> /g <gateway
server> /e <entrpr server> /c "list servers show SBLSRVR_NAME, SV_SRVRID"
```

where:

/u <username> is the server administrator username

/p <password> is the server administrator password

/g <gateway server> is the gateway server address

/e <entrpr server> is the enterprise server name

/c <command> is the execute a single command

This command generates a list of all the Siebel application servers and their IDs. Keep a record of the server IDs, since this information is required in the Siebel Server Configuration dialog box.

4 Copy files from the Siebel Application Server to the Mediator

After configuring the application server, copy the files listed below from the Siebel Application server **\bin** directory to either the <Mediator Root>\bin directory, <Windows>\System32 directory, or any other directory in PATH on the Mediator machine:

For Siebel 7.53, copy the following files:

➤ sarmanalyzer.exe ➤ sslcver.dll ➤ sslcsym.dll	➤ sslcshar.dll ➤ sslcosa.dll

For Siebel 7.7, copy the following files:

➤ sarmanalyzer.exe	➤ sslcosa.dll
➤ libarm.dll	➤ sslcosd.dll
➤ msvcp70.dll	➤ sslcrsa.dll
➤ msvcr70.dll	➤ sslcscr.dll
➤ sslcacln.dll	➤ sslcshar.dll
➤ sslccore.dll	➤ sslcsrd.dll
➤ sslcevt.dll	➤ sslcsym.dll
➤ sslcos.dll	➤ sslcver.dll

5 Synchronize clocks

➤ **On Windows Siebel Servers.** Ensure that all the machines' clocks in the Siebel system are synchronized. This ensures that the correlation of SQLs to transactions is correct.

Synchronize the Siebel Gateway and load generators' clocks by running the following command from the load generator:

```
net time \ <Gateway name> /set /y
```

Replace <**Gateway name**> with the name of the Siebel Gateway.

➤ **On Unix Siebel Servers.** Ensure that all the machines' clocks in the Siebel system are synchronized. This ensures that the correlation of SQLs to transactions is correct.

You can synchronize the clocks on a UNIX system in one of the following ways:

- ➤ Use the **date** command on the UNIX Siebel Gateway server to change the time manually, so it will be synchronized with the Load Generator's clock.
- ➤ Change the time on the load generator so that it will be synchronized with the UNIX Siebel Gateway server.
- ➤ Configure the time difference in Analysis. For more information, see the chapter about Siebel DB Diagnostics Graphs in the *HP LoadRunner Analysis User Guide*.

6 (Siebel DB) Enable logging on the Siebel Server

For task details, see "How To Enable and Disable Logging On the Siebel Server" on page 848.

How to Pre-Configure Oracle 11i Diagnostics

This task describes the pre-configuration steps to be performed by the ALM administrator which allow the performance tester to enable and run Oracle 11i diagnostics.

Note: This task is part of a higher-level task. For details, see "How to Work with Performance Center Administration" on page 622.

This task includes the following steps:

- "Prerequisite" on page 846
- "If connecting to a UNIX server with a remote shell (RSH/RCP) connection" on page 846
- "Enable logging on the Oracle server" on page 847
- "Set or Disable the Oracle server diagnostics password - optional" on page 847

1 Prerequisite

Make sure that the ERP/CRM mediator is installed and configured. For more information, see "How to Add ERP/CRM Mediators" on page 838.

2 If connecting to a UNIX server with a remote shell (RSH/RCP) connection

➤ Verify that the RSH and RCP daemons are running on the UNIX server.

➤ Verify that the UNIX user has permission to run remote shell commands. To check this, type the following at the DOS command prompt:

```
rsh <server machine name> -l <UNIX user login name> -n <command>
```

Example:

```
rsh my_unix -l my_name -n “cd ~;pwd”
```

Note: You can only use RSH commands that work from the DOS command prompt window.

➤ Verify that no output is generated after executing the RSH command.

Note: You should not generate output from the **.login**, **.profile**, and **.cshrc** files (for example, by **echo**, or in any other way, including commands that generate output indirectly, such as **biff**). Where an existing user generates output in the RSH step that cannot be deleted, you should create a new user that does not generate output, and who has permissions to run RSH and RCP commands on the server machine.

---

3 Enable logging on the Oracle server

For task details, see "How To Enable Logging on the Oracle Server" on page 850.

4 Set or Disable the Oracle server diagnostics password - optional

To help ALM deal with the Oracle server diagnostics password, you can either set the password in the Vuser script, or you can disable the password request on the server itself. For task details, see "How To Set and Disable the Oracle Server Diagnostics Password" on page 852.

How to Pre-Configure SAP Diagnostics

This task describes the pre-configuration steps to be performed by the ALM administrator that allows the performance tester to enable and run SAP diagnostics.

Note: This task is part of a higher-level task. For details, see "How to Work with Performance Center Administration" on page 622.

Install the ERP/CRM Mediator

Make sure that the ERP/CRM mediator is installed and configured. For more information, see "How to Add ERP/CRM Mediators" on page 838.

Note: When using SAP Diagnostics, ensure that a SAPGUI client is installed on the same machine as the ERP/CRM Mediator.

How To Enable and Disable Logging On the Siebel Server

This task describes how to enable and disable logging on the Siebel server.

Note:

- This task is part of a higher-level task. For details, see "How to Work with Performance Center Administration" on page 622.
- Enabling logging on the Siebel server can negatively impact server performance. We recommend that you disable logging and restore the default logging settings at the conclusion of the performance test.

This task includes the following steps:

- "To enable logging on the Siebel server" on page 848
- "To disable logging on the Siebel server" on page 849

To enable logging on the Siebel server

Perform the following steps:

a Open a command window and run the following command:

```
<Siebel bin directory>\srvrmgr /g <gateway server> /s <Siebel server> /e
<enterprise server name> /u <username> /p <password>
```

where:

/u <username> is the server administrator username

/p <password> is the server administrator password

/g <gateway server> is the gateway server address

/e <entrpr server> is the enterprise server name

/s <siebel server > is the siebel server (the default server)

b Enter the following commands:

```
change evtloglvl ObjMgrsqllog=4 for comp <component name>

evtloglvl EventContext=3 for comp <component name>

evtloglvl ObjMgrSessionInfo =3 for comp <component name>
```

Example:

For the Call Center component, enter **sccobjmgr_enu** as the component name, as follows:

```
change evtloglvl ObjMgrsqllog=4 for comp sccobjmgr_enu
```

To disable logging on the Siebel server

Perform the following steps:

a Open a command window and run the following command:

```
<Siebel bin directory>\srvrmgr /g <gateway server> /s <Siebel server> /e
<enterprise server name> /u <username> /p <password>
```

where:

/u <username> is the server administrator username

/p <password> is the server administrator password

/g <gateway server> is the gateway server address

/e <entrpr server> is the enterprise server name

/s <siebel server > is the siebel server (the default server)

b Enter the following commands:

```
change evtloglvl ObjMgrsqllog=0 for comp <component name>

change evtloglvl EventContext=0 for comp <component name>

change evtloglvl ObjMgrSessionInfo =0 for comp <component name>
```

How To Enable Logging on the Oracle Server

This task describes how to enable logging on the Oracle server.

Note: This task is part of a higher-level task. For details, see "How to Work with Performance Center Administration" on page 622.

This task includes the following steps:

- "Verify that the trace diagnostics are enabled" on page 850
- "Set the trace file size to unlimited" on page 851

1 Verify that the trace diagnostics are enabled

Perform the following steps:

a Log on to the Oracle application server with administrator privileges, and select the desired module in the Oracle application. The Responsibilities dialog box opens.

b Select **System Administrator** and click **OK**.

c In the **Functions** tab, select **Profile** > **System** and click **Open**. The System Profile Values dialog box opens.

d In the **Display** section, select **Site** and **Profiles with No Values**, enter %Diagnostics% in the **Profiles** field, and then click **Find**.

e If any diagnostics profiles are disabled (denoted by a “Yes” in the **Site** column), change the setting to “No”.

f Save your settings.

2 Set the trace file size to unlimited

For Oracle 9i:

On the Oracle server, run the following command in the SQL editor:

```
Alter system set max_dump_file_size=UNLIMITED scope=both;
```

For Oracle 8i:

a On the Oracle server, run the following command in the SQL editor:

```
Alter system set max_dump_file_size=2048000;
```

b Edit the **init*.ora** file on **$ORACLE_HOME\admin\<sid>\pfile\init<sid>.ora**. Find the line of the parameter, change its value, and then save the file.

Note: Verify that you have enough disk space on the database server since these trace files can be very large.

How To Set and Disable the Oracle Server Diagnostics Password

To help ALM deal with the Oracle server diagnostics password, you can either set the password in the Vuser script, or you can disable the password request on the server itself.

Note: This task is part of a higher-level task. For details, see "How to Work with Performance Center Administration" on page 622.

This task includes:

- "Set the diagnostics password in the Vuser script" on page 852
- "Disable the diagnostics password request on the Oracle server" on page 852

Set the diagnostics password in the Vuser script

In VuGen, add the **nca_set_diagnostics_password(<password>)** function to your script and select a password.

Note: The **nca_set_diagnostics_password** function must come after the **nca_connect_server** function.

Disable the diagnostics password request on the Oracle server

Perform the following steps:

1. Log on to the Oracle server with administrator privileges, and select the desired module in the Oracle application. The Responsibilities dialog box opens.
2. Select **System Administrator** and click **OK**.

3. In the **Functions** tab, select **Profile** > **System** and click **Open**. The System Profile Values dialog box opens.
4. In the **Display** section, select **User**, and enter the required user name. In the **Profile** field, enter %Utilities:Diagnostics% and click **Find**. The Utilities:Diagnostics profile values are displayed.
5. In the **User** column of the Utilities:Diagnostics profile, set the value to **Yes**.
6. Save your settings.

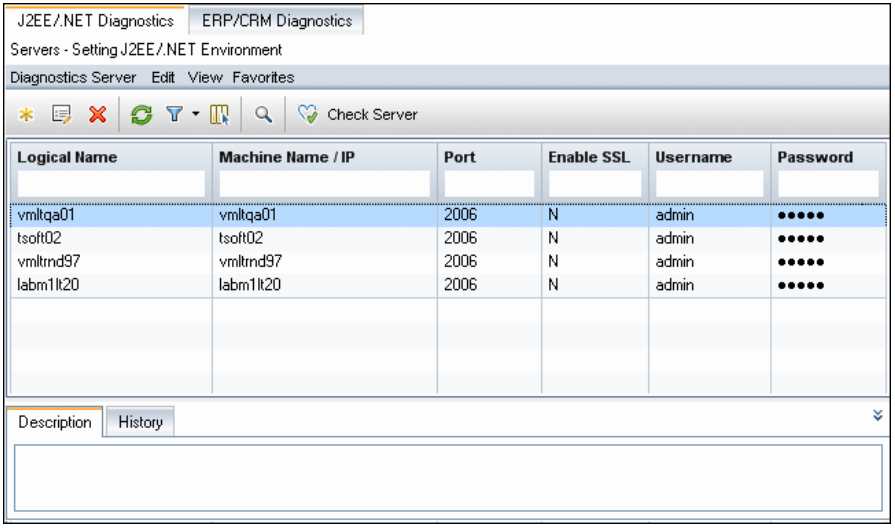
Reference

Diagnostics User Interface

This section includes:

Diagnostics Module Window

The Diagnostics Module Window enables you to add and manage ERP/CRM mediators and J2EE/.NET servers.



To access	On the Lab Management sidebar, under **Lab Settings**, select **Diagnostics.**
Relevant tasks	➤ "How to Add ERP/CRM Mediators" on page 838 ➤ "How to Add HP Diagnostics Servers" on page 839

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
<ALM common areas>	For details on the ALM common areas, see the *HP Application Lifecycle Management User Guide*.
<Diagnostics module fields>	For details on the fields that are available in the Diagnostics module, see "Diagnostics Module Fields" on page 856.
<Diagnostics module menus and buttons>	For details on the icons that are available in the Diagnostics module, see "Diagnostics Module Menus and Buttons" on page 857.
ERP/CRM Diagnostics tab	Enables you to add and manage ERP/CRM Diagnostics mediators.
J2EE/.NET Diagnostics tab	Enables you to add and manage J2EE/.NET Diagnostics servers.
History tab	Displays a history of the changes made to the selected server/mediator, including the date and time of the change and the name of the user who made the change. For details, see the *HP Application Lifecycle Management User Guide*.

Diagnostics Module Fields

This section describes the Diagnostics module fields.

Field	Description
Description	A description of the mediator/server.
Enable SSL	Select **Enable** if ALM is communicating with Diagnostics through SSL.
Logical Name	The logical name given to the mediator/server.
Machine Name / IP	The name or IP address of the mediator/server.
Over Firewall	Denotes if monitoring over a firewall is enabled or not. Select **Y** for enabled and **N** for not enabled. **Note:** Available for ERP/CRM diagnostice only.
Password	Enter the password you use to log in to HP Diagnostics. **Default:** Admin **Note:** Available for J2EE/.NET diagnostics only.
Port	Enter the port number used by the diagnostics server. **Default:** 2006 **Note:** Available for J2EE/.NET diagnostics only.
Type	The ERP/CRM mediator type. **Note:** Available for ERP/CRM diagnostics only.
Username	Enter the user name with which you log on to HP Diagnostics. **Note:** The user name that you specify should have **view**, **change**, and **execute** privileges. For more information about user privileges, see the *HP Diagnostics Installation and Configuration Guide*.

Diagnostics Module Menus and Buttons

This section describes the menus and buttons in the Diagnostics module.

UI Elements (A-Z)	Menu	Description
	Edit and <right-click menu>	Deletes the selected server/mediator from the grid.
 **Check Server/ Mediator**	Diagnostics Server/ Mediator and <right-click menu>	Click to check if the server/mediator is up and running.
 **Copy URL**	Diagnostics Server/ Mediator	Copies a selected server/mediator and pastes its URL as a link. The server/mediator itself is not copied. Instead, you can paste the address into another location, such as an email or a document. Clicking the link opens up ALM and takes you to the server/mediator. If you are not already logged in, ALM first prompts for login details.
 **Diagnostics Server/Mediator Details**	Diagnostics Server/ Mediator and <right-click menu>	Click to view server/mediator details.

UI Elements (A-Z)	Menu	Description
Export	Diagnostics Server/ Mediator and <right-click menu>	Opens the Export Grid Data dialog box, enabling you to export the servers/mediators in the grid as a text file, Microsoft Excel worksheet, Microsoft Word document, or HTML document. Choose one of the following options: ➤ **All.** Exports all servers/mediators in the grid. ➤ **Selected.** Exports selected servers/ mediators in the grid.
 **Find**	View	Opens the Find dialog box, enabling you to search for field details in the module. For details, see the *HP Application Lifecycle Management User Guide*.
 **Go to Diagnostics Server/Mediator**	Diagnostics Server/ Mediator	Opens a dialog box which prompts you for the server/mediator ID. Click **OK** to open the server/mediator details window.
Grid Filters	View and <right-click menu>	Enables you filter the data according to an entry in the filter box. For details about filtering options, see the *HP Application Lifecycle Management User Guide*.
Information Panel	View and <right-click menu>	Shows/Hides the Information Panel in the lower area of the module.
 **New Diagnostics Server/Mediator**	Diagnostics Server/ Mediator	Click to add a new ERP/CRM mediator or J2EE/.NET server. For information on the relevant fields, see "Diagnostics Module Fields" on page 856.

UI Elements (A-Z)	Menu	Description
 **Refresh All**	View	Refreshes the grid so that it displays the most up-to-date information.
Replace	Edit and <right-click menu>	In the grid, opens the Replace dialog box, enabling you to replace a field value in the grid. For more details, see the *HP Application Lifecycle Management User Guide*.
 **Select Columns**	View	Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For more details, see the *HP Application Lifecycle Management User Guide*. For details about the Diagnostics fields, see "Diagnostics Module Fields" on page 856.
 **Set Filter/Sort**	View	Enables you to filter and sort the resources in the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For more details, see the *HP Application Lifecycle Management User Guide*.
Update Selected	Edit and <right-click menu>	Opens the Update Selected dialog box, enabling you to update a field value for a multiple selection in the grid. For more details, see the *HP Application Lifecycle Management User Guide*.

41

AUT Host Management

This chapter includes:

Concepts

Tasks

Reference

Concepts

AUT Resources Overview

Application under test components such as Web/application servers or database servers are hosted on machines known as AUT hosts. The hosts are grouped together in logical containers, known as **AUT host pools**. The AUT hosts are a core element of the new Topology and SiteScope integration features.

Tasks

How to Import AUT Host Data from Excel

This task describes how to import a list AUT hosts from an Excel file (.xls or .csv) into ALM.

This task includes the following steps:

1 Prerequisites

The Excel file must be set up so that the columns can be recognized and mapped by the Import feature.

- The first row of the Excel file must contain the field names, or corresponding logical names, that appear in the table below. (Logical names are not case sensitive.)

  Some fields are mandatory, others are required or optional.

  - **Mandatory** indicates a field that **must** appear in the Excel file. If you omit this field, the import fails. If you omit a value in one of the rows of this field's column, the import of that specific row fails.
  - **Required** indicates a field that **should** appear in the Excel file. If you omit this field, the code adds the field with the default value for all rows. If you include the field, but omit a value in one of the rows of this column, the code adds the default value for that row.
  - **Optional** indicates a field does not have to appear in the Excel file. Omitting this field has no effect on the import procedure.
- Fields representing virtual, reference, and invalid fields are ignored.
- Empty columns are allowed.

Set up the columns and values in the file as follows:

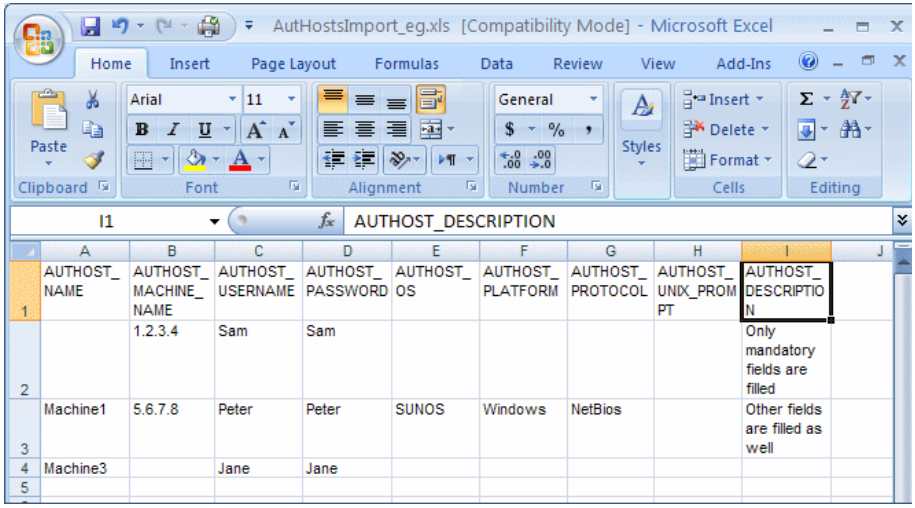
Field name	Logical name	Value	Field for
AUTHOST_NAME Required	Logical Name	Any string	AUT host logical name **Note:** If this value is empty, this will be given the same value as AUTHOST_MACHINE_NAME
AUTHOST_MACHINE_NAME Mandatory	Machine Name / IP	The machine name/ IP	AUT host physical machine name
AUTHOST_USERNAME Mandatory	Username	The username of the machine	User name for logging on to the AUT host machine
AUTHOST_PASSWORD Mandatory	Password	The password of the user name	Password for logging on to the AUT host machine

Field name	Logical name	Value	Field for
AUTHOST_OS Required for UNIX platforms only	OS Type	➤ SUNOS (default) ➤ Sun Solaris ➤ MacOSX ➤ Linux ➤ Red Hat Enterprise Linux ➤ AIX ➤ FreeBSD ➤ HP-UX ➤ HP/UX ➤ HP/UX 64-bit ➤ NonStopOS ➤ OPENSERVER ➤ SCO ➤ SGI Irix ➤ Tru64 5.x ➤ Tru64 pre 4.x (Digital)	AUT host machine operating system (For UNIX platform only)
AUTHOST_PLATFORM Required	Platform	➤ Windows (default) ➤ UNIX	AUT host platform
AUTHOST_PROTOCOL Required	Protocol	Windows: ➤ NetBIOS (default) ➤ SSH ➤ WMI UNIX: ➤ rlogin ➤ Telnet (default) ➤ SSH	AUT host protocol

Field name	Logical name	Value	Field for
AUTHOST_ UNIX_ PROMPT Required for UNIX platforms only	UNIX Prompt	# (default)	UNIX prompt on the AUT host machine
AUTHOST_ DESCRIPTION Optional	Description	Any string	AUT host description

Example:

The following image illustrates an Excel file set up with the following AUT hosts: **1.2.3.4**, **5.6.7.8**, and a third machine whose name was not provided.



2 Import the AUT hosts

a Open the AUT Hosts module:

- **In ALM:** On the ALM sidebar, under **Lab Resources**, select **AUT Hosts**.
- **In Lab Management:** On the Lab Management sidebar, under **AUT Resources**, select **AUT Hosts**.

b Select **AUT Hosts** > **Import**.

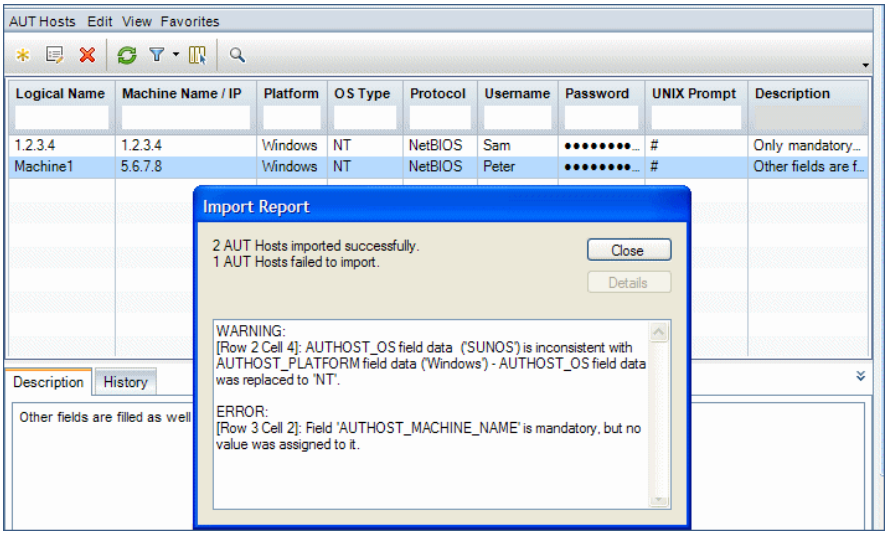
c Browse to the Excel file containing the AUT hosts, and click **Open**.

3 Results

The progress of the import process is displayed. At the end of the process, a report displays the import results. The imported AUT hosts are listed in the AUT Hosts module. AUT hosts that are not imported successfully, must be added manually.

Example:

The results from importing the Excel file in step 1 above are illustrated in the following image:



Note:

- No logical name was provided in the Excel file for machine 1.2.3.4. Therefore, the logical name given is equivalent to the machine name/IP.
- Machine 1's operating system was specified as SUNOS, whereas the platform was specified as Windows. These values are inconsistent as SUNOS is relevant only for a UNIX platform. The value SUNOS was replaced with NT.
- No machine name was specified for the third machine listed in the Excel file. This machine was not imported. It should be added manually.
- Required but non-mandatory values were automatically provided by the system during the import process.

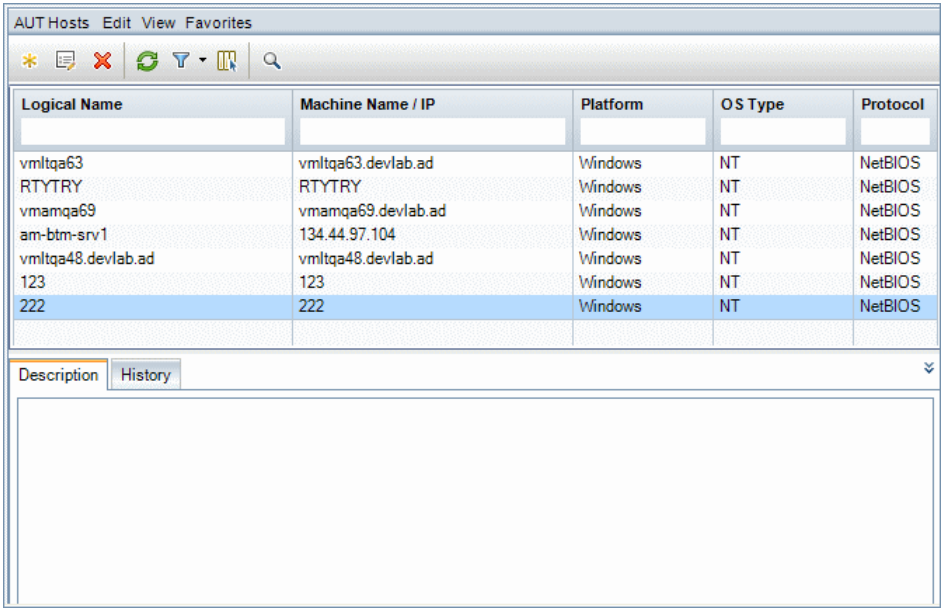
Reference

AUT Resource Modules User Interface

This section includes:

AUT Hosts Module

This module enables you to view and manage AUT hosts.



To access	Use one of the following: ➤ On the Lab Management sidebar, under **AUT Resources**, select **AUT Hosts.** ➤ On the ALM sidebar, under **Lab Resources**, select **AUT Hosts.**
Important information	The AUT Host module is available both in Lab Management and in ALM.
Relevant tasks	"How to Design Topologies" on page 47
See also	➤ "AUT Resources Overview" on page 862 ➤ "Topologies Overview" on page 46

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
<Common Menus and Toolbars>	For details on AUT Resource modules menus and toolbars, see "AUT Resource Module Menus and Buttons" on page 889.
<AUT Hosts grid>	Displays a list of AUT hosts defined in ALM.
Description tab	Displays the main details and a description about the AUT host. **Tip:** Right-click the **Description** area for edit and format options.
History tab	Lists changes made to the selected AUT host. For more details, see the *HP Application Lifecycle Management User Guide*.

AUT Host Fields

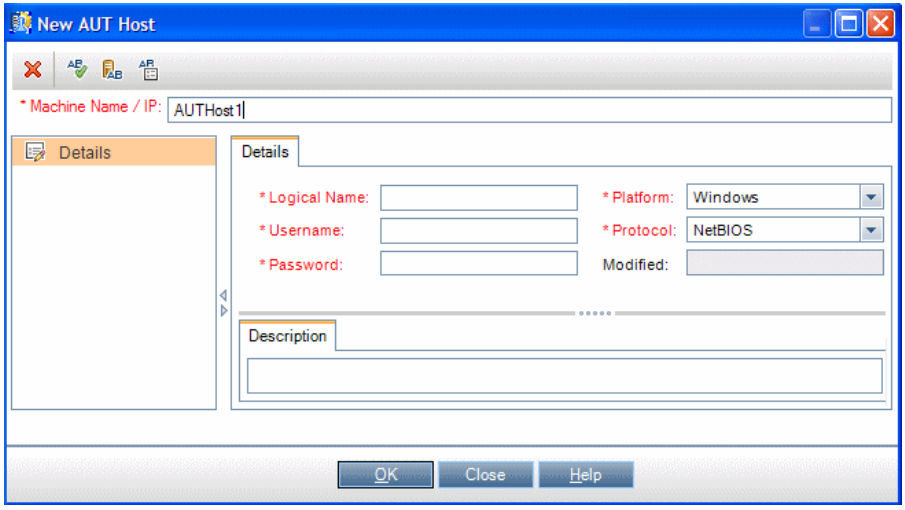
The following table describes the AUT host fields:

Field	Description
Belongs to Pools	The host pools to which the AUT host belongs. **Available in:** Lab Management only
Description	A description of the AUT host.
Logical Name	The logical name given to the AUT host.
Machine Name/IP	The name or IP address of the AUT host machine.
Modified	The date on which the AUT host details were last modified.
OS Type	The operating system of the AUT host machine. **Available for:** AUT hosts in UNIX only.
Password	The password for logging in to the AUT host machine.

Field	Description
Platform	The base operating system of the AUT host machine: Window or UNIX.
Protocol	The network protocol used for communication with the AUT host (for monitoring purposes). **Default value**: Windows: NetBIOS; UNIX: SSH
UNIX Prompt	The prompt used by the operating system. Also used for communication with the AUT host (for monitoring purposes). **Available for:** UNIX AUT hosts only.
Username	The user name for logging in to the AUT host machine.

New AUT Host Dialog Box

This dialog box enables you to create a new AUT host.



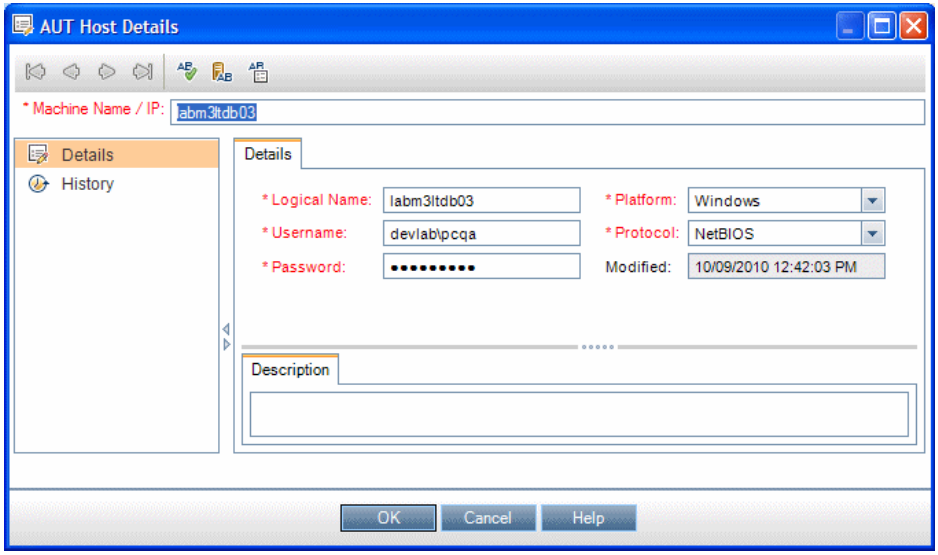
To access	Use one of the following: ➤ On the Lab Management sidebar, under **AUT Resources**, select **AUT Hosts**. Click **New AUT Host** . ➤ On the ALM sidebar, under **Lab Resources**, select **AUT Hosts**. Click **New AUT Host** .
Important information	When creating an AUT host in ALM, the AUT host is automatically added to the project's AUT host pool. **Tip:** If you have a list of AUT hosts set up in an Excel file, you can import this list instead of adding the hosts one by one. For details, see "How to Import AUT Host Data from Excel" on page 863.
Relevant tasks	"How to Design Topologies" on page 47
See also	➤ "Topologies Overview" on page 46 ➤ "AUT Resources Overview" on page 862

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
	**Clear All Fields.** Clears the data.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Machine Name/IP	The name or IP of the AUT host machine.
Details	Enables you to enter the details of the new AUT host. For more details, see "AUT Host Fields" on page 871.

AUT Host Details Dialog Box

This dialog box enables you to view and modify AUT host details.



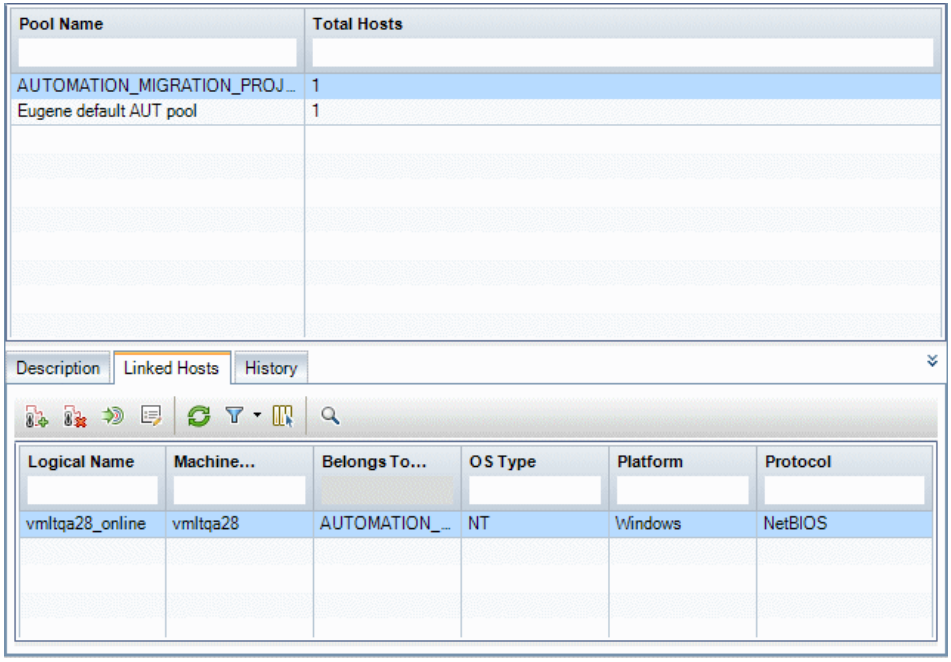
To access	Use one of the following: ➤ On the Lab Management sidebar, under **AUT Resources**, select **AUT Hosts**. Right-click an AUT host in the grid and select **AUT Host Details**. ➤ On the ALM sidebar, under **Lab Resources**, select **AUT Hosts**. Right-click an AUT host in the grid and select **AUT Host Details**.
Relevant tasks	"How to Design Topologies" on page 47
See also	➤ "AUT Resources Overview" on page 862 ➤ "Topologies Overview" on page 46

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
	**First/Previous/Next/Last Entity.** Enables you to browse through the list of AUT hosts.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Machine Name/IP	The name or IP of the AUT host machine.
Details	Displays the details of the selected AUT host. For more details, see "AUT Host Fields" on page 871.
History	Lists changes made to the selected AUT host. For more details, see the *HP Application Lifecycle Management User Guide*.

AUT Host Pools Module

This module enables you to view and manage AUT host pools.



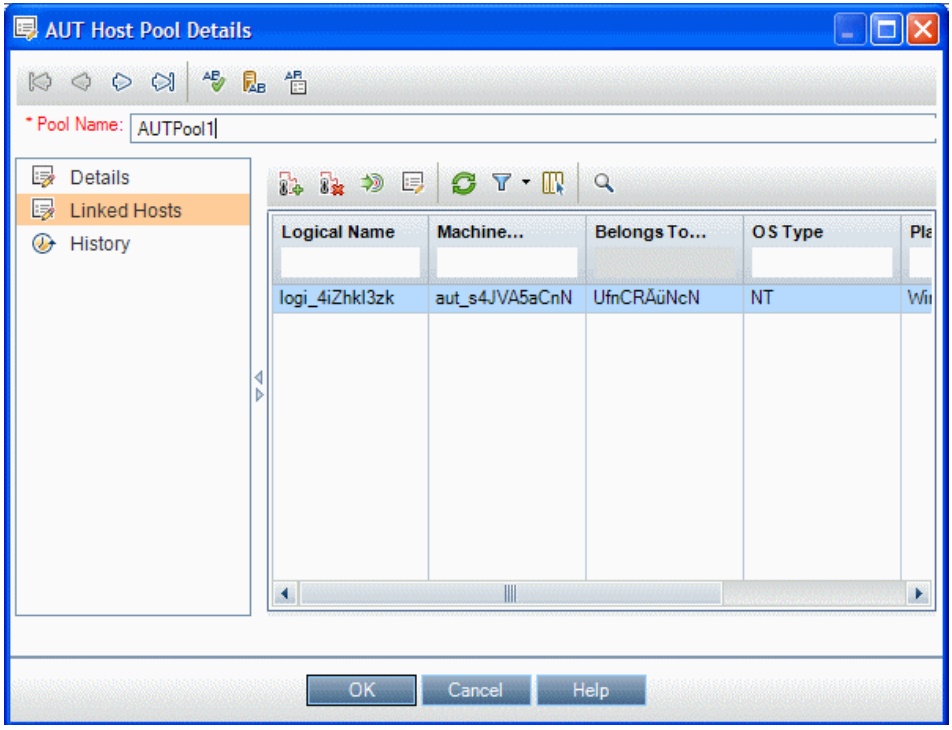
To access	On the Lab Management sidebar, under **AUT Resources**, select **AUT Host Pools**
Relevant tasks	The AUT Host Pools module is available only in Lab Management.
See also	"AUT Resources Overview" on page 862

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
<Common Menus and Toolbars>	For details on AUT Host Pools module menus and toolbars, see "AUT Resource Module Menus and Buttons" on page 889.
<AUT Host Pools grid>	Displays the AUT host pools defined in the system.
Description tab	Displays the main details and a description about the AUT host pool. **Tip:** Right-click the **Description** area for edit and format options.
Linked Hosts tab	Enables you to add AUT hosts to the selected pool and remove hosts from the pool. For details, see "Linked Hosts Page" on page 879.
History tab	Lists changes made to the selected AUT host pool. For more details, see the *HP Application Lifecycle Management User Guide*.

Linked Hosts Page

This page enables you to add AUT hosts to an AUT host pool, and remove AUT hosts from an AUT host pool.



To access	➤ **From the AUT Host Pools module:** On the Lab Management sidebar, under **AUT Resources**, select **AUT Host Pools**. In the information panel, select **Linked Hosts**. ➤ **From the AUT Host Pool Details dialog box:** On the Lab Management sidebar, under **AUT Resources**, select **AUT Host Pools**. Right-click an AUT host pool and select **AUT Host Pool Details.** In the AUT Host Pool Details dialog box, select **Linked Hosts**. **Note:** Available in Lab Management only.
Important information	The Linked Hosts page enables you to link multiple AUT hosts to an AUT host pool. Alternatively, you can link a single AUT host to multiple AUT host pools from the **Belongs To Pools** field in the AUT host's details. For details, see "AUT Host Fields" on page 871.
See also	"AUT Resources Overview" on page 862

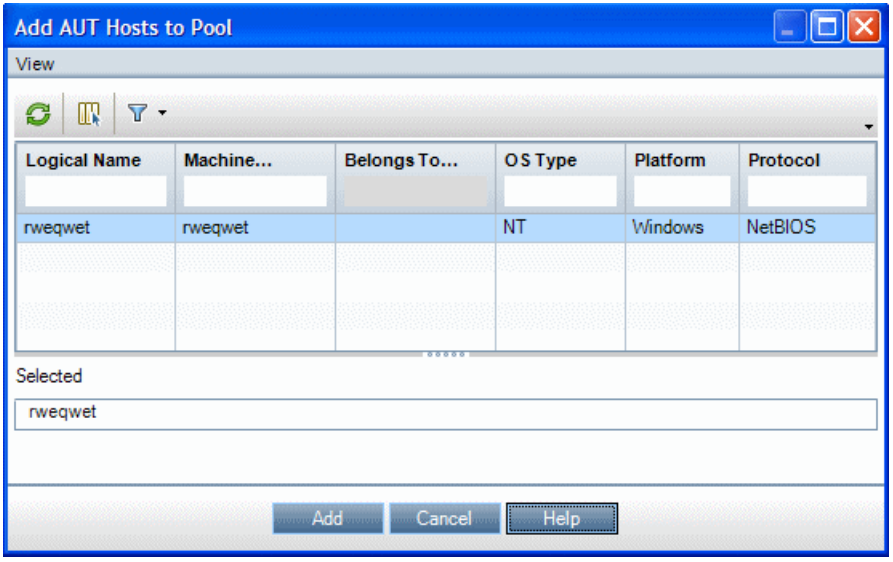
User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Add Hosts to Pool.** Opens the Add AUT Hosts to Pool dialog box, enabling you to select AUT hosts to add to the AUT host pool.
	**Remove Host.** Removes the selected AUT hosts from the AUT host pool.
	**Go to Host.** Displays the selected linked AUT host in the AUT Hosts module.
	**AUT Host Details.** Opens the AUT Host Details dialog box, enabling you to view details about the selected linked AUT host. For details, see "AUT Host Fields" on page 871.
	**Refresh All.** Refreshes the grid so it displays the most up-to-date information.

UI Elements	Description
	**Set Filter/Sort.** Enables you to filter and sort the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For details, see the *HP Application Lifecycle Management User Guide*.
	**Select Columns.** Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For details, see the *HP Application Lifecycle Management User Guide*.
	**Find.** Opens the Find dialog box, enabling you to search for an AUT host. For details, see the *HP Application Lifecycle Management User Guide*.
<Linked Hosts grid>	Lists the AUT hosts that belong to the AUT host pool. For details about the host fields, see "AUT Host Fields" on page 871.

Add AUT Hosts to Pool Dialog Box

This page enables you to select AUT hosts to add to an AUT host pool.



To access	➤ **From the AUT Host Pools module:** On the Lab Management sidebar, under **AUT Resources**, select **AUT Host Pools**. In the information panel, select **Linked Hosts** and click the **Add Hosts to Pool** button. ➤ **From the AUT Host Pool Details dialog box:** On the Lab Management sidebar, under **AUT Resources**, select **AUT Host Pools**. Right-click an AUT host pool and select **AUT Host Pool Details.** In the AUT Host Pool Details dialog box, select **Linked Hosts** and click the **Add Hosts to Pool** button. **Note:** Available in Lab Management only.

Important information	Alternatively, you can link a single AUT host to multiple AUT host pools from the **Belongs To Pools** field in the AUT host's details. For details, see "AUT Host Fields" on page 871.
See also	"AUT Resources Overview" on page 862

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Refresh All.** Refreshes the grid so it displays the most up-to-date information.
	**Select Columns.** Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For details, see the *HP Application Lifecycle Management User Guide*.
	**Set Filter/Sort.** Enables you to filter and sort the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For details, see the *HP Application Lifecycle Management User Guide*.
	Adds the selected AUT hosts to the AUT host pool.
<AUT Hosts grid>	Lists the AUT hosts available to add to the AUT host pool.
Selected	Displays the AUT hosts selected to add to the pool.

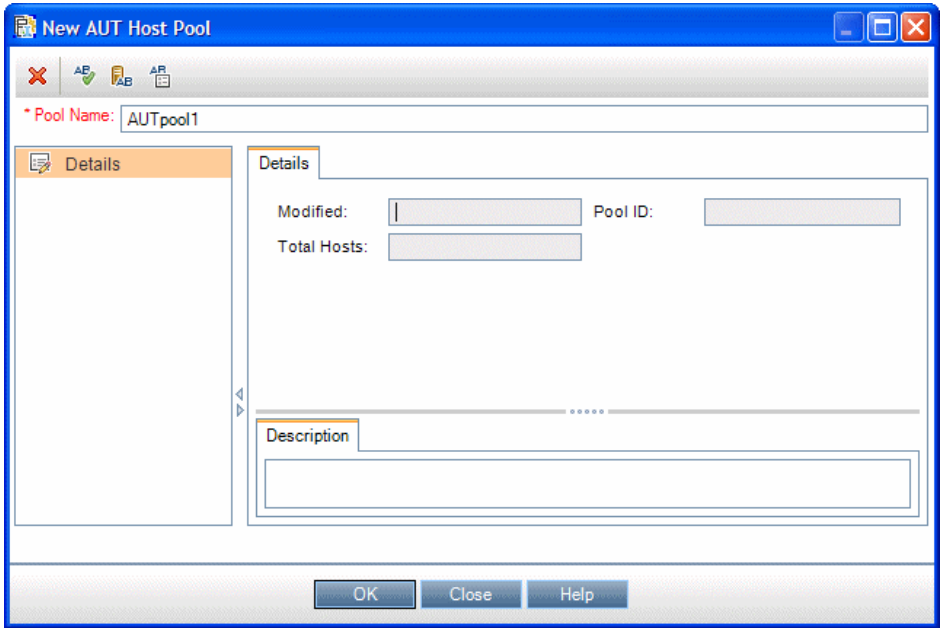
AUT Host Pool Fields

The following fields are available for AUT host pools:

Field	Description
Description	A description of the AUT host pool.
Modified	The date on which the AUT host pool details were last modified.
Pool ID	The ID of the AUT host pool.
Pool Name	The name of the AUT host pool. **Note:** The name may contain up to 128 characters, excluding spaces, periods, and any of the following characters: : ; * \ / ” ~ & ? { } $ % | < > + = ^ [ ] ( )
Total Hosts	The total number of AUT hosts in the host pool.

New AUT Host Pool Dialog Box

This dialog box enables you to create a new AUT host pool.



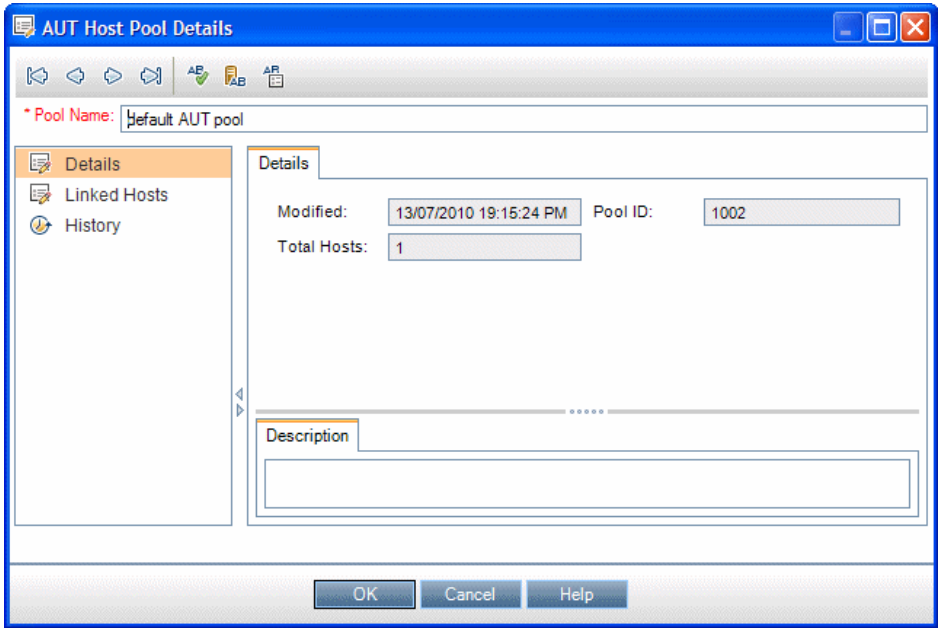
To access	On the Lab Management sidebar, under **AUT Resources**, select **AUT Host Pools**. Click **New AUT Host Pool** .
See also	"AUT Resources Overview" on page 862

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**Clear All Fields.** Clears the data.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Pool Name	The name of the AUT host pool.
Details	Enables you to enter the details of the new AUT host pool. For more details, see "AUT Host Pool Fields" on page 884.

AUT Host Pool Details Dialog Box

This dialog box enables you to view and modify AUT host pool details.



To access	On the Lab Management sidebar, under **AUT Resources**, select **AUT Hosts**. Right-click an AUT host in the grid and select **AUT Host Details**.
See also	"AUT Resources Overview" on page 862

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	**First/Previous/Next/Last Entity.** Enables you to browse through the list of AUT host pools.
	**Spell Check.** Checks the spelling for the selected word or text box.
	**Thesaurus.** Displays a synonym, antonym, or related word for the selected word.
	**Spelling Options.** Enables you to configure how to check the spelling.
Pool Name	The name of the AUT host pool.
Details	Displays the details of the selected AUT host pool. For more details, see "AUT Host Fields" on page 871.
Linked Hosts	Enables you to add AUT hosts to the selected pool and remove hosts from the pool. For details, see "Linked Hosts Page" on page 879.
History	Lists changes made to the selected AUT host pool. For more details, see the *HP Application Lifecycle Management User Guide*.

AUT Resource Module Menus and Buttons

These modules enable you to manage the AUT resources which host applications under test.

To access	Use one of the following: ➤ **In Lab Management:** On the Lab Management sidebar, under **AUT Resources**, select **<AUT Resource>** ➤ **In ALM:** on the ALM sidebar, under **Lab Resources**, select **AUT Hosts**. **Note:** In Lab Management, you can define both AUT hosts and AUT host pools. In ALM, you can define only AUT hosts.
Important Information	➤ AUT hosts can be managed both in Lab Management and in ALM. ➤ Only a user with administrator privileges can manage AUT host pools (in Lab Management).
Relevant tasks	"How to Design Topologies" on page 47
See also	➤ "AUT Resources Overview" on page 862 ➤ "Topologies Overview" on page 46

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Where	Description
 **<AUT resource> Details**	<AUT resource> and right-click menu	Opens the <AUT resource> Details dialog box, enabling you to view details of the selected AUT resource.
Add to Favorites	Favorites	Opens the Add Favorite dialog box, enabling you to add a favorite view to your private or the public folder. For details, see the *HP Application Lifecycle Management User Guide*.

UI Elements (A-Z)	Where	Description
 **Copy URL**	<AUT resource> and <right-click menu>	Copies a selected AUT resource URL and pastes it as a link. You can paste the URL into another location, such as an email or a document. Clicking the link opens up ALM and takes you to the resource file or folder. If you are not already logged in, ALM first prompts for login details.
 **Delete**	Edit and <right-click menu>	Deletes the AUT resource selected in the grid.
Export	<AUT Resource> and <right-click menu>	Opens the Export All Grid Data dialog box, enabling you to export the AUT resources in the grid as a text file, Microsoft Excel worksheet, Microsoft Word document, or HTML document. Choose one of the following options: ➤ **All.** Exports all resources in the grid. ➤ **Selected.** Exports selected resources in the grid.
 **Find**	View	Opens the Find dialog box, enabling you to search for a resource in the module. For details about search options, see the *HP Application Lifecycle Management User Guide*.
 **Go to <AUT Resource>**	<AUT Resource>	Opens the Go To <AUT Resource> dialog box, enabling you to find a specific resource by its ID number. You can only go to resources that are in the current filter.

UI Elements (A-Z)	Where	Description
Grid Filters	View and <right-click menu>	Enables you filter the data according to an entry in the filter box. For details about filtering options, see the *HP Application Lifecycle Management User Guide*.
Import	AUT Hosts	Enables you to import a list of AUT hosts from an Excel file (.xls or .csv) into ALM. For details, see "How to Import AUT Host Data from Excel" on page 863.
Information Panel	View and <right-click menu>	Shows/Hides the Information Panel in the lower area of the module.
 **New <AUT Resource>**	<AUT Resource>	Enables you to add an AUT resource. **Note:** For AUT host pools, this is available in Lab Management only
Organize Favorites	Favorites	Opens the Organize Favorites dialog box, enabling you to organize the list of favorite views by changing properties or deleting views. For details, see the *HP Application Lifecycle Management User Guide*.
Private	Favorites	Lists the favorite views that are accessible only to the user who created them.
Public	Favorites	Lists the favorite views that are accessible to all users.
 **Refresh All**	View	Refreshes the grid so that it displays the most up-to-date information.
Replace	Edit and <right-click menu>	Opens the Replace dialog box in the <AUT Resource> grid, enabling you to replace a resource field value in the grid. For more details, see the *HP Application Lifecycle Management User Guide*.

UI Elements (A-Z)	Where	Description
 **Select Columns**	View	Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For details, see the *HP Application Lifecycle Management User Guide*. For details about the resource fields, see: ➤ "AUT Host Fields" on page 871 ➤ "AUT Host Pool Fields" on page 884
 **Set Filter/Sort**	View	Enables you to filter and sort the resources in the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For details about filtering options, see the *HP Application Lifecycle Management User Guide*.
Updated Selected	Edit and <right-click menu>	Opens the Update Selected dialog box, enabling you to update a field value for a multiple selection in the <AUT resource> grid. For more details, see the *HP Application Lifecycle Management User Guide*.

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Performance Center System Administration

This chapter includes:

Concepts

Tasks

Reference

Concepts

ALM-Performance Center Communication Security

During installation ALM and the Performance Center Server and hosts, a passphrase, known as the **Communication Security passphrase**, is defined. This passphrase enables secure communication between the Performance Center components and the ALM Platform. This passphrase must be identical on all of the components of the system.

The Communication Security passphrase can be updated from time to time. For information about updating the Communication Security passphrase, see "How to Update the Communication Security Passphrase" on page 896.

Performance Center System User

During installation of the Performance Center Server and hosts, a default Performance Center system user, **IUSR_METRO** (default password **P3rfoRm@1nce**), is created in the Administrators user group of the server/host machines.

To prevent security breaches, you can replace Performance Center's default system user by creating a different local system user, or by using a domain user.

For stronger security, you can create a non-administrator Performance Center system user in a local group under the Users group. This system user has the permissions granted to any user in the Users group with extended rights to Web services and the HP file system and registry.

With these limited permissions, such a system user cannot perform all administrative system tasks. You need to specify a configuration user (a user with administrative privileges that is defined on the Performance Center Server and hosts) that Performance Center uses when administrative tasks are required on the system. After the tasks are complete, the system user reverts back to itself, with its limited Performance Center user permissions.

Note: The configuration user is saved in the database so that whenever an administrative-level system user is required to perform a task, the system automatically uses the configuration user, without asking for its credentials.

The Performance Center Server is installed with the System Identity Utility that enables you to manage the Performance Center system user on the Performance Center Server and hosts from one centralized location.

Using this utility, you can periodically update the Performance Center system user name and password. For more information, see "How to Change the System User" on page 898.

Remote Performance Center Server and Host Administration

To perform administrative tasks on the Performance Center Server or hosts (such as adding, configuring, or resetting a Performance Center Server/host), Performance Center must use a user with administrative privileges. This must be the Performance Center system user with administrative privileges or, if the Performance Center system user is non-administrative, a configuration user.

When the Performance Center system user has administrative privileges and is defined on the remote machine, tasks are performed upon request. After validating the Performance Center system user or configuration user, Performance Center can perform required tasks.

Tasks

How to Update the Communication Security Passphrase

This task describes how to update the Communication Security passphrase on the ALM-Performance Center system components.

To learn more about ALM-Performance Center communication security, see "ALM-Performance Center Communication Security" on page 894.

This task includes the following steps:

- "Update the Communication Security passphrase on the ALM Platform" on page 896
- "Update the Communication Security passphrase on the Performance Center components" on page 897

1 Update the Communication Security passphrase on the ALM Platform

a In Site Administration, update the **COMMUNICATION_SECURITY_PASSPHRASE** default parameter. For details, see *HP Application Lifecycle Management Administrator Guide*.

b Restart the **HP Application Lifecycle Management** service on the ALM Platform server.

2 Update the Communication Security passphrase on the Performance Center components

The System Identity Utility is installed on the Performance Center Server. You use this utility to update the Communication Security passphrase on the Performance Center Server and hosts from one centralized location.

a From the Performance Center Server installation's bin directory, open the System Identity Utility (**<Performance Center Server Installation directory>/bin/IdentityChangerUtil.exe**).

Note: You can run this utility from any one of the Performance Center Servers in the system.

---

b Enter the ALM Platform details to connect to ALM.

c The System Identity Utility opens. For user interface details, see "System Identity Utility Window" on page 909.

In the **Communication Security Passphrase** section, select **Change**, and enter the new Communication Security passphrase.

d Click **Apply**.

How to Change the System User

You use the System Identity Utility, installed on the Performance Center Server, to change the system user on the Performance Center Server and hosts.

When you change the system user, or a user's password, the System Identity Utility updates the Performance Center Server and hosts.

Note: This task is part of a higher-level task. For details, see "How to Work with Performance Center Administration" on page 622.

To learn more about the Performance Center system user, see "Performance Center System User" on page 894.

This task includes the following steps:

- "Prerequisites" on page 899
- "Launch the System Identity Utility on the Performance Center Server" on page 899
- "Change the details of the Performance Center user" on page 899
- "Verify that the system user was changed on the Performance Center Server" on page 900

1 Prerequisites

- When changing the system user, Performance Center must be down. That is, all users must be logged off the system and no tests may be running.
- When changing the user password:
  - Ensure that each host is listed in the Machines table under **one alias only**.
  - In the case of a domain user, when the domain IT team notifies you that the password is to be changed, you need to temporarily change the Performance Center system user on the Performance Center Server and hosts to a different user. After the domain IT team has changed the password of the domain user and has notified you of this change, you need to change the Performance Center system user back to the domain user on the Performance Center Server and hosts.

2 Launch the System Identity Utility on the Performance Center Server

a In the Performance Center Server installation's **bin** directory, open the System Identity Utility (**<Performance Center Server Installation directory>/bin/IdentityChangerUtil.exe**).

b Enter the ALM Platform details to connect to ALM.

The System Identity Utility opens. For user interface details, see "System Identity Utility Window" on page 909.

3 Change the details of the Performance Center user

Enter the relevant details to update and click **Apply**. The utility updates the Performance Center Server and hosts, starting with the Performance Center Server.

In the lower part of the utility window, the **Machines** table displays the status of each machine during the configuration process.

If the utility is unable to change the user on the Performance Center Server, it stops the configuration, rolls back the change, and issues a message explaining why the change cannot be made. Correct the error and click **Apply** again.

When configuration completes successfully on the Performance Center Server, the utility proceeds with the configuration of the hosts. The utility attempts to configure all the hosts, even if the configuration on one or more hosts is unsuccessful. In this case, after the utility has attempted to configure all the hosts, correct the errors on the failed hosts, and click **Reconfigure**. The utility runs again on the whole system.

Note: If the configuration continues to fail, you can configure the Performance Center Server and hosts manually. However, all attempts should be made to correct errors that cause the configuration to fail. **Manual configuration should be left as a last resort.** For details on configuring the Performance Center Server and hosts manually, see "How to Configure the System User Manually" on page 901.

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4 Verify that the system user was changed on the Performance Center Server

a Open the IIS Manager and verify that the Performance Center user is defined in the **LoadTest** and **PCS** virtual directories.

b Check in the **PCQCWSAppPool** and **LoadTestAppPool** application pools that the identity is the Performance Center user.

Note: If the Performance Center user was not updated, see "Troubleshooting and Limitations" on page 915.

How to Configure the System User Manually

This task describes how to manually configure the Performance Center system user on the Performance Center Server and hosts.

Note:

- First try to configure the Performance Center user using the System Identity Utility (see "How to Change the System User" on page 898). **Use these manual instructions as a last resort only.**
- This section applies to an administrative or non-administrative Performance Center user on the Performance Center Server and hosts.
- Manual configuration of the Performance Center user on the Performance Center Server and hosts involves granting the required Performance Center policies, updating the Performance Center user, and, for a non-administrative Performance Center user, granting the required Performance Center permissions.
  Follow all the procedures carefully, noting which procedures are relevant for the Performance Center Server and which for the hosts.

This task includes the following steps:

- "Define the Performance Center user as an Admin or Non-Admin user" on page 902
- "Configure IIS settings (Performance Center Server only)" on page 902
- "Configure the COM object identity" on page 903
- "Reset services" on page 903
- "Admin user only: Verify Performance Center user policies" on page 904
- "Non-Admin user only: Configure Performance Center user policies and permissions" on page 905

1 Define the Performance Center user as an Admin or Non-Admin user

The Performance Center system user can have administrative or non-administrative permissions. You define what type of user it is by adding it to the relevant local user group on the Performance Center Server or host.

a Open the Computer Management (**Control Panel** > **Administrative Tools** > **Computer Management**).

b Add the user to the appropriate user group. In **System Tools** > **Local Users and Groups** > **Users**.

- **For administrative system users:** Double-click the Performance Center user, and click the **Member of** tab. If **Administrators** is not listed, click **Add**, select **Administrators**, and click **OK**.
- **For non-administrative system users:** Double-click the Performance Center user, and click the **Member of** tab. Change the Performance Center user to belong to the following groups:

  - Users

  - Distributed Com Users

  - Performance Log Users

2 Configure IIS settings (Performance Center Server only)

a Open the IIS Manager on the Performance Center Server machine:

- **Windows 2003:** Change the system user in the **LoadTest** and **PCS** virtual directories.
- **Windows 2008:** For each of the **LoadTest** and **PCS** virtual directories, add the Performance Center system user and grant the user full control on the virtual directory.

b Change the **PCQCWSAppPool** and **LoadTestAppPool** application pool identity to the Performance Center system user.

3 Configure the COM object identity

For the Performance Center Server and hosts, change the identity of the COM objects to the Performance Center user.

For all the COM objects listed in the **<Performance Center component installation>\bin\MiDCOM.ini** file, configure the identity to be the Performance Center user as follows:

a Run **dcomcnfg**.

b For each COM object, under **Properties** > **Identity**, select **This user** and enter the Performance Center user details.

4 Reset services

For the Performance Center Server and hosts, reset the services as follows:

➤ **Performance Center Servers and hosts:** Reset the **RemoteManagement Agent service** using the following commands:

```
%installation folder%\al_agent\bin\alagentservice.exe -remove

%installation folder%\al_agent\bin\alagentservice.exe -install <username>
<password>
```

where username and password are those of the Performance Center user.

➤ **Performance Center hosts only:**

➤ Reset the **Performance Center Agent service** using the following commands:

```
%installation folder%\launch_service\bin\magentservice.exe -remove

%installation folder%\launch_service\bin\magentservice.exe -install
<username> <password>
```

where username and password are those of the Performance Center user.

➤ Open the Services console, and restart the **Performance Center Load Testing Service**.

5 Admin user only: Verify Performance Center user policies

Note: This section is relevant when configuring an administrative Performance Center user only.

On the Performance Center Server and hosts, verify that the Performance Center user has the necessary policies. For details, see "Required Policies for the Performance Center System User" on page 908.

If any of these policies is missing, grant the Performance Center user the missing policies.

6 Non-Admin user only: Configure Performance Center user policies and permissions

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Note: This section is relevant when configuring a non-administrative Performance Center user only.

On the Performance Center Server and hosts:

a Grant the Performance Center user the required policies. For details, see "Required Policies for the Performance Center System User" on page 908.

b Change registry permissions: Open the Registry Editor (**regedt32**) and give the Performance Center user full access to:

```
- HKEY_LOCAL_MACHINE\Software\Mercury Interactive
- HKEY_CLASSES_ROOT\interface
- HKLM\SYSTEM\CurrentControlSet\Control\SecurePipeServers\winreg
- HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Perflib
- HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon
```

In addition, on hosts only:

```
- HKLM\SOFTWARE\Microsoft\Jet\4.0\Engines\Text (used by Analysis)
- HKEY_CLASSES_ROOT\CLSID\{67489277-9AB8-4AF6-91B4-94ED62303BE5}
```

c Add full control permissions to directories and files:

➤ In the File System folder grant the **Performance Center user** full control of:

```
- The Performance Center directory
(C:\Program Files\HP\Performance Center) and all sub-directories
- %CommonProgramFiles%
- %windir%\TEMP
- If the systemroot is on an NTFS partition, grant at least Read access to
  - %SystemRoot%\System32\Perfc009.dat
  - %SystemRoot%\System32\Perfh009.dat
```

In addition, on hosts only:

```
- C:\Documents and Settings\Default User\Local Settings\Temp
- %windir%\wlrun7.ini
- %windir%\wlrun5.ini
- %windir%\mercury.ini
- %windir%\collate.txt
- %windir%\OnlineSet.ini
```

If a file does not exist, create it and give the user full access.

➤ In the File System folder, after installing Web services, grant the **IWAM_Machine user** Read permissions in the following directory:

```
windir%\TEMP
```

d Add permissions to run .NET applications:

Add full control permissions for the Performance Center user to all folders needed to run **.NET** applications (Web services, and so on).

In a command line, go to

```
%windir%\Microsoft.NET\Framework\v2.0.50727
```

and run

```
aspnet_regiis.exe -ga <MachineName>\IUSR_METRO
```

e Change permissions of the Crypto key:

Open **C:\Documents and Settings\All Users\Application Data\Microsoft\Crypto\RSA\MachineKeys**.

Right-click the **f9416f003254e6f10da1f9bad8e4c383** file and select **Properties**.

In the **Security** tab, add the **Users Group** and grant it full control.

Reference

Required Policies for the Performance Center System User

This section describes the policies required for the Performance Center system user.

Note: This section applies to:

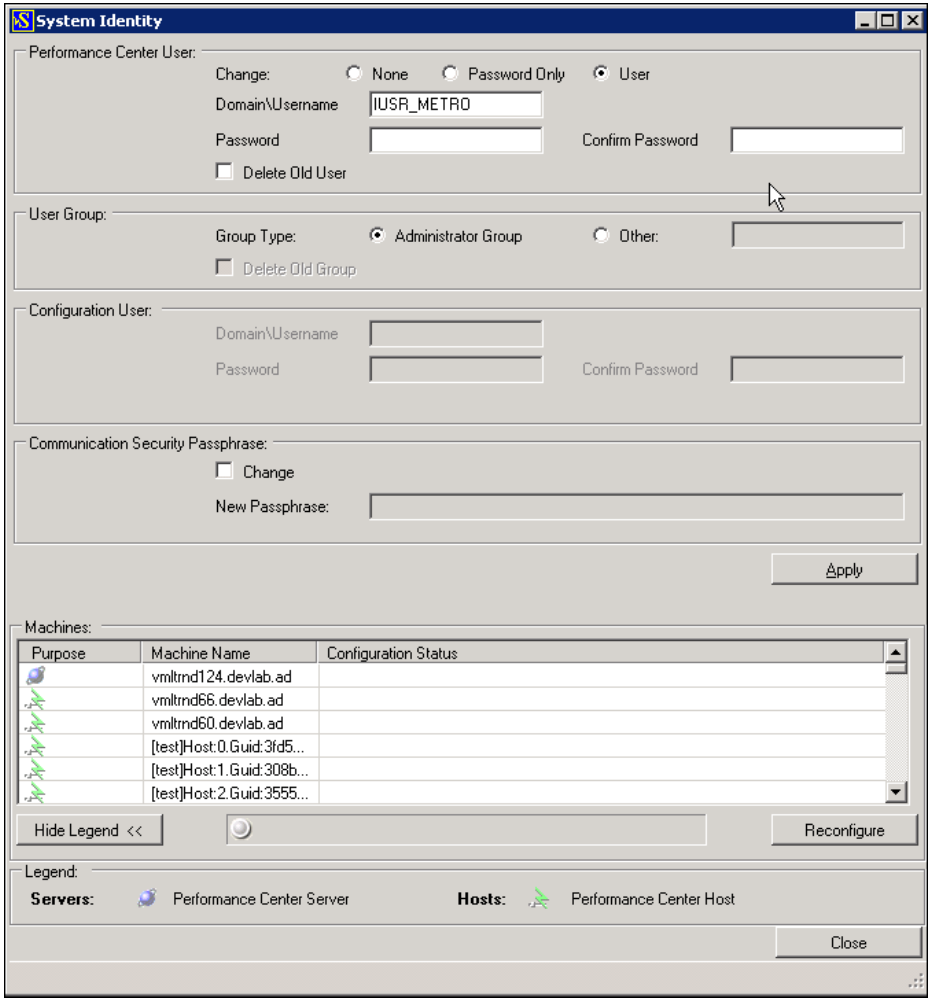
- An administrative or non-administrative Performance Center user
- All Performance Center servers and hosts

The Performance Center user must be granted all of the following policies:

Policy	Reason
Create global object	For Autolab running Vusers on the Controller.
Batch logon rights	The minimum policies required to run Web applications.
Service logon rights	The minimum policies required to run Web applications.
Access this computer from the network	The minimum policies required to run Web applications.
Log on locally	Required by infra services, For example, after reboot, the system logs in with the Performance Center system user.

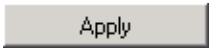
System Identity Utility Window

This utility enables you update the ALM-Performance Center Communication Security passphrase, as well as the Performance Center system user (by default, **IUSR_METRO**) and/or password on the Performance Center Server and hosts from one centralized location.



To access	From the Performance Center Server installation's bin directory, open the System Identity Utility (<**Performance Center Server Installation directory**>**/bin/IdentityChangerUtil.exe**).
Important information	➤ This utility does not apply changes to UNIX machines, Standalone Load Generators, or machines that are located over the firewall. ➤ When updating the Communication Security passphrase, it is essential that it is updated on the ALM Platform as well. ➤ When changing the system user, Performance Center must be down. That is, all users must be logged off the system and no tests may be running.
Relevant tasks	➤ "How to Change the System User" on page 898 ➤ "How to Update the Communication Security Passphrase" on page 896
See also	➤ "Performance Center System User" on page 894 ➤ "ALM-Performance Center Communication Security" on page 894

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	Applies the selected changed on the Performance Center Server and hosts, starting with the Performance Center Server.
	Hides/shows the legend.
	If, when applying a change, there are errors on any of the Performance Center hosts, troubleshoot the problematic host machines, then click **Reconfigure**. The utility runs again on the Performance Center Server and hosts.

UI Elements	Description
Performance Center User	The Performance Center system user details. ➤ **Change.** Enables you to select which detail to change. ➤ **None.** Do not change the user's name or password. ➤ **Password Only.** Enables you to change only the Performance Center system user's password. **Note:** When changing the password: - Ensure that each host is listed in the **Machines** table under one alias only. - In the case of a domain user, when the domain IT team notifies you that the password is to be changed, you need to temporarily change the Performance Center system user on the Performance Center Server and hosts to a different user. After the domain IT team has changed the password of the domain user and has notified you of this change, you need to change the Performance Center system user back to the domain user on the Performance Center Server and hosts. ➤ **User.** Enables you to change the Performance Center system user name and password. ➤ **Domain\Username.** The domain and user name of the Performance Center system user. ➤ **Password/Confirm Password.** The password of the Performance Center system user. ➤ **Delete Old User.** If you are changing the user, this option enables you to delete the previous user from the machine. **Note:** You cannot delete a domain user.

UI Elements	Description
User Group	The details of the user group to which the Performance Center system user belongs. ➤ **Group type.** The type of user group. ➤ **Administrator Group.** Creates a user in the Administrators group with full administrator policies and permissions. ➤ **Other.** Creates a local group under the Users group, granting policies and permissions as well as other Performance Center permissions.
Configuration User	If you are creating a non-administrative Performance Center system user, that is, if you selected **Other** under **User Group**, you need to configure a configuration user (a system user with administrative privileges) that the non-administrative Performance Center system user can impersonate when it needs to perform administrative tasks. For more details, see "Performance Center System User" on page 894. If you selected **Delete Old User** in the **Performance Center User** area, ensure that the configuration user you are configuring is not the same as the system user you are deleting. Alternatively, do not delete the old user. ➤ **Domain\Username.** The domain and user name of a system user that has administrator privileges on the Performance Center Server and hosts. ➤ **Password/Confirm Password.** The password of a system user that has administrator privileges on the Performance Center Server and hosts.

UI Elements	Description
Communication Security Passphrase	The Communication Security passphrase that enables the Performance Center Server and hosts to communicate securely with the ALM Platform. ➤ **Change.** Enables you to change the passphrase. ➤ **New passphrase.** The new Communication Security passphrase. **Note:** This passphrase must be identical to the Communication Security passphrase defined on the ALM Platform. For details, see "How to Update the Communication Security Passphrase" on page 896.

UI Elements	Description
Machines grid	Displays the configuration status on each of the Performance Center components. ➤ **Configuration complete.** The system user configuration was completed. ➤ **Needs to be configured.** The Performance Center server/host is pending configuration. Displayed only after the Performance Center Server configuration is complete. ➤ **Configuring.....** The Performance Center Server/host in being configured. ➤ **Configuration failed.** The Performance Center Server/host configuration failed. The utility displays the reason for failure together with this status. **Notes:** ➤ If the utility is unable to apply the change on the Performance Center Server, the utility stops the configuration, rolls back the change, and issues a message explaining why the change cannot be applied. Correct the error and click **Apply** again. When configuration completes successfully on the Performance Center Server, the utility proceeds with the configuration of the hosts. The utility attempts to configure all the hosts, even if the configuration on one or more hosts is unsuccessful. In this case, after the utility has attempted to configure all the hosts, correct the errors on the failed hosts, and click **Reconfigure**. The utility runs again on the whole system. ➤ When changing system user details, if the configuration continues to fail, you can perform the change on the Performance Center Server and hosts manually. However, this is not recommended—all attempts should be made to correct errors that cause the configuration to fail. Changing the system user manually should be left as a last resort. For details on changing the system user manually, Performance Center see "How to Configure the System User Manually" on page 901.

Troubleshooting and Limitations

This section describes troubleshooting and limitations for Performance Center system user.

Windows 2003: The Performance Center user was not defined in the IIS virtual directories, and the application pool identity is not the Performance Center user.

Troubleshooting: If the Windows Remote Management (WS-Management) (WinRM) service is running, disable the service, and configure the system user manually. For details, see "How to Configure the System User Manually" > "Configure IIS settings (Performance Center Server only)" on page 902.

43

System Health

This chapter includes:

Concepts

Reference

Concepts

System Health Overview

To design and run performance tests in ALM Performance Center, the system must be up and running. Verifying the health of the system includes validating that the components of the system are indeed up and running and communicating with each other, as well as maintaining the system in a healthy state. Periodic automated tasks locate and repair any failures, thereby ensuring constant monitoring of the system's key components.

For System Health user interface details, see "System Health User Interface" on page 920.

Reference

System Health Maintenance Tasks

The following table describes the system health maintenance tasks:

UI Elements (A-Z)	Description
Check Host Task	Verifies the host installation, and updates its status to either **Operational** or **Non-Operational**. **Default frequency.** Every 24 hours
Data Processor Task	Sets and updates a data processing queue for the following actions: Analyzing a test run, recalculating the SLA, or adding test runs to a trend report. **Default frequency.** Every minute
OFW Status Update Task	Updates the real status (**Operational** or **Non-Operational**) of a host that is located over a firewall. **Default frequency.** Every 15 minutes
Orphan Run Task	Identifies orphan test runs during and outside of the active timeslot. **Default frequency.** Every 15 minutes

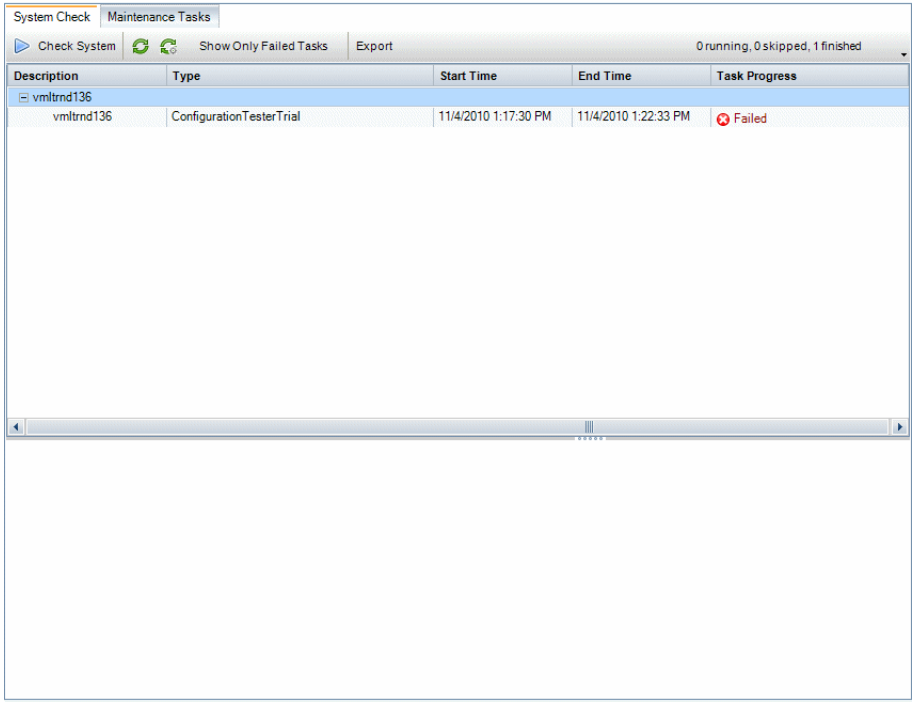
UI Elements (A-Z)	Description
Resource Recovery Task	Performs predefined validation tests on Controllers and load generators that are in the **Non-Operational** state. If the host passes the test, its status changes to **Operational**. ➤ **Controller validation tests.** OTA connection, ability to run, and available disk space. ➤ **Load Generator validation tests.** Connection to Agent The task parameters should be within the following guidelines: ➤ **MIN_APPLICATION_DIR_DISK_SPACE.** Between 10 and 1000 ➤ **CHECK_LG_TIMEOUT.** Between 1 and 15 ➤ **MAX_RETRIES.** Between 1 and 1000 ➤ **RESULT_EXPIRY_DAYS.** Between 1 and 1000 **Default frequency.** Every 15 minutes **Note:** For load generators over a firewall, this is performed by the OFW Status Update task (see above).
Result Cleaning Task	Cleans test run results from Controllers or load generators in the following instances: ➤ If the results have already been collated. ➤ There are old performance tests whose results were not collated. ➤ If the performance test was deleted. **Default frequency.** Every 6 hours

System Health User Interface

This section includes:

System Health Module Window

This module displays information about the ALM Performance Center system health maintenance tasks and overall system checks.

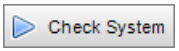
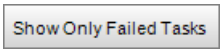


To access	On the Lab Management sidebar, under **Lab Settings**, select **System Health**.

System Check Tab

This tab enables you to run a full validation on your ALM-Performance Center system.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
	Opens the configure system check dialog box, enabling you to select servers and hosts in the ALM-Performance Center system to include in the system check. For details, see "Configure System Check Dialog Box" on page 924.
	**Refresh All.** Refreshes the grid so that it displays the most up-to-date information. If **Auto Refresh** is enabled, this button is disabled.
	**Set Auto Refresh On/Off.** When enabled, automatically refreshes the grid every 5 seconds so that it displays the most up-to-date task information.
	Displays the system check results that have a failed status only.
	Opens the Export Grid Data dialog box, enabling you to export the results of the system check as a Microsoft Excel worksheet. Choose one of the following options: ➤ **All.** Exports all tasks in the grid. ➤ **Selected.** Exports selected tasks in the grid.
<Results grid>	Displays the progress and results of the system check.

Maintenance Tasks Tab

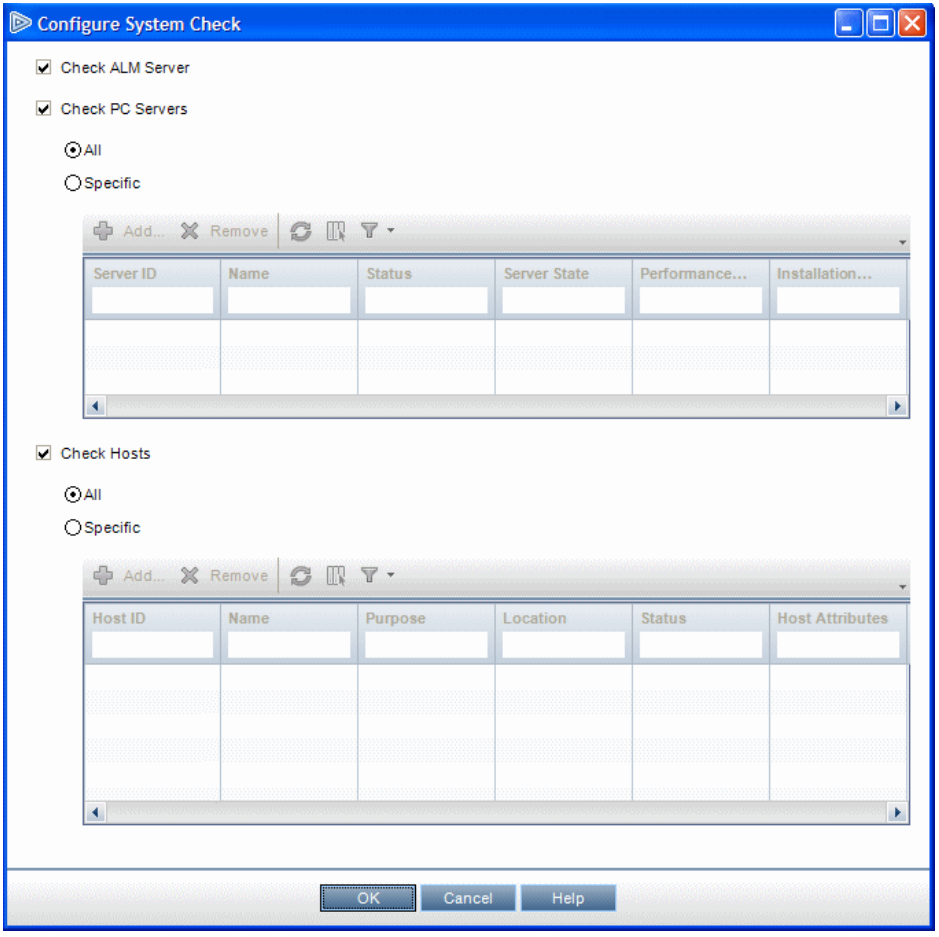
This tab displays information about maintenance tasks performed by the system.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Description
<Maintenance Task tab UI elements>	➤ **Maintenance Task fields.** For field definitions, see "Maintenance Task Fields" on page 926. ➤ **Maintenance Task menus and buttons.** For command and button descriptions, see "Maintenance Task Menus and Buttons" on page 927. ➤ **ALM main menu and sidebar.** For details on the Tools menu, Help menu and sidebar, see "ALM Common Areas" on page 41.
<Maintenance tasks grid>	Displays a list of maintenance tasks. For details, see "System Health Maintenance Tasks" on page 919.
Parameters tab	Displays a description of the selected maintenance task.
Description tab	Displays parameter information for the selected maintenance task. Right-click the text box to display a toolbar for formatting and spell checking the text.

Configure System Check Dialog Box

This dialog box enables you to select which ALM-Performance Center system components (servers and hosts) to include when doing a system check.



To access	**1** On the Lab Management sidebar, under **Lab Settings**, select **System Health**. **2** Click the **System Check** tab, and click Check System .
Important information	➤ The system check is performed on Performance Center Servers and hosts that are in an operational state only. ➤ The system check is performed on hosts with the Controller purpose only.
See also	"System Health Overview" on page 918

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Check ALM Server	Includes the ALM Platform server in the system check.
Check Performance Center Servers	Includes operational Performance Center Servers in the system check. ➤ **All.** Includes all of the operational Performance Center Servers in the system check. ➤ **Specific.** Enables you to select operational Performance Center Servers to include in the system check.
Check Hosts	Includes operational Performance Center hosts with the Controller purpose in the system check. ➤ **All.** Includes all of the operational Performance Center hosts with the Controller purpose in the system check. ➤ **Specific.** Enables you to select operational Performance Center hosts with the Controller purpose to include in the system check.
<Performance Center Server grid>	Lists the Performance Center Servers that you selected to include in the system check, and displays their details.
<Performance Center host grid>	Lists the Performance Center hosts that you selected to include in the system check, and displays their details.

Maintenance Task Fields

The following fields are available in the Maintenance Tasks tab:

Field (A-Z)	Description
Description	A description of the maintenance task
ID	The maintenance task ID.
Name	The maintenance task name. For a list of the maintenance task types, see "System Health Maintenance Tasks" on page 919.
Recurrence (minutes)	Displays the frequency of the maintenance task.

Maintenance Task Menus and Buttons

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements (A-Z)	Where	Description
 **Copy URL**	Maintenance Tasks and <right-click menu>	Copies a selected maintenance task and pastes its URL as a link. The task itself is not copied. Instead, you can paste the address into another location, such as an email or a document. Clicking the link opens up ALM and takes you to the task file or folder. If you are not already logged in, ALM first prompts for login details.
Export	Maintenance Tasks and <right-click menu>	Opens the Export Grid Data dialog box, enabling you to export the tasks in the grid as a text file, Microsoft Excel worksheet, Microsoft Word document, or HTML document. Choose one of the following options: ➤ **All.** Exports all tasks in the grid. ➤ **Selected.** Exports selected tasks in the grid.
 **Find**	View	Opens the Find dialog box, enabling you to search for tasks in the module. For details about search options, see the *HP Application Lifecycle Management User Guide*.
 **Go to Maintenance Task**	Maintenance Tasks	Opens the Go To Maintenance Task dialog box, enabling you to find a specific task by its ID number. You can only go to tasks that are in the current filter.

UI Elements (A-Z)	Where	Description
Grid Filters	View and <right-click menu>	Enables you filter the data according to an entry in the filter box. For details about filtering options, see the *HP Application Lifecycle Management User Guide*.
Information Panel	View and <right-click menu>	Shows/Hides the Information Panel in the lower area of the module.
 **Maintenance Tasks Details**	Maintenance Tasks and <right-click menu>	Opens the Maintenance Task Details dialog box, enabling you to view and edit details of the task.
 **Refresh All**	View	Refreshes the grid so that it displays the most up-to-date information.
Replace	Edit and <right-click menu>	In the grid, opens the Replace dialog box, enabling you to replace a field value in the grid. For more details, see the *HP Application Lifecycle Management User Guide*.
 **Select Columns**	View	Opens the Select Columns dialog box, enabling you to determine which fields to display in the grid and their order. For more details, see the *HP Application Lifecycle Management User Guide*. For details about the System Health fields, see "Maintenance Task Fields" on page 926.

UI Elements (A-Z)	Where	Description
 **Set Filter/Sort**	View	Enables you to filter and sort the tasks in the grid. Any currently applied filters or sorting orders are displayed below the toolbar. For more details, see the *HP Application Lifecycle Management User Guide*.
Updated Selected	Edit and <right-click menu>	Opens the Update Selected dialog box, enabling you to update a field value for a multiple selection in the grid. For more details, see the *HP Application Lifecycle Management User Guide*.

44

Secure Host Communication

This chapter includes:

Concepts

Tasks

Reference

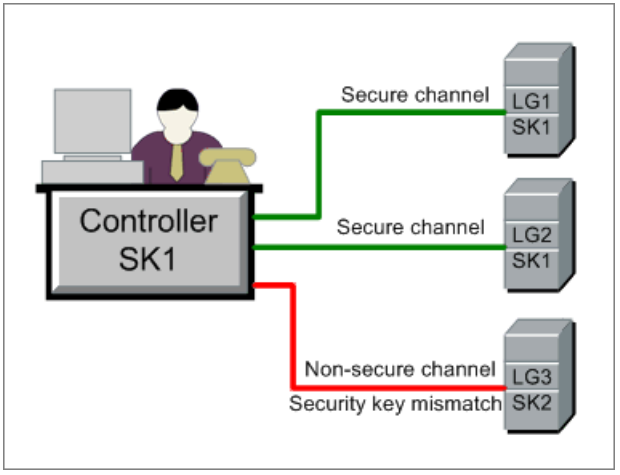
Concepts

Secure Host Communication Overview

The need to secure communication channels from hackers attacking the corporate networks is critical. Securing communication channels ensures confidentiality, integrity, and the user's authenticity within the scope of the load testing application.

Because load generators and Controllers serve so many projects, it is essential that the channels between Controllers and load generators remain opaque to all machines except for the Controllers and load generators participating in running performance tests or collating test data after a run.

Secure communication is established between the Controller and load generator hosts using a **security key**. Each host in the system must be set up with the identical security key. If security keys on the hosts do not match, secure communication cannot be established.



A host is in **secure mode** when it has a security key and security is enforced.

A host is in **non-secure mode**:

- if it has no security key
- if it has a security key but security is **not** enforced

When a host in secure mode tries to communicate with a host in non-secure mode, security is automatically enforced on the non-secure host—assuming their security keys match—allowing secure communication to be established.

Note:

- When you run a performance test, if secure communication cannot be established between a secure host (Controller or load generator) and another host participating in the test, the test cannot run.
- By definition, non-secure hosts can communicate with each other and participate in test runs over non-secure channels.

This can be summarized in the following table:

	Both Hosts in Secure Mode	**Security Mode on Hosts Differ**	**Both Hosts in Non-Secure Mode**
Security keys match	Test runs over secure channel	Test runs over secure channel	Test runs over non-secure channel
Security keys do not match	Test does not run	Test does not run	Test runs over non-secure channel

Host Security Configuration

When you install the hosts (Controllers and load generators), by default no security settings are defined on them, and communication channels between the hosts are not secure. To enforce secure communication between the hosts, you must configure security settings on each host machine immediately after installing the hosts.

When configuring these settings **for the first time**, to avoid configuration over non-secure channels, you must set the security on each host locally using the **Host Security Setup utility**. For details, see "How to Configure Security Settings Locally on Hosts" on page 938.

After initial security configuration, you can update security settings locally or simultaneously across all the Performance Center hosts from a remote location using the **HP Host Security Manager** utility. This utility is installed on the same Performance Center Server. For details, see "How to Update Host Security Settings Remotely" on page 940.

Remote Security Configuration

You can align security settings across all the Performance Center hosts simultaneously from a remote location using the **HP Host Security Manager** utility.

The utility lists all the Performance Center hosts, as well as the MI Listeners required to connect to the hosts that are over a firewall, where applicable.

Using Host Security Manager, you can update the security key on all the hosts, or update the security mode on selected hosts. For details, see "How to Update Host Security Settings Remotely" on page 940.

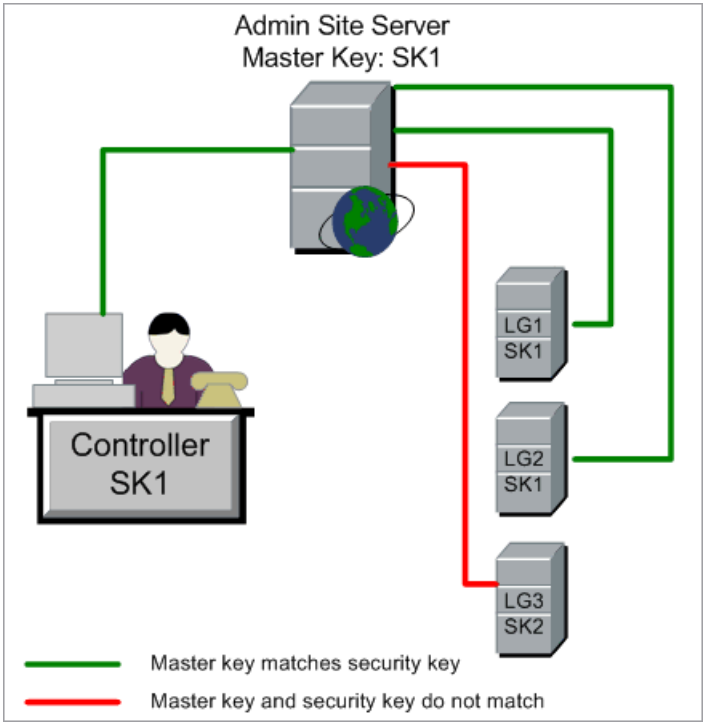
This section also includes:

Master Security Key

To update security settings on the hosts, Host Security Manager uses a master key that matches the security keys on all the hosts. This enables secure communication between Host Security Manager and the hosts for the purpose of remotely updating the security settings.

If the master key and security key on a particular host do not match, Host Security Manager cannot update security settings on that host.

When you open Host Security Manager for the first time, you are prompted for a key. Host Security Manager stores this key as a master key for secure communication with the hosts. If you do not enter the key at this point, you are prompted for it again when you try to update the security settings.



Considerations for Updating UNIX Load Generators

- UNIX load generators that use rsh (remote shell) to connect to the Controller host cannot be updated using Host Security Manager. To update security settings on such load generators, use the local Host Security Setup utility. See "How to Configure Security Settings Locally on Hosts" for UNIX load generators on page 938.
- To update security settings on a UNIX load generator using Host Security Manager, you must launch the load generator daemon for a user and manually grant write permissions to the user on **<installation folder>/config**.

Host Security Best Practices

- To avoid sending security settings over a non-secure channel, perform **initial configuration** of the security settings on each host locally (see "How to Configure Security Settings Locally on Hosts" on page 938).
- Security settings should be changed once a month.
- Security settings can be updated:
  - manually on each host
  - remotely on all hosts simultaneously using the Host Security Manager utility

  If, when using the Host Security Manager utility, updating a host's settings fails, update the settings manually.

Tasks

How to Configure Security Settings Locally on Hosts

This task describes how to configure security settings locally on Controllers and load generators.

Note: This task is part of a higher-level task. For details, see "How to Work with Performance Center Administration" on page 622.

The task describes how to configure security settings on:

- "Windows Hosts" on page 938
- "UNIX Hosts" on page 939

Windows Hosts

1. On each host, launch the Host Security Setup utility (**Start** > **Programs** > **HP Performance Center Host** > **Tools** > **Host Security Setup**).

   For user interface details, see "Host Security Setup Dialog Box" on page 947.

2. Select a security mode for the host.
3. If you selected to enforce secure communication, enter a security key (6 - 16 characters). Enter the key a second time for confirmation.

UNIX Hosts

1 Log in as root user and change to tcsh.

2 Go to the **/opt/HP/HP_LoadGenerator** directory and type:

```
>source ./env.csh
```

3 Run **SecurityKeyConsole.exe**, located in the **<Installation_folder>/bin/** directory.

4 In the Console window, enter an option as follows:

- To change the security mode, enter 1.
- To change the security key, enter 2.

5 If you are changing the security mode:

- To turn the security on, enter 1.
- To turn the security on, enter 0.

6 If you are changing the security key, enter the new key. A valid key is 6 - 16 characters long.

How to Update Host Security Settings Remotely

This task describes how to use Host Security Manager to update security settings on the Performance Center hosts remotely, from the Performance Center Server.

Note: This task is part of a higher-level task. For details, see "How to Work with Performance Center Administration" on page 622.

This task includes the following steps:

1 Prerequisites

- Each host must have a security key defined on it, and all of the hosts' security keys must be identical.
- Host Security Manager must have a master security key that is identical to the security key on all of the hosts. For details, see "Master Security Key" on page 935.

2 Register Performance Center hosts in Host Security Manager

For Host Security Manager to communicate with the Performance Center hosts, you must first register the hosts in Host Security Manager.

Note: Every time you use Host Security Manager to update security settings, make sure that the list of hosts in Host Security Manager is updated.

---

a Open Host Security Manager: On the Performance Center Server, select **Start** > **Programs** > **HP Performance Center Server** > **Tools** > **Host Security Manager**. For user interface details, see "Host Security Manager Window" on page 944.

b Before opening, the tool prompts you for the ALM Platform login credentials. Enter the credentials.

c In the Host Security Manager, click **Get Performance Center Hosts**. The list of hosts is updated as follows:

- The hosts—and, where relevant, their associated MI Listeners—are imported from ALM into the utility.
- If you are updating the list, hosts that are no longer in ALM are removed from the list.

3 Update the security settings

a Update the desired security setting:

- **Security key.** Click **Update Security Key**, enter the new key, and enter it again for confirmation.
- **Security Mode.** Select the hosts in the list that you want to update. To select multiple hosts, hold down the CTRL key on your keyboard while selecting the relevant hosts. Click **Update Security Mode**, and select a security mode.

b Click **Update**.

Host Security Manager attempts to update the security setting on the hosts listed under **Update progress**. As it attempts to update each host, it displays the update status, **Updated** or **Failed**, before attempting to update the next host.

If a host is not updated successfully, check for possible reasons. You can stop the update process by clicking **Stop**.

If there is a mismatch between Host Security Manager's master security key and the host's security key, the Update Error dialog box opens, prompting you for an appropriate action:

- **Skip host.** Skip updating this host.
- **Establish a secure channel using this key.** Use a different security key to communicate securely with the host.
- **Communicate over non-secure channel.** Update the security setting over a non-secure channel. **This action is not recommended**, especially when updating the host security to secure mode. You should rather update the security setting locally on the host (see "How to Configure Security Settings Locally on Hosts" on page 938).

To apply the selected error-handling action to all similar mismatches, select **Use this solution with all similar mismatches**.

Note: The security key update also updates Host Security Manager's master security key. If the update fails on all of the hosts, Host Security Manager's master key is not updated.

---

4 Results

If the update was successful, Host Security Manager displays the time and status of the security key/mode update for each host.

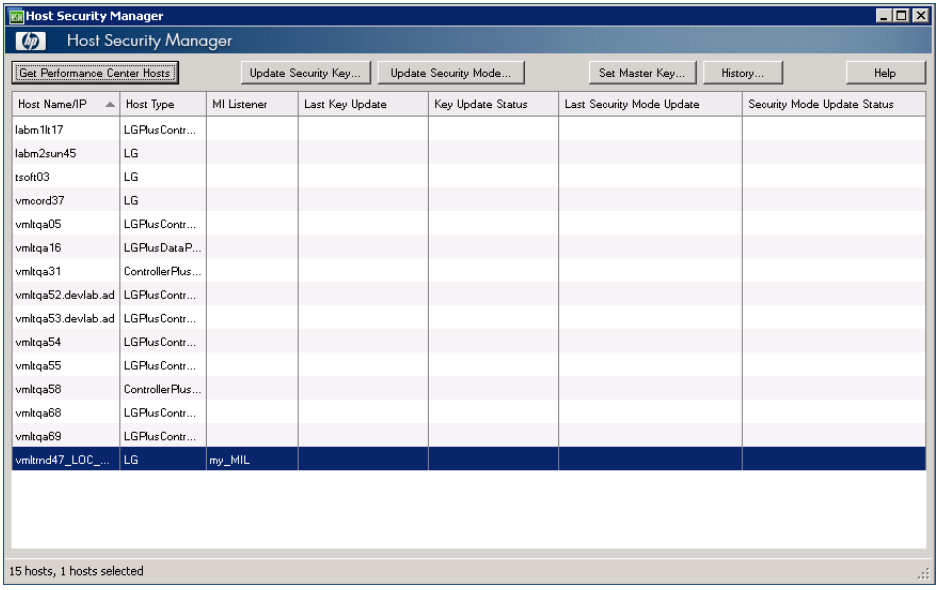
Reference

Secure Host Communication User Interface

This section includes:

Host Security Manager Window

This window enables you to update security settings remotely on all of the hosts in the performance testing system.



To access	On the Performance Center host select **Start** > **Programs** > **HP Performance Center Server** > **Tools** > **Host Security Manager**.
Important information	➤ You must provide Host Security Manager with a master security key before you can update the security settings. ➤ Every time you use Host Security Manager to update security settings, click **Get Performance Center Hosts** to make sure that the list of hosts is up to date.
Relevant tasks	"How to Update Host Security Settings Remotely" on page 940
See also	"Secure Host Communication Overview" on page 932

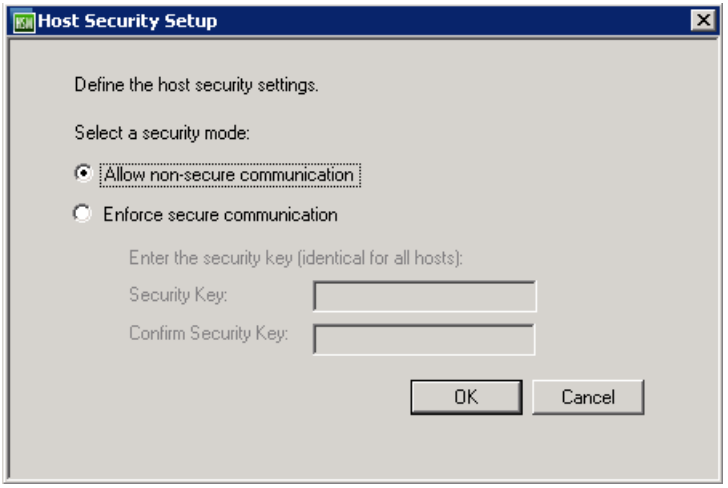
User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Get Performance Center Hosts	Imports all the hosts defined in ALM into Host Security Manager.
Update Security Key...	Opens the Update Security Key dialog box, enabling you to update the security key on all the hosts. For details, see "Update Security Key Dialog Box" on page 949.
Update Security Mode...	Opens the Update Security Mode dialog box, enabling you to update the security mode on selected hosts. For details, see "Update Security Mode Dialog Box" on page 951.
Set Master Key...	Opens the Set Master Key dialog box where you update Host Security Manager's master security key.
History...	Opens the History dialog box, enabling you to view the history of updates made to the hosts. The information displayed includes the date of the update, the operation (key/mode update), and the update status (Passed/Failed).

UI Elements	Description
<**Hosts table**>	Displays the following information: ➤ **Host Name/IP.** The name or IP address of the host. ➤ **Host Type.** The type of host: Controller/ Load Generator. ➤ **MI Listener.** When the host is over a firewall, the name of the MI Listener through which the host communicates with the other hosts. ➤ **Last Key Update.** The last time the security key was updated. ➤ **Key Update Status.** The status of the last security key update. ➤ **Last Security Mode Update.** The last time the security mode was updated. ➤ **Security Mode Update Status.** The status of the last security mode update. **Tip:** You can sort the details on this page in ascending or descending order by clicking the heading of the column by which you want to sort. Click the column heading again to reverse the sort order.

Host Security Setup Dialog Box

This dialog box enables you to update a host's security settings manually.



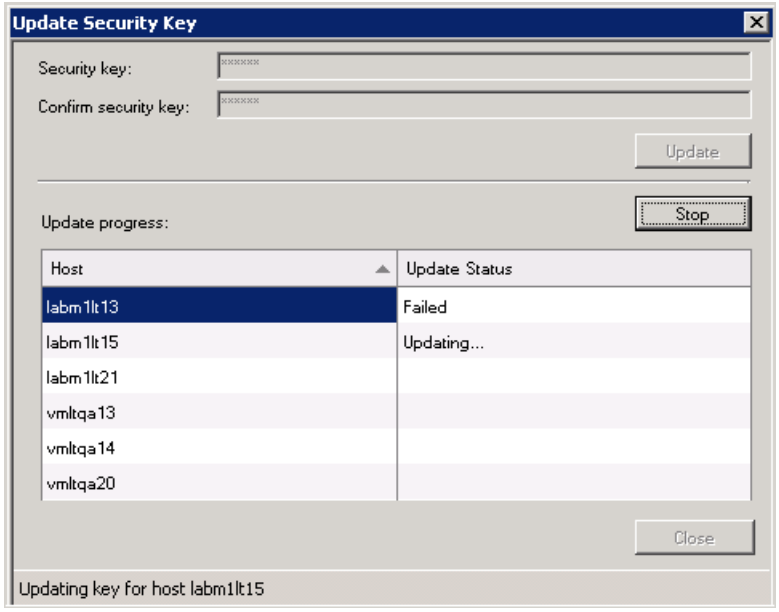
To access	On the host machine, select **Start** > **Programs** > **Performance Center Host** > **Tools** > **Host Security Setup**
Important information	When configuring security settings on hosts for the first time, to avoid configuration over non-secure channels, it is recommended to configure security settings on each host locally using the Host Security Setup utility. After initial security configuration, you can update security settings locally, or simultaneously across all the hosts in the system using the HP Host Security Manager utility installed on the Performance Center Server. For details, see "Remote Security Configuration" on page 934.
Relevant tasks	"How to Configure Security Settings Locally on Hosts" on page 938
See also	"Host Security Configuration" on page 934

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Select a security mode	Select one of the following security modes: ➤ **Allow non-secure communication.** Allows the host to communicate with other machines over a non-secure channel. (Default) ➤ **Enforce secure communication.** Enforces the host to communicate with other machines over a secure channel. If you select this option, you must provide the key (6 - 16 characters long) matching the security key on the other hosts with which it needs to communicate.

Update Security Key Dialog Box

This dialog box enables you to update the security key simultaneously on all the hosts.



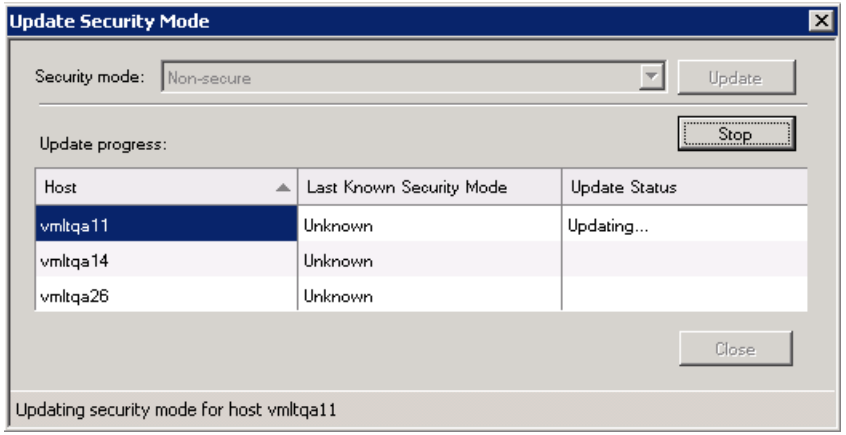
To access	In **Host Security Manager**, click **Update Security Key**.
Important information	When you update the security key, the Host Security Manager's master security key is also updated. If the update fails on all the hosts, the Host Security Manager's master key is not updated.
Relevant tasks	"How to Update Host Security Settings Remotely" on page 940

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Update	Updates the security key on all of the hosts.
Stop	Stops updating the hosts.
Security Key/ **Confirm Security Key**	Enter the new security key to be updated on all the hosts, and a second time for confirmation. **Note:** The key must be 6 - 16 characters long.
Update progress	Displays the hosts and their status during and after the update.

Update Security Mode Dialog Box

This dialog box enables you to update the security mode simultaneously on selected hosts.



To access	In **Host Security Manager**, click **Update Security Mode**.
Relevant tasks	"How to Update Host Security Settings Remotely" on page 940

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Elements	Description
Update	Updates the security mode on the selected hosts.
Stop	Stops updating the hosts.
Security mode	Select a security mode: ➤ **Non-secure**. Allows non-secure communication. ➤ **Secure**. Enforces secure communication.
Update progress	Displays the hosts, their previous status (if known), and their status during and after the update.

Troubleshooting and Limitations

This section describes troubleshooting and limitations for secure host communication.

This section includes:

Cannot Run Test Over Secure Channels

Problem description: When you try to run a test over secure channels, the test cannot initialize because it cannot connect to a Controller or load generator.

Troubleshooting:

Verify that the reason the test cannot run is because of a security key mismatch: try to run the same test with the same hosts from a local Controller.

If a Security Key Mismatch error is displayed in the error log, the keys do not match. Align the security keys on all the host machines.

Test Run Fails. Load Generator Status is Changed to Resource Failure

Problem description: When trying to run a test over secure channels, the test fails to run and the load generator status changes to **Resource Failure**.

Troubleshooting: To re-enable the load generators, manually reset the status on each affected load generator to **Operational**.

When Opening Host Security Manager Get Unhandled Exception

Problem description: When you open Host Security Manager for the first time, a message displays the following exception: **Unhandled exception has occurred....**

Troubleshooting: Click **Continue** to close the message window.

45

ALM Performance Center Permissions

This chapter includes:

***Concepts**

Reference

Concepts

Performance Center Permissions Overview

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

The following section provides details about permission levels that are specific to HP ALM Performance Center. For information about how to view and define these user groups and permissions, see *HP Application Lifecycle Management Administrator Guide*.

For details about the specific ALM Performance Center permissions, see "Performance Center Permission Levels" on page 957.

Reference

Performance Center Permission Levels

The following permission levels are specific to HP ALM Performance Center:

This section includes:

Performance Center Administration Permission Levels

The following administrative tasks are specific to ALM Performance Center. For details about additional administrative tasks, see *HP Application Lifecycle Management Administrator Guide*.

Entity > Permission Level	Description
Performance Center > Download Standalone Applications	User group can download the standalone applications needed for working with ALM Performance Center.
Performance Center > Update General Settings	User group can update the Performance Center General Settings. **Note:** Lab Management only
Performance Center > login to My Performance Center	User group can access My Performance Center. **Note:** ALM project only.

Lab Settings Permission Levels

The Lab Settings tab displays the Lab Settings entities available in Lab Management and their corresponding permission levels. The entities are listed below in alphabetical order.

Entity > Permission Level	Description
Diagnostics Mediator > Create	User group can add ERP/CRM Diagnostics Mediators.
Diagnostics Mediator > Update	User group can update ERP/CRM Diagnostics Mediator information. This permission level enables you to specify the fields that the selected user group can modify.
Diagnostics Mediator > Delete	User group can delete ERP/CRM Diagnostics Mediators.
Diagnostics Mediator > Test Mediator	User group can test ERP/CRM Diagnostics Mediators.
Diagnostics Server > Create	User group can add HP Diagnostics Servers
Diagnostics Server > Update	User group can updateHP Diagnostics Server information. This permission level enables you to specify the fields that the selected user group can modify.
Diagnostics Server > Delete	User group can delete HP Diagnostics Servers
Diagnostics Server > Test Server	User group can test HP Diagnostics Servers
License > Manage Licenses	User group can manage Performance Center and host licenses.
Patch > Create	User group can upload Performance Center patches to ALM.
Patch > Update	User group can update Performance Center patch information. This permission level enables you to specify the fields that the selected user group can modify.
Patch > Delete	User group can delete Performance Center patches.

Entity > Permission Level	Description
PC Server > **Create**	User group can add Performance Center Servers to ALM.
PC Server > **Update**	User group can update Performance Center Server information. This permission level enables you to specify the fields that the selected user group can modify.
PC Server > **Delete**	User group can delete Performance Center Servers from ALM.
PC Server > **Check Server**	User group can perform checks on Performance Center Servers.
PC Server > **Install Patch**	User group can install patches on Performance Center servers.
PC Server > **Reboot**	User group can reboot Performance Center Servers.
PC Server > **Reconfigure Server**	User group can reconfigure Performance Center Servers.
PC Server > **Set ALM Connection**	User group can define ALM Connection information in the Performance Center Servers module.
Project Settings > **Update**	User group can update Performance Center project settings information. This permission level enables you to specify the fields that the selected user group can modify.
Project Settings > **Manage Autostart Retries**	User group can manage autostart retries information.
Project Settings > **Manage Timeslot Alerts**	User group can manage timeslot alert settings.
Project Settings > **Manage Controller Options**	User group can define global Controller options. **Note:** ALM project only
Target IP > **Create**	User group can add target IP addresses.

Entity > Permission Level	Description
Target IP > **Update**	User group can update target IP information. This permission level enables you to specify the fields that the selected user group can modify.
Target IP > **Delete**	User group can delete target IP addresses.

Performance Center Lab Permission Levels

The Performance Center Lab tab displays permissions related to Performance Center lab resources, Application Under Test (AUT) resources, test runs, and timeslots.

Entity > Permission Level	Description
AUT Host > **Create**	User group can add AUT hosts to ALM.
AUT Host > **Update**	User group can update AUT host information. This permission level enables you to specify the fields that the selected user group can modify.
AUT Host > **Delete**	User group can delete AUT hosts.
AUT Host Pool > **Create**	User can add AUT host pools. **Note:** Lab Management only
AUT Host Pool > **Update**	User group can update AUT host pool information. This permission level enables you to specify the fields that the selected user group can modify. **Note:** Lab Management only
AUT Host Pool > **Delete**	User group can delete AUT Host Pools. **Note:** Lab Management only
AUT Host Pool > **Manage AUT host-to-pool association**	User group can add and remove AUT hosts to and from an AUT host pool. **Note:** Lab Management only
Host > **Create**	User can add Performance Center hosts. **Note:** Lab Management only

Entity > Permission Level	Description
Host > **Update**	User group can update Performance Center host information. This permission level enables you to specify the fields that the selected user group can modify. **Note:** Lab Management only
Host > **Delete**	User group can delete Performance Center hosts. **Note:** Lab Management only
Host > **Change Status**	User group can change a Performance Center host's status.
Host > **Check Host**	User group can perform checks on a Performance Center host.
Host > **Install Patch**	User group can install patches on Performance Center hosts.
Host > **Kill Process**	User group can kill processes on Performance Center hosts.
Host > **Manage DP Queue**	User group can view pending data processing requests.
Host > **Reboot**	User group can reboot Performance Center hosts.
Host > **Reconfigure Host**	User group can reconfigure Performance Center hosts.
Host Location > **Create**	User group can add host locations. **Note:** Lab Management only
Host Location > **Update**	User group can update host location information. This permission level enables you to specify the fields that the selected user group can modify. **Note:** Lab Management only
Host Location > **Delete**	User group can delete host locations. **Note:** Lab Management only
Host Pool > **Create**	User group can add Performance Center host pools to ALM. **Note:** Lab Management only

Entity > Permission Level	Description
Host Pool > Update	User group can update Performance Center host pool information. This permission level enables you to specify the fields that the selected user group can modify. **Note:** Lab Management only
Host Pool > Delete	User group can delete Performance Center host pools from ALM. **Note:** Lab Management only
Host Pool > Manage host-to-pool association	User group can add and remove Performance Center hosts to and from a host pool. **Note:** Lab Management only
MI Listener > Create	User group can add MI Listeners to ALM. **Note:** Lab Management only
MI Listener > Update	User group can update MI Listener information. This permission level enables you to specify the fields that the selected user group can modify. **Note:** Lab Management only
MI Listener > Delete	User group can delete MI Listeners from ALM. **Note:** Lab Management only
Test Run > Delete	User group can delete test runs from the Test Runs module. **Note:** Lab Management only
Test Run > Abort Run	User group can abort a test run. **Note:** Lab Management only
Timeslot > Create and Update	➤ **ALM project:** User group can reserve and update performance testing timeslots. ➤ **Lab Management:** User group can reserve and update maintenance timeslots.

Entity > Permission Level	Description
Timeslot > **Delete**	➤ **ALM project:** User group can delete performance testing timeslots. ➤ **Lab Management:** User group can delete maintenance timeslots.
Timeslot > **Abort and Free**	➤ **ALM project:** User group can abort active performance testing and data processing timeslots in his project, and free resources. ➤ **Lab Management:** User group can abort active maintenance timeslots, and free resources.
Timeslot > **Manage Consume VUDs**	User group can select to use VUDs Vusers for the timeslot. **Note:** ALM project only
Timeslot (PC Project) > **Abort and Free**	User group can abort active performance testing and data processing timeslots, and free resources in any project from Lab Management. **Note:** Lab Management only
Timeslot (PC Project) > **Delete**	User group can delete performance testing timeslots in any project from Lab Management. **Note:** Lab Management only
Timeslot (PC Project) > **Update**	User group can update performance testing timeslots in any project from Lab Management. **Note:** Lab Management only
Topology > **Create**	User group can design new topologies. **Note:** ALM project only
Topology > **Update**	User group can update topology information. This permission level enables you to specify the fields that the selected user group can modify. **Note:** ALM project only
Topology > **Delete**	User group can delete topologies. **Note:** ALM project only

Entity > Permission Level	Description
Topology Folder > Create	User group can add topology folders. **Note:** ALM project only
Topology Folder > Update	User group can update topology folder information. This permission level enables you to specify the fields that the selected user group can modify. **Note:** ALM project only
Topology Folder > Delete	User group can delete topology folders. **Note:** ALM project only

Performance Center Test Lab Permission Levels

The following permissions are specific to ALM Performance Center. For details about additional Test Lab permissions, see *HP Application Lifecycle Management Administrator Guide*.

Note: Available in the ALM project only.

Entity > Permission Level	Description
Result > Analyze	User group can analyze performance test results.
Result > Collate	User group can collate performance test results.
Result > Delete Files	User group delete performance test result files.
Result > Upload Files	User group can upload performance test result files.
Run > Abort Run	User group can abort a performance test run.
Run > Operations During Performance Run	User group can perform operations during a performance test run.
Run > Recalculate Performance SLA	User group can recalculate Service Level Agreements (SLAs).
Run > Start PC Run	User group can start performance tests.

Entity > Permission Level	Description
Performance Trend Report > Create	User group can create trend reports.
Performance Trend Report > Delete	User group can delete trend reports.
Performance Trend Report > Update	User group can update trend reports.

Performance Center Test Plan

The following permission is specific to ALM Performance Center. For details about more Test Plan permissions, see *HP Application Lifecycle Management Administrator Guide*.

Note: Available in the ALM project only.

Entity > Permission Level	Description
Test > Download VuGen Script	User group can download VuGen scripts.

46

Managing ALM Performance Center Projects

This chapter includes:

Concepts

Tasks

Concepts

Managing ALM Performance Center Projects Overview

After you create an ALM Performance Center project, you manage it in the same way as a regular project in ALM, that is, from Site Administration. For information about managing projects in ALM, see the *HP Application Lifecycle Management Administrator Guide*.

There are, however, specific use-cases where you must be aware of detailed procedures to successfully perform tasks related to ALM Performance Center projects. These use-cases are:

Migrating from an HP ALM Performance Center environment to HP ALM environment

For more information, see "How to Migrate from HP ALM Performance Center to HP ALM" on page 970.

Migrating an ALM Performance Center system from a staging to a production environment

For more information, see "How to Migrate an ALM Performance Center System from a Staging to a Production Environment" on page 973.

Creating a copy of an ALM Performance Center project

For information about how to create a copy of a project, see *HP Application Lifecycle Management Administrator Guide*.

When creating a copy of an ALM Performance Center project, you must be aware of the following:

- The new project must also have the Performance Center extension enabled.
- Details about test runs will not be included in the ALM Performance Center Usage Reports.

- Timeslot and project settings are not copied.
- Result files associated with the original project are not copied.

Archiving an ALM Performance Center project

Archiving an ALM Performance Center project means exporting or removing the project from the server on which it is located, and in the future importing the project back onto that same server.

For information about exporting, importing, and restoring access to projects, see *HP Application Lifecycle Management Administrator Guide*.

When archiving an ALM Performance Center project, you must be aware of the following:

- You cannot import a project onto the original server, if a project with the same PUID exists on that server.
- If the project was not part of Lab Management, when restoring access to the project:
  - Details about test runs will not be included in the ALM Performance Center Usage Reports.
  - Timeslot and project settings information is lost.

Tasks

How to Migrate from HP ALM Performance Center to HP ALM

This task describes how to successfully migrate your system from HP ALM Performance Center (the source) to HP ALM (the target).

Note: As a result of migrating the system, all information contained in Lab Management originally created on the target will be lost.

To learn more about managing ALM Performance Center projects, see "Managing ALM Performance Center Projects Overview" on page 968.

1 Open Site Administration

For details, see *HP Application Lifecycle Management Administrator Guide*.

2 Move Lab Management from the source to the target environment

a In the source environment, In Site Administration, select the Lab Management tab.

b Remove Lab Management from the source and restore it in the target environment. For details about removing and restoring Lab Management, see "Lab Management Tab" on page 627.

3 Activate Lab Management in the target environment

For details about activating Lab Management, see "Lab Management Tab" on page 627.

4 Update the Performance Center license

In the target environment, in Lab Management, update the Performance Center license. For details, see "Performance Center Licensing User Interface" on page 826.

5 Update the hosts and the Performance Center server in the target environment (if required)

Note: Perform this step if the servers and hosts in the target environment are different than those in the source.

In Lab Management, remove the existing Performance Center Server and hosts and replace with the new server and hosts.

- For details about how to add a Performance Center server, see "How to Manage Performance Center Servers" on page 799.
- For details about how to add Performance Center hosts, see "How to Manage Lab Resources" on page 674.

6 Move the Performance Center projects from the source to the target

Remove the Performance Center projects from the source and restore the in the target environment. For details about removing and restoring projects, see *HP Application Lifecycle Management Administrator Guide*.

7 Activate the Performance Center projects that were moved to the target environment

For details about activating projects, see *HP Application Lifecycle Management Administrator Guide*.

8 In the target, redefine the project settings in Lab Management

Perform this step for each Performance Center project you moved to the target environment. For details about configuring project settings, see "Performance Center Project Settings" on page 637.

9 Activate the Performance Center projects that were restored in the target

For details about activating projects, see *HP Application Lifecycle Management Administrator Guide*.

Note: Test runs information, as well as details about past and future timeslots from migrated projects will not be included in the ALM Performance Center Usage Reports.

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10 Clean the target of unused timeslot information

In the target environment, in Lab Management, delete future timeslots for projects that were not migrated and which will not be migrated in the future.

To delete timeslots:

a On the Lab Management sidebar, select **Lab Usage** > **Timeslots**.

b Select **View** > **Grid View**.

c Select the timeslots to delete, and click the **Delete** button.

How to Migrate an ALM Performance Center System from a Staging to a Production Environment

This task describes how to successfully move an ALM Performance Center system from a staging to a production environment.

Note: As a result of migrating the system, all information contained in Lab Management originally created in the production environment will be lost.

To learn more about managing ALM Performance Center projects, see "Managing ALM Performance Center Projects Overview" on page 968.

1 Open Site Administration

For details, see the *HP Application Lifecycle Management Administrator Guide*.

2 Move Lab Management from the staging to the production environment

a In the staging environment, in Site Administration, select the Lab Management tab.

b Remove the Lab Management project from the staging and restore it in the production environment. For details about removing and restoring Lab Management, see "Lab Management Tab" on page 627.

3 Activate Lab Management in the production environment

For details about activating Lab Management, see "Lab Management Tab" on page 627.

4 Update the Performance Center license

In the production environment, in Lab Management, update the Performance Center license. For details, see "Performance Center Licensing User Interface" on page 826.

5 Update the hosts and the Performance Center server (if required)

Note: Perform this step if the servers and hosts in the production environment are different than those in the staging environment.

In Lab Management, remove the existing Performance Center servers and hosts and replace them with new servers and hosts.

- For details about how to add Performance Center Server, see "How to Manage Performance Center Servers" on page 799.
- For details about how to add hosts, see "How to Manage Lab Resources" on page 674.

6 Move the Performance Center projects from the staging environment to the production environment

Remove each Performance Center project from the staging environment and restore it in the production environment. For details about removing and restoring projects, see *HP Application Lifecycle Management Administrator Guide*.

7 Activate the Performance Center projects in the production environment

For details about activating projects, see *HP Application Lifecycle Management Administrator Guide*.

8 In the production environment, configure the project settings in Lab Management

Perform this step for each Performance Center project you moved to the production environment. For details about configuring project settings, see "Performance Center Project Settings" on page 637.


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