HP Performance Center

for the Windows $\ensuremath{\mathbb{R}}$ operating systems

Software Version: 9.50

User Guide

Document Number: T7331-90013 Document Release Date: January 2009 Software Release Date: January 2009



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Table of Contents

Welcome to This Guide

Welcome to the HP Performance Center User Guide.

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

Performance Center consists of the following modules:

- ► User Site. Used for conducting and monitoring load tests.
- Administration Site. Used for overall resource management, technical supervision, and for managing user and project access rights throughout Performance Center.

This guide covers the User Site. It describes how to use HP Performance Center to define and run load tests on your applications and to analyze the results of your test runs.

For information about Performance Center Administration, see the *HP Performance Center Administrator Guide*.

This chapter includes:

- ► How This Guide Is Organized on page 20
- Who Should Read This Guide on page 21
- Performance Center Online Documentation on page 21
- Additional Online Resources on page 23
- Documentation Updates on page 24

How This Guide Is Organized

The HP Performance Center User Guide contains the following sections:

Part I Understanding HP Performance Center

Introduces you to HP Performance Center. It describes the Performance Center e-service and its advantages, including overviews of Vuser scripts and the entire load testing process. It also describes the User site and how to navigate around the site, and explains how to use the Project Dashboard to understand load test transaction and drill down data.

Part II Designing Load Tests

Describes how to create and configure a load test for your application.

Part III Executing Load Tests

Describes how to execute a load test, and monitor your application's performance application during the test. It also describes how to view load test results and analyze load test data.

Part IV Working with Diagnostics

Describes Performance Center's J2EE/.NET and ERP/CRM Diagnostics modules which help identify performance problems in J2EE, .NET, Siebel, Oracle, and SAP environments.

Part V Configuring Vuser Script Run-Time Settings

Describes how to configure Vuser Script run-time settings to emulate different types of user activity.

Part VI User Management

Describes how to view and manage your own personal user information, and view the other users in the Performance Center system.

Part VII Troubleshooting

Provides troubleshooting tips and information for Performance Center problems.

Who Should Read This Guide

[we need to decide what to include here - -or whether to include this section at all - this is what was in the last version)

This guide is for the following users of Performance Center:

- ► Performance Engineers
- ► Project Managers

This document assumes that you are moderately knowledgeable about enterprise application development and highly skilled in enterprise system and database administration.

Performance Center Online Documentation

Performance Center includes a complete set of documentation describing how to use the product. A comprehensive Documentation Library is available from the **Help** menu in the User and Administration Sites. PDFs can be read and printed using Adobe Reader, which can be downloaded from the Adobe Web site (<u>http://www.adobe.com</u>). Printed documentation is also available on demand.

Accessing the Documentation

You can access Performance Center documentation as follows:

- ➤ In the User and Administration Sites, click the Help link in the top right corner of the window. In the bookmarks on the left, click Home to open the Performance Center Documentation Library front page which provides quick links to the online Performance Center Documentation Library.
- Printable guides can be accessed from Start > Program
 Files > Performance Center > Documentation.

Getting Started Documentation

► **Readme.** Provides last-minute news and information about Performance Center.

➤ HP Performance Center System Configuration and Installation Guide. Explains how to install and configure the Performance Center components. Available in PDF format only. Accessible from the HP Installation DVD.



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➤ HP Performance Center Quick Start. A self-paced guide showing you how to use Performance Center to create, run, and monitor load tests. Available in PDF format only.

Accessible from the General tab that is displayed when you open the User Site.

Performance Center User Guides

- ► HP Performance Center User Guide. Describes how to use Performance Center to create, schedule, run, and monitor load tests.
- ➤ HP Performance Center Monitor Reference. Describes how to set up the server monitor environment and configure Performance Center monitors for monitoring data generated during a load test run.

Performance Center Administration

➤ HP Performance Center Administrator Guide. Describes how to use Performance Center Administration Site for overall resource management, site management, system configuration, technical supervision, and user privileges in Performance Center projects.

Troubleshooting

➤ HP Performance Center Troubleshooting Guide. Provides information for troubleshooting problems while working with Performance Center Available in PDF fomat only.

Standalone Applications

The following documentation is available only on host machines, and if standalone components are installed:

➤ HP Analysis User Guide. Describes how to generate graphs and reports to analyze your load tests after they have run. ➤ HP Virtual User Generator User Guide. Describes how to create Vuser scripts through recording and programming.

Additional Online Resources

Troubleshooting and Knowledge Base accesses the Troubleshooting page on the HP Software Support Web site where you can search the Self-solve knowledge base. The URL for this Web site is <u>http://h20230.www2.hp.com/troubleshooting.jsp.</u>

HP Software Support accesses 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. The URL for this Web site is <u>www.hp.com/go/hpsoftwaresupport</u>.

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: <u>http://h20229.www2.hp.com/passport-registration.html</u>

HP Software Web site accesses the HP Software Web site. This site provides you with the most up-to-date information on HP Software products. This includes new software releases, seminars and trade shows, customer support, and more. The URL for this Web site is <u>www.hp.com/go/software</u>.

Documentation Updates

HP Software is continually updating its product documentation with new information.

To check for recent updates, or to verify that you are using the most recent edition of a document, go to the HP Software Product Manuals Web site (<u>http://h20230.www2.hp.com/selfsolve/manuals</u>).

Part I

Understanding HP Performance Center

1

Introduction

HP Performance Center is a global cross-enterprise load testing tool that you install on your organization's own infrastructure. Performance Center enables you to manage multiple, concurrent load testing projects across different geographic locations without any need to travel between them. Performance Center administers all your internal load testing needs. With Performance Center, you manage all aspects of large-scale load 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 forth) that you define in a Vuser script. You design Vuser scripts to emulate typical user activity in your application. For details, see "About Vuser Scripts" on page 29.

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 load 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 is affecting the service level agreements (SLA) or other performance thresholds that are important to your business.

Note: Although this guide generally refers to load testing Web sites, Performance Center can be used to load test a wide variety of non-Web applications. For details, see Chapter 7, "Managing Vuser Scripts."

This chapter includes:

- ➤ The Load Testing Process on page 28
- ► About Vuser Scripts on page 29
- ► About the Controller on page 30
- ► System Advantages on page 30

The Load Testing Process

To conduct a load test of your application through the Internet, you perform the following steps from your Web browser:

- **1** Access the Performance Center User site and log in. For details, see "Accessing HP Performance Center" on page 36.
- **2** Upload Vuser scripts. For details, see "Managing Vuser Scripts" on page 123.
- **3** Reserve a timeslot. For details, see "Reserving Timeslots" on page 91.
- **4** Configure the load test. For details, see "Configuring Load Tests" on page 165.
- 5 Set project options. For details, see Chapter 19, "Setting Project Options."
- **6** Configure Run-Time Settings. For more information on configuring runtime settings, see "Configuring General Run-Time Settings" on page 549.
- 7 Run the load test. For details, see Chapter 24, "Running a Load Test."

- **8** Configure load settings during test run. For details, see "Configuring Schedule Settings from the Load Test Run Page" on page 364.
- **9** View the running load test. For details, see Chapter 22, "Viewing Vusers During a Load Test."
- 10 Monitor online graphs. For details, see Chapter 25, "Online Monitor View."
- **11** View results of the load test using Performance Center summary reports. For details, see "Viewing Load Test Results" on page 417, and "Viewing the Analysis Summary Report" on page 423.

About Vuser Scripts

When you run a load 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 load testing a Web site, the Vuser script emulates a real user accessing URLs, clicking links, submitting forms, and so on. When you create a load test, you distribute your Vuser scripts among your Vusers.

For example, in the case of load 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 and uploading them to the Vuser scripts list. You can also create a simple URL-based Vuser script by listing a series of URLs.

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

About the Controller

The Controller is the manager of a load test. The Controller receives the scripts, their run-time 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 load test, the Controller displays online monitoring information. At the conclusion of the test run, the Controller collates the data for analysis.

System Advantages

- Performance Center's step-by-step process helps guide you through the load 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 load tests, scripts, and timeslots. 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.

2

The User Site

The Performance Center User Site is structured so that you can navigate around the site to create, run, and perform actions on your load test. This chapter provides details on how to access and navigate the Performance Center User site.

This chapter includes:

- About the User Site on page 31
- ► Accessing HP Performance Center on page 36
- ► Select/Change Project Page on page 37

About the User Site

The Performance Center User site provides permanent buttons and links to access important information and move around the site.

At the top of the page, Performance Center displays several links that are available throughout the User site:

- Help. Click to access the Performance Center online Help. Performance Center provides context-sensitive help which enables you to get specific information about whatever part of the User Site you are using at any given moment.
- > About. Click for version and build number information.
- ► Log Out. Click to end the current Performance Center User session.

In addition, Performance Center displays a navigation menu on the left-side of the page. This menu is available throughout the Performance Center User Site. The menus provide links to pages which help you create, run, analyze, and maintain your load tests.

Projects

The Projects menu contains the following submenu links:

- ➤ Status. Click to return to the Dashboard and the General Status page. For details, see "Viewing the Dashboard" on page 41, and "The Status Page General Tab" on page 40.
- ➤ Hosts. Click to open the Hosts page. From the Hosts page, you view, reboot, and check Performance Center hosts. For details, see "Understanding the Hosts Page" on page 58.
- ➤ Timeslots. Click to open the Timeslots page. From the Timeslots page, you view and reserve timeslots. For details, see Chapter 5, "Working With Timeslots."
- ➤ Vuser Scripts. Click to view all existing Vuser scripts. From the Vuser Scripts page, you can view, upload, download, edit, or delete a Vuser script. You can also create a URL-based Vuser script. For details, see "Understanding Vuser Scripts" on page 124.
- Monitor Profiles. Click to open the Monitor Profiles page. From this page you can create new monitor profiles or select existing profiles, and add them to your project or copy them from one project to another. For details, see "Monitor Profiles Page at a Glance" on page 110.
- Autostart Viewer. Click to open the Autostart Viewer page. From this page you can view the start times and configuration details for all tests scheduled with the Autostart feature. For details, see Chapter 23, "Viewing Autostart Load Tests."
- ➤ Options. Click to open the Project Options page. From this page you configure the monitors, load test run-time settings, timeout, general, and debug information options for all your load test projects. For details, see Chapter 25, "Online Monitor View."
- Change Project. Click to view a a different project in Performance Center. This option in available to users who are assigned to more than one project.

Load Tests

The Load Tests menu contains the following submenu links:

- ➤ Manage. Click to open the Load tests page. From this page you can create a new load test, or view a list of all existing load tests and runs. From the list of load tests, you can run, edit, and view results for tests, or view the Load Test Run page for a recently run or currently running load test. For details, see "About Creating and Configuring Load Tests" on page 165, and "Viewing Load Tests" on page 47.
- ➤ Search Results. Click to open the Search Load Test Results page. This page lists all load tests in the project that have run. For details, see "Searching Load Test Results" on page 51.
- ➤ Running. Lists load test that are currently running. Click the name of a running load test to monitor the load test run. For details, see "Monitoring Load Test Data" on page 318.
- ➤ Trend Reports. Click to open the Trend Reports main page. From this page you can create new and modify existing trend reports. For details, see Chapter 27, "Trend Reports."

User Information

The User Information menu contains the following submenu link:

- ► **Personal Details.** Click to open the Personal Details page where you can view and manage your personal user details.
- ► Users. Click to open the Users page where you can view and manage information about Performance Center users in your projects.
- ► **Roles**. Click to open the Roles page where you can view information about Performance Center roles.
- ➤ Projects. Click to open the Projects page where you can view information about Performance Center projects.
- Privilege Management. Click to open the Privilege Management page where you can view information about user-role assignments in your projects.

For details, see Chapter 37, "Introducing User Management."

Miscellaneous

The Miscellaneous menu contains the following submenu links:

- Downloads. Click to open the Downloads page. From this page you can download various applications. The Downloads page describes each application and explains how to download it. For more information, see "Downloads Page" on page 34.
- ➤ What's New. Click to open the What's New page. From this page you can get a brief description of all the new features in the Performance Center release, including links to video walkthroughs. For more information, see "What's New Page" on page 35.

Downloads Page

The Downloads page enables you to download various applications. The Downloads page describes each application and explains how to download it.

Note: Contact your system administrator if the download links are not available.

The following downloads are available:

Standalone Analysis. Click Standalone Analysis Download to install the full standalone version of HP LoadRunner Analysis that enables you to analyze load test data offline from any computer on which Analysis is installed. You use Analysis graphs and reports to organize and display load test results and summarize system performance. LoadRunner Analysis integrates with Performance Center to let you download result and session files for analysis, then upload the session files and reports to Performance Center to share the results with other users.

- Standalone VuGen. Click Standalone VuGen Download to install the full standalone version of HP Virtual User Generator (VuGen) for creating all types of virtual user (Vuser) scripts. Using VuGen, you record business processes into test scripts and customize the scripts according to defined user behavior. VuGen works together with Performance Center to provide an efficient method for uploading and downloading Vuser scripts to and from the Performance Center Web site script repository for Vuser script editing.
- Standalone Load Generator. Click Standalone Load Generator Download to install a standalone version of the load generator. Instead of installing a Performance Center Host and then configuring it as a load generator, you can install a standalone version of the load generator.
- ➤ Snapshot Viewer. Click Snapshot Viewer Download to install the Snapshot Viewer which enables you to view snapshot on error pages captured from virtual Web users during load test runs. The viewer displays snapshots from files with .SOE and .INF extensions. A Snapshot on Error (.SOE) file is a zipped file containing one or more snapshots in .INF format.
- Monitor over Firewall Agent. The Monitor Over Firewall component is used to monitor servers that are located over a firewall. Before you can download this component from the Downloads page, you need to copy the setup file to the File Server. To do this, copy the monitors_over_fw.exe file from the <Performance Center installation disk>\Additional Components\Download Monitor Over Firewall directory and paste it in the File Server's <installation directory>\LRFS\Downloads directory.

What's New Page

The What's New page provides a brief description of all the new features in the Performance Center release, including links to video walkthroughs. To view the videos, you must install the Codec file. Click the link to download the file.

Accessing HP Performance Center

You access HP Performance Center using a supported Web browser, from any computer with a network connection (intranet or Internet) to the HP Performance Center servers. The level of access granted a user depends on the user's permissions. For details on granting user permissions, see the *HP Performance Center Administrator Guide*.

For details on Web browser requirements, as well as minimum requirements to successfully view Performance Center, see the *HP Performance Center System Configuration and Installation Guide*.

Logging In to the Performance Center User Site

You log in to the HP Performance Center User Site from the login page.

To log in to the HP Performance Center User Site:

1 In your Web browser, type the following URL:

http://<server_name>/loadtest

where **server_name** is the name or IP address of the HP Performance Center User Site server.

The HP Performance Center login page opens.

- **2** Type the login parameters (login name and password). These credentials must be defined in the HP Performance Center system.
- 3 Click Log In.
 - If you belong to just one project, the Performance Center Project Dashboard opens. You can access the Dashboard at any time by selecting
 Project > Status from the navigation menu. For more information, see "Viewing the Dashboard" on page 41.
 - ➤ If you belong to more than one project, the Select Project page opens displaying a list of all the projects to which you belong and an indication of each project's status. The five most recently used projects appear in a separate list under **Recent Projects**. Click the name of the Performance Center project you want to enter. For more information, see "Select/Change Project Page" on page 37.
Logging Out

To prevent unauthorized entry, when you have completed your session, you should log out of the User Site.

To log out:

 Click Log Out at the top of the page to exit and return to the Performance Center login page.

Select/Change Project Page

When you log on to Performance Center, if you belong to more than one project the Select Project page opens displaying a list of all the projects (up to 10 projects per page) to which you belong and an indication of each project's status. The 5 most recently used projects appear in a separate list under **Recent Projects**.

Each project's status is determined by the condition of the last run of all load tests in the project that were posted to the Dashboard. For more information, see "Viewing the Dashboard" on page 41.

lcon		Description
٠	(green)	Project achieved all load test performance targets.
Q _x	(red)	Project did not achieve all load test performance targets. If any load test fails to reach its targets, the project is assigned a red light.
Q.	(gray)	No load test performance targets were defined for the project.

A project can be assigned one of the following statuses:

To view a project, you can select it from the list. At any time, you can change the project you are viewing by selecting **Projects** > **Change Project** from the left navigation menu.

To select/change a project:

1 If the list of projects on the Select/Change Project page is a long list, type the name of your project in the search text box and click **Filter** to locate your project. The filter feature supports partial text look up.

To reshow the complete list of projects, 10 at a time, click **Show all**.

2 Click the name of the Performance Center project you want to enter. The Dashboard of the elected project opens. For details, see "Viewing the Dashboard" on page 41.

If at any time during your session you want to change the project, you can return to the Change Project page by selecting **Projects > Change Project** from the left navigation menu.

3

Project Status

The Dashboard provides an overview of your load test's status, and has the drill-down capability to view individual load test performance. The status and performance data are relative to the goal criteria you establish for your application.

This chapter includes:

- ► Viewing Project Status on page 39
- ➤ The Status Page General Tab on page 40
- ► Viewing the Dashboard on page 41
- Understanding Drilldown Data on page 43
- Creating a Project Dashboard on page 45
- ► Viewing Load Test Performance Targets and Results on page 47
- Publishing Load Test Performance Results on page 52

Viewing Project Status

The Status page displays the Dashboard and General tabs.

Using the Dashboard, you can monitor key performance data for the load tests in your project. The Dashboard includes the overall status of the most recent load test run, and provides drill-down analysis enabling you to view the performance of individual transactions. In addition, you can email a link to the Dashboard page.

Before you can view performance data in the Dashboard, you run the load test, and select which load test runs to publish to the Dashboard.

The Dashboard tab displays the overall status of the most recent load test run. It also provides drill-down analysis of all included load tests when measured against the established performance criteria.

The General tab provides an overview of a project's activities, including information on running load tests, recently run load tests, and timeslot reservations.

The Status Page - General Tab

The General tab of the Status page provides an overview of a project's activities, including information on running load tests, recently run load tests, and timeslot reservations.

To open the General tab, select **Projects** > **Status** from the left-side menu, and select the **General** tab.

The General tab displays:

- Currently Running Load Tests. If one or more load tests are currently running, they are displayed under this heading together with the test start time. Click the name of a running load test to monitor the load test run. For details, see "Monitoring Load Test Data" on page 318.
- ➤ Recently run Load Tests. The five most recently run load tests are displayed under this heading together with the test run date. Click the name of a load test to view results for the load test run. For details, see "Viewing Load Test Results" on page 417.
- Next reserved Timeslots. Timeslots that have been reserved for a load test are displayed under this heading. The load test start time, duration, and the number of Hosts (and Vusers) are displayed. For details, see "Reserving Timeslots" on page 91.

Viewing the Dashboard

The Performance Center Dashboard displays the status of each load test in your project that has been published to the dashboard. The load test status is the overall status of the load test, determined by the condition of the last run of the load test.

A load test can be assigned one of the following status icons:

lcon		Rating	Description
0	(green)	Succeeded	Load test reached all its targets.
Q X	(red)	Failed	Load test did not reach all its targets. A load test receives a Failed status if any transaction within the test does not reach its performance targets.
0	(gray)	No data	No load tests targets were defined for the project.

When you log on to Performance Center and select a project, the Dashboard for the project opens. For more information about posting load tests to the dashboard, see "Publishing Load Test Performance Results" on page 52.

To navigate to the Dashboard from a page within your project, select **Project > Status**, and click the **Dashboard** tab.

Status Tir	ne on Server : 24-Mar-2008 2:06:49 PM ((GMT -5) EST)						
General Dashboard							
Load Tests Summary	Send Dashboard link						
Select a Load Test to view details All Load Tests							
Load Test	Status						
www	Succeeded						
• <u>123321</u>	Succeeded						
Click a Load Test to list its details or <u>Click here</u> to list details from all Load	l Tests.						
Load Tests Details							
•							

To send an email with a link that opens a view of the dashboard, click **Send Dashboard link**.

Note: The email recipient must have Network access to the server on which the User site resides.

Viewing Transaction Tables

You can view the status of individual transactions in a particular load test, or for all load tests in the Dashboard, from the load test transaction tables.

To view transactions for a particular load test:

➤ In the Load Tests Summary section, click a load test to open the transaction table for that load test. A transaction table opens in the Load Test Details section, displaying the individual transactions for that load test.

Time on Server : 24-Mar-2008 3:24:17 PM ((GMT -5) EST)		
General Dashboard		
Load Tests Summary Select a Load Test to view details	<u>Send Dashboard link</u>	
All Load Tests		
Load Test	Status	
• •	Succeeded	
<u>123321</u>	Succeeded	
Load Tests Details		
Transaction	Status	
• transaction response time Action Transaction	Succeeded	
• transaction response time test	Succeeded	
• transaction response time twzt	Succeeded	
• transaction response time vuser end Transaction	Succeeded	
• transaction response time vuser init Transaction	Succeeded	
Click a transaction for its details.		

The **Load Tests Details** section displays all the reported transactions for the selected load tests. The transaction status consists of a **Succeeded** or **Failed** rating. If a transaction has a **Failed** status, the table also provides a description of the load thresholds that caused the failure. If no targets were set for the load test, the **No Data** status is displayed.

To view transactions tables for all load tests:

► In the Load Tests Summary section, click the Click here link.

Status Time on Server : 24-Mar-2008 3:24:17 PM ((GMT -5) EST)		
General Dashboard		
		Send Dashboard link
Load Tests Summary Select a Load Test to view deta	ils	
All Load Tests	1 4	Chatura
	Load lest	Status
• • • • • • • • • • • • • • • • • • •		Succeeded
<u>123321</u>		Succeeded
Click a Load Test to list its de	tails or <mark>Click here</mark> to list details from all Load Te	ests.

A transaction table for each load test opens in the Load Test Details section, displaying the individual transactions for each load test.

Understanding Drilldown Data

The transaction tables enables you to drill down to view performance graphs for all load test runs posted to the Dashboard. The graphs display the performance of transactions within an established threshold and display trend data. You create thresholds by specifying performance targets. For more information, see "Setting Performance Targets" on page 46.

You can view the performance graphs for a particular transaction or for all transactions in the load test.

To display performance graphs for a particular transaction:

➤ On the Status page Dashboard tab, in the Load Tests Details section click a transaction to open the performance graph for that transaction.

tatus	Time on Server : 24-Mar-2008 3:37:23 PM ((GMT -5) EST)
General	Dashboard
Transactio)n view
<u>Dashboard</u>	> <u>www</u> > transaction_response_time_Action_Transaction graphs
Note: Each transaction t while the de	graph displays measurements of different load criteria. For each the actual performance is displayed as a bold line, fined goal is displayed as a dashed line in the same color.
Transacti ¥users m	ion response time for load criteria Running easured in ¥U
15	
14	
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12	
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A transaction graph is displayed for the load test. The graph displays trend data for the various load test runs posted to the Dashboard.

The graph's title bar provides the load test criteria and load value. For each transaction the actual performance is displayed as a bold line, while the defined goal is displayed as a dashed line in the same color. This allows you to evaluate trends and performance in your load tests.

Creating a Project Dashboard

Creating the initial dashboard for your project involves the following steps:

- ► Creating Benchmark Load Tests
- ► Setting Performance Targets

Creating Benchmark Load Tests

Using VuGen, create one or more scripts that emulate typical end-user activities running on your application. The scripts should be designed to include key performance transactions. For more details on recording scripts, see the *HP Virtual User Generator User Guide*. In the following procedure, you will establish transaction response time goals for the recorded transactions you designate.

To create a benchmark load test:

- 1 Incorporate your scripts into a load test. By setting performance targets for the load test, you create benchmarks to measure your applications performance. For more details on creating load tests, see Part II, "Designing Load Tests."
- **2** Save the load test and follow the directions for setting performance thresholds in "Setting Performance Targets" on page 46.

Note: You can include a load test in the Dashboard and set performance targets for a saved load test at any time.

Setting Performance Targets

After you record and save your load test, you set various load test performance targets using the SLA wizard. You should configure the targets to establish acceptable performance and time criteria.

Note:

- Setting performance targets has no impact on the way your load test runs. After a load test run, Performance Center analyzes the results and compares them to the targets you set. For more information on load test analysis, see "Viewing Load Test Performance Targets and Results" on page 47.
- Performance targets are not copied when you clone a load test (by clicking Save As in the Load Test configuration pages).

For details on defining performance targets for your load test, see Chapter 8, "Defining Performance Targets."

After you set performance targets, you can run the load test, and select which load test runs to publish to the Dashboard.

Note: You must enable the load test to be published to the Dashboard before you can publish the load test results. For more information, see "Publishing Load Test Performance Results" on page 52.

Viewing Load Test Performance Targets and Results

After a load test run, you can view load test results and targets and determine the runs you want to publish to the Dashboard. Performance Center analyzes the test run data and compares the performance targets to the actual results. You can view a full list of the load tests in the Load Tests page and performance targets and results in the Run Results page.

Viewing Load Tests

The Load Tests page displays all the load tests—up to 10 load tests at a time—that you have created to date, including load tests you ran or are currently running, load tests you saved, and load tests scheduled to run at a later date.

Load Tests		Time on Server : 12-Jun-200	07 8:56:44 AM ((GMT -5) EST)			
Load Test Name:	Last Modified: Fro	m .	то			
			Filter Clear Filter			
New Load Test Currently Showing: 1 - 9 / 9						
<u>Name (</u> # of Runs)	₹ Last Modified Date	Status				
🗄 <u>Slavik_LT (4)</u>	11-Jun-2007	Valid				
Check (0)	6-Jun-2007	Valid	🔲 💿 🕨 🗙			
Test 2 (0)	6-Jun-2007	Valid	🖵 💿 🕨 🗙			
🛨 Load Cri None (1)	6-Jun-2007	Valid	🖾 💿 🕨 X			
🗄 <u>SLA All (1)</u>	6-Jun-2007	Valid	🖾 💿 🕨 🗙			
Test SLA 2 (0)	6-Jun-2007	Valid	🖵 💿 🕨 🗙			
SLA Test (0)	6-Jun-2007	Valid	🔲 💿 🕨 🗙			
E SLA 1 (2)	6-Jun-2007	Valid	🖾 💿 🕨 🗙			
	6-Jun-2007	Valid	🖾 💿 🕨 🗙			
			Currently Showing: 1 - 9 / 9			

To open the Load Tests page, select **Load Tests > Manage**.

From the Load Tests page, you can do the following:

- ► View target analysis
- ► Create new load tests
- Perform actions on your load tests, including run load tests, delete load tests, set performance targets, and publish test results to the Dashboard
- Link to various pages relevant to a load test, including the Load Test configuration page (from the Load Test link) and the Load Test Results page (from the Status link)

The Load Tests page is comprised of the following areas:

Filter Area

Enables you to filter the Load Tests table according to load test name or when the load test was last updated.

Load Test Table

Displays information about the load tests in the Performance Center system, and enables you to perform actions on the load tests.

The table contains the following columns:

Field	Description
Name (# of Runs)	 Displays the name of the load test and the number of runs for the load test. Click a load test name to edit that load test's settings. Click the "+" icon to view a run history of the load test, including: ID. The ID number assigned to each load test run. Date. The time and date of the load test run. Tester. The user who ran the load test. Duration. The duration of the load test run. Vusers. The number of Vusers that ran in the load test. Status. The status for each load test run. Click the status description to view and analyze the results of that run in the Load Test Results page. For more information on the run status, see "Collating and Analyzing Load Test Data" on page 412.
Last Modified Date	Displays the date that the load test was last modified.
Status	Displays the current status of the load test. Possible statuses are Valid and Invalid. If the status is Invalid, click the link to open the validation results. The validation results provide the problem level, the name of the tab and the location of where the problem occurred, and a description of the problem. Click Edit Load Test to open the Load Test configuration page for the invalid test. Fix the problem in the load test and click Save to validate the test.

	Click the Publish Load Test to Dashboard button to enable you to add load test results to the Dashboard. Once enabled, you can select the load test run results you want to publish to the dashboard.
N	Click the Remove Load Test from Dashboard button to delete load test results or individual load test runs from the Dashboard.
۲	Click the Set Load Test Performance Targets button to set load test thresholds using the Service Level Agreement Wizard.
۸	Click the Run Load Test button to run a load test.
×	Click the Delete Load Test button to delete a load test or particular run from the Performance Center database.

You can click a column heading to sort the table by that field.

Note: Sorting settings are saved per user, per project. The next time the same user enters the Load Tests page in a specific project, the page displays the results based on the most recent sort order.

Working with the Load Tests Page

You use the filter area of the Load Tests page to locate specific load tests.

To view target analysis:

- 1 Select Load Tests > Manage. The Load Tests page opens.
- **2** To locate a specific load test, filter the list in the filter area at the top of the page.
 - ➤ To filter the load tests by name, in the Load Test Name box, enter the name of the load test (or part thereof). The page returns a list of all the load tests that have the specified string anywhere in their names. For example, if you entered te, the display list might include create1 and dftest(10).

➤ To show loads test that ran between specific dates, use the browse buttons adjacent to the Last Modified: From and To boxes to select the dates.

Click **Filter** to filter the list.

Note: Filter settings are saved per user, per project. The next time the same user enters the Load Tests page in a specific project, the page displays results based on the most recent filter.

3 Click the "+" button adjacent to a load test to expand the list of load test runs.

<u>Name (</u>	# of Runs)	₹ <u>Last Modifie</u>	d Date		Status		
🗆 <u>Slavik</u>	<u>LT (4)</u>	11-Jun-2007			Valid	۲	×
ID	Date	Tester	Duration	Vusers	Status		
2389	9. 11-Jun-2007 2:40:48 PM	Ekaterina Nov	3 mins	10	Before Collating Results		×
2386	5. 11-Jun-2007 11:25:02 AM	Ekaterina Nov	4 mins	10	Before Collating Results		×
2385	5. 11-Jun-2007 11:17:07 AM	Ekaterina Nov	4 mins	10	Before Collating Results		×
2384	. 11-Jun-2007 11:01:26 AM	Ekaterina Nov	3 mins	10	Before Collating Results		×

4 Select the test run that you want to view, and click the link in the **Status** column.

The Load Test Results page opens and displays the **Files and Reports** tab. The Files and Reports tab provides access to the information about the load test such as the default report, Vuser logs, and comments. For more information, see "Files and Reports Tab" on page 418.

5 To review the load test analysis information, select the **Results vs. Targets** tab. After you review this information, you can select the load test run results to publish to the Dashboard (see "Publishing Load Test Performance Results" on page 52). The run status (published/not published) is displayed below the table.

Searching Load Test Results

In the Search Load Tests Results page, you can view a list of load tests which have already been run and which have load test results.

To search for a load test results of a particular load test:

1 On the Performance Center left menu, select Load Tests > Search Results. The Search Load Tests Results page opens.

Search Load Tests Results						
Load Te	st Name:	Run Date: From	то			
User Notes:			Filter Clear Filter			
		Currently Sho	wing: 1 - 15 / 44 🔘 🕚 1 <u>2 3</u> 🕗 🕗			
Run ID	Load Test Name	Run Date	User Notes			
14726	MoTFW Test	10/13/2004 10:56:23 PM				
6545	Test3	12/30/2003 11:42:49 AM				
<u>6544</u>	Test3	12/30/2003 11:38:39 AM				
6543	Test3	12/30/2003 11:36:33 AM				
2086	ATT_priv	5/7/2003 1:10:57 PM				
2058	ATT_priv	4/14/2003 8:48:19 PM				
2057	ATT_priv	4/14/2003 2:35:43 PM				
<u>1944</u>	JapTest	2/20/2003 6:10:30 PM				
1892	TestCommand	2/7/2003 5:48:53 PM				
1891	TestCommand	2/7/2003 4:53:36 PM				
1826	test_agent	12/31/2002 12:10:17 PM				

The page displays 15 load tests at a time.

To see more load tests, you can use the arrow buttons above the list to navigate between sets of 15 load tests.

- **2** To locate a specific load test, filter the list in the filter area at the top of the page.
 - ➤ To filter the load tests by name, in the Load Test Name box, enter the name of the load test (or part thereof). The page returns a list of all the load tests that have the specified string anywhere in their names. For example, if you entered te, the display list might include create1 and dftest(10).
 - ➤ To show loads test that ran between specific dates, use the browse buttons adjacent to the Run Date: From and To boxes to select the dates.

To filter the load tests by user notes, in the User Notes box, type an alphanumeric string that is included in the notes.

Click **Filter** to filter the list.

Note: Filter settings are saved per user, per project. The next time the same user enters the Search Load Tests Results page in a specific project, the page displays results based on the most recent filter.

3 Click the Run ID number of the desired load test. The Load Test Results page opens and displays the **Files and Reports** tab.

The Files and Reports tab provides access to the information about the load test such as the default report, Vuser logs, and comments. For more information, see "Files and Reports Tab" on page 418.

Publishing Load Test Performance Results

When you run the load test, Performance Center measures the transaction response time and charts the success rate of the selected transactions for the established criteria. After reviewing the results of a load test run, you can select which load test runs to include in the Dashboard.

You publish runs to the Dashboard from the Load Tests or Load Test Results page. You can publish the complete run, or part of a run—if, for example, you wanted to exclude the Start/Stop Vuser action.

Before you can publish a load test's run results to the Dashboard, you must enable publishing the load test.

To publish load test results to the Dashboard:

On the Load Tests page, select the load test that you want to publish, and click the Publish to Dashboard button.

The button icon changes to **Published**. You can now publish run results for the load test to the Dashboard.

<u>Name (</u> # of Runs)	₹ <u>Last Modified Date</u>	Status		
🗄 <u>tali (3)</u>	1-Aug-2005	Valid	۲	×
± <u>four (2)</u>	28-Jul-2005	Invalid	۲	×

- **2** Under the selected load test, select the run that you want to publish from the Load Tests page or the Load Test Results page.
 - On the Load Tests page, select the load test run, and click the Publish to Dashboard button.

<u>Name</u>	(# of Runs)	₹ <u>Last Modified</u>	<u>Date</u>		Status		
🗆 <u>tali (</u>	3)	1-Aug-2005			Valid	2	×
Id	Date	Tester	Duration	Vusers	Status		
78.	1-Aug-2005 10:02:56 AM	Admin	10 mins	40	<u>Finished</u>		×
51.	28-Jul-2005 2:11:07 PM	Admin	9 mins	40	Before Creating Analysis		×
50.	28-Jul-2005 1:46:46 PM	Admin	3 mins	40	Finished	⊠	×

➤ On the Load Test Results page, select a load test run, click the Results vs. Targets tab, and click Publish.

Transaction / Transactions Per Second	1 TPS	3 TPS	10 TPS	20 TPS	25 TPS
trans_one	0.078 / 2.596	0.081/ 2	0.845 / 3	0.897 / 3	2.234 / 3
trans_three	0.198/1	0.861/ 1	0.486 / 2	NA / 4	NA / 4
trans_two	1.054 / 1	1.104 / 2	1.555 / 3	1.767/ 2	3.167/2
Results marked in red indicate transaction	ons that did no	t perform a	is specified	l in targets	
	_				
This run is not published to the Da	shboard P	ublish			



 \square

3 In the Define Time Range dialog box that opens, select one of publishing options.

🖉 Define Time Range Web Page Dialog 🛛 🛛 🗙
Define Time Range
Dublish Complete Run
O Publish Part of Run
(useful if you want to exclude the ramp up, for example)
Start Time: 0 minutes after run start time
End Time: 15 minutes after run start time
ок

- Publish Complete Run. Publishes the complete run to the Dashboard (default option).
- Publish Part of Run. Allows you to publish part of the run to the Dashboard by defining the time range. This is useful, for example, if you want to exclude the Start Vuser action. Define the start and end time by specifying the number of minutes to wait after the run begins.
- **4** Click **OK**. Performance Center publishes the results (or part of them) to the Dashboard. The **Published** button is displayed, indicating that the load test run has been published to the Dashboard.

Note: You can add a load test's results to the Dashboard at any time from the Load Tests page.

To remove load test results from the Dashboard:

On the Load Tests page, select the load test that you want to remove from the Dashboard, and click the **Remove from Dashboard** button. The load test results are removed from the Dashboard.

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To remove a load test run from the Dashboard:

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- **1** On the Load Test Results page select the load test run to remove.
- **2** On the Results vs. Targets tab, click **Remove from Dashboard**.

Alternatively, on the Load Tests page, select the load test run that you want to remove from the Dashboard, and click the **Remove from Dashboard** button.

The data for the load test run is removed from the drilldown performance graphs. If no other runs for the load test have been published to the Dashboard, the load test is removed from the Dashboard.

Chapter 3 • Project Status

4

Performance Center Hosts

Host machines are used for test runs. You manage the hosts in the Performance Center Administration site. In the User Site you can view the hosts that are assigned to your projects. You can check the status of selected hosts and reboot hosts when necessary.

This chapter includes:

- ► About Performance Center Hosts on page 57
- ► Understanding the Hosts Page on page 58
- ► Editing Host Details on page 65
- ► Viewing Host Details on page 66
- ► Rebooting Hosts on page 73
- ► Understanding Host Allocation on page 75
- ► Handling Resource Failure on page 76
- ► Checking Hosts on page 77

About Performance Center Hosts

The Administrator manages the information stored in the system about the hosts. Performance Center uses the information to allocate hosts to load test runs.

When you design a load test, you specify how many hosts it requires and reserve the necessary number of hosts for a specific time period.

Since the availability of hosts is limited, Performance Center allocates specific time periods called timeslots. Reserving a timeslot, actually reserves the required hosts for the specified timeslot. When the user tries to reserve a timeslot, Performance Center allocates hosts according to parameters that you control from the Hosts page in the Administration site.

For more information about managing Performance Center hosts, see the *HP Performance Center Administrator Guide*.

Understanding the Hosts Page

The Hosts page displays information about the host machines in the Performance Center system, and enables you to reboot hosts, modify host details, and check host connectivity.

To access the Hosts page:

On the Performance Center left menu, select Projects > Hosts. The Hosts page opens.

The Hosts page is comprised of the following areas:

- ➤ Filter area. Enables you to set the number of hosts displayed, and filter the Hosts table according to location, name, and run status criteria. For more information, see "Filter Area" on page 59.
- ➤ Hosts table. Displays information about the hosts in the Performance Center system, and enables you to perform actions on the hosts. For more information, see "Hosts Table" on page 60.
- Details for Host area. Displays more details about the hosts and enables you to edit host details. For more information, see "Editing Host Details" on page 65.

Filter Area

The Filter area of the Hosts page enables you to customize the host information displayed. You can set the number of hosts displayed on the page, and filter the host display.

Setting the Number of Hosts Displayed

You can set the number of hosts that are displayed on the page. You can select to display 10, 20, 50, 100, or all hosts on a page.

To set the number of hosts displayed:

- 1 In the Filter by section, in the Per Page list, select the number of hosts to display per page.
- **2** Click **Filter**. The display updates according to the option you selected.

Filtering the Hosts Display

You can use the filter lists to display a specified subset of the hosts, according to location, name, and run status criteria.

To filter the display:

- **1** From one or more of the filter lists, select the desired filtering options.
 - ► The **Run Status** options are:
 - > All Statuses. Displays all hosts regardless of status.
 - Idle. Displays hosts in the following states: Finished, Run Failure, Failed Collating Results, Failed Creating Analysis Data, Deleting Temporary Results, Temporary Results Deleted. A short time after the run, it also displays hosts in the Collating Results, Creating Analysis Data, Before Collating Results, and Before Creating Analysis Data state.
 - Run. Displays hosts in the following states: Ready, Running, Stopping. Immediately after the run, it also displays hosts in the Collating Results, Creating Analysis Data, Before Collating Results, and Before Creating Analysis Data state.

2 Click **Filter**. The display updates according to the options you selected.

Note: Filter settings are saved per user, per project. The next time you enter the Hosts page in a specific project, the page displays results based on your most recent filter.

Hosts Table

The Hosts table displays the host details. You can sort the table by any of the columns. For instructions on sorting the table, see "Sorting the Hosts Table" on page 63.

The Host table displays the following information about the hosts:

- Status light. An indicator of the current system performance of the host, represented by a color. For more details about the host status indicator, see "Understanding Host Status" on page 63.
- ➤ Name. The host name that you assign when you add a new host. You can click the name to open the Host Details page for the host.
- Purpose. The function the host performs in a test run. You define a host as a Controller, Load Generator, Controller + Load Generator, or Data Processor. The purpose of the machine is indicated by a series of icons, as described in the following table.

lcon	Purpose	Description
ł	Controller	The Controller host manages the load test. Each test requires one host as a Controller.
*	Load Generator	Load generator hosts run the Vusers in a load test. There can be any number of load generators in a given test.

lcon	Purpose	Description
M	Controller + Load Generator	Enables you to use the host as a Controller and a load generator. You can use the Controller as a load generator, and assign Vusers to run on the Controller. In general, this is not recommended practice and is only appropriate for load tests that have a very small number of Vusers.
di.	Data Processor	The data processor is used for publishing information to the Dashboard. Although it is possible to configure a machine as a Controller and a data processor, it is not recommended.
8	Over Firewall	Used alongside the load generator icon to indicate that the load generator is located over a firewall.
SSL	SSL	Used alongside the load generator icon to indicate that the load generator uses SSL to communicate with the Controller during run time.

- ➤ Pool. The host pool to which the host is assigned. Host pools allow you to control which hosts are allocated to which projects. When allocating hosts for a test, the system allocates hosts with the pool specified for the project in the project profile. For more information about host pools, see the HP Performance Center Administrator Guide.
- ➤ Location. 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.
- State. The state of the host. An indicator is displayed next to the host name, according to its current state. For more details about the host status indicator, see "Understanding Host Status" on page 63.
- **> Run Name**. The name of the load test that is currently running on the host.

 Run Status. The status of the load test that is currently running on the host. This field applies only to hosts that are in the Running state. Click the Running link to display information for the current run. The Last Run Information page contains data only if there is an active run.

🛎 Last Run Information - Mi	crosoft Internet Explorer	_ 🗆 ×
Last Run Information		
User Name:	Build Manager Sanity	
Run State:	Running	
Duration (min):	0	
Total Vusers Involved:	10	
Max Concurrent Vusers:	0	
Controller (#Vusers):	loof(9)	
Host List (#Vusers):	loof(1);	
Results Directory:	C:\Program Files\HP\ Performance Center\ orchidtmp\Results\35	
	Close	

- ➤ Run Time. The start time of the load test that is currently running on the host.
- Project. The name of the project that is currently running in the load test on the host.
- ➤ User. The name of the user that is currently running the load test on the host.

Below the Hosts table, you can perform the following actions:

- ➤ Reboot. Enables you to remotely reboot host machines from the User site. For more information, see "Rebooting Hosts" on page 73.
- Check Hosts. Enables you to check the connections between various host machines within your system. For more information, see "Checking Hosts" on page 77.

To perform actions on all the Performance Center hosts, select all hosts by selecting the check box at the top of the check box column. To clear all check boxes at once, clear the check box at the top of the check box column.

Sorting the Hosts Table

You can sort the hosts according to the values in any column.

To sort the hosts:

Click the column heading of your choice. A downward facing arrow is displayed next to the column heading. The hosts are sorted in descending order of the values in that column.

When you click the heading again, the arrow reverses direction, and the hosts are sorted in ascending order of the values in that column.

Note: Sorting settings are saved per user, per project. The next time the same user enters the Hosts page in a specific project, the page displays the results based on the most recent sort order.

Understanding Host Status

Host status is an indicator of the current system performance of the host, represented by a color. A combination of the State and the SiteScope measurement determines the indicator color. A color other than green is a warning that the system performance is less than optimal and warrants investigation.

System performance is assessed according to four parameters: CPU usage, memory usage, disk space, and running services. There is a threshold for each parameter. If a Performance Center service stops for any reason, the machine state turns red (Error).

The following table lists the possible states and the associated indicator color.

Indicator	Host State	SiteScope Status
	Operational	Host is operational.
•	Operational	Some measurements are out of range, but the host is still operational.
e,	Operational	Indicates that at least one of the performance parameters is outside of its threshold, and the host is not recommended for running tests on.
₽ _×	Resource Failure	Host is not operational. If the host is in the Resource Failure state, you should try to fix the problem, then change the condition back to Operational . If the system detects that the host is still not working, the condition reverts to Resource Failure .
	Unavailable	The user manually changed the host status to Unavailable.
	Maintenance	An installation is taking place.
	Rebooting	Host reboot is taking place. Displays the time (MM:SS) since the rebooting process started.
	Transferring X%	A patch is being transferred from the File server to the host. The percentage shows the progress of the patch transfer.
<u>.</u>	Installing X%	A patch installation is taking place. The percentage shows the progress of the patch installation.

Editing Host Details

You can change the state of one or multiple hosts in the Details for Host area on the Hosts page.

Important: To change the state of a host in the User Site, users need to be assigned with **Edit host (partial)** project permissions.

To change the state of a host:

- **1** Select the desired hosts in the Hosts table. The selected hosts are displayed in the **Details for host** list.
- 2 In the Details for Host area, select one of the following states from the State list: **Operational**, **Unavailable**, **Resource Failure**, or **Maintenance**. Additionally, temporary states of **Rebooting**, **Transferring**, or **Installing** are available while a machine goes through a rebooting or patch installation process.

If the host is in the **Resource Failure** state, try to fix the problem, then change the condition back to **Operational**.

3 Click **Save** to save changes to the hosts. Performance Center displays a message informing you that the details were successfully saved. If you move away from the page without saving the changes, the settings are not saved.

Viewing Host Details

You can view and manage details about each host on the Host details page.

You access the Host details page by clicking the name of any host in the Hosts page.

The Host details page includes the following tabs:

- ➤ Properties tab. Allows you to view host properties. See "Host Properties Tab" on page 67.
- ➤ Status tab. Allows you to view the host status and to perform host connectivity checks. See "Host Status Tab" on page 69.
- ➤ Processes tab. Allows you to view and end processes on a host. See "Host Processes Tab" on page 70.
- ➤ Logs tab. Allows you to view detailed information about the tasks performed on the host, the action status, and a description of any errors. See "Host Logs Tab" on page 71.
- ➤ Runs tab. Allows you to view runs on a specific host. See "Host Runs Tab" on page 72.

Host Properties Tab

The Properties tab provides general information about the host.

Hosts> Host vmltr	nd29 Information
Properties Stat	us Processes Logs Runs
Host Name:	vmltrnd29
Host Logical Name:	vmltrnd29_ofw
OS Type:	Win2000/XP
Installation:	N/A
Purpose:	Load Generator
Comments:	None
Priority:	3
Location:	ofw
MI Listener:	labm1ltd34.devlab.ad
Host Pool:	General
Allocation:	0
State:	Operational
Login Informa	tion
User Na	me: IUSR_METRO
Passwo	rd: ********
	Advanced - Over Firewall Edit

The Host Properties tab displays the following details:

- ► Host Name. The host name that you assign when you add a new host.
- Host Logical Name. The logical name given to the host when it was added to the system.
- ► **OS Type**. The host operating system.
- > Installation. Indicates whether the host is a standalone load generator.
- ► **Purpose**. The function the host performs in a test run. You define a host as a Controller, Load Generator, Controller + Load Generator, or Data Processor.
- ► **Comments**. Any relevant information about the host.
- 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.

- ➤ Location. 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.
- ➤ MI Listener. For hosts located over a firewall, the IP address or name of the MI Listener that enables data collection.
- ► Host Pool. The host pool to which the host is assigned.
- ➤ Allocation. The number of timeslot to which the host is allocated. 0 means the host is not allocated.
- State. The state of the host. The possible states are; Operational, Unavailable, Resource Failure, and Maintenance. Additionally, temporary states of Rebooting, Transferring, or Installing are assigned while a host goes through a rebooting or patch installation process.
- ► Login information.
 - ► User Name. The user name of the host.
 - ► **Password**. The password of the host.
 - **Domain**. The host domain.
- Installed Components. A list of components installed on the host, including version and patches.
- Security Mode. If the host is designated as a load generator, this field indicates whether the load generator is located over a firewall and whether it is using SSL to communicate with the Controller.

Note:

- When the load generator is configured to use SSL, it uses SSL to communicate with the Controller during run time only. For non run-time functionality (including collating results), the load generator does not use SSL as the communication protocol.
- ➤ When Host Security settings enforce host communication over secure channels, SSL security is still supported.

Host Status Tab

The **Check Host** area of the Status tab provides information about the connections between the selected host and various machines within your system.

For more information about checking host connections, see "Checking Hosts" on page 77.

If SiteScope monitoring is enabled, the **SiteScope Data** table displays detailed information about the host, as collected by the SiteScope monitor. For more information, see the *HP Performance Center Administrator Guide* and the *HP Performance Center System Configuration and Installation Guide*.

All functions are automatically performed when the tab is opened, the page is refreshed, or when you click the **Check Host** button.

Propertie	status	Processes	Logs	Runs	
Checl State	k Host :				
Ping	to Host:	Succeede	d to ping 3	times. Average t	ime is 0 ms.
Over	Firewall Statu	s: Connecte	d.		
FileS	erver:	N/A			
Datal	ase:	N/A			
Ping	to URL:				
Ping	to URL Status:	N/A			
		Check I	Host		
SiteSo	ope Data				
Stat	te	Name		Status	
•	MEMORY			16% used, 1469ľ 0.36 pages/sec	MB free,
•	SERVICE 'R Agent Serv	temoteManagei ice'	ment	running	

If you want the selected host to ping a remote site, type the URL address in the **Ping to URL** box and click **Check Host**. Performance Center displays the results in the **Ping to URL Status** field.

Note: To ping to a host or to a URL, the Performance Center system user must have administrator privileges.

Click the **Hosts** link at the top of the page to return to the Hosts page.

Host Processes Tab

The Processes tab provides detailed information about the processes and resource usage of the selected host.

Properties State	IS Processe	s Logs	Runs	
	Pa	age will reload in	41 secs. Refre	esh Now
Name	Processor Time %	Mem. Usage (Bytes)	Elapsed Time (Hours)	PID Kill
ACLIENT	0	1781760	7.801	3248 😣
ACIntUsr	0	3248128	7.508	3172 🔞
ALWrapperServer	0	10686464	6.286	2248 🗭
DWRCS	0	3751936	8.815	1376 🗭
DWRCST	0	3465216	7.508	1256 🗭
DefWatch	0	5238784	8.816	1328 🗭
Idle	99.996	28672	8.819	0 😣
MDM	0	3964928	8.815	1512 🗭
OrchidScheduler	0	8990720	7.184	4092 🗭
OrchidStatusMonitor	0	8859648	7.187	1308 🗭
Rtvscan	0	56475648	8.815	1780 🗭
SavRoam	0	4988928	8.815	1668 🗭
SmartDiskCleaner	0	6430720	6.322	5968 🗭

To end a process, click the Kill Process button in the process's Kill column.

Click the **Hosts** link at the top of the page to return to the Hosts page.

Note: Performance Center is unable to display processes and resource usage information for UNIX machines.

Host Logs Tab

The Logs tab provides detailed information about the tasks performed on the selected host, the action status, and a description of any errors.

Properties St	atus <u>Processes</u>	Logs <u>Runs</u>	
Show action pref	ormed in Last Week 💌	Apply Filter	Clear Log
			Showing: 1-4/4
Action	Time	Status	Error Description
Reboot	6/6/2005 11:08:24 AM	Passed	
Reboot	6/6/2005 10:18:23 AM	Failed	Failed to reboot due to invalid user details for LogOn
Reboot	6/6/2005 10:20:21 AM	Passed	
Install	6/6/2005 11:17:22 AM	Failed	Failed to create task

You can filter the information by a specific time frame, refresh the table to view the most current tasks, and clear the log.

To view log files for the action, click the error description link.

Click the **Hosts** link at the top of the page to return to the Hosts page.

Host Runs Tab

The Runs tab provides detailed information about load test runs performed on the selected host.

<u>Pro</u>	perties	Status Process	ses Logs	Runs			
v	iew run de	etails for Last Month	 Apply Filt 	er			
Cu	rrently s						
R	tun Id≜	<u>Date</u>	<u>LoadTest</u>	Project	User	<u>State</u>	Duratio
	2	3/8/2005 1:15:53 PM	igor_test_1	Default	Admin	Finished	0
	3	3/8/2005 1:23:05 PM	igor_test_1	Default	Admin	Finished	0
	6	3/8/2005 1:28:13 PM	igor_test_1	Default	Admin	Finished	0
	7	3/8/2005 1:33:37 PM	igor_test_1	Default	Admin	Finished	0
	8	3/8/2005 1:35:28 PM	igor_test_1	Default	Admin	Finished	4
	9	3/8/2005 1:40:02 PM	igor_test_1	Default	Admin	Finished	2
	10	3/8/2005 1:43:46 PM	igor_test_1	Default	Admin	Finished	2
	11	3/8/2005 1:48:48 PM	igor_test_1	Default	Admin	Finished	4
	15	3/8/2005 1:59:12 PM	igor_test_1	Default	Admin	Run Failure	0
	16	3/8/2005 2:27:29 PM	igor_test_1	Default	Admin	Run Failure	0
	18	3/8/2005 2:42:44 PM	igor_test_1	Default	Admin	Run Failure	4
	19	3/8/2005 2:59:18 PM	igor_test_1	Default	Admin	Run Failure	2
	20	3/8/2005 3:06:30 PM	igor_test_1	Default	Admin	Run Failure	1
	23	3/8/2005 3:39:01 PM	igor_test_1	Default	Admin	Run Failure	6

You can filter the information by a specific time frame and refresh the table to view the most current tasks. You can also sort the information by clicking the header of any column in the table.

The Run Details table displays the following details about each test run:

- Run ID. The identification number of the test run. This number is automatically generated by the system when the load test starts running.
- **> Date**. The start date and time of the test run.
- ► Load Test. The name given to the test when it was created.
- > **Project**. The name of the project running the test.
- ► User. The name of the user running the test.
- ► **State**. The state of the test run. If a test is stuck in a particular state, you can change it. For details, see the *HP Performance Center Administrator Guide*.
- **> Duration**. The time the load test took to run.

Click the Hosts link at the top of the page to return to the Hosts page.
Rebooting Hosts

Performance Center enables you to reboot hosts remotely from the User Site.

Notes:

- ➤ 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 host.

To reboot hosts:

- **1** From the Hosts page, select the hosts you want to reboot.
- 2 Click Reboot. The Reboot Hosts window opens.

🎒 Reboot Mac	🖻 Reboot Machine - Microsoft Internet Explorer 💦 📃 💌				
Reboot Ho	sts				
You chose to reboot the following 1 machine(s). For each machine verify that the login, password, and domain information is correct, and click Reboot. Performance Center will automatically log you on to these machines after startup. If you delete or change the default login values, you must log on to these machines at startup.					
Machine gum	Login IUSR_METRO	Password *******	Domain gum	Message	
		Reboot Cancel Help	5		

If Performance Center is unable to reboot the host—for example, because the selected host is the Administration Site server or a task is running on the host—a message is displayed in the **Message** column. **3** Supply login information for all hosts that should be automatically logged on after the hosts reboot. If you leave the boxes empty, you must log on to these hosts at startup.

Note: If you supplied login information when the host was configured, it is displayed in the appropriate column.

4 Click Reboot.

You can follow the progress of the reboot from the Hosts page. During reboot, the state of the host changes to **Rebooting** and the time (MM:SS) since the rebooting process started is displayed.

Understanding Host Allocation

When creating a test, the user specifies the number of hosts required for the test, and reserves a timeslot. To successfully reserve a timeslot, the required number of hosts needed for the test must be available.

When the user tries to reserve a timeslot, the system uses some of the information that is displayed on the Hosts page to determine if the required number of hosts, with the proper purposes, are available. If the required hosts are found, and are available for the requested time period, the timeslot is successfully reserved and the hosts are allocated. If the system cannot find suitable hosts to allocate for the requested time period, the timeslot cannot be reserved.

Each test requires one host as a Controller, one or more hosts that are load generators (it is possible to designate one host as a Controller + Load Generator), and one host for data processing. Performance Center uses different criteria to allocate hosts for each of these purposes, and out of all the hosts that meet the requirements, allocates those with highest priority. The two allocation methods are described below.

Allocating Controller and Load Generator Hosts

For load generation, Performance Center uses the following criteria for allocating hosts:

- **> Run ID**. **null** means the host is not currently running.
- > Allocation. 0 means the host is not allocated to the timeslot.
- ► State. Operational.
- Purpose. Controller, Controller + Load Generator, or Load Generator as indicated.
- Pool. The same pool as specified for the project for which the test is being run. For each project, Performance Center assigns hosts from a specific pool. This pool is specified in the project information page.
- Project. Either none or the name of the test's project for which the test is being run. Priority goes to hosts already assigned to the project.

Allocating Data Processor Hosts

For data processing, Performance Center allocates a host with the following values:

- ► State. Operational.
- > Purpose. Data Processor.
- ➤ Pool. The same pool as specified for the project for which the test is being run.
- ➤ Allocation. 0 5, because one host can be used for up to 5 concurrent operations.

Handling Resource Failure

If any of the hosts fail when Performance Center tries to run a test on the set of allocated hosts, the condition of the failed hosts changes from **Operational** to **Resource Failure**, and an error log describing the problem is sent to the main site.

You can try to fix the problem according to the description in the error log, then change the condition back to **Operational**. If the host is still not operational, the condition automatically returns to **Resource Failure** in the next test run.

If you are using the Host Checkup Service (enabled from the General Settings of the Administration site), Performance Center automatically detects host resource failure and attempts to restore the host to the **Operational** state.

Checking Hosts

You can check the connections between your project's hosts and the various machines within your system.

To check hosts:

1 From the Hosts page, select the hosts that you want to check and click the **Check Hosts** button. The Check Hosts dialog box opens displaying the selected hosts together with an icon next to the host name indicating the host's purpose.

🚰 Check Hosts - Microsol	Check Hosts - Microsoft Internet Explorer provided by Hewlett-Packard					
Check Hosts					Close Help	
					Check Hosts	
Host Name	Ping to Host	Quer Firewall Status	File Server	Database	Ding 11D1	
M Host Name	Ping to Host	Over Firewall Status	File Server	Database		
✓ .≯ labm1ltd30	×	N/A	×	×	N/A	
🔽 祦 labm1ltd35	N/A	 ✓ 	N/A	N/A	N/A	
🔁 - Controller そ - Loa	🖻 - Controller ≷ - Load Generator 🦂 - Controller+Load Generator 🎚 - Data Processor					
Result Status: labm1lt	:d35					
Ping to Host:	ig to Host: N/A					
Over Firewall Status:	er Firewall Status: Connected					
File Server:	N/A	A				
Database:	N/A	A A				
Ping to UKL:	N//	A				

By default, all the selected hosts are enabled. If you not do want to check a specific host, clear that host's check box.

Tip: Selecting or clearing the check box in the check box column header selects or clears all the check boxes respectively.

2 If you want the selected hosts to ping a remote site, in the **Ping URL** column header, type the URL address.

- **3** Click **Check Hosts**. Based on the purpose of the host, Performance Center checks one or more of the following connections:
 - > **Ping to Host**. The Administration Site server pings the selected host.
 - ➤ Over Firewall Status. For load generators over a firewall, Performance Center checks that the load generator is connected to an MI Listener.
 - ► File Server. The selected host attempts to write, read, and delete from the File Server.
 - **> Database**. The selected host connects to the Database Server.
 - ► **Ping URL**. The selected host pings the listed URL.

Note: To ping to a host or to a URL, the Performance Center system user must be a user with administrator privileges.

The Check Hosts table displays the success or failure of the actions.

The following table describes which connections Performance Center checks for each type of host.

Host purpose	Ping to Host	Over Firewall Status	File Server	Database	Ping URL
Regular load generator	Yes	N/A	N/A	N/A	Yes
Unix Load Generator	Yes	N/A	N/A	N/A	N/A
Standalone load generator	Yes	N/A	N/A	N/A	N/A
Load generator over firewall	N/A	Yes	N/A	N/A	N/A
Controller host	Yes	N/A	Yes	Yes	Yes
Data processor	Yes	N/A	Yes	Yes	Yes

- **4** Select a host to view the results of the host check. Details for each action are listed in the **Result Status** area.
- **5** Click **Close** to return to the Hosts page.

Chapter 4 • Performance Center Hosts

5

Working With Timeslots

To run a load test for your application, the number of load generators and Vusers required for running the test must be available. You can reserve resources so they will available for a test run. You can also have Performance Center automatically start running a test during the reserved timeslot period.

This chapter includes:

- ► About Project Resources and Reserving Timeslots on page 82
- > The Timeslots Page at a Glance on page 83
- ► Viewing Timeslot Information on page 86
- ► Reserving Timeslots on page 91
- Scheduling Load Tests to Autostart on page 98
- ➤ Configuring Post-Run Analysis Settings on page 101
- ► Running Vusers on the Controller Machine on page 102
- ► Editing Timeslots on page 104

About Project Resources and Reserving Timeslots

The Administrator manages project resources by defining the purpose of each host, controlling which projects can use which hosts, prioritizing the use of certain hosts over others, monitoring host performance, and following up on any operating problems.

When you create a load test, you specify the number of host machines required for the load test from the project resources available. The available resources are determined by the number of host machines, and the purpose assigned to each host. Each test requires one host as a Controller, one or more hosts to be load generators (it is possible to designate one host as a Controller + Load Generator), and one host for data processing.

Note: Unless your project is allowed to use a Controller as a load generator (determined by the administrator), you cannot assign Vusers to run from the Controller machine. For best results, we recommend running Vusers on dedicated load generator machines only. Running Vusers on the Controller can overload the machine and affect load test results.

You use the Timeslots page to reserve a resources for your load test. To check there are sufficient resources available to run your load test, you can select a load test and view the timeslots that have adequate resources available to run the load test, or filter the timeslots by the required number of load generators (and Vusers). If the required number of load generators and Vusers are available, you can reserve the resources for a specific time period. You can reserve a timeslot even if you have not yet defined your load test.

In addition, if you want your load test to begin its run automatically, you can reserve the date and time of the timeslot using the Autostart feature. Performance Center automatically runs the test at the start of the timeslot it is associated with.

You can perform the following actions from the Timeslots page:

- ► Check timeslot availability
- ► Reserve timeslots

- ► View all of your currently reserved timeslots
- > Schedule a load test to start running automatically
- ► Select the post-run analysis option
- ► Enable Vusers to run on the Controller machine
- ► Edit and delete timeslots

The Timeslots Page at a Glance

The Timesplots page displays reserved timeslots in either a calendar view (default) or a table view.



Timeslot Inventory

The inventory section at the top right of the page displays the total resources available for the project.

Project Limits	Host pool
Vusers: 100000	Load Generator (LG): 1
Runs: 10	Contrioller (C): 0
Machines: 10	C + LG: 1

Project Limits	Vusers	The maximum number of Vusers a project can run at once. The total number of Vusers used by all the project's concurrent load tests must not exceed this number.
	Runs	The maximum number of concurrent runs allowed within a project.
	Machines	The maximum number of machines a project can use at once. The total number of machines used by all the project's concurrent load tests must not exceed this number.
Host Pool Availability	Load Generator (LG)	The number of machines available in the project's pool on which Vusers are run during a load test.
	Controller (C)	The number of machines available in the project's pool that can be used to design and manage a load test.
	C + LG	(Controller + Load Generator) The number of machines available in the project's pool that can serve as both a Controller and a load generator. These machines provide greater flexibility— especially if resources are scarce—by allowing you to configure your load test to use the Controller as a load generator and run Vusers on the Controller machine.

The inventory provides project limits and host pool availability as follows:

Timeslots Views

You can view reserved timeslots either in the calendar view or in the table view.

 Calendar view. (Default view) Provides access to timeslot information over a 12-month range (the six past and six future months). The Information is displayed over a 7-day period. In the resource availability section of the calendar view, you can specify a date range and set load generator and Vuser criteria (if enabled) to filter the calendar and check timeslot resource availability. You can also show timeslots for a specific load test.



➤ Table view. Displays information about reserved timeslots in a tabular form. It displays information about who reserved the timeslot, the selected load test (if selected) and scheduled start time of the load test, how long the load test is scheduled to run, and the number of machines reserved for the load test.

In the resource availability section of the table view, you can specify the date range for which to view reserved timeslots.

Reservations from: 18-Feb-2008 12:00:00	AM to: 24-Feb-2008 11:00:00 PM	Go Project Limits Vusers: 100 Runs: 10 Machines: 10	Host pool Contrioller (C): Load Generator (I C + LG:	0 .G): 1 1
Click a timeslot to edit			Currently Show	ving: 1 - 7 / 7
<u> </u>	Reserved by	Load Test	Duration (hh:mm)	Machines
18-Feb-2008 10:09:10 AM	Admin	defect_65931	0:17	1
19-Feb-2008 10:45:50 AM	Admin	defect_65931	0:10	2
19-Feb-2008 10:59:18 AM	benny	Test by number	0:09	2
19-Feb-2008 11:10:58 AM	benny	test1	1:12	2
19-Feb-2008 12:33:11 PM	Nick	test2	1:00	2
19-Feb-2008 2:09:02 PM	Nick	test3	0:20	2
19-Feb-2008 5:25:07 PM	Nick	test4	1:00	2

For more information, see "Viewing Timeslot Information" on page 86.

Timeslot Information

The tabs displayed at the bottom of the Timeslots page provide information about the timeslot and timeslot options. You use this area to reserve timeslots and edit existing reservations.

For more information, see "Reserving Timeslots" on page 91.

Viewing Timeslot Information

You can view information for reserved timeslots in the calendar and table views of the Timeslots page, and resource availability information for all timeslots in the calendar view.

This section includes:

- ➤ "Checking Resource Availability in the Calendar View" on page 87
- "Checking Reserved Timeslot Information in the Calendar and Table Views" on page 90

Checking Resource Availability in the Calendar View

You can check resource availability for all timeslots by specifying the number of load generators (and Vusers) that you require, or by specifying a particular load test, and having Performance Center display the available timeslots based on the number of load generators (and Vusers) required for that test.

To view resource availability in Calendar View:

- **1** Open the Timeslots page (**Project** > **Timeslots**).
- **2** In the resource availability section of the calendar view, in the **Show timeslots for** boxes, specify the date range for which you want to view timeslots.

Note: The calendar view options are limited to a twelve month range (the six previous, and the six future months). To view a wider range, use the table view.

3 In the **View availability for** boxes, type the number of load generators (and Vusers) to view availability for.

Note: You can use the Controller as a load generator.

4 Click **Go**. The timeslots are displayed as follows:

Indicator	Timeslot Availability	Description
	Current	The current time.
	Reserved by this project	The timeslot (and some resources) is reserved by the current project. There are enough resources to run an additional load test.

Indicator	Timeslot Availability	Description
	Reserved by other projects	The timeslot (and some resources) is reserved by other projects. There are enough resources to run an additional load test.
	Reserved by this and other projects	The timeslot (and some resources) is reserved by the current project and by other projects. There are enough resources to run an additional load test.
	Available	The timeslot is available and there are sufficient Hosts (and Vusers), and the number of concurrent runs is within the project's limits.
×	No resources	The timeslot is available but the requested number of Hosts (or Vusers) are not available, or the number of concurrent runs exceeds the project's limit.

To view a breakdown of available resources for a specific timeslot (where some resources are available), place the cursor over the timeslot. A tool tip appears displaying available resource information for that timeslot.

Available resources for Vusers:	this project at this time: 970
 Runs: Machines:	4 9
Available resources in F Controllers(C):	lost Pool at this time:
Load Generators(LG): C+LG:	1 0 (All in use)

5 To clear the filter and display the timeslot availability for the selected date range, click **View Existing Timeslots**.

6 To view resource availability for an existing load test, click **More Options**. The More Options dialog box opens.

🖉 More Options - Microsoft Internet Explorer			
View Availability – Advanced Options			
Take resource requirements (Load Generators, Vusers) from the following load test			
Load Test:			
Run Vusers on Controller (If checked, Performance Center will display availability for the number of Load Generators specified. If unchecked, Performance Center will display availability for			
number of Load Generators specified plus a Controller machine)			
OK Cancel Help			

Select the desired load test from the list.

If you intend to run Vusers on the Controller machine, select **Run Vusers on Controller**. Performance Center checks the availability of the specified number of load generator machines, assuming that one of the load generators is a Controller machine. If you do not select this option, Performance Center checks the availability of the specified number of load generator machines, plus an additional machine for the Controller. For more information, see "Running Vusers on the Controller Machine" on page 102.

- 7 Click OK. The More Options dialog box closes and the number of load generators (and Vusers) required in the selected load test is displayed in the View timeslot availability section.
- **8** Click **Check Timeslots** to check availability for the load generators (and Vusers) required in the selected load test.

Checking Reserved Timeslot Information in the Calendar and Table Views

You can view information for reserved Timeslots in both the calendar view and the table view.

- ➤ To check a reserved timeslot in the calendar view, click a reserved timeslot in the timeslot grid.
- ➤ To check a reserved timeslot in the table view, click a timeslot in the timeslots table.

If only one timeslot is reserved, the timeslot information is displayed in the **Timeslot Details** tab.



If more than one timeslot is reserved for this time, a table containing all the existing timeslots reserved for this time is displayed below the timeslot grid in calendar view and below the reserved timeslots table in table view.

Existing timeslots reserved for this time						
≜ <u>Start Time</u>	<u>Reserved by</u>	Load Test	<u>Duration</u> (hh:mm)	<u>Machines</u>	<u>Vusers</u>	
1-Apr-2008 7:30:00 AM	Admin		1:00	1 (+1)	10	<u>edit</u>
1-Apr-2008 8:00:00 AM	Admin		1:00	1 (+1)	10	<u>edit</u>
Select the timeslot that you want to view, edit, or delete New Delete						

If you select a row in the table, the corresponding timeslot is highlighted in the timeslots grid. To edit an existing timeslot, click the **Edit** link in the row of the selected timeslot. The **Timeslot Details** tab opens, displaying details of the selected timeslot.

Note: The availability calculation is done according to the default project settings. By default, the **Run Vusers on Controller** option is unchecked and the calendar displays availability according to these settings. If your host pool contains only one host, and **Run Vusers on Controller** is not selected, the calendar displays a red X indicating there are not enough resources available. To change the default settings, click **More options** and select **Run Vusers on Controller**. Set the number of load generators required and click **Go** to refresh the view.

Reserving Timeslots

You reserve a timeslot for a load test from the Timeslots page. You configure the timeslot settings from the following tabs that are displayed at the bottom of the Timeslots page:

- Timeslot Details. Allows you to select the load test start time, duration, number of Vusers, and determine how your host machines are allocated. It also allows you to autostart your test so that it begins its run automatically.
- ➤ Options. Allows you to select the post-run analysis option and configure the load test to run Vusers on the Controller machine. For more information, see "Configuring Post-Run Analysis Settings" on page 101, and "Running Vusers on the Controller Machine" on page 102.
- ➤ Comments. Allows you to add comments about to the timeslot. Type comments in the Comments field and click Save to save the comments.

Note: When working with a double-byte language (Japanese, Chinese, Korean, or Vietnamese), you can use up to 160 characters.

To reserve a timeslot:

- **1** Check that the desired resources are available. For more information, see "Viewing Timeslot Information" on page 86.
- **2** Select a starting date and time for your load test by doing one of the following:
 - ➤ In the calendar view, click the cell that represents the desired starting date and time.
 - ➤ In the Timeslot Details tab, click the Select Start Time link to open the calendar, and select the exact year, month, day, and start time.

Timeslot Details Options Comments	
Start Time: Select Start Time Autostart (Test: Select Load Duration: (hours) (minutes) (including 15 minutes for results processing)	<u>i Test</u>) Machine Selection (Total:) Automatic - Load Generators # Manual - <u>Select Machines</u>
Reserve a New Timeslot	New Save Clear

Notes:

- ➤ If you select your date using the calendar in the Timeslot Details tab and it does not fall within the currently displayed calendar view, you can manually change the display range to view your reservation.
- > To clear the Timeslot Details tab at any time, you click New.
- **3** Type the desired duration of the timeslot in the **Duration** box. You can only reserve durations in half and whole hour increments. Performance Center automatically adds an extra 15 minutes for processing results.

4 If you want the test to begin its run automatically, select **Autostart** and click **Select Load Test**. The Select Load Test dialog box opens.

🗿 Select Load Test - Microsoft Internet Explorer								
Select Load Test for Autostart Note: Only tests that are configured with scheduler settings and have 'Valid' status are available in the list								
Curre	Currently showing: 1 - 8 / 38 1 - 8 👂 👂							
	<u>Name</u> ≜	<u>Description</u>	<u>Status</u>	<u>Load Generators</u>	<u>Vusers</u>			
0	1st load test	test autostart with terminals	Valid 0	4	20			
0	2nd load test	Test autostart with terminals	Valid 0	1	100			
•	3rd load test		Invalid	з	56			
•	4th load test		Invalid	4	601			
0	Copy of my load test	test use exist terminal sessions	Valid II	з	16			
•	hhh		Invalid	1	2			
		OK Cancel	Help					

From the list, select the test you want to autostart, and click **OK**.

For more information on autostarting load test runs, see "Scheduling Load Tests to Autostart" on page 98.

Note: Only tests that are configured with scheduler settings and that have the **Valid** status are available from the list.

5 In the **Number of Vusers** box, specify the number of Vusers you require.

- **6** Under **Machine Selection**, select one of the following options to determine how your load generator machines are allocated:
 - Automatic Load Generators #. Instructs the system to assign your test to any available load generator. Specify the total number of load generators you require in the load test. Performance Center reserves the specified number of load generator machines, plus an additional machine for the Controller, unless the Run Vusers on Controller option is selected in the Options tab. For details, see "Running Vusers on the Controller Machine" on page 102.

Click **Save** to reserve the timeslot. A message at the bottom of the Timeslots page informs you whether the timeslot was reserved.

➤ Manual. Allows you to assign specific load generators to your test. Continue with "Manually Selecting Host Machines" on page 96.

For more information about timeslot - load test host allocation, see "Relationship between Timeslot and Load Test Host Allocation" on page 95.

Relationship between Timeslot and Load Test Host Allocation

The following table describes the relationship between timeslot and load test host allocation. For more information on load test host allocation, see "Load Generator Distribution" on page 180.

Load Test	Timeslot	Behavior	
Machines specified by user	Machines Selected Manually	 If the machines specified in the timeslot match the load test machines, Performance Center runs the test. If the machines do not match, Performance Center does not run the test. Try allocating load test machines in the timeslot (if available), and releasing the specified machines. 	
Machines specified by user	Machines allocated automatically	 If the machines allocated in the timeslot match the load test machines, Performance Center runs the test. If the machines allocated in the timeslot do not match the load test machines, Performance Center tries to allocate the user-specified machines. If those machines are unavailable, Performance Center does not run the test. 	
Automatic machine selection	Machines Selected Manually	 Performance Center runs the test. 	
Automatic machine selection	Machines allocated automatically	 Performance Center runs the test. 	

Manually Selecting Host Machines

You can assign specific Controller and load generator machines to your test.

To manually select the host machines for your load test:

- **1** In the Timeslots page, click the **Timeslot Details** tab.
- **2** Select **Manual** and click the **Select Machine** link.

The Select Machines wizard opens displaying a list of available Controller machines.

🗿 Select Machines - Microsoft Internet Explorer 💦 📃 🗷									
Se	Select a Controller								
Tin	Timeslot details: From: 22-Jul-2005 2:00:00 PM Duration: 0:30 (hours)								
Filt	Filter by: Location All locations Purpose All purposes Name Filter								
Cui C	ID	nowing:1-4 Name ≜	Location	OS Type	Purpose	Condition	Comment		
0	20	iowa	Default	Win2000/2003/XP	Controller + Load Generator	Operational	QTP, License problem		
C	1	labm1qc04	Default	Win2000/2003/XP	Controller + Load Generator	Operational	Maintenance Service Tests		
C	7	qcdbas1	Default	Win2000/2003/XP	Controller + Load Generator	Operational	WR, License problem		
C	6	qcfarm	Default	Win2000/2003/XP	Controller + Load Generator	Unavailable	WR, License problem		
_									
				Next >>	Cancel Help				

To filter the list of machines, in the filter section, select the location or purpose of the machine, or type the machine name in the **Name** field, and click **Filter**.

The Purpose column identifies the machines as **Controller** or **Controller + Load Generator**.

3 In the **C** column, select the Controller machine that you want to reserve, and click **Next**.

🥔 S	🖻 Select Machines Wizard - Microsoft Internet Explorer 🛛 🗖 🗖 🔀								
Se	Select Machines								
Se	lect Lo	ad Ge	nerators						
Tin	neslot	detail	l s: From: 8	8-May-2005 7:30:	00 AM Duration: 0:30	(hours)			
Fil	Filter by: Location All locations 💌 Purpose All purposes 💌 Name Filter								
Cu	rrentl	ly sha	owing: 1 - 2	/2	OC Turn	Duurseen	Condition	Commont	
	3	<u>,</u>	germ	Default	US 1902 Win2000/2003/XP	Load Generator	Operational	comment	
R	1		tomato	Default	Win2000/2003/XP	Load Generator + Controller	Operational		
	<< Back OK Cancel								

The Select Load Generator Machines dialog box opens.

The Purpose column identifies the machines as **Load Generator** and **Controller + Load Generator**.

In the **LG** column, select the load generator machines that you want to reserve.

Note: If **Run Vusers on Controller** is selected in the Options tab, the Controller machine is automatically assigned the load generator purpose as well.

- **4** To save your selections and close the dialog box, click **OK**. To return to the Select a Controller page, click **Back**. To disregard the changes and close the dialog box, click **Cancel**.
- **5** In the Timeslots page, click **Save** to reserve the timeslot. A message at the bottom of the Timeslots page informs you whether the timeslot was reserved.

Changing Duration or Start Time

When you manually specify machines after selecting a start time and duration, machines are guaranteed to be available for the load test. If you subsequently change the start time or duration, some of the machines may no longer be available.

If there are insufficient resources available, Performance Center displays the following message: "If you change the start time/duration of the test, some of the machines will no longer be available, and you will have to reselect from the available machines. Do you want to proceed?"

Click **OK** to proceed. The Select Machines dialog box opens, and displays only those machines that are available at the new start time/duration. Select the machines as described in "Manually Selecting Host Machines" on page 96.

Click **Cancel** to disregard the changes to the start time/duration.

Scheduling Load Tests to Autostart

You can configure a load test to automatically begin its run at the start of the timeslot that it is associated with. Autostarting tests allows you to maximize resource usage by enabling you to have your resources available 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 9:00-5:00 day. The hours between 9:00-5:00 are peak hours of host usage, during which time all the hosts are usually reserved. In addition, there may be times during the day that some tests cannot be run because there are no available hosts. To extend host resource usage, employees may come in early or stay late to run tests. However, this only extends the peak usage by a couple of hours at the beginning and end of the day. In contrast, the non-standard work hours pass with very little host resource usage.

This section includes:

- ► "Overview of Reserving and Viewing Autostart Timeslots" on page 99
- ➤ "Best Practices for Autostarting Load Tests" on page 100

Overview of Reserving and Viewing Autostart Timeslots

To reserve, view, or manage a test with autostart, you must perform the following steps:

1 Create a load test with scheduler settings defined.

Autostarting a test requires scheduler settings. Once you save a load test with scheduler settings, it becomes available on the Timeslots page.

For more information, see Chapter 11, "Configuring Scheduler Settings."

2 Reserve a timeslot.

You reserve a timeslot, enable the Autostart feature, and select the test to autostart in the Timeslot Details tab of the Timeslots page.

For more information, see "Reserving Timeslots" on page 91.

3 View and manage reserved timeslots.

You can view Autostart load tests, access reports on tests that have run, and cancel tests that are scheduled to run from the Autostart Viewer.

For more information, see Chapter 23, "Viewing Autostart Load Tests."

Best Practices for Autostarting Load Tests

Before scheduling a load test to Autostart, first run the test manually. This will give you an idea of how long the test takes to perform certain steps. This information can then be taken into consideration when reserving a timeslot for the test, and thereby avoid the need for troubleshooting at a later time.

- ➤ If the load test takes more than 15 minutes to stop, reserve a timeslot that will end at least 15 minutes after the Vusers are scheduled to finish exiting the load test.
- ► If the load test takes more than 15 minutes to collate run data:
 - Reserve a timeslot that will end at least 15 minutes after the Vusers are scheduled to finish exiting the load test.
 - Select Do not collate results from the Post-run analysis settings. You can collate and analyze results at a later point. For more information on Postrun analysis settings, see "Configuring Post-Run Analysis Settings" on page 101.
- ► If the load test takes more than 15 minutes to generate analysis data:
 - Reserve a timeslot that will end at least 15 minutes after the Vusers are scheduled to finish exiting the load test.
 - Select Do not collate results from the Post-run analysis settings. You can collate and analyze results at a later point. For more information on Post-run analysis settings, see "Configuring Post-Run Analysis Settings" on page 101.

Configuring Post-Run Analysis Settings

You can configure the post-run analysis settings from the Options tab of the Timeslots page. By default, when a load test finishes running, Performance Center automatically collates the results from the load generator machines. You can change the setting to have Performance Center automatically collate and analyze the test data, or postpone collation to a later time. If you delay collating or analyzing data, you can always collate and analyze the data at a later time.

Note: If the Controller is collating and analyzing test data, it will not be available for another load test scheduled for the same time. The time required in the collating and analyzing process depends on the number of Vusers, length of test, and so on.

To configure post-run analysis settings:

1 In the Timeslots page, click the **Options** tab. The Options tab opens.

Timeslot Details	Options	Comments		
Post-run analysis: O Collate and Analyze results O Collate only O Do not collate results			☑ Run Vusers on Controller	
Reserve a New Timesl	ot			New Save Clear

- **2** Select one of the following post-run analysis options:
 - Collate and Analyze. Performance Center collates the run data from the load generators and generates analysis data. After data is collated, 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.

- ➤ Collate only. Performance Center collates the run data from the load generators. After data is collated, Performance Center automatically deletes the temporary results from the load generators. You can download the raw results from the Load Test Results page, or manually analyze results at a later point from the Load Test Results page. This is the default setting.
- Do not collate. Frees the machines immediately after the load test ends. You can collate and analyze results at a later point from the Load Test Results page.

Note: To allow manual deletion of temporary results from the load generators and controllers, deselect the **Delete Temporary Results** option in the General Settings page of the Administrator Site.

3 Click **Save** to save the post-run analysis option. A message at the bottom of the Timeslots page informs you whether the option was saved.

Running Vusers on the Controller Machine

To provide greater flexibility, or if resources are scarce (for example, if you only have a single machine to run the test), you can configure your load test to use the Controller as a load generator. You configure Performance Center to run Vusers on the Controller machine when reserving the timeslot.

For best results, running Vusers on dedicated machines that are load generators only is recommended. Running Vusers on the Controller can overload the machine and affect load test results.

To run Vusers on a Controller machine:

1 In the Timeslots page, click the **Options** tab. The Options tab opens.



2 Select **Run Vusers on Controller**. Performance Center reserves the number of load generator machines required for the load test. If your test requires three load generators, Performance Center reserves three load generator machines (one of the load generators will be a Controller as well).

If you do not select this option, Performance Center reserves the specified number of load generator machines, plus an additional machine for the Controller. Using the example above, Performance Center reserves four machines (three load generators and one Controller).

Note:

- The Run Vusers on Controller option may be unavailable if your administrator has chosen to prevent you from changing the predefined settings.
- If you manually select machines for the load test with the Run Vusers on Controller option selected, and specify a load generator that serves as a Controller, you cannot save the timeslot if you subsequently disable this option.
- **3** Click **Save**. Performance Center reserves the timeslot for the number of load generators and Vusers, and the duration time required in the selected load test. Performance Center adds the scheduled test to the Autostart Viewer page.

Note: Timeslot availability is calculated according to the default project settings. By default, the **Run Vusers on Controller** option is unchecked and the Calendar displays availability according to these settings. If your host pool contains only one host, and **Run Vusers on Controller** is unchecked, the calendar displays a red X indicating there are not enough resources available. For more information, see "Viewing Timeslot Information" on page 86.

Editing Timeslots

You can edit a timeslot from the Calendar or Table view of the Timeslots page. If you select a timeslot to edit from the Calendar View and only one timeslot is reserved for the selected time, the timeslot information is displayed in the **Timeslot Details** tab. If multiple timeslots are reserved for the same time, a table containing all the reserved timeslots for this time is displayed below the timeslot grid.

Note: You cannot edit a past time, or a timeslot that is already in use in a running load test.

To edit a reserved timeslot when Automatic machine selection is selected:

1 In the Calendar view, select the timeslot to edit. The timeslot properties are displayed in the **Timeslot Details** tab.

Timeslot Details	Options	Comments		
Start Time: <u>1-May-201</u> Duration: 0 (ho (including 15 minutes	ours) 30 🔹	1 Nu (minutes) 🗖 cessing)	mber of Vusers: Autostart (Test: <u>Select Load Test</u>)	Machine Selection (Total:1) O Automatic - Load Generators # 1 Manual - <u>Edit Machines</u>
Reserve a New Timesl	ot			New Save Clear

- **2** To modify the timeslot reservation fields, click the **Start Time** link. A calendar opens displaying the date and time of the timeslot. Edit the calendar and click **Set**. The calendar closes.
- **3** Edit the duration field if necessary.
- **4** Edit the number of load generators (and Vusers) as required. To check for available resources, look in the Inventory section of the Timeslots page.
- **5** Click **Save**. A message at the bottom of the Timeslots page informs you whether the timeslot was updated.

To edit multiple reserved timeslots when Automatic machine selection is selected:

In the Calendar view, select the timeslot to edit. Where more than one timeslot is reserved for this time, a table containing all the reserved timeslots for this time is displayed below the timeslot grid.



You can sort the timeslots by clicking the column heading. An arrow appears next to the column heading indicating if the timeslots are sorted in descending or ascending order.

To add a timeslot reservation, click **New** and type the timeslot details in the **Timeslot Details** tab.

To delete a timeslot reservation, select the timeslot row and click **Delete**.

Note: You can only edit or delete future timeslots.

- **2** Click the **Edit** link in the row of the timeslot that you want to edit. The table closes and the timeslot properties are displayed in the **Timeslot Details** tab.
- **3** Continue with the configuration procedures for a reserved timeslot above.

To update the edit fields when Host Selection: Manual is selected:

- **1** Perform steps 1-4 of editing a reserved timeslot on page 104.
- **2** If you change the Host Selection to **Automatic**, click **Save**. A message at the bottom of the Timeslots page informs you whether the timeslot was updated.
- **3** To change a host machine, click **Select Machines**, and follow the instructions in "Manually Selecting Host Machines" on page 96.

If the change in time does not effect the hosts that are currently assigned to the time slot, a list of available hosts is displayed and you may select from it as described above.

If you extend a timeslot, and the extended timeslot overlaps a different reserved timeslot, the original host may not be available for the duration of the timeslot. For example:

Timeslot "A" starts at 2:00 PM and runs for one hour. When it was originally reserved the available hosts where named "host1" and "host2". You reserved the timeslot with "host1" as the selected host.

Timeslot "B" starts at 4:00 PM and runs for one hour. When it was originally reserved the available hosts where named "host1" and "host2". You reserved the timeslot with "host1" as the selected host.

If you want to extend Timeslot "A" by an additional two hours, a conflict arises because "host1" is reserved for Timeslot "B" during the desired time. In this case, a message informs you that "host1" is unavailable for the (extended) timeslot. In order to extend the timeslot, you must select "host2" as your host.

4 Click **Save**. A message at the bottom of the Timeslots page informs you whether the timeslot was updated.

To delete a reservation:

- **1** Select a timeslot row to delete.
- **2** Click the **Delete** button at the bottom of the page to delete the timeslot.

Note: You can only delete a future timeslot, or release a timeslot up to the current time.

Chapter 5 • Working With Timeslots
6

Monitor Profiles

You monitor load test execution using the Performance Center online monitors. To monitor server resources, you must configure the monitor settings for a load 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 load test in your project.

You can manage monitor profiles from the Monitor Profiles page.

The Monitor Profiles page provides a list of monitor profiles that exist in a project. Along with the general information provided in the main table, you can view, edit, and copy existing monitor profiles, and create new profiles that can be used by any test within your project.

Note: When designing or running a load test, you select which monitor profiles to use in the load test. For more information, see "Selecting Monitor Profiles for a Load Test" on page 221 and "Creating or Modifying the Runtime Monitor Profile" on page 386.

This chapter includes:

- ► Monitor Profiles Page at a Glance on page 110
- Managing Monitor Profiles on page 111
- Adding Monitor Over Firewall Machines on page 118

Monitor Profiles Page at a Glance

The Monitor Profiles page displays a list of all the monitor profiles in the Performance Center project.

From this page, you can:

- ► Create a new monitor profile
- ► Edit a monitor profile
- > Duplicate a monitor profile within the project
- > Import a monitor profile from another project
- ► Delete a monitor profile

The page also displays the MI_Listener machine IP address/name (if configured during installation), and the Monitor Over Firewall machines selected for the project. You can add Monitor Over Firewall machines or delete them from the Monitor Over Firewall machines list. For more information, see "Adding Monitor Over Firewall Machines to the Monitor Profiles Page" on page 311.

To open the Monitor Profiles page, on the Performance Center left menu, select **Project > Monitor Profiles**.



Managing Monitor Profiles

This section describes:

- ► "Creating Monitor Profiles" on page 111
- ► "Editing Monitor Profiles Settings" on page 114
- ► "Importing Monitor Profiles" on page 115
- ► "Duplicating Monitor Profiles" on page 117
- ► "Deleting Monitor Profiles" on page 117

Creating Monitor Profiles

The following section describes how to create monitor profiles in the Monitor Profiles page.

To create a monitor profile:

- **1** In the Monitor Profiles page, click **Add**.
- **2** The New Profile dialog box opens. Type a profile name and description and click **OK**.

3 The Add Monitor page opens. Select the monitor that you want to run and click **Next**.

Add Monitor	<u>_</u>
Choose Monitor:	Cancel Next >>
🗆 System Resource Graphs	
O Antara FlameThrower	
🕫 Windows Resources	
C UNIX Resources	
C SNMP	
C SiteScope	
O Windows Resources (SiteScope)	
C SNMP (SiteScope)	
C Server Resources (SiteScope)	
🖻 Web Server Resource Graphs	
C Apacha	•

4 The Choose Server page opens. Type the name or IP address of the server whose resources you want to monitor and, where relevant, the user login name and password. Click **Next**.

Add Monitor: Windows Resources	
Choose Monitor >> Choose Server:	Cancel Next >>
Server Name:	
User Name: Password:	

- **5** The Choose Measurements page opens.
- Expand a measurement group to display the available measurements. Select the measurements or measurement groups that you want to monitor.

To remove a selection, clear the relevant measurement's check box.

Add	Ιм	lonitor: Windows Resources: localhost
Choose	e Mo	nitor >> <u>Choose Server</u> >> Choose Measurements: Cancel Save
	Ser	viceModelEndpoint 3.0.0.0
	☑	Calls
	☑	Calls Per Second
		Calls Outstanding
	☑	Calls Failed
		Calls Failed Per Second
		Calls Faulted
		Calls Faulted Per Second
	☑	Calls Duration
		Transactions Flowed
	☑	Transactions Flowed Per Second

- 6 Click Save.
- **7** To add additional monitors or servers to the profile, click **Add** and repeat steps 3 6 for each monitor and server that you want to add to the profile.

Note: For information about setting up a specific monitor before configuring its measurements, see the relevant monitoring section in the *HP Performance Center Monitor Reference*.

8 On the left menu, select **Project** > **Monitor Profiles**. The monitor profiles is displayed in the list.

Editing Monitor Profiles Settings

This section describes how to edit monitor profile settings.

To edit a monitor profile's name and description:

 On the Monitor Profiles page (Project > Monitor Profiles), select a profile and click Edit Name to open the Edit Profile dialog box.

🔮 Edit Profile - Mic	rosoft Internet Explorer	
Edit Profile		
Profile Name:	SAP Monitoring	
Description:	Monitoring SAPGUI resources	×
	OK Cancel	

2 Edit the profile name and description, and click **OK**.

Note: You cannot give a monitor profile the same name as an existing monitor profile.

To modify a profile's settings:

1 On the Monitor Profiles page, select the profile you want to modify, and click the **Edit profile** button. The profile's page opens.

➤ To add another monitor to the profile, click Add. Provide the server information and select the measurements to monitor in the same way you would when creating a new profile. For details, see "Creating Monitor Profiles" on page 111.



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 \mathbf{X}

- To edit details of a monitor server in the profile, click the Edit button next to the relevant server, modify the measurement selection, and click Save.
- ► To delete a monitor server from the profile, click the **Delete Server** button next to the relevant server and click **OK**.
- ➤ To delete a monitor from the monitor profile, click the Delete Monitor button next to the relevant monitor and click OK.
- **2** On the left menu, select **Project** > **Monitor Profiles** to return to the Monitor Profiles page.

Modifying Monitor Profiles During a Run

You can modify the monitor profile settings while a load test is running. These changes apply to the current run only. They are not saved for subsequent runs of the load test. For more information, see "Creating or Modifying the Runtime Monitor Profile" on page 386.

Importing Monitor Profiles

You can import a single or several monitor profiles, with all their data, from an external project into the current project.

Note: Only users with the **Create monitor profile** permission in the current project can import monitor profiles.

To import monitor profiles from an external project:

1 On the Monitor Profiles page, click **Import**. The Import Monitor Profiles dialog box opens.

Imp	ort Monitor Profiles	
Sele	ct Project: Corp	Go
Moni	tor profiles for project: Corp	
	Monitor Profile Name ↓	Description
	Monitors	Internal server montions
	Local Profile	This is a local profile for the loadtest.
	CN_SITE	SiteScope monitoring. Dont delete before contacting Erik Luukas!
V	Internal sone?	Added monitors for CN on SiS server 10.163.130.34.
	External sone?	
Display Mess	ring items per page (1 - 5 of 5)	« <u>1</u> /1 »
		Import Close Help

2 In the **Select Project** list, select the project from which to import the profiles and click **Go**. The page displays all of the monitor profiles in the project you selected.

You can sort the profiles 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.

You filter the monitor profiles using the filter boxes below the column headings. The filter feature supports partial text look-up.

3 Select the profiles to import.

- **4** Click **Import**. A message appears in the **Messages** box notifying you whether the profile was imported successfully or not.
 - ➤ If the import succeeded, click Close to close to Import Monitor Profile dialog box. The imported profiles appear on the Monitor Profile page.
 - ► If the import failed, check the event log in the Administration Site. For more information, see the *HP Performance Center Administrator Guide*.

Duplicating Monitor Profiles

You can duplicate a monitor profile, with all its data, within the current project.

Note: Only users with the **Create monitor profile** permission in the current project can duplicate monitor profiles.

To duplicate a monitor profile within the project:

- **1** On the Monitor Profiles page, select a profile to duplicate.
- 2 Click Duplicate.

×

A duplicate of the selected profile appears on the Monitor Profiles page. Performance Center automatically assigns a default name to the monitor profile. To edit the name, select the monitor profile and click **Edit Name**.

Deleting Monitor Profiles

You delete monitor profiles from the Monitor Profiles page. (**Project > Monitor Profiles**)

To delete a monitor profile:

- **1** On the Monitor Profiles page, select the profile you want to delete.
- **2** Click the **Delete Profile** button and click **OK**. The profile is deleted from the Monitor Profiles list.

Adding Monitor Over Firewall Machines

On the Monitor Profile page, you manage the Monitor Over Firewall machines that can be accessed by load tests in this project.

To add a Monitor Over Firewall machine to a project:

1 On the Monitor Profiles page, click **Modify machine names**.



The Monitor Over Firewall Machines dialog box opens.

2 In the **Machine name** box, type the name of the Monitor Over Firewall machine.

🗿 Monitor Over Firewall machines - Microsoft Internet Explorer 📃 🔲 🗙
Edit Monitor Over Firewall machine list
Add a new Monitor Over Firewall machine:
Machine name: mofw2 Add
Note: You must use lower case for machine's name
Close Help

3 Click **Add**. The Monitor Over Firewall machine is added to the list.

4 Click **Close**. The name of the Monitor Over Firewall machine now appears on the Monitor Profiles page.

Monitor Profiles	
MI Listener IP address/name: Empty	
Monitor Over Firewall machines: mofw2 Modify machine names	

To select the Monitor Over Firewall machines to monitor a load test, see "Selecting Monitor Profiles for a Load Test" on page 221.

To remove a Monitor Over Firewall machine from a project:

1 On the Monitor Profiles page, click **Modify machine names**.

The Monitor Over Firewall Machines dialog box opens.

2 Click the Delete Monitor button next to the Monitor Over Firewall machine that you want to remove from the project.

🗿 Monitor Over Firewall machines - Microsoft Internet Explorer	. 🗆 🗵
Edit Monitor Over Firewall machine list	
	-
mofw2	
Add a new Monitor Over Firewall machine:	
Machine name: Add	
Note: You must use lower case for machine's name	
Close Help	-

The machine is removed from the list.

3 Click **Close**. The machine no longer appears on the Monitor Profiles page.

Part II

Designing Load Tests

7

Managing Vuser Scripts

This chapter discusses Vuser scripts and how to work with them in Performance Center and VuGen.

This chapter includes:

- ► About Managing Vuser Scripts on page 123
- Understanding Vuser Scripts on page 124
- ➤ Managing Scripts in the Vuser Scripts Page on page 125
- Managing Vuser Scripts in VuGen on page 139

About Managing Vuser Scripts

When you run a load test, 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 create Vuser scripts using HP's Virtual User Generator (VuGen). For more information, see the *HP Virtual User Generator User Guide*. You can also use Performance Center's URL-based script generator (see "Creating URL-Based Scripts in Performance Center" on page 134).

You upload the scripts to the Performance Center Vuser Scripts page. When you design a load test, you select one of the uploaded scripts as a basis for your test.

You can upload and manage scripts using one of the following:

- ➤ The Performance Center Vuser Scripts page. See "Managing Scripts in the Vuser Scripts Page" on page 125.
- ➤ HP Virutal User Generator. See "Managing Vuser Scripts in VuGen" on page 139.

Understanding Vuser Scripts

To have a better understanding of creating and configuring Vuser scripts, it is important to understand the way a script is stored and how it is accessed by a load test.

When you upload a script to the Vuser Scripts page, the script resides on the file server. The file server serves as a storage area for all uploaded scripts. The scripts can be used by multiple load tests.

The run-time settings for the uploaded script are the ones in effect when you recorded your script using VuGen.

When you create a load test, you specify which scripts you want to include in your load test. A script can be included in a load test as is. During a run, Performance Center uses the run-time settings of the uploaded script.

Another possibility is to change the run-time settings of the script when you configure your load test. In this case, when you save the load test, the newly configured run-time settings are saved to the database server and are associated with the particular load test. During a run, Performance Center ignores the run-time settings of the script and uses the ones you created on the database server.

To summarize, there are two possible routes you can take when including a script in a load test. In route one, the script is included without changes to the run-time settings, while in route two the run-time settings are changed when you configure the load test.

In route one, when the load test runs the script, it is executed from the file server with the run-time settings found there.

In route two, when the load test runs the script, it is executed from the file server with the run-time settings found on the database server.

Implications for Script Editing

As discussed, once a script is uploaded to the Vuser Script page, Performance Center stores any changes in the database. The script remains intact on the file server. It needs to stay the same on the file server because it is a shared resource.

Suppose you want to edit a script. After you download the script, you record additional steps and change some run-time settings.

When you upload the script, the test you uploaded replaces the script on the file server. In the case of route one, the updated script is run including the changed run-time settings. In the case of route two, the updated script is run. However, the load test uses the run-time settings stored in the database.

To update the run-time settings in the database, you need to change them from the Load Test configuration page. For more information, see "Configuring General Run-Time Settings" on page 549.

This logic applies to any other load tests that access your edited script.

Managing Scripts in the Vuser Scripts Page

From the Vuser scripts page (**Project** > **Vuser Scripts**), you can upload scripts, view script content, download scripts to a local directory, import scripts from another project, duplicate existing scripts, and delete scripts.

This section includes the following topics:

- ▶ "The Vuser Scripts Page at a Glance" on page 126
- ➤ "Uploading Scripts to the Vuser Scripts Page" on page 130
- ➤ "Importing Scripts from Other Projects" on page 132
- ➤ "Creating URL-Based Scripts in Performance Center" on page 134
- ► "Duplicating a Script" on page 136

- ► "Downloading Scripts from the Vuser Scripts Page" on page 137
- ➤ "Viewing Uploaded Scripts in the Vuser Scripts Page" on page 138

The Vuser Scripts Page at a Glance

The Vuser Scripts page displays all the stored Vuser scripts that are available in your project for use by Vusers during a load test. To access this page, on the Performance Center left menu, select **Project** > **Vuser Scripts**.

Vuser Scri	ots			
🟦 🐮 🛅 💷	🕘 6ð 🗙 🗘			
Туре	Script Name	Comment		Date Modified
Web Services	5k_dotnet_mst20			1/15/2008 10:50:22 AM
Web Services	5k_vugen_mst20			1/15/2008 10:50:29 AM
URL based	dd			1/14/2008 5:18:58 PM
Web (HTTP/HTML)	Web_message			1/15/2008 10:50:30 AM
Displaying 10 -	items per page (1 - 4 of 4)			« <u>1</u> /1 »
Vuser Script In	formation			
Script Name:	5k_vugen_mst20	D	ate Modifed:	1/15/2008 10:50:29 AM
Comment:	script for project2	D	ate Uploaded:	1/15/2008 10:50:28 AM
				Save Restore

The Vuser Scripts page includes the following components:

- ► Scripts Table (see page 127)
- ► Scripts Details Pane (see page 128)
- ► Scripts Toolbar (see page 129)

Scripts Table

Each row in the table represents a Vuser Script. You can select the amount of scripts to be displayed in the **displaying <n> items per page** list.

The scripts table includes the following columns:

- ► **Type.** The Vuser script type.
- **Script Name.** The name of the Vuser script.
- **Comment.** Any relevant information about the script.
- > Date Modified. The date on which the script was last updated.

Sorting and Filtering the Scripts

You can sort the scripts in the table 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.

You filter the scripts using the filter boxes below the column headings.

Note: Sorting and filtering settings are saved per user, per project. The next time the same user enters the Vuser Scripts page in a specific project, the page displays results based on the most recent sort order and filter.

To filter the scripts:

1 In one of the filter boxes below the column headings, type the relevant text or select a value from the list. Press ENTER.

The table displays scripts according to the selected filter option.

2 You can filter these results further by entering additional filter values for other columns in the table.

Notes:

- ➤ The filter supports partial text entries. For example, if you entered th, the display list might include Seth, Thomas, and Anthony.
- ➤ The filter does not support regular expressions or the following characters: :; & * \ ' / # ~ ,? { } \$ % | <> + = ` ^ [] !

Scripts Details Pane

When you select a script from the table, the script details are displayed in the details pane on the lower part of the page. You can edit the **Script Name** and the **Comment** field.

Note: To edit script details, you need to be assigned with **Edit script details** permissions.

The details pane includes the following fields:

- **Script Name.** The name of the Vuser script.
- **Comment.** Any relevant information about the script.
- **> Date Modified.** The date on which the script was last updated.
- > Date Uploaded. The date on which the script was first uploaded.

To edit the Script Name or Comment field:

- **1** Type the relevant information in the **Script Name** or **Comment** field.
- **2** To revert back to the original user details that were displayed before you modified them, click **Restore**.

To save your changes to the user details, click Save.

Note: You cannot give a script the same name as an existing script.

Scripts Toolbar

You use the toolbar buttons to perform the following actions.

Function	Button	Enables You To:
Upload Scripts	셝	Upload Vuser scripts saved in zip format to the Vuser Scripts page. See "Uploading Scripts to the Vuser Scripts Page" on page 130.
Import Scripts	₽	Import a Vuser Scripts from other projects into the current project. See "Importing Scripts from Other Projects" on page 132.
Create URL-based Script	*	Create a basic Vuser script that consists of simple links. See "Creating URL-Based Scripts in Performance Center" on page 134.
Duplicate Script	0=0	Duplicate a Vuser Script within the current project. See "Duplicating a Script" on page 136.
Download Script	约	Download scripts from the Vuser Scripts page and save them in a specified location. See "Downloading Scripts from the Vuser Scripts Page" on page 137.
View Script	69	View the code for each action in the selected script. See "Viewing Uploaded Scripts in the Vuser Scripts Page" on page 138.
Delete Script	×	Delete the selected script from the Vuser Scripts page.
Refresh	Φ	Refresh the data on the page.

Uploading Scripts to the Vuser Scripts Page

You upload Vuser scripts saved in zip format to the Vuser Scripts page. Before you perform the upload, check the following:

- the zip file is named after the Vuser script (.usr) file. For example, if the Vuser script file is oracle_test.usr, the zip file must be named oracle_test.zip.
- ➤ the zip file must contain the complete contents of the Vuser script folder, including the Vuser script file, and all related data files. The script files must be at the root of the zip file.

To upload a Vuser script from the Vuser Scripts page:

1 On the Vuser Scripts page (**Project** > **Vuser Scripts**), click the **Upload Scripts** button. The Upload Vuser Script dialog box opens.

🚰 Upload Vuser Script Microsoft Internet Explorer	
Upload a Yuser Script	A
Select Yuser script(s) to upload. Note that the sc in ZIP format and include all the files in the test s	ript must be script folder.
	Browse
Note: you can easily upload Vuser scripts from Vu connecting to Performance Center (PC) from Vuge saving the scripts directly to PC.	gen by ≥n and
Coverwrite existing scripts	
Upload Clear Form Close He	elp
	V



- **2** Click the **Browse** button, and browse to the zip file containing the Vuser script you want to upload.
- **3** Select the zip file, and click **Open**.
- **4** Select **Overwrite existing Scripts** to replace a script that already exists in the Vuser Scripts list.
- **5** Click **Upload** to upload the script and add it to the Vuser Scripts list.

Importing Scripts from Other Projects

You can import a single or several Vuser Scripts, with all their data, from another project into the current project. The import feature is only available if you have **Upload script** permissions in the current project.

To import Vuser Scripts from another project:

1 On the Vuser Scripts page (**Project** > **Vuser Scripts**), click the **Import Scripts** button. The Import Scripts page opens.

Cripts for	r project: Corp Script Name ↑ Ccc_domino_oldenv_generio_2 CN_1_1_1_01_02_med_reset	Script Type Multi+Web (HTTP/HTML)	Last Modified
Cripts for	r project: Corp Script Name ↑ Coo_domino_oldenv_generio_2 CN_1_1_1_01_02_med_reset	Script Type Multi+Web (HTTP/HTML)	Last Modified
۲ ۲ ۲	Script Name ↑ Coco_domino_oldenv_generio_2 CN_1_1_1_101_02_med_reset	Script Type Multi+Web (HTTP/HTML)	Last Modified
ব আ	ccc_domino_oldenv_generio_2 CN_1_1_1_01_02_med_reset	Multi+Web (HTTP/HTML)	8/15/2006 12:57:07 PM
지 지 지	ccc_domino_oldenv_generic_2 CN_1_1_1_01_02_med_reset	Multi+Web (HTTP/HTML)	8/15/2006 12:57:07 PM
	CN_1_1_1_1_01_02_med_reset		011012000 12.01.01 1 W
2		Multi+Web (HTTP/HTML)	11/3/2005 11:04:57 AM
	CN_1_1_1_01_med_reset	Multi+Web (HTTP/HTML)	11/3/2005 11:05:08 AM
	CN_1_1_1_02_med_reset	Multi+Web (HTTP/HTML)	11/3/2005 11:05:20 AM
	CN_1_1_1_03_med_reset	Multi+Web (HTTP/HTML)	12/14/2005 11:19:37 AM
	CN_1_1_1_04_med_reset	Multi+Web (HTTP/HTML)	11/4/2005 10:01:05 AM
	CN_1_1_1_06_med_reset	Multi+Web (HTTP/HTML)	11/3/2005 11:05:52 AM
	CN_1_1_1_07_med_reset	Multi+Web (HTTP/HTML)	11/3/2005 1:20:10 PM
v	CN_1_1_1_09_med_reset	Multi+Web (HTTP/HTML)	12/14/2005 12:11:02 PM
v	CN_1_1_1_10_med_reset	Multi+Web (HTTP/HTML)	11/3/2005 11:06:40 AM
isplaying ite	ems per page (1 - 10 of 86)		« 🔟 /9 »
lessages			
			<u> </u>
			-
			Import Close Wala

2 Select the project from which to import the script from the **Select Project** drop down list. Then click **Go**. The page displays a list of all the scripts in the project you selected.



You can sort the scripts 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.

You filter the vuser scripts using the filter boxes below the column headings. The filter feature supports partial text look up.

3 Select the scripts to import using the check boxes.

Tip: Selecting or clearing the check box next to the **Script Name** box, selects or clears all the check boxes respectively.

- **4** Click **Import**. A message appears in the **Messages** window notifying you if the import succeeded or failed.
 - ➤ If the import succeeded, click Close to close the Import Scripts page. The imported scripts appear in the Vuser Scripts page.
 - ► If the import failed, check the event log.

Creating URL-Based Scripts in Performance Center

You can use the URL-based script generator to create a basic Vuser script that consists of simple links. For example, you can create a Vuser script that accesses your status page and links to other pages within your site.

You can create your script by manually typing the URL information.

To manually create a URL-based Vuser script:

 On the Vuser Scripts page (Project > Vuser Scripts), click the URL-based Script Generator link. The URL- based Script Generator dialog box opens.

🚰 URL-based Script Generator - Performance Center - Microsoft Internet Explorer provided by Hewlett-Packard	
Create a URL-based script	
Type a name for the Vuser script.	
Insert URLs into the Vuser script. Type the URL, or copy and paste the URLs from the Web browser address window to the script generator using the <u>Cop</u>	y/Paste View.
http://	
Insert URL Overwrite URL	
	Move Up
	Move Down
	Delete
Double-click a URL to view it in a Web browser.	Delete
Use the buttons on the right to move a selected URL up or down, or to delete it.	
Create Script Cancel Help	
Performance Center processes the entire URL-based script as a single transaction. Unless otherwise configured in the script's run-time settings, the script will run continuously for the duration of the load test.	
	

- **2** Type a name for the Vuser script.
- **3** Insert URLs into the Vuser script by either:
 - ➤ Typing the address of the URL into the Insert URLs into the Vuser script box. Click Insert URLs. The URL appears in the Vuser script box. Repeat for all the URLs in the script.

 Copying and pasting the URL address from the Web browser address window using the Copy/Paste View. Click Copy/Paste View to open the Web browser address window and recorder window.



Move through your Web site using the browser window, and copy and paste the URL into the recorder below. Click **Insert URL**. Repeat for all the URLs in the script. Click **Exit Composing Mode** to close the windows and return to the Create a URL based script dialog box. The URLs are displayed in the Vuser script box.

4 To replace a URL in the Vuser script box, select it, type a new URL, and click **Overwrite URL**.

To delete a URL in the Vuser script box, select it, and click Delete.

To change the order of the URLs in the Vuser script box, use the **Move Up** and **Move Down** buttons to change the URL order.

5 Click **Create Script** to create the script and add it to the Vuser Scripts list, or **Cancel** to close the URL-based Script Generator dialog box without saving the Vuser script.

To modify a URL-based script:

- **1** Select the script in the scripts table and click the **View Script** button. The Create a URL based script dialog box opens.
- **2** Modify the script using the editing tools and methods described above.
- **3** Click **Save Script**. The Vuser Scripts page is updated with the modified script.

Duplicating a Script

You can duplicate a Vuser Script, with all its data, within the current project. The duplicate feature is only available if you have **Upload script** permissions in the current project.

To duplicate a Vuser Script within the project:

1 On the Vuser Scripts page (**Project** > **Vuser Scripts**), from the scripts table, select the script to duplicate.

2 Click the **Duplicate Script** button.

A duplicate of the selected script appears in the Vuser Scripts page. Performance Center automatically assigns a default name to the script. You can edit the name in the scripts details pane.



0=0

Downloading Scripts from the Vuser Scripts Page

You can download scripts from the Vuser Scripts page and save them in a specified location. You can use VuGen to edit the downloaded scripts and then upload them back on to your system.

To download a script from the Vuser Scripts page:

- 1 On the Vuser Scripts page (**Project** > **Vuser Scripts**), from the scripts table, select the script to download.
- **2** Click the **Download Script** button. Performance Center prepares the script for download and opens the Ready for Download dialog box.

🖉 Ready For Download - Microsoft Internet Explorer 💦 💶 🗙				
The requested file is ready for download!				
Size of Citrix_Colated.USZ file you are about to download is 513 KB				
Download				
Close Help				

- **3** Click the **Download** link. The File Download dialog box opens.
- **4** Click **Save**. The Save As dialog box opens.
- **5** Choose a file name and the location into which to download the file.
- 6 Click Save to download the file.

☆

You can use VuGen to open and modify the script.

Viewing Uploaded Scripts in the Vuser Scripts Page

You can open an uploaded script, and view the code for each action from the Vuser Scripts page.

To view a Vuser script:

- 1 On the Vuser Scripts page (**Project** > **Vuser Scripts**), from the scripts table, select the script to view.
- **2** Click the **View Script** button. The script opens in a read-only window.



- **3** Select an action to view its code.
- **4** To download the script, click Download Script and follow the instructions described in "Downloading Scripts from the Vuser Scripts Page" on page 137.



Managing Vuser Scripts in VuGen

VuGen works together with Performance Center to provide an efficient method for uploading Vuser scripts to the Performance Center script repository (Vuser Scripts page) and for editing scripts.

This section includes the following topics:

- ➤ "Preparing VuGen to Work with Performance Center" on page 139
- ► "Connecting VuGen to Performance Center" on page 140
- ➤ "Uploading a Vuser Script from VuGen" on page 141
- ► "Downloading Vuser Scripts in VuGen" on page 144
- ▶ "Editing Vuser Scripts in VuGen" on page 146
- ➤ "Disconnecting VuGen from Performance Center" on page 147

Preparing VuGen to Work with Performance Center

To manage Vuser scrips in VuGen, perform the following steps:

- 1 Check your version of VuGen is enabled to manage scripts.
 - **a** Start VuGen, and open a new or existing VuGen script.
 - **b** Open the **Tools** menu.

If the menu item **Performance Center Connection** is available on the Tools menu, your version of VuGen is enabled to manage scripts.

Note: If your version of VuGen is not enabled to manage scripts, or if you do not have VuGen installed on your machine, you need to install an updated version of VuGen. For installation information, see the *HP Performance Center System Configuration and Installation Guide*.

2 Connect VuGen to Performance Center.

To access a Performance Center project, you must first connect it to the Web server on which Performance Center is installed. For more information, see "Connecting VuGen to Performance Center" on page 140.

Connecting VuGen to Performance Center

VuGen works together with Performance Center to provide an efficient method for uploading and downloading Vuser scripts to and from Performance Center. In order for VuGen to access a Performance Center project, you must first connect it to the Web server on which Performance Center is installed. You can then upload or download Vuser scripts.

To connect VuGen to Performance Center:

1 In VuGen, select **Tools > Performance Center Connection**. The Configure Performance Center Connection dialog box opens.

Configure Pe	formance Center Connection
<u>U</u> RL:	http://bmx/LoadTest
	Example : "http://PCserver/loadtest"
U <u>s</u> er Name:	Tester1
Password:	жжжж
Rememb	er user name and password
🗖 <u>A</u> uto con	nect on start
Help	<u>C</u> onnect Cancel

- 2 In the URL box, type the URL address of the Web server on which Performance Center is installed. The URL address should be in the format: http://<server_name>/loadtest
- **3** Enter your user name and password. Contact your Performance Center administrator if you need assistance.
- **4** To automate the login process, select **Remember user name and password**. The specified username and password are saved to the registry, and displayed each time you open the dialog box.
- **5** To automatically open the connection to the Performance Center server when you start VuGen, select **Auto connect on start**. VuGen attempts to connect to Performance Center using the displayed login information.
- **6** Click **Connect**. The Performance Center Connection dialog box displays the connection status.

Once the connection is established, all the fields are displayed in read-only format.

Note: If the connection fails, a dialog box displays the reason for the connection failure.

You cannot be connected to Performance Center and Quality Center at the same time.

If VuGen is not connected to Performance Center, you can save the Vuser script files locally to the file system. Later, when VuGen is connected to Performance Center, open the script in VuGen and upload it to Performance Center as described below.

Uploading a Vuser Script from VuGen

Once VuGen is connected to the Web server on which Performance Center is installed (see "Connecting VuGen to Performance Center" on page 140), you can upload scripts directly to the Performance Center Web server.

VuGen lets you select the extent of the uploading. Depending on your requirements, you can do a partial or a complete upload. The upload options are:

Upload Script	X
Upload options	
 Upload run time files (Script, RTS, parameters, etc.) 	
 Upload all files (longer upload time) 	
Learn more shout upload options	
OK Cancel	

- ➤ Upload run time files. Deletes all main script files (*usr*, *c*, *cfg*, and *xml* files) from the server. It does not delete data files or old recorded data. Next, VuGen uploads the script files, the run-time settings, and the parameter files.
- ➤ Upload all files. First VuGen deletes all script and data files from the server. VuGen then uploads the current script and data files, including the recording data and the replay result directories.

Uploading the run time files only is quicker since VuGen only uploads the script files—not all of the recording data and the replay results.

Note: If you previously downloaded the run time files, by default VuGen will only upload the files that were downloaded. If you want to upload newly created files, for example, snapshots generated after replay, you must specify **Upload all files**.

To upload a script to Performance Center from VuGen:

1 Make sure that you are connected to Performance Center. Select **Tools** > **Performance Center Connection**.

2 Select File > Save As in VuGen. The Save script dialog box opens.

Save script			×
Save script to Performance Center projects:	Find Project:	ngspj	Þ
i efrat_project			
EmptyProj			
🕀 🖳 Internal Portal			
⊡ Netbank - Poland			
baseli95			
baselineA_251_500_soloIDs			
Autorun_test			
SecureMail_experimenting			
			-
File name: 90_Web_Load_http_ex			
Select from file system	[OK	Cancel

- **3** In the **Find Project** box, type a name of a project or part of the name to locate the desired project. To begin the search, click the arrow to the right of the box. To move to the next match, click the arrow again.
- **4** Select the project under which you want to save the script. In the **File name** box, type a name for the script.

Note: File names can only consist of English letters, digits, or the underscore character, and cannot exceed 250 characters.

- **5** Click **OK**. The Upload Script dialog box opens. Select one of the Upload Options, **Upload run time files** or **Upload all files**.
- 6 Click OK to upload the files to the Performance Center server.

Downloading Vuser Scripts in VuGen

Once VuGen is connected to the Web server on which Performance Center is installed (see "Connecting VuGen to Performance Center" on page 140), you can download scripts for editing.

Depending on your requirements, you can do a partial or a complete download. The download options are:

Download Script	×				
-Download options					
 Download run time files (Script, RTS, parameters, etc.) 					
C Download all files (longer download time)					
Learn more about download options					
OK Cancel					

- ➤ Download run time files. VuGen downloads the script files only, allowing faster downloads. This includes the script file, run-time settings, and parameter files.
- Download all files. VuGen downloads the script and data files, including the recording data and the replay result directories.

A partial download of run time files only is quicker since VuGen only downloads the script files. If you download all the script and data files, the transfer will take more time.

Once you are connected to the Performance Center server, you can download your script files to VuGen.
To download a Vuser script from Performance Center:

- Make sure that you are connected to Performance Center. Look for the PC Connected button on VuGen's the status bar.
- **2** In VuGen, select **File > Open**. The Select Script dialog box opens.

Select Script			×
Select script from Performance Center projects:	Find Project:	net	Þ
🗄 🖳 Hyperion			
🗄 🕀 🧰 Install verification			
🗄 🕀 🧰 Internal Portal			
📑 🕀 🧰 lasse_test			
💿 🕀 💼 Netbank - Poland			
🖶 🕀 💼 NGSP			
🖶 💼 NGSP SE			
🗄 🕀 🗀 NIMS			
🗄 💼 NimsNEW			
🗄 💼 Nordic Cash Pool Fl int			
🖶 💼 NTP			
🗄 💼 OTC - One Time Code			
🗄 💼 RICANS			
🚽 🧰 shadi_proj			
🗄 🕀 🧰 Teller			
🗄 💼 TestDirector			
Select from file system		OK.	Cancel
	_		

- **3** Search for the project containing the script you want to download. In the **Find Project** box, type a name of a project or part of the name to locate the desired project. To begin the search, click the arrow to the right of the box. To move to the next match, click the arrow again.
- **4** Expand the project and select the script that you want to download.

5 Click OK. The Download Script dialog box opens.



- 6 Select a download option: Download run time files or Download all files.
- **7** Click **OK** to download the files from Performance Center. The Downloading files progress bar opens. When the download is complete, the progress bar closes and VuGen displays the script.

Editing Vuser Scripts in VuGen

After you download a script, you can edit it in VuGen.

By default, downloaded files are saved to your **Temp** directory. You can save the changes locally or upload the edited script back to the Performance Center server.

If you are connected to Performance Center, the Save operation automatically uploads the script to the Performance Center server.

Downloaded scripts whose source is the Performance Center server, appear in the File menu's Recent Script list, with a **[PC]** prefix.

To save changes made to a downloaded scripts:

1 To save the script on the Performance Center server, click **Save**. VuGen prompts you with the Upload options (provided that you are connected).

If you want to upload newly created files, such as snapshots generated after replay, you must specify **Upload all files**.

2 To save the script locally, click **Save As.** The Save Script dialog box opens. Click **Select from file system** and browse for the desired location. Click **OK**.

Disconnecting VuGen from Performance Center

You disconnect VuGen from the Performance Center Web server using the Configure Performance Center Connection dialog box.

To disconnect VuGen from Performance Center:

- 1 In VuGen, select **Tools** > **Performance Center Connection**. The Configure Performance Center Connection dialog box opens.
- **2** Click the **Disconnect** button. VuGen disconnects from Performance Center, and the dialog box closes.

Chapter 7 • Managing Vuser Scripts

Defining Performance Targets

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

This chapter includes:

- ► About Defining Service Level Agreements on page 150
- > Defining an SLA Goal Measured Per Time Interval on page 151
- > Defining an SLA Goal Measured Over the Whole Run on page 161
- ► Understanding the Service Level Agreement Window on page 163

About Defining Service Level Agreements

When you design a load test, you can define goals or **service level agreements** (SLAs) for the performance metrics. When you run the load test, Performance Center gathers and stores performance-related data. When you analyze the run, Analysis compares this data against the SLAs and determines SLA statuses for the defined measurements.

Depending on the measurements that you are evaluating, Performance Center determines SLA statuses in one of the following ways:

- ➤ SLA status determined at time interval over a timeline. Analysis displays SLA statuses at set time intervals—for example, every 10 seconds—over a timeline within the run. For more information, see "Defining an SLA Goal Measured Per Time Interval" on page 151.
- ➤ SLA status determined over the whole run. Analysis displays a single SLA status for the whole load test run. For more information, see "Defining an SLA Goal Measured Over the Whole Run" on page 161.

Note: You can define and edit SLAs in Performance Center or in Analysis.

For details about viewing SLA information in Analysis reports, see the *HP LoadRunner Analysis User Guide*.

Defining an SLA Goal Measured Per Time Interval

For the **Average Transaction Response Time** and **Errors per Second** measurements, Analysis displays SLA statuses at set time intervals over a timeline within the run.

That is, at each time interval in the timeline—for example, every 10 seconds—Analysis checks if the measurement's performance deviated from the threshold defined in the SLA.

When creating SLAs for these measurements, you can also specify which load criteria to take into account when comparing the data.

- ➤ To define SLAs for Average Transaction Response Time, see "SLAs for Average Transaction Response Time" below.
- To define SLAs for Errors per Second, see "SLAs for Errors Per Second" on page 156.
- To set the time intervals that Analysis uses for evaluating the SLA, see "Selecting a Tracking Period" on page 160.

Note: A transaction that contains the "@" symbol in its name will not display SLA results in the default report summary page. To view results, rename the transaction so that it does not contain this symbol.

SLAs for Average Transaction Response Time

This section explains how to define an SLA for evaluating the status of Average Transaction Response Time during the run. For Average Transaction Response Time, Performance Center evaluates SLA statuses at set time intervals within the run.

Note: To set the time intervals that Analysis uses for evaluating the SLA, see "Selecting a Tracking Period" on page 160.

To define an SLA for Average Transaction Response Time:

 In the Load Tests page, in the relevant load test row click the Performance Targets button or click Target at the bottom of the Load Test configuration page.

The Service Level Agreement window opens.

- **2** Click **New SLA**. The Service Level Agreement Wizard opens.
- **3** Click Next.
- **4** Complete the SLA Wizard steps, as described in the following sections.

Measurement—Select a Measurement for Your Goal

For Average Transaction Response Time, SLA statuses are evaluated at set time intervals within the run.

Under SLA status determined at time intervals over a timeline, select Average Transaction Response Time. Click Next.

Transactions—Select Transactions

From the **Available Transactions** list, select the transactions that you want to evaluate as part of your SLA and click **Add**.

The transactions you selected are displayed in the **Selected Transactions** list.

Click Next.

Load Criteria—Set Load Criteria

Select load criteria for your goal and define appropriate load value ranges.

Note: In the next wizard step (Thresholds page), you will set different thresholds per each of these load value ranges.

1 In the **Load Criteria** box, select the relevant load criteria that you want to use.

You can select the following load criteria:

- ► Running Vusers
- ➤ Throughput
- ➤ Hits per Second
- ► Transactions per second
- ► Transactions per second (passed)

To define an SLA without load criteria, select **None** in the **Load Criteria** box.

- **2** Define the Load Values.
 - In the Less than box, set the lower load value range by entering a maximum value for this range. This range is between 0 and the maximum value you entered, but does not include the maximum value.
 - ➤ To set in-between load value ranges, select Between and enter minimum and maximum values for the range. The minimum value is included in the range and the maximum value is not.

Load Criteria:	Running Vusers 💌		
Load Values:	🖉 Less than	5	
	✓ Between	5	- 10
	🗌 Between		-
	🗌 Between		-
	🗹 Greater than or equal to	10	

Note: You can set up to three in-between ranges.

➤ To set the upper load value range, select Greater than or equal to and enter the minimum value for this range. The minimum value is included in this range.

Note: Valid load value ranges are consecutive—there are no gaps in the range—and span all values from zero to infinity.

3 Click Next.

Thresholds—Set Threshold Values

Set maximum thresholds for each transaction that you are evaluating.

- ➤ If you defined load criteria in the previous step, you set thresholds for each transaction per the defined load value ranges.
- ➤ If you did not define load criteria, you set a single threshold for each transaction.

Type the relevant thresholds (per load criteria, if defined) in the first table on the page.

Tip: If you want to apply one set of threshold values to all transactions, type the threshold values in the table displayed at the bottom of the page and click **Apply to all transactions**. These values are applied to all the transactions in the first table.

After you apply one set of threshold values to all transactions, you can modify the thresholds of individual transactions manually in the first table.

	Running Vusers		
Transaction Name	<5	5≤ and <10	≥10
WebLoadTest	4	7	4

Note: If Average Transaction Response Time exceeds the maximum threshold value during a particular time interval during the run, Analysis displays an SLA status of **Failed** for that time interval.

Finish

If you want to define another SLA after you save the current one, select **Define another SLA**.

Click **Finish** to save the SLA.

Note: For details about viewing SLA information in Analysis reports, refer to the *HP LoadRunner Analysis User Guide*.

SLAs for Errors Per Second

This section explains how to define an SLA for evaluating the status of Errors per Second during the run. For Errors per Second, Performance Center evaluates SLA statuses at set time intervals within the run.

Note: To set the time intervals that Analysis uses for evaluating the SLA, see "Selecting a Tracking Period" on page 160.

To define an SLA for Errors per Second:

 In the Load Tests page, in the relevant load test row click the Performance Targets button or click Target at the bottom of the Load Test configuration page.

The Service Level Agreement window opens.

- 2 Click New SLA. The Service Level Agreement Wizard opens.
- 3 Click Next.
- **4** Complete the SLA Wizard steps, as described in the following sections.

Measurement—Select a Measurement for Your Goal

For Errors per Second, SLA statuses are evaluated at set time intervals within the run.

Under SLA status determined at time intervals over a timeline, select Errors per Second, and click Next.

Load Criteria—Set Load Criteria

Select load criteria for your goal and define appropriate load value ranges.

Note: In the next wizard step (Thresholds page), you will set different thresholds per each of these load value ranges.

1 In the **Load Criteria** box, select the relevant load criteria that you want to use.

You can select the following load criteria:

- ► Running Vusers
- ► Throughput
- ➤ Hits per Second

To define an SLA without load criteria, select **None** in the **Load Criteria** box.

- **2** Define the Load Values.
 - In the Less than box, set the lower load value range by entering a maximum value for this range. This range is between 0 and the maximum value you entered, but does not include the maximum value.
 - ➤ To set in-between load value ranges, select Between and enter minimum and maximum values for the range. The minimum value is included in the range and the maximum value is not.

Load Criteria:	Running Vusers 💌		
Load Values:	🖉 Less than	5	
	✓ Between	5	- 10
	🗌 Between		-
	🗌 Between		-
	🗹 Greater than or equal to	10	

Note: You can set up to three in-between ranges.

➤ To set the upper load value range, select Greater than or equal to and enter the minimum value for this range. The minimum value is included in this range.

Note: Valid load value ranges are consecutive—there are no gaps in the range—and span all values from zero to infinity.

3 Click Next.

Thresholds—Set Threshold Values

In the Thresholds page you set a maximum threshold value for Errors per Second.

- ➤ If you defined load criteria in the previous step, type threshold values per the defined load value ranges, in the table provided.
- ➤ If you did not define load criteria, type the maximum threshold value in the Threshold box.

Click Next.

Note: If Errors per Second exceeded the maximum threshold value during a particular time interval during the run, Analysis displays an SLA status of **Failed** for that time interval.

Finish

If you want to define another SLA after you save the current one, select **Define another SLA**.

Click **Finish** to save the SLA.

Note: For details about viewing SLA information in Analysis reports, refer to the *HP LoadRunner Analysis User Guide*.

Selecting a Tracking Period

When you define a service level agreement for measurements that are evaluated over a timeline, Performance Center determines SLA statuses at specified time intervals within that timeline. These time intervals are known as the **tracking period** of the load test.

To define the tracking period for the load test:

- **1** In the Service Level Agreement window, click the **Advanced** button. The Advanced Options window opens.
- **2** Select one of the following methods to determine the tracking period for the load test.

► Internally calculated tracking period.

Analysis sets the tracking period to the minimum value possible, taking into account the aggregation granularity defined for the load test. This value is at least 5 seconds. It uses the following formula:

Tracking Period = Max (5 seconds, aggregation granularity)

> Tracking period of at least X seconds.

Select a value (X) to determine the minimum amount of time for the tracking period. This value can never be less than 5 seconds.

Analysis sets the tracking period to the nearest multiple of the load test's aggregation granularity that is greater than or equal to the value (X) that you selected.

Assume, for example, that you select a tracking period of X=10, and assume that the aggregation granularity for the load 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 load test's aggregation granularity such that m(Aggregation Granularity) \geq X

3 Click OK.

Defining an SLA Goal Measured Over the Whole Run

For certain measurements—Total Hits, Average Hits, Total Throughput, and Average Throughput—Analysis displays a single SLA status for the whole load test run. This section explains how to define an SLA for these measurements.

To define an SLA that evaluates the status over a whole run:

 In the Load Tests page, in the relevant load test row click the Performance Targets button or click Target at the bottom of the Load Test configuration page.

The Service Level Agreement window opens.

- 2 Click New SLA. The Service Level Agreement Wizard opens.
- **3** Click Next.
- **4** Complete the SLA Wizard steps, as described in the following sections.

Measurement—Select a Measurement for Your Goal

For the following measurements, Analysis displays a single SLA status for the whole load test run:

- ► Total Hits
- ► Average Hits (Hits per second)
- ► Total Throughput
- ► Average Throughput (Bytes per second)

Select **SLA status determined over the whole run**, select the relevant measurement, and click **Next**.

Thresholds—Set Threshold Values

The measurement that you selected in the previous step is displayed in the **Selected measurement** box.

In the **Threshold** box, type the minimum threshold value for your measurement.

Click Next.

Note: If the measurement value falls below this minimum threshold value during the run, Analysis displays an SLA status of **Failed** for the entire run.

Finish

If you want to define another SLA after you save the current one, select **Define another SLA**.

Click **Finish** to save the SLA.

Note: For details about viewing SLA information in Analysis reports, refer to the *HP LoadRunner Analysis User Guide*.

Understanding the Service Level Agreement Window

Function	Button	Enables You To
New SLA	New SLA	 Define a new SLA. See: "Defining an SLA Goal Measured Per Time Interval" on page 151 "Defining an SLA Goal Measured Over the Whole Run" on page 161
Details		View the details of the SLA selected in the Service Level Agreement window. The Service Level Agreement - Goal Details box opens, displaying a summary of the details of the selected SLA.
Edit	Ø	Edit the definitions of the SLA selected in the Service Level Agreement window. The SLA wizard opens with the details of the selected SLA.
Delete	×	Delete the SLA selected in the Service Level Agreement window.
Advanced	Advanced	Adjust the tracking period for SLAs that are evaluated per time interval over a timeline. See "Selecting a Tracking Period" on page 160.

The Service Level Agreement window includes the following options:

Chapter 8 • Defining Performance Targets

9

Configuring Load Tests

After you add Vuser scripts to the Vuser Scripts list (see Chapter 7, "Managing Vuser Scripts"), you create a load test and configure its settings.

This chapter includes:

- ► About Creating and Configuring Load Tests on page 165
- ► Viewing Load Test Summary Details on page 167

About Creating and Configuring Load Tests

You create and configure a load test from the Load Test configuration page.



Creating a load test involves:

- ► Creating a load test
- ► Designing a workload for the load test

- ► (Optional) Configuring monitor settings
- ► (Optional) Configuring diagnostic distribution settings

Creating a Load Test

When you create a load test, you give the load test a name and description.

To create a load test:

- 1 On the Performance Center left menu, select Load Tests > Manage. The Load Tests page opens, displaying all the load tests in the current project.
- **2** Click the **New Load Test** button.

The Load Test configuration page opens, displaying the **General** tab.

3 In the **Name** and **Description** boxes, enter a name and description for the new load test.

General		Workload	Monitors	Diagnostics
Name:	Load Te	st 1		
Description:	Descript	ion		

4 Click **Save** at the bottom of the Load Test configuration page to save the load test.

The load test is saved but is invalid at this stage. To create a valid load test, you must design a workload for the load test, as described below.

Designing a Workload for the Load Test

After you create a load test, you design a workload for the load test.

When you start designing your load test, you create Vuser groups to run in the load test, and select a method for distributing load generators among the Vuser groups. You can create a schedule for running the load test, and configure other optional load test settings.

For more information, see Chapter 10, "Designing Load Test Workloads."

Configuring Monitoring Settings (Optional)

When designing the load test, you can define relevant monitors and monitor resources that will monitor the load test when it runs. You can select existing monitor profiles for the load test or create new ones. For details, see Chapter 12, "Configuring Load Test Monitor Settings."

Configuring Diagnostic Distribution Settings (Optional)

You can enable diagnostics modules to collect diagnostics data about the load test. For details, see Chapter 13, "Configuring Diagnostics Settings."

Viewing Load Test Summary Details

After you create and configure a load test, Performance Center displays the following information in the **Load Test Details** section of the General tab:

```
      Load Test Details

      No. Vusers: 3

      No. Load Generators: 1

      Diagnostics:

      Monitoring:

      Scripts:

      Rendezvous2

      Citrix_Colated
```

- ► No. Vusers. Total number of Vusers configured to run in the load test.
- > No. Load Generators. Number of load generators configured in the load test.
- ➤ Diagnostics. The diagnostics servers and J2EE/.NET probes that are enabled in the load test.
- > Monitoring. The monitor profiles used for monitoring the load test.
- ► Scripts. The Vuser scripts used in the load test.

Chapter 9 • Configuring Load Tests

10

Designing Load Test Workloads

To run load tests on your application, you must design a workload that emulates groups of users running on the application.

This chapter includes:

- ► The Workload Tab at a Glance on page 170
- > Overview of Configuring Workload Settings on page 171
- ► Types of Workloads on page 173
- ► Selecting a Workload Type on page 175
- ► Creating Vuser Groups on page 177
- ► Load Generator Distribution on page 180
- ➤ Configuring Optional Workload Settings on page 185
- ► Viewing Scripts on page 190

The Workload Tab at a Glance

You design a workload in the Workload tab of the Load Test configuration page.



The Workload tab is divided into the following areas:

- Workload definition area. Provides a definition of the workload selected for the load test.
- Groups pane. In the Groups pane, you create and configure Vuser groups to run in the load test and define how to distribute the load generators among the Vuser groups.
- Scheduler pane. In the Scheduler pane, you can design a schedule for the load test.

*	
\$	

Tip: You can optimize the area of the Groups and Scheduler panes by clicking the Collapse/Expand buttons in the top left corner of each pane.

Overview of Configuring Workload Settings

Part of creating a load test involves designing a workload for the load test. You create Vuser groups that emulate groups of users running on the application, and configure how they should behave in the load test.

The following diagram illustrates the workload design flow:



1 Select a workload type.

Select the type of schedule to set up for the load test, and a method for distributing Vusers among the Vuser groups. See "Types of Workloads" on page 173.

2 Create Vuser groups.

Create groups of Vusers to run selected Vuser scripts in your load test. See "Creating Vuser Groups" on page 177.

3 Determine how to distribute load generators among the Vuser groups, and assign load generators to the Vuser groups.

Select a method for distributing load generators among Vuser groups in the load test, then assign the load generators to the Vuser groups accordingly. See "Load Generator Distribution" on page 180.

4 Design a schedule for running the load test.

When you design a schedule for a load test, you can specify how many Vusers to start running in each Vuser group, how long to run them, and when to stop running them. See Chapter 11, "Configuring Scheduler Settings."

5 Configure optional workload settings.

You can also configure the following optional settings from the Workload tab:

- ➤ Terminal Services. When using manual load generator distribution, you can open terminal services sessions on the load generator, enabling you to run multiple GUI Vusers simultaneously on the same application. For more information, see "Configuring Terminal Sessions" on page 238.
- ➤ Run-time Settings. You can edit run-time settings for the script, and copy the run-time settings used in one script to another script. For more information, see "Configuring Run-Time Settings" on page 187.
- Command Line Parameters. Sending command line arguments enables you to configure load test settings without the need to manually define them in the UI. For more information, see "Using Command Line Arguments" on page 189.
- Rendezvous Points. Rendezvous points cause multiple Vusers to perform tasks at exactly the same time, thereby creating intense user load on the server. Creating rendezvous points enables you to check your system's response under specific load. For more information, see Chapter 16, "Using Rendezvous Points."
- ➤ WAN Emulation. Emulating a WAN during a load test enables the load test to run in an environment much closer to an actual deployment scenario, exposing issues that can arise from WAN conditions such as latency, bandwidth limitations and packet loss. For more information, see Chapter 17, "WAN Emulation."

Types of Workloads

When you start designing a load test, you design a workload for the test, selecting a **type of schedule** by which to run the load test, and an appropriate **method for distributing Vusers** among the Vuser groups that you created for the load test.

Schedule Run Modes

You can schedule a load test to run according to the run-time settings defined in the enabled Vuser groups, or you can let the groups run over and over again until a defined schedule instructs them to stop running.

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

- ➤ Basic schedule. Vusers run according to the run-time settings defined in the Vuser script. You can schedule how to start running the Vusers (gradually or simultaneously), how long to run them for, and how to stop running the them (gradually or simultaneously). When all the Vusers have finished running, the load test ends.
- ➤ Real-world schedule. The load 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 schedule different numbers of Vusers to start and stop running several times, and you can specify how long to wait between each action.

Load Test Schedule Types

When setting up a load test, you can schedule all the Vuser groups in the load test to run together, or you can schedule each Vuser group according to its own schedule.

Scheduling by Load Test. When you define a schedule by load test—one global schedule for all the selected Vuser groups in the load test—Performance Center runs all the Vuser groups in the load test concurrently, applying each action proportionately to all the Vusers groups.

For example, take a load test with three enabled Vuser groups, **Group1**, **Group2**, and **Group3**, where Group1 has 10 Vusers, Group2 has 20 Vusers, and Group3 has 30 Vusers, giving a total of 60 Vusers. When scheduling by load test, if the schedule instructs Performance Center to load 30 Vusers, Performance Center loads a proportional number of Vusers from each of the groups—that is, 5 from Group1, 10 from Group2, and 15 from Group3, totalling 30 Vusers, as instructed.

Scheduling by Group. For each enabled Vuser group in a load test, you can define a separate schedule. When running the load test, all the Vuser groups run, but each on its own schedule.

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

Vuser Distribution Methods

When selecting a workload, you must specify how to distribute the Vusers among the Vuser groups.

➤ By number. Enables you to allocate a number of Vusers to each Vuser groups. When you create a Vuser group, by default Performance Center allocates 10 Vusers to the group. You can edit this number of Vusers. The total number of the Vusers assigned to all the Vuser Groups is displayed in the Groups pane toolbar.



➤ By percentage. Enables you to specify a percentage of the total number of Vusers in the load test to allocate to each Vuser group. After you select all the Vuser groups for the load test, you specify the percentage of Vusers that you want to assign to each group. Alternatively, you can have Performance Center calculate the percentage according to a ratio of Vusers to use from each group. For more information, see "Distributing Vusers Using Relative Distribution" on page 186.

Selecting a Workload Type

.....

You select a workload for the load test in the Workload tab. The workload comprises a type of **schedule** by which to run the load test, and an appropriate method for **distributing Vusers** among the Vuser groups that you created for the load test.

To select a workload option for your load test:

- **1** On the Load Test configuration page, click the **Workload** tab.
- **2** Next to the **Workload type** box, click the **Select Workload Type** button. The Workload Types dialog box opens.

Workload Typ	es	
$ \land $	Basic schedule, by load test	
	Basic schedule, by group	
	Real-world schedule, by load test By number By percentage	
12	Real-world schedule, by group	
OK Cancel		

- **3** Select a workload by clicking the image:
 - **Basic schedule, by load test.** All Vuser groups run on one basic schedule.
 - ► **Basic schedule, by group.** Each Vuser groups runs on its own basic schedule.
 - ► **Real-world schedule, by load test.** All Vuser groups run on one real-world schedule.
 - ► **Real-world schedule, by group.** Each Vuser groups runs on its own real-world schedule.

For more information about the workload types, see "Types of Workloads" on page 173.

- **4** If you select a schedule **by load test**, select a method for distributing the Vusers among the Vuser groups:
 - ► **By number.** Enables you to allocate a number of Vusers to each Vuser groups.
 - ► **By percentage.** Enables you to specify a percentage of the total number of Vusers to allocate to each Vuser group.

For details, see "Vuser Distribution Methods" on page 174.

Note: When scheduling by **Vuser group**, you can allocate Vusers to the Vuser groups by number only.

5 Click OK. A definition for the workload you selected is displayed in the Workload type box.

Creating Vuser Groups

After you have selected a type of workload for the load test, you create one or more Vuser groups to run Vuser scripts in the load test run.

To create Vuser groups:

- **1** On the Load Test configuration page, click the **Workload** tab.
- **2** In the Groups pane, select scripts in one of the following ways:
 - ➤ To select a single script: In the Script column, click Click here to add a new group. A list opens containing all the scripts in the current project.

Select a script for the Vuser group.

E Gro	ups	
+ 68	🖻 🖅 📉 🔛 🐼 💷 🖾 🛛 Total	Vusers:0
#	Script	Group
	Click here to add a new group	•



➤ To select multiple scripts: Click the Add Multiple Groups button, select multiple scripts in the list, and click OK.

🎒 Add	Multiple Groups - Microsoft Internet Explorer prov 💶 🗖 🗙
Select sc	ripts:
	Script Name 🔺
	91_Rendezvous
	oracle na
	oracle_na
	script
	script1
	script2
	soript3
	script4
	ScriptWithCMD
	snapshot_error
Displayi	ng items per page (1 - 10 of 11) 🔍 🔟 /2 »
	OK Cancel
<u> </u>	

Note: If the script you want to use does not appear in the list, you need to upload it to the Vuser Scripts page. For details, see "Uploading Scripts to the Vuser Scripts Page" on page 130.

3 In the **Group Name** column, the Vuser group is given the same name as the selected script.

(Optional) To rename the Vuser group, click the group name and type a new name. The name must not contain spaces nor any of the following characters: $< > . | : ; ! ? & * # - @ % ^ ()$.

- **4** (Optional) Allocate Vusers to the Vuser groups according to the type of workload you selected for your load test (see "Vuser Distribution Methods" on page 174):
 - **By number.** Allocate Vusers to each Vuser group.
 - Basic schedule: In the Groups pane, enter the number of Vusers in the # column.

\$	Groups	5	
+	68 🖹 🖉	7 🗙 🔛 🚱 💷 🖾 🛛 Total Vusers: 50	
#		Script	Group
20		hp_Copy_2	hp_cop
20		script	script
10		script2	script2
		Click here to add a new group	

 Real-world schedule: In the Scheduler pane, enter the number of Vusers to run in each Start Vusers action.

Slobal Schedule			
🎽 🍕	🛍 🔎 Scheduled Vusers: 50		
Action	Properties		
Initialize	Initialize each Vuser just before it runs		
Crout Uncour	Start: 50 vusers gradually 💽		
otart vusers	2 Vusers every 00:00:15 (HH:MM:SS)		
Duration	Run for 00:05:00 (HH:MM:SS)		

The total number of the Vusers assigned to all the Vuser Groups is displayed in the Groups pane toolbar.

- **By percentage.** Specify the total number of Vusers to run in the load test:
 - Basic schedule: In the Groups pane, enter the number of Vusers in the Total Vusers box.

🗙 Gro	sdr			
+ 60 🗈	// × 💥 🗞 🖻 🖾	Total Vusers:	50	LG Dis
% (100)	Script			Gro
26	script1			🔹 scri
26	script2			scrip
24	script3			scrip
24	script4			scrip
	Click here to add a	new group		-

 Real-world schedule: In the Scheduler pane, enter the number of Vusers to run in each Start Vusers action.

🗢 Grou	ps			
+ 68 🗈	🖅 🗙 🔛 🖾 🛛 Total Vusers:	50 LG Distr		
% (100)	Script	Grou		
26	script1	💽 script		
26	script2	script		
24	script3	script		
24	script4	script		
Click here to add a new group				
💙 Glob	al Schedule			
V Glob	al Schedule	Scheduled Vusers: 50		
Slob	al Schedule	Scheduled Vusers: 50		
Slob	al Schedule Properties Initialize each Vuser just before it runs	Scheduled Vusers: 50		
Slob	al Schedule Properties Initialize each Vuser just before it runs Start: 50 Vusers gradually	Scheduled Vusers: 50		
Start Vuser	al Schedule Properties Initialize each Vuser just before it runs Start: 50 Vusers gradually 2 Vusers every 00:00:15 (HH:MM:S	Scheduled Vusers: 50 •		
Start Vuser	Al Schedule Properties Initialize each Vuser just before it runs Start: 50 users gradually 2 Vusers every 00:00:15 (HH:MM:SS)	Scheduled Vusers: 50 • 38)		

After you select all the groups for the load test, specify the percentage of Vusers that you want to assign to each group, or select a relative distribution ratio by which Performance Center should distribute the Vusers from each group (see "Distributing Vusers Using Relative Distribution" on page 186).

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

Load Generator Distribution

In a load test, you specify how to distribute available load generators among the Vuser groups.

Load Generator Distribution Methods

If you have symmetrical load generators, you can select one of the automatic distribution methods, or you can assign a different number of load generators to each group manually.

Using the automatic distribution method, Performance Center automatically assigns virtual load generators to Vuser groups during the load test design phase. These virtual load generators serve as placeholders for actual load generators that are allocated at run time.

Using the manual distribution method, if you know which load generators will be available at run time, you can manually assign these actual load generators to Vuser groups during the design phase. If you do not know which load generators will be available at run time, you can manually assign virtual load generators to Vuser groups during the design phase, and then at the initialization stage of the load test run, assign actual load generators. Manual distribution enables you to distribute your load generators among Vuser groups, without overloading any one load generator.
Automatic Load Generator Distribution

When you select an automatic load generator distribution method, Performance Center assigns a selected number of virtual load generators to the Vuser groups during the load test design phase. At run-time, Performance Center automatically replaces the virtual load generators with actual load generators available in the system.

The following automatic distribution methods are available:

- ► Assign all load generators to each group. Performance Center automatically assigns all load generators to each group (Default).
- Assign one load generator to each group. Performance Center automatically assigns one virtual load generator to each Vuser group. If you have fewer groups than load generators, not all load generators are assigned to groups. If you have more groups than load generators, the load test is saved with an Invalid status.
- ➤ Assign an equal number of load generators to each group. Performance Center automatically distributes all of the virtual load generators one by one, evenly among all the Vuser groups.



If you have more groups than load generators, the load test is saved with an **Invalid** status.

Manual Load Generator Distribution

The manual load generator distribution options enable you to assign virtual or actual load generators to the Vuser groups.

The following manual distribution options are available:

- ➤ Assign virtual load generators to groups at design time. You manually assign virtual load generators (LG1, LG2, and so on) to the Vuser groups, and Performance Center assigns actual load generators at run time.
 - Assign actual load generators manually at run time. If you select this option, when the load test starts, Performance Center prompts you to assign the actual load generators to the virtual load generators, instead of assigning the actual load generators itself. For more information, see "Manually Assigning Specific Load Generators at Run Time" on page 363.
- ➤ Assign actual load generators to groups. You manually assign actual load generators to the Vuser groups.

Distributing Load Generators Among Vuser Groups

You distribute load generators among Vuser groups when you design the load test. You can have Performance Center distribute the load generators automatically, or you can distribute them manually among the groups.

To distribute load generators among Vuser groups:

- **1** On the Load Test configuration page, click the **Workload** tab.
- **2** Next to **LG Distribution**, click the browse button. The Load Generator Distribution Method dialog box opens.

....

- **3** Select a method for distributing the load generators among the Vuser groups, as follows:
 - ➤ Automatic Distribution. Performance Center automatically assigns load generators to the Vuser groups, as described in "Automatic Load Generator Distribution" on page 181.
 - Manual Distribution. You manually assign virtual or actual load generators to the Vuser groups, as described in "Manual Load Generator Distribution" on page 182.

Click OK.

- **4** If you selected an automatic load generator distribution method, in the **LG** box specify the number of load generators to automatically distribute among the Vuser groups at run-time.
- **5** If you selected a manual load generator distribution method, you need to manually assign the load generators to the Vuser groups according to the method you selected.
 - If you selected Assign virtual load generators to groups at design time, assign virtual load generators as follows:
 - To assign virtual load generators to a single Vuser group, in the Groups pane, select the group, and click the Select virtual load generators link.

Group	Groups				
🖻 🖉 🗙 🔯 🏹 🖻 🖾 Total Vusers: 30		30	LG Distribution: Manually assign virtual load generators to groups		
	Script		Group Name	Virtual Load Generators	
	hp_Copy_2	•	hp_copy_2	Select virtual load generators	
	script2		script2	Select virtual load generators	
	script		script	Select virtual load generators	



 To assign virtual load generators to multiple groups simultaneously, click the Assign Load Generators to Multiple Groups button next to the LG Distribution box. In the dialog box that opens, select load generators to assign. If you are assigning the load generators to multiple Vuser groups, select the Vuser groups to which to assign the load generators.

¢	¹ Multi	iple Load Generator Assignment - Microsoft Internet Explorer pro	vide 💶 🔳 🗙
Γ	Assigr	n multiple load generators to multiple groups	
L	Select	t load generators:	
L		Name	
L		LG1	
L		LG2	
L		LG3	
L		LG4	Ν
L		LG5	4
L		LG6	
			Add
L	Select	t groups:	
L		Name	
L		hp_copy_2	
L		script2	
		script	

You can add more virtual load generators to the list by clicking the **Add** button. In the Add Load Generators dialog box that opens, enter the number of load generators to add and click **OK**. Performance Center adds the selected number of virtual load generators to the list in the Virtual Load Generators dialog box.

Note: If you selected **Assign actual load generators at run time**, you can assign actual load generators at run time. For more information, see "Manually Assigning Specific Load Generators at Run Time" on page 363.

- If you selected Assign actual load generators to groups, assign actual load generators as follows:
 - ► To assign load generators to a single Vuser group, select the group and click the **Select Load Generators** link.



E g

 To assign load generators to multiple groups simultaneously, click the Assign Load Generators to Multiple Groups button next to the LG Distribution box

The dialog box that opens displays the load generators that are currently available in the host pool. Select load generators to assign. If you are assigning the load generators to multiple Vuser groups, select the Vuser groups to which to assign the load generators.

- **6** (Optional) To open terminal services sessions on a particular load generator, see "Configuring Terminal Sessions" on page 238.
- **7** Click **Apply** to apply your selections, or click **OK** to apply your settings and close the Load Generators dialog box. In the Workload tab, the selected load generators are displayed in the Virtual/Actual Load Generators column.
- 8 Click Save on the Load Test configuration page to save your settings.

Configuring Optional Workload Settings

You can configure the following optional workload settings:

- Distribute Vusers using relative distribution. See "Distributing Vusers Using Relative Distribution" on page 186.
- Configure script run time settings. See "Configuring Run-Time Settings" on page 187.
- Define command-line arguments. See "Using Command Line Arguments" on page 189.

► Emulate WAN settings. See Chapter 17, "WAN Emulation."

Distributing Vusers Using Relative Distribution

When distributing Vusers by percentage, Performance Center can calculate the exact percentage of Vusers to assign to each Vuser group based on a relative distribution ratio that you provide.

To distribute Vusers using relative distribution:

- **1** On the Load Test configuration page, click the **Workload** tab.
- **2** Click the **Relative Distribution** button. The Relative Distribution dialog box opens.

🗿 Relative Distribution - Microsoft Internet Explorer 📃 🔲 🗙				
You can let Performance Center calculate the exact percentage of Vusers to assign to each group based on the ratio that you enter. For example, if you enter a ratio of 1:3 and click OK, the percentage fields are updated to reflect this (25%:75%).				
# ¥users Ratio	Group Name			
1	group1			
1	group2			
3	group3			
	OK Cancel			

3 Under **# Vuser Ratio**, type a number representing the ratio for each Vuser group, and click **OK**. Performance Center converts this number into a percentage.

For example, to distribute the Vusers among the groups at a ratio of 1:1:3, type 1 for **group1**, 1 for **group2**, and 3 for **group3**.

4 Click **Save** on the Load Test configuration page to save your settings.

Following the example above, Performance Center assigns 20% of the Vusers to **group1**, 20% to **group2**, and 60% to **group3**.

Configuring Run-Time Settings

You can configure the run-time settings of Vuser scripts that you have uploaded. The run-time settings define the way that the script runs. Run-time settings are applied to Vusers when you run a script.

Configuring run-time settings allows you to emulate different kinds of user activity. For example, you could emulate a user who responds immediately to output from the server, or a user who stops and thinks before each response. You can also configure the run-time settings to specify how many times the Vuser should repeat its set of actions.

If you do not edit the run-time settings, Performance Center runs the script using the default settings, or the last saved settings if the script was recorded in VuGen.

You can also copy run-time settings used in one script to other scripts in your load test.

To edit run-time settings for the script:

r

- **1** On the Load Test configuration page, click the **Workload** tab.
- **2** Select the script, and click the **Edit Runtime Settings** button. The Run-Time Settings dialog box opens.

script1 - Run-Tim	e Settings - Microsoft Internet Explorer provided by Hewlett 💶 🔲 🗙
General	General:Run Logic
Run Logic Pacing Log Think Time	Init vuser_init Run Action Action
Browser Browser Emulation	End Delete Move Up
Network Speed Simulation	Move Down
Preferences Proxy Download Filters	Properties
	Hint: Move the mouse over an item to see its description
	OK Use Defaults Cancel

3 Configure the run-time settings. For more information on configuring a script's run-time settings, see "Configuring General Run-Time Settings" on page 549.

To use the default settings, click **Use Defaults**. Vuser scripts have individual run-time setting defaults for VuGen and the Controller, to support the debugging environment of VuGen and the load testing environment of the Controller.

- **4** Click **OK** to save the settings.
- **5** Click **Save** on the Load Test configuration page to save your settings.

To copy run-time settings:

1 On the Load Test configuration page, click the **Workload** tab.

Note: To copy run-time settings, there must be at least two different scripts of the **same type** selected for the load test.

2 Click the **Duplicate Runtime Settings** button. The Duplicate Run Time Settings dialog box opens.

🚰 Duplicate Run Time Settings - Microsoft Internet Explorer 👘 🔲 🗖 🗙		
Duplicate Run Time Settings		
Select a source group and then select target groups. The Run-time settings of the target groups will be replaced by the run-time settings of the source group.		
Select source group:		
sequentialusage		
Select groups from the list:		
checktimeslotavailability_tc78_aqua		
browseusersite_tc78_aqua		
OK Cancel		

0=0

- **3** Under **Select source group**, select the group from which you want to copy the run-time settings. The source group is displayed in the box and any other groups in the load test with the same type of script are listed below as potential target groups.
- **4** Select the target groups into which to copy the run-time settings.
- 5 Click OK. The run-time settings are copied into the selected target groups.
- 6 Click Save on the Load Test configuration page to save your settings.

Using Command Line Arguments

You can pass arguments to instruct the Controller how to behave. By passing arguments in the command line, you configure load test settings without the need to manually define them in the UI.

To send parameters to the script:

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- **1** On the Load Test configuration page, click the **Workload** tab.
- **2** Select a script and click the **Command line** button. The Command Line dialog box opens.

Command Line - Microsoft Internet Explorer		
Command lines		
Apply to current script		

3 Type the name and value of the parameter you want to send using the format:

<-Parameter_Name> <value>

For more information on the command line parsing functions, or for details on including arguments on a command line, see the *HP LoadRunner Online Function Reference*.

4 In the list box, select whether to apply the command line to the current script only or to all the scripts in the load test, or to add it to all the scripts in the load test.

Viewing Scripts

6-3

You can open an uploaded script, and view the code for each action from the Load Test configuration page.

To view a Vuser script:

- **1** On the Load Test configuration page, click the **Workload** tab.
- **2** Select a group and click the **View Script** button. The script opens in a read-only window.

Script Actions web Page L	Dialog	Download Script	Close	? Help	X
Name: URLerrorONlazarus Type: Web (HTTP/HTML) Actions: <u>vuser init</u> Action <u>vuser end</u> Included Files:	#include "web_api.h" #include "Irw_custom_body.h" vuser_init() { return 0; }				

- **3** Select an action to view its code.
- **4** To download the script, click **Download Script** and follow the instructions in "Downloading Scripts from the Vuser Scripts Page" on page 137.

You can use VuGen to edit the downloaded scripts and then upload them back on to your system.

11

Configuring Scheduler Settings

After you select a workload and create the Vuser groups to run in your load test, you can define a schedule according to which the load test should run. You can schedule when to initialize, start, and stop Vusers during the run, and how long an action should continue running.

This chapter includes:

- ► About Scheduling Load Tests on page 192
- ► Scheduler at a Glance on page 193
- ➤ Setting Scheduler Options on page 194
- ► Understanding Schedule Actions on page 195
- ► Managing the Scheduler on page 201
- ► Managing Schedule Actions on page 205
- ➤ Viewing Load Test Schedules in the Schedule Graph on page 210
- ► Managing Schedule Actions From the Schedule Graph on page 214
- ► Controlling Scheduler During Load Test Runs on page 215

About Scheduling Load Tests

You use the Scheduler to create a schedule that distributes load in a load test in a controlled manner. You can then monitor your Vusers throughout the load test run. Using the Scheduler, you can:

- ➤ Set the time at which the load test should begin running. You specify the amount of time you want Performance Center to wait after the load test is started.
- Stipulate how Vusers are initialized, and how many Vusers Performance Center starts and stops within a certain time frame. You specify whether Performance Center should start or stop all Vusers in a load test or Vuser group simultaneously, or start/stop only a certain number of Vusers within a specified amount of time.
- Set the timing aspect of a load test, limiting the execution duration of the Vusers or of Vuser groups within the load test. You limit the execution time duration by specifying the amount of time the Vusers or Vuser groups should be in the running state. You can set a load test to run according to the run-time settings defined in the enabled Vuser groups, or you can let the groups run over and over again until the schedule settings instruct them to stop running.

You configure schedule settings in the **Workload** tab of the Load Test configuration page. You can select the schedule you want to use for all the Vuser groups in your load test, or for each Vuser group.

Note: Rendezvous points (see Chapter 16, "Using Rendezvous Points") in a Vuser script interfere with a scheduled load test. If your script contains rendezvous points, your load test will not run as scheduled.

Scheduler at a Glance

You configure a schedule for a load test in the **Scheduler pane** of the Load Test configuration page's Workload tab.



The Scheduler pane contains the following sections:

Schedule Actions Grid

You define the actions for a schedule in the Actions grid. For real-world schedules, you can add, modify, and delete schedule actions.

When creating a schedule by group, you can copy a Vuser group's schedule settings to other Vuser groups' schedules.

For more information about schedule actions, see "Understanding Schedule Actions" on page 195.

Schedule Graph

The schedule graph displays a graphical representation of the defined schedule. The lines in the graph correspond to the groups in the Groups pane, and the line segments correspond to the actions defined in the Actions grid. The graph is interactive—you can split actions and delete actions from the graph itself.

For more information, see "Viewing Load Test Schedules in the Schedule Graph" on page 210.

Setting Scheduler Options

You set general Scheduler options from the Scheduler Options box.

To set schedule options:

1 On the Load Test configuration page, in the top right corner of the Workloads tab, click **Schedule Options**.

Workload	Monitors	Diagnostics
le by load test, number	mode	Scheduler Options

- **2** Select Scheduler options as follows:
 - ➤ Enable Scheduler. Enables the Scheduler so that you can run the load test according to a defined schedule. To define a schedule, this option must be selected.
 - Start the Scheduler after a delay of HH:SS:MM. Enables you to specify when, after the Run Load Test command has been issued, the Scheduler should start running the schedule. If this option is not selected and the Scheduler is enabled, the schedule starts to run as soon as the load test is started.
 - ➤ 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.
 - ➤ Pause Scheduler at load test start. Pauses the Scheduler at the start of a load test run, enabling you make changes to the load test design just before the load test is about to run. You can then restart the Scheduler manually. For more details, see "Manually Starting the Scheduler" on page 362.
- **3** Click **OK** to save the selected options.

Understanding Schedule Actions

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

This section describes the available schedule actions:

- ► Start Group
- ► Initialize
- ► Start Vusers
- ► Duration
- ► Stop Vusers

For information on managing the schedule actions, see "Managing Schedule Actions" on page 205.

Start Group

The Start Group action defines when to start running a Vuser group. This action is available for group schedules only.

Note: By default, the Start Group action appears as the first action in the Actions grid when you select a workload with a schedule **by group**. It is always followed by the **Initialize** action. It cannot be deleted.

Options	Description
Start immediately after the load test begins (Default)	The Scheduler starts running the selected Vuser group as soon as the load test starts running.
Start <00:00:00> (HH:MM:SS) after the load test begins	After the load test starts running, the Scheduler waits the specified time (in hours, minutes, and seconds) before it starts running the selected Vuser group.
Start when group <group name=""> finishes</group>	The Scheduler starts running the selected Vuser group immediately after the Vuser group specified in this option has finished running.

Initialize

The Initialize action instructs the Scheduler to prepare the Vusers so that they are in the Ready state and can run.

Note: By default, the Initialize action appears in the Actions grid for all schedules. It cannot be deleted.

Options	Description
Initialize all Vusers simultaneously Wait for <00:00:00> (HH:MM:SS) after initialization	The Scheduler initializes all the Vusers in the load test or selected Vuser group together, and waits the specified amount of time before running them.
Initialize XX Vusers every <00:00:00> (HH:MM:SS) Wait for <00:00:00> (HH:MM:SS) after initialization	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.
Initialize each Vuser just before it runs (Default)	The Scheduler initializes the each Vuser in the load test or selected Vuser group just before it starts running. Note: This option is not available for Group schedules when the Wait for all groups to initialize option is selected. See "Setting Scheduler Options" on page 201.

Start Vusers

The Start Vusers action instructs Performance Center to start running the Vusers.

Options	Description
Start XX Vusers: Simultaneously (Default)	The Scheduler runs the specified number of Vusers simultaneously.
Start XX Vusers: YY Vusers every <00:00:00> (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.

Notes:

- 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 load test is running, you can add Vuser groups/scripts to a load test and enable them. When starting the Vusers gradually, if you add a Vuser group after all the Vusers in the load test have started running, the new group will start running immediately.

Duration

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

Options	Description
Run until complete	The load test runs until all the Vusers have finished running.
Run for <00.00:00:00> (dd.HH:MM:SS)	The load test in its the current state for the specified amount of time (in days, hours, minutes, and seconds) before continuing with the next action. The default Duration period is 5 minutes. The maximum definable
	duration period is 99.23:59:59 dd.HH:MM:SS.
Run indefinitely (Basic schedule only)	The load test runs indefinitely.

Note:

- ➤ In a real-world schedule, if a Duration action is not followed by another action, the load test continues to run indefinitely.
- 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 XX Vusers: Simultaneously (Default)	The Scheduler stops the specified number (All or XX) of running Vusers at once.
Stop XX Vuser: YY Vusers every <00:00:00> (HH:MM:SS)	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.

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, 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.

Managing the Scheduler

When you select atype of workload for your load test, you select the type of schedule you want to design for the load test. (See "Load Test Schedule Types" on page 173.) After you have created the Vuser groups to run in the load test, you design the schedule by which to run the groups.

This section includes:

- ► "Setting Scheduler Options" on page 201
- ▶ "Defining Load Test Schedules" on page 202

Setting Scheduler Options

You set general Scheduler options from the Scheduler Options box.

To set schedule options:

1 On the Load Test configuration page, in the top right corner of the Workloads tab, click **Schedule Options**.



- 2 Select Scheduler options as follows:
 - ➤ Enable Scheduler. Enables the Scheduler so that you can define a schedule for the load test, and run the load test according to the defined schedule.
 - Start the Scheduler after a delay of HH:SS:MM. Enables you to specify when, after the Run Load 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 load 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 in the load test are set to Initialize each Vuser just before it runs, the Scheduler automatically changes this setting to Initialize all Vusers simultaneously.

- Pause Scheduler at load test start. Pauses the Scheduler at the start of a load test run, enabling you make changes to the load test design just before the load test is about to run. You can then restart the Scheduler manually. For more details, see "Manually Starting the Scheduler" on page 362.
- **3** Click **OK** to save the selected options.

Defining Load Test Schedules

Note: These instructions also apply when modifying an existing schedule.

To define a schedule:

- Ensure that the Scheduler is enabled. In the top right corner of the Workload tab, click Scheduler Options, select Enable Scheduler, and click OK.
- **2** The Actions grid displays the default actions that correspond to the schedule type you selected in your workload.



For details about the schedule actions, see "Understanding Schedule Actions" on page 195.

You can modify these actions, and, in real-world schedules, you can add more actions. For details, see "Managing Schedule Actions" on page 205.

Notes: Schedules by group only:

- When the load test is scheduled by group, each group runs its own schedule.
- ➤ You can copy schedule settings from one Vuser group to another. For more information, see "Copying Group Schedule Settings" on page 209.

Select action for the schedule as follows:

- **a** Start Group. (Schedule by group only). Start running the group:
 - ► Immediately upon starting the load test run
 - > After the specified period of time has elapsed
 - ► After a specified group has finished running

- **b** Initialize. Set the Vusers that will run in the load test to initialize before they run as follows:
 - Initialize all the Vusers at the same time, and wait the specified time before running the Vusers
 - Initialize a specified number of Vusers at given time intervals, and wait the specified time before running the Vusers
 - > Initialize each Vuser just before it starts running

Note: When scheduling by group, you can schedule all the Vusers in all the enabled Vuser groups to initialize before any of them start running. To set this option, see "Setting Scheduler Options" on page 201.

• Start Vusers/Duration/Stop Vusers. Specify how many Vusers to start running, how long they should run, and how many to stop running at a time.

In basic schedules, there is one Start Vuser action, one Duration action, and one Stop Vuser action. You can specify whether to start all the Vusers simultaneously or gradually, how long to run them, and whether to stop them all simultaneously or gradually.

Note: For real-world schedules, to create a schedule that runs indefinitley, the last action should be a **Run for** Duration action.

3 If you want to delay the start time of the load test schedule, click **Scheduler Options**, select **Start the Scheduler after a delay of:**, and enter the amount of time after the Run Load Test command has been issued that the Scheduler should activate the schedule.

Enter this value in the hh:mm:ss format. The maximum delay that you can define is 23:59:59 hh:mm:ss.

Click OK.

4 Click **Save** to save the settings.

Managing Schedule Actions

When you create a load test, the Actions grid of the Scheduler lists default schedule actions. These actions are also displayed in the schedule graph. You add, edit, and delete schedule actions in the Actions grid.

This section includes:

- ► "Actions Grid Toolbar" on page 205
- ► "Adding Schedule Actions" on page 206
- ► "Editing Schedule Actions" on page 208
- ► "Deleting Schedule Actions" on page 208
- ► "Copying Group Schedule Settings" on page 209

Toolbar Button	Button Name	Enables You To
*>	Add New Action	Add an action after the selected action.
**	Delete Action	Delete the selected action.
(a)	Duplicate Schedule Settings	Copy another group's schedule settings to the selected group.
		For details, see "Copying Group Schedule Settings" on page 209.
Ļ	Apply	View modification to action in the schedule graph.

Actions Grid Toolbar

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Adding Schedule Actions

In a real-world schedule, you can add actions to simulate a more true-to-life schedule by which to run your load test.

Note: You can also add schedule actions in the schedule graph. For more information, see "Managing Schedule Actions From the Schedule Graph" on page 214.

To add an action to a schedule:

1 In the Actions grid, select an action after which to insert the new action, and click the **Add New Action** button.

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

A list of actions opens.

Group schedule for: g1				
🤯 🔹 🖏 🛛 📢	Scheduled Vusers: 20	С		
Start Yush	s perties			
Duration	alize each Vuser just before it runs			
Stop Vuser	s t: 20 Vusers gradually 🔹	1		
	2 Vusers every 00:00:15 (HH:MM:SS)			
Duration	Run for 00:05:00 (HH:MM:SS)			
Stop Vusers	Stop all Vusers: 5 every 00:00:30 (HH:MM:SS)	-		

2 Select the type of action to add.

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Note: You can add a Start Vusers, Stop Vusers, or Duration action. For details about each action type, see "Understanding Schedule Actions" on page 195.

► If you are adding a Start Vusers or Stop Vusers action:

In the **Properties** column, type the number of Vusers to start/stop running, and select whether to:

- ► start/stop running the Vusers simultaneously
- ► start/stop running the Vusers gradually

When starting/stopping Vusers gradually, type 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 the **Apply** button to save the action settings.

3 When you have finished adding actions to the schedule, click **Save** to save the updated schedule.

Important: If you navigate away from the Load Test configuration page without clicking **Save**, changes made to the schedule are not saved.

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Editing Schedule Actions

You edit the schedule actions in the Actions grid.

To edit a schedule action:

1 In the Actions grid, select the action that you want to edit.

You can select the action in the grid or by selecting the corresponding line in the schedule graph (see "Viewing Load Test Schedules in the Schedule Graph" on page 210).

The **Properties** column becomes editable.

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

You can edit all types of actions. For details about each action type, see "Understanding Schedule Actions" on page 195.

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

Important: If you navigate away from the Load Test configuration page without clicking **Save**, changes made to the schedule are not saved.

Deleting Schedule Actions

You delete schedule actions in the Actions grid.

Alternatively, you can delete schedule actions from the schedule graph. For more information, see "Managing Schedule Actions From the Schedule Graph" on page 214.

To delete a schedule action:

1 In the Actions grid, select the action you want to delete.

Note: You cannot delete Start Group or Initialize actions.

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- **2** On the Actions grid toolbar, click the **Delete Action** button, and click **OK**. The selected action is deleted from the Actions grid.
- 3 Click Save.

Important: If you navigate away from the Load Test configuration page without clicking **Save**, the actions are not deleted.

Copying Group Schedule Settings

If you are creating a schedule by group, and you have already defined schedule settings for one of the groups, you can copy those settings to other groups.

Note:

- > Schedule settings include the schedule run mode and the set of actions.
- > You can copy group schedules that are the same type only.

To copy a Vuser group's schedule settings to a particular group:

- **1** In the Groups pane or in the header of the Actions grid, select the Vuser group to which you want to copy the settings.
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- **2** On the Actions grid toolbar, click the **Duplicate Schedule Settings** button. The Select Group dialog box opens.
- **3** Select the Vuser group from which to copy the schedule settings, and click **OK**.

The schedule settings are copied to the selected Vuser group.

Viewing Load Test Schedules in the Schedule Graph

The **schedule graph** provides a graphical representation of the load test's schedule.



For real-world schedules, the graph is **interactive** in that you can split and delete schedule actions from within the graph.

To edit actions, you can select them in the graph and modify them in the Actions grid. For details, see "Editing Schedule Actions" on page 208.

This section includes:

- ► "Schedule Graph Toolbar" on page 211
- ▶ "Showing and Hiding the Graph Legend" on page 211
- ➤ "Viewing Vuser Group Schedules in the Schedule Graph" on page 212

Toolbar Button	Button Name	Enables you to
营	Delete Action	Delete a selected action from the schedule.
7	Split Action	Split a selected action into two identical halves of the original action.
M	Hide Legend	Hide the graph legend.
•H7	Show Legend	Show the graph legend.

Schedule Graph Toolbar

Showing and Hiding the Graph Legend

- ➤ To hide the schedule graph legend, click the Hide_Legend button in the upper-right corner of the graph pane.
- ➤ To show the schedule graph legend, click the **Show_Legend** button in the upper-right corner of the graph pane.



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Viewing Vuser Group Schedules in the Schedule Graph

Note: This section is relevant to group schedules only.

When scheduling by group, all the Vuser groups' schedules are displayed in the schedule graph. You can also view a selected Vuser group's schedule on its own.

To view a particular Vuser group's schedule:

1 In the Actions grid, select a group from the **Group schedule for** list that you want to view in the graph.

Make sure that the graph legend is displayed. (See "Showing and Hiding the Graph Legend" on page 211.) The line representing the selected group is highlighted in the graph. In the legend, the check box of the selected Vuser group is unavailable.



2 At the top of graph legend, clear the **Vuser Group** check box. Alternatively, you can clear the check boxes adjacent to each of the other groups.



The Vuser group that you selected remains selected, and is displayed in the graph.

- ► To view all of Vuser groups in the graph again, select the **Vuser Groups** check box.
- ➤ To view a specific group together with the default group, select that group's check box.

Managing Schedule Actions From the Schedule Graph

You can split actions in the graph and delete actions from the graph. Each line in the graph represents an action in the Actions grid. When you split or delete actions in the graph, the schedule is updated in the Actions grid as well.

Note: Only Start Vusers, Duration, and Stop Vusers actions are displayed in the graph.

This section describes:

- ► Splitting an Action In the Schedule Graph
- > Deleting an Action From the Schedule Graph

Splitting an Action In the Schedule Graph

In the schedule graph, when you split an action, the resulting two actions represent two identical halves of the original action.

For example:

- ➤ You can split an action that starts 20 Vusers into two identical actions that start 10 Vusers each. Then you can modify each of these actions to start a different number of Vusers, or to start the Vusers at different rates.
- ➤ You can split an action that runs the scenario for 30 minutes into two identical actions that run the scenario for 15 minutes each. Then you can modify each of these actions to run the scenario for different durations.

To split an action into two:

1 In the graph, select the line that represents the action that you want to split.

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

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- **2** Click the **Split Action** button. The selected line is split in two. The original action in the Actions grid is split into two equivalent actions, each representing half of the original action.
- **3** Edit the actions in the Actions grid (see "Editing Schedule Actions" on page 208). The change is reflected in the graph.
- 4 Click Save to save your changes.

Deleting an Action From the Schedule Graph

You can delete a schedule action from the schedule graph.

To delete a schedule action:

- **1** In the Actions grid or in the graph, select the action you want to delete.
- **2** In the graph pane toolbar, click the **Delete Action** button, and click **OK**. The selected action is deleted from the graph and from the Actions grid.
- **3** Click **Save** to save your changes.

Controlling Scheduler During Load Test Runs

For information about pausing the scheduler or modifying schedules during a load test run, see "Configuring Schedule Settings from the Load Test Run Page" on page 364.

Chapter 11 • Configuring Scheduler Settings
Configuring Load Test Monitor Settings

When you design a load test, you can configure one or more monitor profiles to monitor server resources when you run the load test.

This chapter includes:

- ► Configuring Monitor Settings on page 218
- ► Creating Monitor Profiles for a Load Test on page 219
- ► Selecting Monitor Profiles for a Load Test on page 221
- ► Editing a Monitor Profile for a Load Test on page 223

Configuring Monitor Settings

When configuring a load test, you can configure monitor settings to monitor server resources during the load test run.

Note: You can also configure monitor settings while the load test is running. For more information, see "Creating or Modifying the Runtime Monitor Profile" on page 386.

You configure monitor settings in the Monitors tab of the Load Test configuration page.

General	Workload	Moni	tors	Diagnostics	
Select the monitors that	Select the monitors that you want to use or create a profile just for this loadtest				
🔽 Name			Description		
✔ Profile2			Active server pages	: <u>1</u>	
✓ Profile1			Processor metrics	r an	
Add Local Pr	ofile Add Profile.		Over Firewall Ma	achines	

In the Monitors tab you can:

- Define a monitor profile for the current load test and create monitor profiles that can be used for the current load test and for other load tests.
 For details, see "Creating Monitor Profiles for a Load Test" on page 219.
- Select existing monitor profiles and Monitor Over Firewall machines to use for the load test. For details, see "Selecting Monitor Profiles for a Load Test" on page 221.
- ➤ Edit monitor profiles. For details, see "Editing a Monitor Profile for a Load Test" on page 223.

Creating Monitor Profiles for a Load Test

When designing a load test, you can create a local monitor profile that is specific to the load test you are designing, and you can create monitor profiles for the load test that can be used by other load tests in the project.

To create a monitor profile when configuring a load test:

- **1** On the Load Test configuration page, click the **Monitors** tab.
- **2** Select the monitor profile that you want to create:
 - To create a monitor profile for the current load test, click Add Local Profile.
 - To create a monitor profile that can be used for other load tests, click
 Add Profile, type a name and description of the profile and click OK.
- **3** The Add Monitor page opens. Select the monitor that you want to run and click **Next**.

Add Monitor	
Choose Monitor:	Cancel Next >>
🗆 System Resource Graphs	
O Antara FlameThrower	
🖸 Windows Resources	
C UNIX Resources	
C SNMP	
C SiteScope	
O Windows Resources (SiteScope)	
C SNMP (SiteScope)	
C Server Resources (SiteScope)	
🗆 Web Server Resource Graphs	
O Anacha	

4 The Choose Server page opens. Type the name or IP address of the server whose resources you want to monitor and, where relevant, the user login name and password. Click **Next**.

Add Monitor: Windows Resources			
<u>Choose Monitor</u> >> Choose Server:	Cancel Next >>		
Server Name:			
User Name: Password:			

5 The Choose Measurements page opens.

Expand a measurement group to display the available measurements. Select the measurements or measurement groups that you want to monitor.

To remove a selection, clear the relevant measurement's check box.

Add Monitor: Windows Resources: localhost				
	Cancel Save			
🖃 🔲 ServiceModelEndpoint 3.0.0.0				
✓ Calls				
☑ Calls Per Second				
Calls Outstanding				
☑ Calls Failed				
Calls Failed Per Second				
Calls Faulted				
Calls Faulted Per Second				
☑ Calls Duration				
Transactions Flowed				
✓ Transactions Flowed Per Second				

6 Click Save.

7 To add additional monitors or servers to the profile, click **Add** and repeat steps 3 - 6 for each monitor and server that you want to add to the profile.

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- **8** Click **Close** to close the Monitor Profile window.
 - > If you added a local profile, it is displayed as Local Profile.
 - If you added a regular monitor profile (Add Profile), it is displayed on the Monitors tab and is also added to the main Projects> Monitor Profiles page. For more information, see Chapter 6, "Monitor Profiles."

Selecting Monitor Profiles for a Load Test

You can select monitor profiles for a load test when designing the load test. You can select one or more monitor profiles defined in the project, and one or more Monitor Over Firewall machines.

To select monitor profiles for the load test:

- **1** On the Load Test configuration page, click the **Monitors** tab.
- **2** Select one or more profiles in the list.

Note: When selecting more than one SiteScope monitor, make sure that they all have the same account credentials.

To select a Monitor Over Firewall machine for the load test:

- **1** On the Load Test configuration page, click the **Monitors** tab.
- **2** Click the **Over Firewall Machines** button. The Modify Agents List dialog box opens.
- **3** Select the Monitor Over Firewall machines for the load test and click **OK**.



When you run the load test, your system monitors Vusers over the firewall. While the test is running, you can view graphs of the monitor over firewall data from the load test server monitors. For more information in viewing online monitor data, see Chapter 25, "Online Monitor View."

Removing a Monitor Profile from a Load Test

You can remove a monitor profile from a load test if you no longer want to use it for that load test.

Note: You can also remove monitor profiles from the load test while the load test is running. For more information, see "Creating or Modifying the Runtime Monitor Profile" on page 386.

To remove a monitor profile from a load test:

- **1** On the Load Test configuration page, click the **Monitors** tab.
- **2** Clear the check box of the monitor profile that you no longer want to use for the load test.
- **3** For Monitor Over Firewall machines, click **Over Firewall Machines**, clear the relevant machine's check box, and click **OK**.
- **4** Click **Save** to save the changes to the load test configuration.

Editing a Monitor Profile for a Load Test

You can edit any monitor profile used in your load test.

To edit a profile:

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- **1** On the Load Test configuration page, click the **Monitors** tab.
- **2** Click the **Edit Profile** button in the relevant profile row. The Monitor Profile configuration page opens and displays the profile properties.

Monitor Profile: Windows Profile						
The Profile includes the	following monitor	rs:				
		с	lose		Add	
Monitor	Server	Measurement				
Windows Resources					\sim	
	jar				\mathbf{X}	
		% User Time (Processor 0)				
		Interrupts/sec (Processor 0))			
		% DPC Time (Processor 0)				
		DPCs Queued/sec (Processo	or 0)			

➤ To add another monitor to the profile, click Add. Provide the server information and select the measurements to monitor in the same way you would when creating a new profile. For details, see "Creating Monitor Profiles" on page 111. \mathbf{X}

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- To edit details of a monitor server in the profile, click the Edit button next to the relevant server, modify the measurement selection, and click Save.
- ► To delete a monitor server from the profile, click the **Delete Server** button next to the relevant server and click **OK**.



- **3** Click **Close** to close the Monitor Profile dialog box.
- **4** Click **Save** to save the changes to the load test configuration.

13

Configuring Diagnostics Settings

After you create a load test for your application, you configure the diagnostics settings. You can then save or run your load test.

Performance Center's Diagnostics modules are application performance optimization solutions that are designed to help you improve the performance of your applications on the J2EE/.NET and ERP/CRM platforms throughout the application life cycle. They provide monitors that trace, time, and troubleshoot individual transactions that rapidly identify and pinpoint performance problems. These monitors help you to maximize business process performance, scalability, and efficiency.

HP Diagnostics provides you with the capability to monitor the performance of your applications that run on most of the J2EE compliant application servers and the Microsoft .NET Framework.

ERP/CRM Diagnostics provides you with the capability to monitor the performance of your applications that run on SAP, Siebel, Siebel DB, and Oracle DB environments.

For more information about setting up the diagnostics modules, see Part IV, "Working with Diagnostics."

Chapter 13 • Configuring Diagnostics Settings

14

Post Load Test Configuration

After you create and configure a load test for your application, you can save, copy, or run your load test.

This chapter includes:

- > Saving and Validating a Load Test on page 227
- ► Copying a Load Test on page 228
- ► Running a Load Test on page 229

Saving and Validating a Load Test

After you configure a load test, you save it so that you can run it later. Each time you save design settings, Performance Center checks the validity of the settings, and displays the validation status in the lower-left corner of the Load Test configuration page.

The possible values for the validation status are:

Status	Description
Load test saved.	Load test configuration settings are valid and load test is saved.
Load test cannot be saved.	Load test configuration settings are not all valid. The load test is not saved.
Load test contains errors. Click here for more information.	The load test contains errors and is rendered invalid. The erros can be viewed in the Load Test Validation Results window.

If the load test contains errors, **c**licking the **Click here** link displays the Load Test Validation Results window. The validation results provide the problem level, the name of the tab and the location of where the problem occurred, and a description of the problem.

¢	🖹 Load Test Validation results - Microsoft Internet Explorer 📃 🔲 🗙				
	Load Test Validation results				
	Level	Tab	Location	Error	
	Error	Design Groups	Vusers	Group 'rendezvous1' must have at least one Vus	er
	Error	Design Groups	Load Generators	Group 'rendezvous1' must have at least one hos	t
	Close				

Fix the problem and click **Save** to validate your design settings.

Note: You can also view the Load Test validation results for any load test that has an **Invalid** status on the Load Tests page. Click the **Invalid** link to display the errors, then click **Edit Load Test** to open the Load Test configuration page for the invalid test.

Copying a Load Test

After you configure your load test, you can make copies of it for use within the project. You do so from any of the tabs in the Load Tests configuration page. This enables you to make minor changes to your load test (for example, scheduling), and reuse it, without having to recreate the whole test.

Note: Performance targets are not copied when you copy a load test.

To copy a load test:

- 1 In any of the Load Test configuration page tabs, click **Save As**. The Save Load Test As dialog box opens.
- **2** Type the new name of the load test. By default, Performance Center names the copy of the load test <**loadtest_name**>_<**number**>.

🗿 Save Load Test As - Microsoft Interne 💶 🗙			
Save as:	load_test_2		
Messages			
	OK Close		

3 Click **OK**. The Load Test configuration page displays the new copy of the load test.

Running a Load Test

After you configure your load test, you can run it from the Load Test configuration page. You can also run a load test that you saved, or ran previously, from the Load Tests page.

To start running the load test, do one of the following:

- ► From the Load Test configuration page, click **Start**.
- From the Load Tests page, click the **Run Load Test** button in the row of the load test that you want to run.

The load test initialization process begins. For more information, see "Starting a Load Test" on page 353.

Chapter 14 • Post Load Test Configuration

15

Using Terminal Sessions

You can use Performance Center's terminal sessions feature to run multiple load generators simultaneously in your load test on a terminal server. It also enables you to overcome the limitation of being able to run only a single GUI Vuser on a Windows-based load generator.

This chapter includes:

- ► About Terminal Sessions on page 232
- ➤ Using Terminal Sessions in Performance Center on page 232
- > Setting up the Performance Center Agent on the Load Generator on page 234
- ➤ Configuring Terminal Services Logon Settings on page 235
- ► Launching a Terminal Client Session on page 236
- ► Configuring Terminal Sessions on page 238

About Terminal Sessions

Terminal sessions allow centralized management of computing resources for each client connected to the server, and provides each user with their own working environment. Using a terminal server client, you can operate in a server-based computing environment from a remote machine, and see only your individual session, which is managed transparently by the server operating system, independent of other client sessions.

Using terminal sessions in Performance Center 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 GUI testing tools: WinRunner (for Microsoft Windows applications), and 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.

Using Terminal Sessions in Performance Center

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

You select the number of terminals to be used in your load 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 1 Vuser for each terminal session. Performance Center then evenly distributes the number of Vusers among the client sessions.

Note: For terminal sessions troubleshooting information, see Chapter 50, "Troubleshooting Terminal Sessions."

Overview of Setting up Terminal Sessions in Performance Center

The number of terminal services is limited, according to the terminal server installation, and client configuration as described below.

Before opening a terminal session:

► Install a load generator host on the terminal server machine. For details, see the *HP Performance Center System Configuration and 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.

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.

To create a new terminal session:

- 1 Configure the Performance Center Agent on the load generator machine. See "Setting up the Performance Center Agent on the Load Generator" on page 234.
- **2** Check that the correct terminal services logon settings are configured in the Remote Desktop Connection client software on the Controller machine. See "Configuring Terminal Services Logon Settings" on page 235.
- **3** Configure terminal sessions from the Controller machine, as described in "Configuring Terminal Sessions" on page 238.

To connect to an existing terminal session:

1 Configure the Performance Center Agent on the load generator machine. See "Setting up the Performance Center Agent on the Load Generator" on page 234.

- **2** Launch a terminal client session on the Controller machine, ensuring that the Performance Center Agent is running as a process, as described in "Launching a Terminal Client Session" on page 236.
- **3** Configure terminal sessions from the Controller machine, as described in "Configuring Terminal Sessions" on page 238.

Setting up the Performance Center Agent on the Load Generator

This section decribes how to configure the Performance Center Agent on the machine where the load generator machine.

To set up the Performance Center Agent on the load generator machine:

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

🛃 Agent Configuration	X
Enable Firewall Agent Enable Terminal Service	Settings
Help	OK Cancel

2 Select **Enable Terminal Services** and click **OK**. Performance Center displays the following message.

Restart Agent	×
Agent must be restarted in orde Would you like to restart the Ag	er to apply your new settings. gent now?
OK)	Cancel

3 Click **OK** to restart the Performance Center Agent and apply the new settings.

Configuring Terminal Services Logon Settings

If you are creating a new terminal services session, you must check that Remote Desktop Connection client software is installed on the Controller machine, and the correct terminal services logon settings are selected. For load generators on Windows 2003 operating systems, you must make sure that each user is not restricted to one session.

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.

To configure the correct Terminal Server logon settings:

- 1 Select Start > Programs > Administrative Tools > Terminal Services Configuration > RDP-TCP. Right-click RDP-TCP, and select Properties to open the RDP-TCP Properties dialog box.
- **2** In the RDP-TCP Properties dialog box, click the **Logon Settings** tab.

RDP-Tcp Properties	5		? ×
Remote Control General	Client Settings	Network Adapte Sessions	er Permissions Environment
 Use client-prov Always use the 	ided logon informatio following logon info	on mation:	
User name:			_
Domain:			
Password:	vet		
Contrim passwi	for password		
	OK	Cance	Apply

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

To configure load generators on Windows 2003 operating systems:

1 Select Start > Programs > Administrative Tools > Terminal Services Configuration > Server Settings.

Terminal Services Configuration				
ActionYiew] ← → 🔁	🖬 <u> 6</u> 😫			
Tree	Settings	Attribute		
Terminal Services Configuration	👪 Terminal server mode	Remote Administration		
Connections	🔀 Delete temporary folders on exit	Yes		
Server Settings	🔀 Use temporary folders per session	Yes		
	🐯 Internet Connector licensing	Disable		
	👪 Active Desktop	Enable		
	🔀 Resrict each user to one session	No		
	Bermission Compatibility	Windows 2000 Users		
	4	•		

2 In the Server Settings, make sure that the **Restrict each user to one session** attribute is **No**.

Launching a Terminal Client Session

If you are connecting to an existing Terminal Services session, you need to open a Terminal Client session, log in to the session, and run the Performance Center Agent as a process.

To open a Terminal Client session on the Controller machine:

- 1 Select Start > Programs > Accessories > Communcation > Remote Desktop Connection, or select Start > Run and run the mstsc command. The Remote Desktop Connection dialog box opens.
- **2** Click **Options**.

- **3** In the **General** tab:
 - **a** In the **Computer** box, type the name or IP address of a terminal server, or select a terminal server from the list of available servers.
 - **b** Enter your user name, password, and domain name (if required) for logging in to the terminal server.

Nemote Desktop Connection
Remote Desktop Connection
General Display Local Resources Programs Experience
Logon settings
Type the name of the computer, or choose a computer from the drop-down list.
Computer: dype_ts_machine_name/IP_here>
User name:
Password:
Domain:
Save my password
Connection settings Save current settings, or open saved connection.
Save As Open
Connect Cancel Help Options <

- **4** Click **Connect**. A Terminal Client window opens.
- **5** Repeat step 3 to open the number of Terminal Client sessions required.

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

Run the Performance Center Agent as a process. To do this, run
 <Performance Center installation>\launch_service\bin\magentproc.exe.
 You need to run the Performance Center Agent as a process for each terminal session that you are running.

Configuring Terminal Sessions

After you have set up the Performance Center Agent on the load generator machine and opened a terminal client session on the Controller machine, you can configure terminal sessions. You configure terminal sessions from the User Site during load test configuration using the Terminal Services Manager.

Note:

- ➤ You can enable Terminal Services sessions when configuring load tests with manual load generator distribution only.
- ➤ The Terminal Services Manager does not support Terminal Services sessions over a firewall. To configure Terminal Services sessions over a firewall, see "Configuring Terminal Sessions Over A Firewall" on page 240.

To configure terminal sessions:

P

- **1** On the Load Test configuration page, click the **Workload** tab.
- 2 For a selected group, click the Select Load Generators/Select Virtual Generators link. The Load Generators (Actual)/Virtual Load Generators dialog box opens.

ë	Load	l Ge	nerators	(Actual) - M	icrosoft Internet Explorer		_ 🗆 ×
		7.00	-				******
		ID.	Name	Location	Purpose	Condition	
		1	loof	Default	Load Generator + Controller	Operational	P
		2	gum	Default	Load Generator	Operational	P
		4	gum	Default	Load Generator + Controller	Operational	P
		7	gum	Default	Load Generator + Controller	Operational	P
	Sel	ect /	All C	lear All			
					OK Cancel		

3 Select the load generator on which you want to open terminal session, and click the **Terminal Services** button. The Terminal Services Manager opens.

🚰 Terminal Services Web Page Dialog	×
Terminal Services	
Enable Terminal Services	
Number of Terminal Services to open on Load Generator:	
Maximum number of Vusers to run in a Terminal Service:	
Create new Terminal Services sessions	
Connect to existing Terminal Services session	
Note: All Terminal Services sessions will be opened on the load generator when the load generator is connected. To change the Terminal Session settings, you must stop all Vusers running on the load generator, and disconnect the load generat	or.
OK Cancel Help	

4 Select **Enable Terminal Sessions** to apply the settings to the load generator running on the terminal server.

- **5** Type the number of terminals you want to use in your load test. You must open a terminal client session for each terminal on which you want to run Vusers during the load test.
- **6** Type the maximum number of Vusers that you want to run in a terminal session. 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.
- **7** Select one of the following connection options:
 - Create new Terminal Services sessions. Enables the Controller to launch Terminal Services sessions automatically using the Remote Desktop Connection.
 - Connect to existing Terminal Services session. Enables a connection to an existing Terminal Services session. For more information on opening and logging in to a terminal client session, see "Launching a Terminal Client Session" on page 236.
- **8** Click **OK** to save the settings and close the dialog box. Performance Center distributes the number of Vusers evenly among the client sessions.

Note:

- ➤ During run time, you can set or change terminal services settings only when the load generator is disconnected. You can do this from the Load Generators (Virtual/Actual) dialog box, or the Workload tab.
- If your environment is configured with a local user (from the General Settings page of the Administration Site), 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.mydomain.com).

Configuring Terminal Sessions Over A Firewall

When a load generator is located over a firewall, to configure terminal sessions on that load generator, you need to configure terminal sessions as virtual, independent virtual load generators. Each virtual load generator must have its own logical name.

To configure terminal sessions as independent load generators over a firewall:

- **1** Open the load generator machine console.
- 2 If the Performance Center Agent is not running as a process, run
 <Performance Center installation>\launch_service\bin\magentproc.exe.
- **3** Configure the Performance Center Agent on the console.
 - **a** Select **Enable Firewall Agent**, click **Settings**, and in the **Local Machine Key** field, enter a logical virtual load generator name, for example machine_ofw.

A	Agent Configuration			×
	Over Firewall Settings			
	Property	Value		Ĺ
	MI Listener Name			
	Local Machine Key	machine_ofw		
	Connection Timeout (seconds)	20		
	MI Listener Heer Name			

b Select **Enable Terminal Services**.

Agent Configuration					
🔽 Enable Firewa	Settings				
🔽 Enable Termin					
OK	Cancel	Help			

- c Click OK.
- **4** Create one or more terminal sessions on the load generator console machine.
- 5 For each terminal session, run the Agent Configuration as you did for the console above. For each session, specify a different Local Machine Key name in the Firewall Agent > Settings box, for example, machine_ofw_1, machine_ofw_2, ..., machine_ofw_n.

Note: If you stop the agent on a terminal session, you must reconfigure the settings for that particular terminal session before restarting the agent.

6 When selecting the load generators for the load test in the Controller, select the local machine key for each individual virtual load generator used.

16

Using Rendezvous Points

Performance Center allows you to check your system's response under specific load. To do this, you can use rendezvous points to cause multiple Vusers to perform tasks at exactly the same time, thereby creating intense user load on the server.

This chapter includes:

- ► About Using Rendezvous Points on page 243
- ➤ Setting the Rendezvous Attributes on page 246
- ➤ Setting the Rendezvous Policy on page 247
- ➤ Viewing Rendezvous Information on page 249
- ➤ Manually Releasing Vusers from a Rendezvous on page 251

About Using Rendezvous Points

During a load 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 and enables Performance Center to measure server performance under load.

Suppose you want to measure how a web-based banking system performs when ten Vusers simultaneously check account information. In order to emulate the required user load on the server, you instruct all the Vusers to check account information at exactly the same time. You make sure that multiple Vusers act simultaneously by creating a **rendezvous point**. When a Vuser arrives at a rendezvous point, it is 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 details on the release criteria, see "Setting the Rendezvous Policy" on page 247.

You define rendezvous points in the Vuser script. For information about inserting rendezvous points into Vuser scripts, see the *HP Virtual User Generator User Guide*.

Using the Controller, you can influence the level of server load by selecting which of the rendezvous points will be active during the load test, and how the Vusers handle a rendezvous point.

For example, to test an online bank, you could create a load 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.

Overview of Using Rendezvous Points

The following procedures outline how to use rendezvous points to control load peaks on the server:

1 Create the Vuser scripts, inserting the necessary rendezvous points.

2 Create a load test.

When you add a Vuser group to a load test, Performance Center scans the group's associated script for the names of the rendezvous points and adds them to the list on the Rendezvous page. If you create another Vuser group that runs the same script, the Controller adds the new Vusers to the rendezvous and updates the list.

3 Set the level of emulated user load.

You determine the level of load by selecting the rendezvous points that will take part in the load test. For more information, see "Setting the Rendezvous Attributes" on page 246.

4 Set the attributes for the rendezvous (optional).

For each rendezvous you can set **Policy** attributes. For more information, see "Setting the Rendezvous Policy" on page 247.

5 Run the load test.

For information on manipulating the Vusers during load test execution using the Release command, see "Manually Releasing Vusers from a Rendezvous" on page 251.

Setting the Rendezvous Attributes

You enable and disable Rendezvous Points from the Rendezvous page. By disabling and enabling a rendezvous, you influence the level of server load. In addition, the Rendezvous page displays general information about the rendezvous point: which script is associated with the rendezvous, and the rendezvous status.

To enable rendezvous points to take part in the load test:

1 On the Load Test configuration page, click the **Workload** tab, and click the **Rendezvous** button.

Rendezvous - Microsoft Internet Explorer					
Curr	ently showing: 1 - 9 / 9				
	Rendezvous Name		Status	Contained in Scripts	Policy
	41-123456789012345678901		Enabled	Defined in 1 script:	- 1
	43-123456789012345678901		Enabled	∃ Defined in 1 script:	
	Case@Sensitive		Enabled	☑ Defined in 1 script:	
	pass+end		Enabled	∃ Defined in 1 script:	
	S1,S2		Enabled	∃ Defined in 1 script:	
	\$1,\$2,\$3		Enabled	∃ Defined in 1 script:	- *
	S2		Enabled	∃ Defined in 1 script:	
	\$2,\$3		Enabled	∃ Defined in 1 script:	- *
Select All Clear All Disable					
		Close		4	

The Rendezvous dialog box opens.

2 Select the rendezvous points you want to enable or disable from the Rendezvous list. Use the forward and back buttons to scroll through the list of rendezvous points.

3 Click the **Enable/Disable** button. The selected rendezvous points become enabled/disabled.

To select all the rendezvous points, click **Select All**. To clear all your selections, click **Clear All**.

4 Click **Close** to close the Rendezvous page.

Setting the Rendezvous Policy

Setting the rendezvous policy determines how the Vusers handle a rendezvous point. You set the following policy attributes for each rendezvous:

- ➤ Release policy. Sets how many Vusers are released from a rendezvous at a time
- ► **Timeout.** How long the Controller waits before releasing Vusers from a rendezvous

To set the rendezvous policy attributes:

1 On the Load Test configuration page, click the **Workload** tab, and click the **Rendezvous** button. The Rendezvous page opens.



2 Select a rendezvous from the Rendezvous page, and click the **Rendezvous Policy** button. The Rendezvous Policy page opens.

🗿 Rendezvous Policy - Html_Tags - Microsoft Internet Explorer 🛛 📃 🗖	×
Rendezvous Policy - Html_Tags	1
O Release when 100 % of all Vusers arrive at the rendezvous O Release when 100 % of all running Vusers arrive at the rendezvous O Release when 1 Vusers arrive at the rendezvous	
Timeout between Vusers: 30 seconds	
OK Close Help	~

- **3** In the Policy section, select one of the following three options:
 - ➤ Release when X% of all Vusers arrive at the rendezvous. Releases the Vusers only when the specified percentage of all Vusers arrives at the rendezvous point.

Note: This option interferes with the scheduling of your load test. If you select this option, therefore, your load test will not run as scheduled.

- ➤ Release when X% of all running Vusers arrive at the rendezvous. Releases the Vusers only when the specified percentage of all Vusers running in the load test arrives at the rendezvous point.
- ➤ Release when X Vusers arrive at the rendezvous. Releases the Vusers only when the specified number arrives at the rendezvous point.
- **4** Type a timeout value in the **Timeout between Vusers** box. After each Vuser arrives at the rendezvous point, Performance Center waits up to the maximum timeout period you set for the next Vuser to arrive. If the next Vuser does not arrive within the timeout period, the Controller releases all the Vusers from the rendezvous.

Each time a new Vuser arrives, the timer is reset to zero. The default timeout is 30 seconds.

5 Click **OK** to save your settings and close the Rendezvous Policy page.

Viewing Rendezvous Information

You can view rendezvous status during a load test from the Rendezvous dialog box.

To view rendezvous information:

- 1 On the Load Test Run page, click the **Design** button. The Load Test Design dialog box opens.
- 2 Click **Rendezvous**. The Rendezvous dialog box opens.

🎒 Rei	ndezvous - Microsoft Internet Explorer					I×
Rend	lezvous					*
Curr	ently showing: 1 - 10 / 27			1 - 10 🌘	DD	
	Rendezvous Name	Status	Vuser Script Name	Po	olicy	
	41-123456789012345678901	0 of 6	∃ Defined in 2 scripts:		* a	
	42-123456789012345678901	0 of 6	∃ Defined in 2 scripts:		* a	
	43-123456789012345678901	0 of 9	∃ Defined in 3 scripts:		* a	
	All_kind_of_cGI_is_going	0 of 6	∃ Defined in 2 scripts:		* a	
	Case@sensitive	0 of 3	∃ Defined in 1 script:		* a	
	CASE@SENSITIVE	0 of 3	∃ Defined in 1 script:		* a	
	Case@Sensitive	0 of 3	∃ Defined in 1 script:		* a	
	CGI_request	2 of 6	∃ Defined in 2 scripts:		* a	
	examle_4_changing_the_de	0 of 6	∃ Defined in 2 scripts:		* a	
	example8_password_enteri	0 of 6	∃ Defined in 2 scripts:		* a	
Se	lect All Clear All		Enable Disabl	e Re	elease	
	Close R	efresh	Help			
						$\mathbf{\nabla}$

Field	Description
Rendezvous Name	Displays the names of the rendezvous points in the load test.
Status	Displays the number of Vusers that arrived at the rendezvous point, out of the total number of Vusers assigned to the rendezvous.
Vuser Script Name	Lists the number of scripts in which the rendezvous point is defined. Drill down to view the names of Vuser scripts that are associated with the rendezvous point.

The following information is provided during load test execution:

To enable rendezvous points:

- Select the rendezvous points you want to participate in the load test, and click the Enable button.
- ➤ To select all the rendezvous points, click Select All. To clear all your selections, click Clear All.

To disable rendezvous points:

 Select the rendezvous points you want to disable from participating in the load test, and click the **Disable** button.

To release all Vusers waiting at selected rendezvous points:

 Select the rendezvous points from which you want to release all Vusers that are currently waiting, and click **Release**. Performance Center releases all Vusers that are currently waiting at the selected rendezvous point.

If you want the load test to continue even though all the Vusers did not reach the rendezvous, click this button.

To view the rendezvous policy:



Click the Rendezvous Policy button to view the rendezvous policy. You cannot change the rendezvous policy during a load test run.

Manually Releasing Vusers from a Rendezvous

While you run a load test, you can manually release Vusers from a rendezvous before the Controller releases them.

To manually release Vusers from a rendezvous:

- **1** On the Load Test Run page, click the **Design** button. The Load Test Design dialog box opens.
- 2 Click **Rendezvous**. The Rendezvous dialog box opens.
- **3** Select a rendezvous from the Rendezvous list.
- **4** Click **Release**. The Vusers in the rendezvous are released.

Chapter 16 • Using Rendezvous Points
17

WAN Emulation

You can enable and configure the WAN Emulator from the Workload tab of the Load Test configuration page.

This chapter includes:

- ► About WAN Emulation on page 254
- ► Configuring the WAN Emulator on page 256
- ► Emulated Locations on page 259
- ► Viewing WAN Emulation Monitors on page 261
- ► Excluding Machines from WAN Emulation on page 261
- ► Additional WAN Emulation Limitations on page 262
- ► WAN Emulation Best Practices on page 263

About WAN Emulation

HP Performance Center is integrated with 3rd 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 of this, your load test tests 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 scenario 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*.

Overview of the WAN Emulation Process

To run a load test using WAN Emulation, you follow the process below:

1 Install the WAN Emulator

Make sure that the relevant 3rd party components are installed on the load generator machines.

Note that in addition to the load generators, you may be required to install the WAN Emulator on additional LoadRunner components. For more information, see the relevant WAN emulation software installation documentation.

2 Determine WAN Emulation Goals

In the WAN Emulation Settings page, determine which locations you would like to emulate in your load test.

3 Configure the WAN Emulation

Configure the WAN Emulation on the desired load generators via the WAN Emulation Settings dialog box, which is a component of the integrated 3rd party software. If several load generators are being configured to emulate a specific location, make sure that each load generator is configured with the same settings. For more information see, "Configuring the WAN Emulator" on page 256.

4 Run the WAN Emulation

The WAN Emulation starts and stops automatically as you start and stop the load test. WAN metrics are automatically collected during the load test.

5 View the WAN Metrics

You can view all 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 information on grouping results in Analysis, see the relevant section in the *HP LoadRunner Analysis User Guide*.

Configuring the WAN Emulator

You enable and configure the WAN Emulator from the Workload tab of the Load Test configuration page.

To configure the WAN Emulator:



1 In the Workload tab, click the WAN Emulation Setting button. The WAN Emulation Settings page opens.

Load Generator 🔺	Emulation	Emulated Location
LG1	Enabled	
LG2	Disabled	
LG3	Disabled	
Displaying items per page (1 - 3 of 3)		« <u>1</u> /1 »
LG1 WAN Emulation settings		
Enable WAN Emulation		
Emulated location name:		
WAN Emulation settings		
	Sa	eve Restore
Close	Help	

The WAN Emulation Settings page displays a list of the load generators assigned to the load test, and the WAN Emulation status for each one.

You change the settings for any selected load generator in the <load generator name> WAN Emulation settings pane.

Note: For important information about running the WAN Emulation on load generators that run on a UNIX platform, and on a load generator that is also the Controller, see "Load Generator Limitations" on page 258.

- 2 Select the load generator in the list and select **Enable WAN Emulation** in the <**load generator name> WAN Emulation settings** pane at the bottom of the WAN Emulation Settings page.
- **3** In the **Emulated location name** box, type a location for the load generator. For more information on emulated locations see "Emulated Locations" on page 259.
- **4** Click **WAN Emulation Settings** to open the WAN Emulation Settings dialog box.
 - For information on some of the typical network emulation settings, see "Typical Network Emulation Settings" on page 259.
 - ➤ For detailed information on configuring the WAN Emulation settings via the 3rd party software components, see the relevant WAN emulation software documentation.

Note: To undo changes made in the WAN Emulation Settings dialog box, click **Restore**.

5 Click **Save**. The WAN Emulation status for the load generator you selected changes to **Enabled**, and if you entered an Emulated location, it appears under **Emulated Location**.

Load Generator Limitations

When configuring the WAN Emulator, you must be aware of the following load generator 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 load 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 load 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 load 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 load test starts. For more information, see "Running Vusers on the Controller Machine" on page 102.

Removing Load Generators from the Load 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 load 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 load 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.

Typical Network Emulation Settings

The WAN Emulator allows you to emulate probable WAn effects over your network, thereby creating a more realistic scenario. The most typical effects which you can configure are:

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 load 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. For example, in the image below, you can group metrics according to load generators that were defined with the **LA-NY** location, as well as load generators where no WAN Emulation was defined.

pheesings			
ansaction Summary			<u></u> K
Filter condition:			Cancel
	Criteria	Values	10000
Transaction Name			Help
Transaction Response Time			S
Scenario Elapsed Time	11		<u>S</u> et Default
Emulated Location		LA-NY	
Host Location		✓ LA-NY	
Host Name		No WAN Emulation	
Transaction Hierarchical Path			
Script Name	//		
Transaction End Status			
Group By: Available groups: Emulated Location Group Name Host Location Host Name Script Name		Selected groups:	
Transaction Hierarchical Path VuserID			

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*.

For information about viewing Analysis results in Performance Center, see Chapter 26, "Analyzing a Load Test."

Viewing WAN Emulation Monitors

The WAN Emulation starts and stops automatically as you start and stop the load test. WAN Emulation monitors are assigned automatically when the load test run starts and WAN metrics are automatically collected during the load test run. You can view the WAN metrics during the scenario 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 more information, see Chapter 21, "Configuring Monitors Over a Firewall."

Excluding Machines from WAN Emulation

In some situations you may want to exclude certain machines from the WAN Emulation. You can do this by setting the WAN Emulator to refrain from affecting traffic from a load generator to specified machines, for example, a software update server. Network traffic which is not affected by the emulation will not suffer any WAN effects and will not be included in the WAN Emulation results.

Machines are excluded by one of the following methods:

Default. The following machines are always excluded by default: The Controller machine or the MI Listener and proxy server, the Diagnostics Commander server, and the SiteScope server (configured to monitor Performance Center servers and hosts).

Note: The Diagnostics server IP only appears as excluded if the load test is integrated with HP Diagnostics.

➤ Global. You can set specific machines to always be excluded. That is, so long as they remain excluded, they will never suffer any effects of the WAN Emulation, irrespective of which load generator they are connected to. You define this in the General Settings page of the Performance Center Administrator Site. For more information, see the section that deals with configuring general settings in the HP Performance Center Administrator Guide.

Note: The number of machines that may excluded any one time, including those that are excluded by default, might be limited by the WAN emulation software.

Reasons to Exclude Machines

Examples of situations where you should exclude machines from an emulated WAN include:

- ➤ In a Multiprotocol load test that includes a Web server and a database server; where information from the database server is not required as a part of the load test. In such a case, you would exclude the database server.
- > You may want to exclude all deployment and software upgrade servers.
- ➤ Where the Controller is running or monitoring Vusers over a firewall using the HTTPS configuration. The IP address of the proxy server should be excluded.

Additional WAN Emulation Limitations

The following are known limitations for WAN Emulation:

➤ Selecting either Use bandwidth, or Use custom bandwidth in the Network: Speed Simulation node in the Run Time Settings, may interfere with the WAN Emulation settings and could lead to unexpected behavior. For more information on Run Time Settings, see "Configuring Run-Time Settings" on page 187.

- ► The integrated WAN emulation software might not comply with accepted Internationalization (I18N) conventions.
- ➤ The WAN Emulation software may consume large amounts of memory, since the technology delays traffic and captures traffic for later analysis. To verify that the load generator machine has sufficient memory, compare the load generator memory consumption with and without the emulation.

WAN Emulation Best Practices

We recommend the following when running a load test with WAN Emulation:

- Once the load test has started, check that WAN Emulation is running in one of the following ways:
 - Check for a confirmation message in the notification messages of the Output window. The message should contain the following text:

WAN Emulation started on host <host name> with the following configuration <config>

- ➤ Ping the load generator from your machine and check that the latency and packet loss behavior is as defined. Your machine must not be excluded from WAN Emulation to do this.
- ➤ If you kill the LR_Bridge.exe or magentproc.exe processes on a load generator to stop a load test, manually stop the WAN Emulation as well.

Chapter 17 • WAN Emulation

18

Using Functional Testing Scripts in Performance Center

Using Performance Center you can test and monitor how your application's *functionality* is affected by heavy load. Performance Center can integrate functional testing scripts in the form of *GUI Vuser scripts* into a load test. These GUI Vuser scripts are created using HP's functional testing software, HP QuickTest Professional or HP WinRunner.

This chapter includes:

- ► About Using Functional Testing Scripts in Performance Center on page 266
- ► Introducing GUI Vuser Scripts on page 267
- Using QuickTest to Create GUI Vuser Scripts for Performance Center on page 269
- Using WinRunner to Create GUI Vuser Scripts for Performance Center on page 271
- ► Running GUI Vuser Scripts in a Performance Center Load Test on page 278

About Using Functional Testing Scripts in Performance Center

HP QuickTest, HP's functional testing software, enables you to create complex tests that examine the full spectrum of your application's functionality.

Performance Center can integrate these QuickTest scripts into a load test in the form of GUI Vuser scripts. These scripts, which have already been designed and debugged in QuickTest, can be used as the basis of your load test.

The main advantages of running functional testing scripts in Performance Center are:

- ➤ To check how your application's functionality is affected by heavy load
- To measure the response time that a typical user experiences on the client side while your application is under load (end-to-end response time)

For example, you can add QuickTest or WinRunner test scripts to specific points in a Performance Center load test to confirm that the application's functionality is not affected by the extra load at those sensitive points.

Another advantage of using a GUI Vuser script as part of your Performance Center load test is that the GUI Vuser script runs on your screen during the load test, enabling you to watch the actual steps executed by the Vuser in real time.

Introducing GUI Vuser Scripts

GUI Vusers enable you to measure and monitor end-to-end user response times while your client/server system is under load. A GUI Vuser emulates the complete environment of a human user.

For example, a human user sits at a machine, operates applications using the keyboard and the mouse, and reads information on the machine's monitor. Similarly, a GUI Vuser runs on its own machine and operates applications. A GUI Vuser can be programmed to read and act on information that appears on its machine's display.

Suppose that you have a bank server that services many automatic teller machines (ATMs). You could create a GUI Vuser script that:

- ► opens the ATM application
- ► enters an account number
- ► enters the amount of cash to be withdrawn
- ► withdraws cash from the account
- ► checks the balance of the account
- ► closes the ATM application
- ► repeats the process

The actions of each GUI Vuser are described in a GUI Vuser script. You use QuickTest and WinRunner to create GUI Vuser scripts.

You monitor and manage GUI Vusers from the Performance Center User site. For instance, you can run, pause, or view Vusers, and monitor the load test status.

Note: You cannot use VuGen to run a GUI Vuser script. In the User site, you run a GUI Vuser script as part of a load test; you use WinRunner or QuickTest to run a GUI Vuser script in standalone mode.

Understanding GUI Vuser Technology

GUI Vusers measure real end-to-end response times. End-to-end response times represent the total time that a user waits for a response after submitting a request. End-to-end response times include GUI response times as well as network and server response times.



Using QuickTest to Create GUI Vuser Scripts for Performance Center

When creating test scripts in QuickTest that are going to be used as GUI Vuser scripts in a Performance Center load test, you need to follow certain guidelines to ensure smooth integration of the script. For detailed explanations about creating tests in QuickTest see the QuickTest documentation.

This section describes the following general guidelines:

- ► Limitations
- ► Including Transactions
- ► Adding Statements
- ► Designing Tests for Performance Center

Limitations

QuickTest offers several features that are designed specifically for integration with Performance Center. Some QuickTest features, however, may not be available when they are integrated with Performance Center. For more information about specific limitations, see the QuickTest readme.

Including Transactions

To measure the performance of the server, you define **transactions**. A transaction represents an action or a set of actions that you are interested in measuring. You define transactions within your Vuser script by enclosing the appropriate sections of the script with **start** and **end** transaction statements.

For example, you can define a transaction that measures the time it takes for the server to process a request to view the balance of an account and for the information to be displayed at the ATM.

Note: Performance Center only provides performance information for data that is included within a transaction. Therefore, your QuickTest test must include transactions to be used by Performance Center.

For more information about defining trasnactions in your QuickTest script, see the QuickTest documentation.

Adding Statements

You can use the **Services** object and its associated methods to insert statements that are specifically relevant to performance testing. These include **Abort**, **GetEnvironmentAttribute**, **LogMessage**, **SetTransactionStatus**, **ThinkTime**, **UserDataPoint**, **StartTransaction** and **EndTransaction**. For more information on these methods, see the QuickTest documentation.

Designing Tests for Performance Center

Consider the following design guidelines when designing tests for use with Performance Center:

- The QuickTest tests you use with Performance Center should be simple tests, designed to pinpoint specific operations.
- > Performance Center cannot run nested action iterations.
- ➤ Do not include references to external actions or other external resources, such as an external Data Table file, environment variable file, shared object repositories, and so forth.
- Include transactions in your QuickTest test because Performance Center only provides performance information for data that is included within a transaction.

Using WinRunner to Create GUI Vuser Scripts for Performance Center

This section outlines how to use WinRunner to create and enhance GUI Vuser scripts that are going to be used in a Performance Center load test. For detailed explanations about creating tests in WinRunner, see the WinRunner documentation.

Note: Some WinRunner features may not be available when they are integrated with Performance Center.

This section includes:

- ► "Understanding GUI Vuser Scripts" on page 272
- ▶ "Inserting Transactions and Rendezvous Points" on page 274
- ► "Using Vuser Functions in GUI Vuser Scripts" on page 275
- ► "Sending Messages to the Controller" on page 276
- ► "Obtaining Information about Vusers and Load Generators" on page 277

Understanding GUI Vuser Scripts

WinRunner is a complete development environment for creating, editing, and debugging Windows-based GUI Vuser scripts. Using WinRunner, you record the actions of a human user on an application.

For example, you could record a user entering an account number into an ATM and then withdrawing fifty dollars. These actions are automatically transcribed into a script in HP's Test Script Language (TSL).

GUI Vuser scripts are written in TSL—HP's Test Script Language. TSL is a high-level C-like programming language. It combines the power and flexibility of a conventional programming language with functions designed specifically for testing. For additional information about TSL, see the *TSL Online Reference* (available from the WinRunner Help menu)

This section presents a basic Vuser script, created in WinRunner. The script starts an ATM application (mratm.exe), enters an account number, deposits fifty dollars, and then closes the application.

Note: This script will not work on a Unix machine.

The first section of the script starts an application and moves it to a new location on the screen. The **system** function starts the ATM application. The **win_move** function moves the ATM application to a specified location on the screen.

Initialize and invoke ATM client application. invoke_application("c:\mratm.exe","","",SW_SHOWMINIMIZED); win_move ("Mercury ATM", 325, 0); Next, the Vuser enters an account number into the ATM. The **set_window** function activates the ATM window. The **edit_set** function instructs the Vuser to enter the account number into the ATM's account field.

```
# Type in account number in the Account field.
account = 100;
set_window ("Mercury ATM");
edit set ("Account", account);
```

After entering the account number, the Vuser enters the amount it wants to deposit and presses the deposit button. The **edit_set** function enters the amount to be deposited in the amount field. The **button_press** function tells the Vuser to press the ATM's Deposit button.

```
# Enter the amount to be deposited in the amount field.
amount = 50;
set_window ("Mercury ATM");
edit_set ("Amount", amount);
# Press the Deposit button.
button press ("Deposit");
```

The final section of the test tells the Vuser to close the ATM application. The **menu_select_item** function selects the Exit command from the File menu.

Close client application. menu_select_item ("File; Exit");

Inserting Transactions and Rendezvous Points

To measure the performance of the server, you define **transactions**. A transaction represents an action or a set of actions that you are interested in measuring. You define transactions within your Vuser script by enclosing the appropriate sections of the script with **start** and **end** transaction statements. For example, you can define a transaction that measures the time it takes for the server to process a request to view the balance of an account and for the information to be displayed at the ATM.

Note: Performance Center only provides performance information for data that is included within a transaction. Therefore, your WinRunner test must include transactions to be used by Performance Center.

You insert **rendezvous points** into Vuser scripts to emulate heavy user load on the server. **Rendezvous points** instruct Vusers to wait during test execution for multiple Vusers to arrive at a certain point, so that they may simultaneously perform a task. For example, to emulate peak load on the bank server, you can insert a rendezvous point instructing 100 Vusers to deposit cash into their accounts at the same time.

After recording a basic Vuser script using WinRunner, you manually insert:

- Transaction statements into the script to measure the performance of the server
- > Rendezvous statements into the script to emulate a specific user load

To mark the start of a transaction:

► Insert a **start_transaction** statement into the Vuser script.

To mark the end of a transaction:

Insert an end_transaction statement into the Vuser script. For the syntax of the start_transaction and end_transaction functions, see the *TSL Online Reference* (available from the WinRunner Help menu).

To insert a rendezvous point:

➤ Insert a rendezvous statement into the Vuser script. For the syntax of the rendezvous function, see the *TSL Online Reference* (available from the WinRunner Help menu).

Using Vuser Functions in GUI Vuser Scripts

This section lists the Vuser functions that you can use to enhance your GUI Vuser scripts. For syntax and examples of the functions, see the sections that follow or the *TSL Online Reference* (available from the WinRunner Help menu).

Function	Description
declare_rendezvous	Declares a rendezvous.
declare_transaction	Declares a transaction.
end_transaction	Marks the end of a transaction for performance analysis.
error_message	Sends an error message to the Controller.
get_host_name	Returns the name of a load generator.
get_master_host_name	Returns the name of the Controller load generator.
lr_whoami	Returns information about the Vuser executing the script.
output_message	Sends a message to the Controller.
rendezvous	Sets a rendezvous point in a Vuser script.
start_transaction	Marks the beginning of a transaction for performance analysis.
user_data_point	Records a user-defined data sample.

Sending Messages to the Controller

When you run a load test, the User Site's Output window displays valuable information about script execution. In addition to the messages automatically sent by WinRunner, you can include statements in each script that send error and notification messages to the User Site. For example, you could insert a message that displays the current state of an application. After load test execution, you can save these messages to a file.

The **error_message** function sends an error message to the User Site's Output window. The syntax of this function is:

```
error_message (message);
```

where *message* is a text string.

In the following example, the Vuser script sends a message when a fatal error occurs during script execution.

```
if (fatal_error < 0){
    mess="fatal error - Exiting.";
    error_message (mess);
    texit (1);
}</pre>
```

The **output_message** function is used to send a special notification that is not an error message. The syntax of this function is:

```
output_message (message);
```

where message is a text string.

For further information on the **error_message** and the **output_message** functions, see the *TSL Online Reference* (available from the WinRunner Help menu).

Obtaining Information about Vusers and Load Generators

During load test execution, you can obtain the identity of:

- > the Vusers performing a task at a particular moment in the load test
- ► the load generator executing a script
- ► the Contorller host machine

For example, you could program statements into a Vuser script to return the ID of each active Vuser currently using an application, and print this information to a file.

The following functions obtain information about Vusers and load generators:

Function	Description
lr_whoami	Returns the name of a Vuser and the Vuser group it belongs to
get_host_name	Returns the name of the machine executing the script
get_master_host_name	Returns the name of the Controller host machine

In the following example, the **get_host_name** function returns the name of the load generator currently running the script. The **print** statement saves the information to a file.

```
my_host_name = get_host_name();
print("my local load generator name is:" & my_host_name) > vuser_file;
```

For more information about these functions, see the *TSL Online Reference* (available from the WinRunner Help menu).

After recording a basic Vuser script, you insert statements into the script that measure the performance of the server (transactions), and create a synchronized user load (rendezvous points). For more details about GUI Vusers, see your *HP LoadRunner Online Function Reference*.

Running GUI Vuser Scripts in a Performance Center Load Test

After you have created your GUI Vuser script in QuickTest or WinRunner, you are ready to integrate the script into a Performance Center load test Before you run the Performance Center load test you should consider the following guidelines:

- > You can run only one GUI Vuser concurrently per machine.
- Ensure that QuickTest and WinRunner are closed before running the load test.
- ➤ In the script's Run-Time Settings dialog box, only the General categories and sub-categories (Run Logic, Pacing, Miscellaneous, Think Time) are relevant for QuickTest and WinRunner tests.

To add a GUI Vuser script to a Performance Center load test:

- **1** Navigate to the **Workload** tab of the load test.
- **2** If the script is not selected for the load test, click **Click to add new script** and select it from the list of scripts.

19

Setting Project Options

You can configure how load generators and Vusers behave when you run a load test so that the load test accurately emulates your working environment.

This chapter includes:

- ► About Project Options on page 280
- ► Setting Monitor Options on page 281
- ► Configuring Load Test Run-Time Settings on page 284
- ► Setting Timeout Intervals on page 286
- ► Setting Debug Information Options on page 288
- ► Setting General Options on page 290

About Project Options

Before you run a load test, you can configure load generator and Vuser options for all your load test projects from the Options pages. Although the default settings correspond to most environments, Performance Center allows you to modify the settings in order to customize the load test behavior. The settings apply to all future load test runs in the project and generally only need to be set once. The settings apply globally to all the load generators in a load test.

To open the Options pages, select **Project** > **Options**. You can configure the following options in Performance Center from the Options pages.

- ➤ 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.
- Run-Time Settings. Enables you to specify values relating to Vuser quotas, stopping Vusers, and random sequence seed.
- ► **Timeout**. Enables you to set the timeout interval for commands and Vuser elapsed time.
- ► **Debug Information**. Enables you to specify the extent of the trace to be performed during load test execution.
- ► **General**. Enables you to specify the multiple IP address mode.

Note: The settings discussed in this chapter are unrelated to the Vuser runtime settings. These settings, which apply to individual Vusers or scripts, contain information about logging, think time, the network, the number of iterations, and the browser. For information on setting the run-time settings, see the *HP Virtual User Generator User Guide*.

Setting Monitor Options

On the **Options** > **Monitors** page you can 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.

<u>Monitors</u>	Monitors
	Transaction Data
Run-Time Settings	Enable Transaction Monitor
Timeout	Sample information at frequency (sec) 5
	Send information in mode
Debug Information	Summary
	🔿 Raw Data
General	Server Resource Monitors
	Data Sampling Rate (sec) 3
	Debug
	🔲 Display debug messages
	Debug level 0
	Hint: Monitors Click on this link to configure relevant options
	Saus Use Defaults
	offer overbeiddig

To set Monitor options:

- **1** Select **Project > Options**, and click **Monitors**.
- **2** Select **Enable Transaction Monitor**, specify the frequency at which the monitor should send updates to the Controller for the Transaction, Data Point, and Web Resource graphs, and set the desired **Send** option. For more information, see "Transaction Data" on page 282.
- **3** Enter a data sampling rate for the server resource monitors. For more information, see "Server Resource Monitors" on page 283.
- **4** To display debug messages on the Output window, select **Display debug messages**. For the Network monitor, specify a **Debug level** from 1-9. For more information, see "Debug Messages" on page 283.

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

To restore Performance Center default settings, click **Use Defaults**, then click **Save**.

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 load test.
- ➤ 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 data is averaged for the frequency period defined, and only one value is sent to the Controller. The default frequency is 5 seconds. For a small load test, use a frequency of 1. For a large load test, you use a frequency of 3 5. 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.

Note: You cannot modify these settings during a load test; you must stop the load test before deactivating the monitor or changing its frequency.

- Send information in mode. Specify 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. However, since all of the data is being transferred to the Controller, it 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 is the period of time (in seconds) between consecutive samples. 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. To set a sampling rate for a specific graph, see "Customizing the Online Monitor View" on page 401.

The sampling rate you set 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 load test and reopen it.

Each monitor has a different minimum sampling rate. If the default sampling rate, or the rate set on the **Options** > **Monitors** page 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 sampling rate on the **Options** > **Monitors** page is set at less than 10 seconds, the Oracle Monitor continues to monitor data at 10 second intervals.

Debug Messages

The online monitor provides debugging capabilities. You can display the debug messages in the Output window. For the Network monitor, you can indicate the debug (detail) level of messages sent to the log, ranging from 1-9.

Configuring Load Test Run-Time Settings

To prevent system overload, and to control the way in which Vusers stop running, you can specify load test run-time settings relating to Vuser quotas, stopping Vusers, and random sequence seed on the **Run-Time Settings** page.

<u>Monitors</u>	Run-Time Settings
	Yusers Quota
<u>Run-Time Settings</u>	Number of Vusers that may be initialized simultaneously on all load generators 999 🗧
	When stopping Vusers
Timeout	O Wait for the current iteration to end before stopping
Debug Information	O Wait for the current action to end before stopping
	Stop immediately
General	Random advance mode of file type parameter
	Use random sequence with seed
	lise seed 0
	Hint:
	Run-Time Settings
	Click on this link to configure relevant options
	Save Use Defaults

To set the load test run-time settings:

- **1** Select **Project** > **Options**, and click **Run-Time Settings**.
- **2** To set a Vuser quota, specify the desired value. For more information, see "Vuser Quotas" on page 285.
- **3** Select the way in which you want Performance Center to stop running Vusers. For more information, see "Stopping Vusers" on page 285.
- **4** To specify a seed value for a random sequence, select **Use random sequence with seed** and type the desired seed value. For more information, see "Random Sequence Seed" on page 285.
- **5** Click **Save** to save your settings.

To restore Performance Center default settings, click **Use Defaults**, then click **Save**.

Vuser Quotas

To prevent your system from overloading, you can set quotas for Vuser activity. The Vuser quotas apply to Vusers on all load generators. You can limit the number of Vusers initialized at one time (when you send an Initialize command).

Stopping Vusers

When you click the **Stop** button, you control the way in which Vusers stop running:

- ➤ Wait for the current iteration to end before stopping. Instructs Performance Center to allow a Vuser to complete the iteration it is running before stopping. The Vusers move to the Gradual Exiting status and exit the load test gradually (Default option).
- ➤ Wait for the current action to end before stopping. Instructs Performance Center to allow a Vuser to complete the action it is running before stopping. The Vusers move to the Gradual Exiting status and exit the load test gradually.
- ➤ Stop immediately. Instructs Performance Center to stop running the Vusers immediately. The Vusers move to the Exiting status and exit the load test immediately.

Random Sequence Seed

Performance Center lets you set a seed number for random sequencing. 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 load 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 on the Run-Time Settings dialog box in the *HP Virtual User Generator User Guide*). Select this option if you discover a problem in the test execution and want to repeat the test using the same sequence of random values.

Setting Timeout Intervals

Performance Center lets you 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 it does not complete the command within the time limit, the Controller issues an error message.

Monitors	Timeout	
	Command Timeout (seconds)	
Run-Time Settings	Enable timeout checks	
	Load Generator	
Timeout	Connect operation (sec)	30 *
Debug Information	Disconnect operation (sec)	120 .
	Vusers	
General	Init stage (sec)	180 📫
	Run stage (sec)	120 ÷
	Pause stage (sec)	120 ÷
	Stop stage (sec)	120
	Hint: General Click on this link to configure relevant of	ptions
Save Use Defaults		

To set timeout intervals:

- **1** Select **Project** > **Options**, and click **Timeout**.
- **2** To specify a command timeout interval, select **Enable timeout checks** and specify the appropriate timeouts. For more information, see "Enable Timeout Checks" on page 287.

Clear **Enable timeout checks** to disable the timeout test.

3 Click **Save** to save your settings.

To restore Performance Center default settings, click **Use Defaults**, then click **Save**.

Enable Timeout Checks

Instructs Performance Center to monitor the status of load generators or Vusers after a command is issued by the Controller. If the load generator or Vuser does not complete the command within the timeout interval, the Controller issues an error message. If you disable the timeout limitations, Performance Center 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.

You can specify the following load generator and Vuser timeout intervals:

- ► Load Generator
 - Connect operation (sec). Type the time limit that Performance Center waits to connect to any load generator. If a connection is not successful within this time, the status of the load generator changes to Failed. The default connection timeout is 30 seconds.
 - Disconnect operation (sec). Type the time limit that Performance Center waits to disconnect from any load generator. If a disconnection is not successful within this time, the status of the load generator changes to Failed. The default disconnection timeout is 120 seconds.
- ➤ Vusers
 - ➤ Init stage (sec). Type the timeout value for the Initialize action. The default time limit is 180 seconds.
 - ➤ Run stage (sec). Type the timeout value for the Start Vusers action. The default time limit is 120 seconds.
 - ➤ Pause stage (sec). Type the timeout value for the Duration action. The default time limit is 120 seconds.
 - ➤ Stop stage (sec). Type the timeout value for the Stop Vusers action. The default time limit is 120 seconds.

For details about load test schedule actions, see Chapter 11, "Configuring Scheduler Settings."

Note: Performance Center's 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. Performance Center adds an internal value, based on the number of active Vusers, to the specified timeout value.

Setting Debug Information Options

Performance Center lets you create trace files, which are used to gather information for debugging purposes. You can determine the extent of the trace to be performed during a load test by enabling trace options on the **Debug Information** page. The debug information is written to the Vuser Errors page.

Monitors	Debug Information
Run-Time Settings	General
Timeout	File Transfer
	Incoming communication
Debug Information	Outgoing communication
<u>General</u>	
	Save Use Defaults

The following trace flags are available: **General**, **File Transfer**, **Incoming Communication**, and **Outgoing Communication**. You only need to select the flags relating to your problem. For example, if you encounter specific problems with the transfer of files, select the **File Transfer** flag.
The Performance Center agent and Controller machine create some temporary files, which 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 load test, all these files are automatically deleted.

To set the Debug Information settings:

- 1 Select **Project > Options**, and click **Debug Information**.
- **2** Select the desired trace flags.
- **3** Click **Save** to save your settings.

To restore Performance Center default settings, click **Use Defaults**, then click **Save**.

Setting General Options

You can specify global settings for multiple IP address allocation from the **Options** > **General** page when the IP spoofing option is selected. For details on enabling IP spoofing, see "Enabling IP Spoofing from Performance Center" on page 301.

The Controller can allocate an IP address per process or per thread. Web Vusers require IP address allocation per process. WinSock Vuser IP addresses can be allocated per thread or per process. Allocation per thread results in a more varied range of IP addresses in a load test.

Monitors	General Multiple IP address mode
Run-Time Settings	O IP address allocation per process
Timeout	IP address allocation per thread
Debug Information	
<u>General</u>	
	Save Use Defaults

To set the General settings:

- **1** Select **Project** > **Options**, and click **General**.
- **2** Select the desired multiple IP address mode.
- **3** Click **Save** to save your settings.

To restore Performance Center default settings, click **Use Defaults**, then click **Save**.

20

Configuring Multiple IP Addresses

When you run a load test, the Vusers on each load generator machine use the machine's IP address. You can define multiple IP addresses on a host machine to emulate a real-world situation in which users sit on different machines.

This chapter includes:

- ► About Multiple IP Addresses on page 292
- ► Adding IP Addresses to a Host on page 293
- ► Using the IP Wizard on page 294
- ► Configuring Multiple IP Addresses on UNIX on page 298
- ► Updating the Routing Table on page 300
- ► Enabling IP Spoofing from Performance Center on page 301

About Multiple IP Addresses

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 machine have the same IP address, server and router optimizations do not reflect real-world situations.

Performance Center's multiple IP addressing enables Vusers running on a single machine to be identified by many IP addresses. The server and router recognize the Vusers as coming from different machines and, as a result, the testing environment is more realistic.

Note: The maximum number of IP addresses that can be spoofed per network card for Windows NT SP3 is 35 IPs; Solaris (version 2.5.1) up to 255 IPs; Solaris (version 2.6 and higher) up to 8192 IPs.

Applicable Protocols

Multiple IP addressing is applicable to the following protocols:

- ► Client/Serve. DNS, Windows Sockets
- ► Custom. JavaScript Vuser, VB Vuser, VB Script Vuser
- ► E-business. FTP, Palm, SOAP, Web (HTTP/HTML), Web Services, and the dual WinSock\Web Dual Protocol
- ► 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
- ► Wireless. i-Mode, VoiceXML, WAP

This feature can be implemented on Windows and UNIX platforms.

Adding IP Addresses to a Host

Performance Center includes the IP Wizard that you run on each Windows host machine to create multiple IP addresses. You add IP addresses to a machine once and use the addresses for all load tests. For information about adding IP addresses on UNIX machines, see "Configuring Multiple IP Addresses on UNIX" on page 298.

To add new IP addresses to a load generator:

- **1** Run the IP wizard on a host machine to add a specified number of IP addresses. Manually configure the new IP addresses for UNIX Host machines.
- **2** Restart the machine.
- **3** If necessary, update the server's routing table with the new addresses.
- **4** Enable IP spoofing in the Performance Center User Site. For more information, see "Enabling IP Spoofing from Performance Center" on page 301.

Using the IP Wizard

The IP Wizard resides on each Performance Center host or load generator machine. You run this process once to create and save new IP addresses on Windows machines. 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.

To add new IP addresses to a load generator machine:

1 Invoke the IP Wizard (**ipwizard.exe**) from the Performance Center **bin** folder.

IP Wizard - Step 1 of 3
IP Wizard helps you manage your machine's IP addresses
Select one of the following:
Create new settings
O Load previous settings from file:
O Restore original settings
Before any changes you make can have effect
I. This machine must be restarted
Important 2. The rodding table of the web server high need updating
Kappen K

Note: The IP Wizard only works on machines with a fixed IP, not on machines with a DHCP.

- **2** If you have an existing file with IP address settings, select **Load previous settings from file** and select the file.
- **3** If you are defining new settings, select **Create new settings**.

4 Click **Next** to proceed to the next step. If you have more than one network card, select the card to use for IP addresses and click **Next**.

The optional Web server IP address step enables the IP Wizard to check the server's routing table to see if it requires updating after the new IP addresses are added to the load generator.

IP Wizard - Step 2 of 3
Optional: You can enter your Web server's IP address here.
IP Wizard will check if the Web server's routing table will need updating. If so, scripts will be generated to help you update.
< Back Next> Cancel Help

5 To check the server's routing table directly after adding the addresses, type the server IP address. For more information, see "Updating the Routing Table" on page 300.

6 Click **Next** to see a list of the machine's IP address(es). Click **Add** to define the range of addresses.



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.

- **7** Select a class that represents the correct submask for the machine's IP addresses.
- 8 Specify the number of addresses to create. Select **Verify that new IP** addresses are not already in use to instruct the IP Wizard to check the new addresses. The IP Wizard will only add the addresses not in use.

9 Click **OK** to proceed.

After the IP Wizard creates the new addresses, the summary dialog box lists all of the IP addresses.

IP Wizar	d - Step 3 of 3				
	IP Address	Subnet Mask			
	207.232.012.025	255.255.255.000			
	192.168.1.1	255.255.255.0			
	192.168.1.2	255.255.255.0			
				Number of	
				IP's added:	
				n 3 ddddd.	
				2	
	Add	Remove			
					_
	Z Back	Finish	Гa	ncel Help	
		1 11 11 11			

10 Click **Finish** to exit the IP Wizard. The IP Wizard - Summary dialog box opens.

IP Wi	zard - Summary	×
	The following scripts have been generated to help you add IP addresses to the routing table of Web server 200.200.200.200 E:\TEMP\unix_routing.sh E:\TEMP\nt_routing.bat IP Wizard will add the following IP addresses to this machine: 192.168.1.1 Mask 255.255.255.0	
	Reboot now to update routing tables Save OK Cancel	

- **11** Note the address of the **.bat** file, and see "Updating the Routing Table" on page 300 for information about using the batch file to update the routing table, if necessary.
- **12** After you update the routing table, check **Reboot now to update routing tables** to initialize the NT device drivers with the new addresses.
- 13 Click OK.

Configuring Multiple IP Addresses on UNIX

To configure multiple IP addresses on UNIX, manually configure the addresses on the Performance Center host or load generator machine.

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

2 Create /etc/hostname.hme0:n files that contain the hostname for the virtual host n. Note that 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.

3 You can also directly enable/modify a 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**.

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.

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 subnet mask. Place this command in the **rc.local** file so that it executes upon boot.

Updating the Routing Table

When 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 through the router. Make sure to add the following to the server routing table: route from the Web server to the router, and routes from the router to all of the IP addresses on the load generator machine.

To update the Web server routing table:

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

- **2** For each occurrence of [CLIENT_IP], insert your IP address instead.
- **3** Run the batch file on the server machine.

Enabling IP Spoofing from Performance Center

After you define multiple IP addresses, you can enable IP spoofing for a load test.

Note: You must enable IP spoofing before running a load test.

To enable IP spoofing from the User site:

- On the Performance Center left menu, select Load Tests > Manage. The Load Tests page opens, displaying all the load tests in the current project.
- **2** Click the load test for which you want to enable IP spoofing.
- **3** On the Load Test configuration page that opens, click the **General** tab.
- 4 Under Advanced, select Enable IP Spoofer.



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

Chapter 20 • Configuring Multiple IP Addresses

21

Configuring Monitors Over a Firewall

To monitor servers over a firewall, you need to configure the Monitor Over Firewall machine. On the Monitor Over Firewall machine, you use the Server Monitor configuration tool to select which servers to monitor and to define specific measurements that Performance Center collects for each monitored server.

In the User Site, you establish a connection between the tests you are running and the Monitor Over Firewall machines.

This chapter includes:

- ► About Monitoring over a Firewall on page 304
- ► Configuring Monitor Settings on page 305
- Configuring the User Site to Receive Monitor Over Firewall Information on page 310

About Monitoring over a Firewall

To enable monitoring of your servers over a firewall, you install the Monitor Over Firewall component on a dedicated machine.

Important: Before you configure the Monitor Over Firewall machine to monitor servers over a firewall, you need to set up your Performance Center system to work with firewalls. For detailed information, see the section about working with firewalls in the *HP Performance Center System Configuration and Installation Guide*.

After you have set up your Performance Center system to work with firewalls, you need to carry out the following steps to enable monitoring over a firewall:

1 Configure monitor settings on the Monitor Over Firewall machine.

Use the Server Monitor configuration tool to select which servers to monitor and to define specific measurements that Performance Center collects for each monitored server.

See "Configuring Monitor Settings" on page 305.

2 Configure the User Site to receive monitor over firewall information.

Establish a connection between the tests you are running and the Monitor Over Firewall machines.

See "Configuring the User Site to Receive Monitor Over Firewall Information" on page 310.

Configuring Monitor Settings

You configure the monitor settings from the Monitor Over Firewall machine, using the Monitor Configuration tool. You select the type of monitors to run and the server whose resources you want to monitor, add the measurements to monitor for each server, and specify the frequency with which you want the monitored measurements to be reported.

To configure monitor settings:

1 On the Monitor Over Firewall machine, choose Start > Programs > HP Performance Center > Advanced Settings > Monitor Configuration. For machines without the complete Performance Center installation, choose Start > Programs > Server Monitor > Monitor Configuration. The Monitor Configuration dialog box opens.





2 Click the **Add Server** button. The New Monitored Server Properties dialog box opens.

New Monitored Server Properties	<u>? ×</u>
Monitored Server:	
Available Monitors:	
Antara FlameThrower	
	122
Ariba	
ATG Dynamo	
BroadVision (4.5-5.4)	
BroadVision (5.5-6.x)	
CheckPoint FireWall-1	
Citrix MetaFrame XP	
ColdFusion	
DB2	
🗖 Fujitsu INTERSTAGE	
IBM WebSphere MQ	-
OK	Canad 1
UK	

3 In the Monitored Server box, type the name or IP address of the server whose resources you want to monitor.

Note: To add several servers simultaneously, separate the server names or IP ranges with commas. For example, 255.255.255.0-255.255.255.5, server1, server2.

4 From the **Available Monitors** list, select the monitors appropriate for the server being monitored.

5 Click OK to close the New Monitored Server Properties dialog box. The Monitored Servers list is displayed in the Monitor Configuration dialog box.

Monitored Servers
Monitored
Monitored
Monitors
Monitors
Monitors
Monitors
Monitors
Monitors

0

Performance Center displays default measurements for certain monitors in the Measurements to be Monitored section. You can specify the frequency at which Performance Center reports the measurement in the Measurement Properties section.

- **6** To add additional monitored servers to the list, repeat steps 2 through 5.
- **7** To edit the monitor configuration properties for a server, click the **Edit** button. The Monitored Server Properties dialog box opens enabling you to edit the monitors for the server whose resources you are monitoring.
- **8** Click **Apply** to save your settings.

Cloning a Monitored Server's Properties

To monitor the same properties on different server machines, you can clone a selected server's properties using the Clone Monitored Server Properties dialog box.

To clone a monitored server's properties:

- **1** Open the Monitor Configuration dialog box.
- **2** Right-click the server you want to clone, and select **Clone**. The Clone Monitored Server Properties dialog box opens.

Clone Monitored Server P	roperties	? ×
Monitored Server: Delta		
Available Monitors:		
Antara FlameThrower		
Apache		
Ariba		
ATG Dynamo		
BroadVision (4.5-5.4)		
BroadVision (5.5)		
I EJB		
Fujitsu INTERSTAGE		
iPlanet (NAS)		_
	ОК	Cancel

3 In the **Monitored Server** box, type the name or IP address of the cloned server you want to create.

Tip: To create several cloned servers simultaneously, separate the server names or IP ranges with commas. For example, 255.255.255.5, server1, server2.

- **4** The **Available Monitors** list displays the monitors that were selected for the server being cloned. Select additional appropriate monitors for the cloned server.
- **5** Click **OK** to close the Clone Monitored Server Properties dialog box. The cloned server is displayed in the Monitored Servers list.
- **6** Click **Apply** to save your settings.

Adding and Removing Measurements

After you configure one or more server machines to monitor, you add measurements to monitor for each server. If Performance Center added default measurements, you can edit them as required.

To add a measurement to monitor:

- **1** Open the Monitor Configuration dialog box.
- **2** Select a server from the Monitored Servers list.
- **3** Click the **Add Measurement** button. Select the appropriate monitor. A dialog box opens, enabling you to choose measurements for the monitor you selected.
 - **4** Select the measurements that you want to monitor, and click **OK**.
 - **5** Click **Apply** to save your settings.

÷

To remove a measurement from the measurements list:

- **1** Select the measurement, and click the **Delete** button.
 - **2** Click **Apply** to save your settings.

Configuring Measurement Frequency

Once you have configured monitor measurements, you configure measurement frequency, that is, you set a schedule for reporting each measurement.

Measurement Properties		
Schedule: report measurement every	1	Minute(s)

To set a schedule for reporting a measurement:

- **1** In the Monitor Configuration dialog box, in the **Measurement Properties** section, select the configured server measurement you want to schedule.
- **2** Specify the frequency at which you want Performance Center to report the measurement.
- **3** Click **Apply** to save your settings.

Configuring the User Site to Receive Monitor Over Firewall Information

After you configure your monitors, you configure the Performance Center User Site to receive Monitor Over Firewall information during load tests.

To configure the User Site to receive Monitor Over Firewall information:

- 1 In the Monitor Profile page, add the Monitor Over Firewall machines that can be accessed by load tests in this project. See "Adding Monitor Over Firewall Machines to the Monitor Profiles Page" on page 311.
- **2** In the Load Test configuration page, select the Monitor Over Firewall machines you want to use in a specific load test. See "Selecting Monitor Profiles for a Load Test" on page 221.

During a load test run you can edit Monitor Over Firewall machine information. See "Editing Monitor Over Firewall Information" on page 383.

Adding Monitor Over Firewall Machines to the Monitor Profiles Page

In the Monitor Profile page, you add the Monitor Over Firewall machines that can be accessed by load tests in this project.

To add a Monitor Over Firewall machine to your monitor list:

1 Select **Project > Monitor Profiles**. The Monitor Profiles page opens.

Monitor Profiles	Time on Server : 9-1	Mar-2008 3:04:29 PM ((GMT	-8) PST)
MI Listener IP address/name: Em Monitor Over Firewall machines: N	pty o machines were defin	ed. <u>Modify machine names</u>	
		Add Duplicate	Import
The project includes the following	monitor profiles:	Currently Showing	:1-1/1
profile1		Edit Name	×

2 Click **Modify machine names**. The Monitor Over Firewall machines dialog box opens.

Note: In this dialog box, you can add Monitor Over Firewall machines, and edit or delete existing Monitor Over Firewall machines.

🗿 Monitor Over Firewall machine	ss - Microsoft Internet Explorer provided by 📮 🗖 🗙
Edit Monitor Over Firewall r	nachine list
mofw1 ×	
Add a new Monitor Over Firewa	Il machine:
Machine name:	Add
Note: You must use lower case	e for machine's name
	Close Help

- **3** In the **Machine name** box, type the name of the Monitor Over Firewall machine.
- **4** Click **Add**. The Monitor Over Firewall machine is added to the page.
- **5** Click **Close**. The name of the Monitor Over Firewall machine now appears on the Monitor Profiles page.

To select the Monitor Over Firewall machines to monitor a load test, see "Selecting Monitor Profiles for a Load Test" on page 221.

While the load test is running, you can change the status of a Monitor Over Firewall machine or add another monitor to the load test.

To modify the Monitor Over Firewall machines:

- **1** On the Load Test Run page, click the **Design** button. The Load Test Design dialog box opens.
- **2** Click **Settings**. The Settings dialog box opens.
- **3** Click the **Server Monitors** tab. Performance Center displays the Monitor Over Firewall machines that are monitoring the load test, as well as their connection status.

🚰 Settings - Microsoft Internet Explorer p	rovided by Hewle	tt-Packard	
Change Duration Server Monitors	Refresh freque	ency Miscellane	005
Edit Monitor Over Firewall machine	list		
Monitor Over Firewall machiness in load	test:		
Name		Status	Connect/ Disconnect
mofw1		Down	₽
Add Monitor Over Firewall machine: m	ofw2 🔹		
OK Clos	e Refresh	Help	

- ➤ To connect or disconnect a Monitor Over Firewall machine, click the Connect/Disconnect button.
- ➤ To add a Monitor Over Firewall machine to the load test, select it from the Add Monitor Over Firewall machine list.
- 4 Click OK.
- **5** Click **Close** to close the Settings dialog box.

Chapter 21 • Configuring Monitors Over a Firewall

Part III

Executing Load Tests

Viewing Vusers During a Load Test

During the load run, you can view the actions that are performed by Vusers.

This chapter includes:

- ► About Viewing Vusers During a Load Test on page 317
- ► Monitoring Load Test Data on page 318
- ► Tracking Vuser Messages on page 324
- ► Viewing the Output Window on page 325
- ► Viewing Snapshots on Errors on page 330

About Viewing Vusers During a Load Test

While a load test runs, Performance Center measures and records the transactions you defined in your Vuser script. You can monitor a running load test from the Load Test Run page.

On the Load Test Run page, you can:

- Monitor key load test data. For details, see "Monitoring Load Test Data" on page 318.
- Monitor Vuser status for each script. For details, see "Monitoring Vuser Status" on page 322.
- Track Vuser messages. For details, see "Tracking Vuser Messages" on page 324.
- ➤ View online graphs. For details, see Chapter 25, "Online Monitor View."

Monitoring Load Test Data

You monitor load test data during the load test run to get an overview of the test's status and the effects of load on your Web server. At the top of the Load Test Run page, you can view the user and project name.

```
User: Admin Project: Default
Test: lazarus Scheduler stopped (go to Design... -> Scheduler... to start scheduler) Status: Down
```

The status section displays the name of the running test, the step that the Scheduler is performing, the next action of the Scheduler, and the status of the load test. The Status statement and corresponding icon informs you of the status of the run.

You also monitor run time data, displayed beneath the Groups table, during the load test run.

```
Running Yusers: 0 Time: 00:36:55 Hits/sec: 8 Passed trans: 1227 Failed trans: 0 Errors: 0 Trans details
```

Link	Description
Running Vusers	Shows the number of currently running Vusers.
	Click Running Vusers to open the Running Vusers - Whole Load Test graph. You can select and view any available graph from the graph list. For more information, see the <i>HP</i> <i>Performance Center Monitor Reference</i> .
Time	Shows the start Time, elapsed Time, time remaining in the load test, and time remaining in the timeslot. The last 15 minutes of the timeslot are allocated to collate and analyze the load test data.
	Click Time to open the Load Test Time Information dialog box. For more information, see "Load Test Time Information" on page 320.

This information includes:

Link	Description
Hits/Sec	Shows the number of hits made on the Web server by Vusers during each second of the load test run. This figure helps you evaluate the amount of load Vusers generate, in terms of the number of hits.
	Click Hits/Sec to open the Hits per Second - Whole Load Test graph. You can select and view any available graph from the graph list. For more information, see the <i>HP</i> <i>Performance Center Monitor Reference</i> .
Passed Trans	Shows the number of completed, successful transactions performed during a load test run. This figure helps you determine the actual transaction load on your system at any given moment.
	Click Passed Trans to open the Total Passed Transactions - Whole Load Test graph. You can select and view any available graph from the graph list. For more information about Transaction Monitor graphs, see the <i>HP Performance</i> <i>Center Monitor Reference</i> .
Failed Trans	Shows the number of completed, unsuccessful transactions performed during a load test run.
	Click Failed Trans to open the Total Failed Transactions - Whole Load Test graph. You can select and view any available graph from the graph list. For more information, about Transaction Monitor graphs, see the <i>HP Performance</i> <i>Center Monitor Reference</i> .
Errors	Shows the number of Vuser errors that occurred.
	Click Errors to view the Output window. For more information, see "Viewing the Output Window" on page 325.
Trans Details	Click Trans Details to open the Transaction Details dialog box. The Transaction Details dialog box shows each individual transaction in the script, and lists transactions per second, and the number of transactions that passed, failed, and stopped. For more information, see "Transaction Details" on page 321.

Load Test Time Information

To view the timing aspects of the load test, click the **Time** link at the top of the Load Test Run page. The Load Test Time Information dialog box opens.

Timeslot Remaining Time:	00:57:40	(HH:MM:SS)		
Start Time:	09:24:24	(HH:MM:SS)		
Elapsed Time:	00:01:31	(HH:MM:SS)		
Remaining Time:	00:42:29	(HH:MM:SS)		
Note: The last 15 minutes of the timeslot are allocated to collating and analyzing the load test results.				

The Load Test Time Information dialog box displays the following information:

- **> Timeslot Remaining Time**. The time remaining in the timeslot.
- **Start Time**. The server time at the start of the timeslot.
- **Elapsed Time**. The time that has elapsed since the start of the timeslot.
- **> Remaining Time**. The time remaining in the test.

Transaction Details

You can view details of individual transactions in the Transactions Details dialog box. To open the Transactions Details view dialog box, click the **Trans Details** link at the top of the Load Test Run page.

Transactions Details - Microsoft Internet Explorer					
Transactions Details					1
<u>Name</u>	<u>TPS</u>	Passed	<u>Failed</u>	<u>Stopped</u>	
HTMLTAGSTransaction	0,38	200	0	0	
HTTPSSitesTranscation	0,38	200	0	0	
vuser_end_Transaction	0,38	20	0	0	
EnteringLazarusTransaction	0,56	209	0	0	
Action_Transaction	0,56	189	0	20	
vuser_init_Transaction	0,00	20	0	0	
RelativeLink1Transaction	0,67	200	0	0	
withoutURLTransaction	0,56	189	0	11	
Close		Refresh			
0.050					

The Transaction Details dialog box displays the following information:

- ► Name. Lists the names of the individual transactions in a script.
- **► TPS**. Displays the number of transactions per second.
- ► **Passed**. Lists the number of transactions that passed.
- ► **Failed**. Lists the number of transactions that failed.
- **Stopped**. Lists the number of transactions that stopped.

Monitoring Vuser Status

Performance Center enables you to track the status of each Vuser that runs during the load test. Performance Center displays the number and status of Vusers for each Vuser script.

As a load test runs, the Load Test Run page displays, for each script, the number of Vusers and the Vuser's status.

🗄 Group:	Down	Init	Ready	Run	Rendez	Exiting	Passed	Failed	Stopped	Error
Total:	53	2	22	0	0	0	0	0	0	0
🛨 getvuserip 🔻	24 🔻		15 🔻							
🛨 purchaseor 🔻	29 🔻	2 🔻	7 🔻							

The possible statuses are as follows:

Status	Description
Down	The Vuser is down.
Init	The Vuser is being initialized on the remote machine.
Ready	The Vuser already performed the init section of the script and is ready to run.
Run	The Vuser is running. The Vuser script is being executed on a load generator.
Rendez	The Vuser has arrived at the rendezvous and is waiting to be released by Performance Center.
Exiting	The Vuser has finished running or has been stopped, and is now exiting. Gradual exiting is shown in parenthesis.
Passed	The Vuser has finished running. The script passed.
Failed	The Vuser has finished running. The script failed.
Stopped	The Vuser stopped when the Stop command was invoked.
Error	A problem occurred with the Vuser. Check the output dialog box for a complete explanation of the error.

To display Vuser status per host, click the "+" symbol beside the Vuser script name to open the host list for the script. To close the host list, click the "-" symbol.

To perform Vuser actions from the Vuser menu, see "Vuser Menu" on page 347.

To view Vuser messages for a set of Vusers, display the host list for a script, and click a linked number. The Vuser Details dialog box opens. Click a Vuser ID to view the activity log for the selected Vuser. For details, see "Tracking Vuser Messages" on page 324.

Tracking Vuser Messages

Performance Center enables you to track Vuser activity that occurs during the load test run, including logged messages from the script run, as well as error messages, from the Load Test Run page.

To view the Vuser activity log:

- 1 Click the "+" symbol beside a script name to display the host list for the script.
- 2 To view the messages related to a group of Vusers, click the arrow next to the action of a group of Vusers in the Groups table, and click **Show Vusers**. Performance Center opens the Vuser Details dialog box and displays each Vuser's ID and relevant details.

Vusers Details - Microsoft Internet Explore	r	
Yusers Details		×
Filter Vusers Groups = htmlerroronlazarus Generators = All Statuses = Run		Edit Refresh
Currently showing: 1 - 5 / 5		
Vuser ID Status	Generator Details	
	labm1app03	
	labmiapp03	
	labmiapp03	
전 Run Pause Stop	Gradual Stop	
	Close	
3 Click a specific Vuser ID to open the activity log for that Vuser. The Vuser log opens, displaying run-time information about the Vuser.

Viewing the Output Window

While the load test runs, the Vusers and load generators send error and notification messages to the Controller. You can view these messages in the Output window. Performance Center clears the messages in the Output window at the start of each load test run.

To view messages in the Output window:

1 Click the **Errors** link in the load test data area. The Output window opens and displays the Error Summary table.

🖉 Errors - Microsoft Internet Explorer 📃 🗆 🗙							
		HELP					
All notifications (0)	Remove all messages	Refresh Close Help					
🗉 All errors (8)	L	ast updated : 15:47:58					
Note that Performance Center can save up to 10,000 error messages simultaneously (depending on Controller configuration). If the number of errors in the load test exceeds this figure, only the newest messages are saved. Error Summary							
Error Source (Script & Line Number or Injector name)	Number of errors (Whole Load Test)	Current number of Yusers with Errors					
<u>urlerroronlazarus 1:Action:200</u>	4	2					
First Error: Action.c(200): Error -27985: There is no context for HTML-based functions. A previous function may not have used "Mode=HTML" or downloaded only non-HTML page(s), or the context has been reset (e.g., due to a GUI-based function). Snapshot Info [MSH 0 11]							
htmlerroronlazarus 1:Action:58	4	2					
First Error: Action.c(58): Error -27195: "web_f LeftOf=""), Snapshot Info [MSH 0 5]	ind" failed. 0 occurrence(s) of "fdsfdsfs	" found (RightOf="xcvxcv",					
			-				

The Error Summary table lists each error and its source, the number of times it occurred over the course of the whole load test and the number of Vusers affected.

2 To view all the errors, click the "+" symbol beside **All Errors** at the top of the Output window.

Errors - Microsoft Internet	Explorer				_ 0
				HELP	
			Remove all messages	Refresh	Close
□ All errors (6)			Last	t updated : 11:5	57:03
Showing 1 - 6 of 6			<u>Go to message number:</u>		
Time	Vuser ID	Errors			
3-May-2005 11:24:04 AM	None	Host: Controller , E	rror: Communication error: Faile	d to connect to	remote h
3-May-2005 11:24:05 AM	None	Host: Controller , E	rror: Process "lr_bridge.exe" was	not created on	remote h
3-May-2005 11:24:05 AM	None	Host: germ , Conne	ction to load generator failed.		
3-May-2005 11:24:05 AM	None	Host: Controller , E	rror: Communication error: Faile	d to send mess	age - soc
3-May-2005 11:39:40 AM	None	Host: Controller , F	ailed to keep alive the run, the I	2EE Commande	er is not r
3-May-2005 10:42:27 AM	med_rec:1	Action.c(13): Error -2	6628: HTTP Status-Code=403 (F	orbidden) for "h	http://pat
4					Þ
Note that Performance Cente configuration). If the numbe	er can save u r of errors in	p to 10,000 error mes the load test exceeds	sages simultaneously (dependir this figure, only the newest me	ng on Controller ssages are save	≥d.

3 To view a list of all occurrences of a specific error, click the "+" symbol beside an error in the list.

🗧 Errors - Microsoft Internet Explorer 📃 🗖						
					HELP	
All notifications (0)			Remove all	messages	Refresh	Close
∃ All errors (8)				Last	t updated : 15:	47:58
Note that Performance Cente configuration). If the number	r can save up to 10,00 r of errors in the load to	0 error me est exceed	ssages simultane Is this figure, only	ously (depend the newest m	ling on Controll essages are sa	er ved.
	E	rror Sun	imary			
Error Source (Script & Injector name)	Line Number or	I	N umber of erro i (Whole Load Test	rs :)	Current num Vusers with	ber of Errors
🗉 urlerroronlazarus 1:Acti	ion:200		4		2	
First Error: Action.c(200 not have used "Mode=HT a GUI-based function), S)): Error -27985: There FML" or downloaded onl napshot Info [MSH 0 1	is no cont ly non-HTI 1]	ext for HTML-bas 4L page(s), or the	ed functions. A : context has b) previous funct)een reset (e.g.	ion may ., due to
🗉 <u>htmlerroronlazarus</u> 1:A	ction:58		4		2	
First Error: Action.c(58) LeftOf=""), Snapshot Inf	: Error -27195: "web_fi o [MSH 0 5]	nd" failed.	0 occurrence(s) o	f "fdsfdsfs" fo	und (RightOf="	×cv×cv",
Showing 1 - 4 of 4			<u>Go to me</u>	essage number	<u>r:</u>	
Time	Vuser ID	Errors				
18-May-2005 3:47:35 PM	htmlerroronlazarus:2	Action.c(58): Error -27195:	"web_find" fai	led. 0 occurren	ce(s) of "f
18-May-2005 3:47:35 PM	htmlerroronlazarus:1	Action.c(58): Error -27195:	"web_tind" fai	led. 0 occurren	ce(s) of "f
18-May-2005 3:48:40 PM	htmlerroronlazarus:1	Action.cl	58): Error -27195: 58): Error -27195:	"web_rind fai	iled. 0 occurren	ce(s) of "f
10 May 2000 5140140 PM	indifierror offiliazarus i 1	Accorne	50), Eno, -27150,	web_inid fai	ilea. o occarren	
1						

4 To view the point in the Vuser script where the error occurred, click the error in the **Error Source** column. The Vuser script opens in a new page, and the line at which the error occurred is shown.



To download the script, click the script link and download the Vuser script file from the Ready to Download dialog box.

5 Click a specific Vuser ID to open the activity log for that Vuser.

🛿 Yuser html_err_war:1 Info - Microsoft Internet Explorer	
Activity log for Vuser: html_err_war:1	
Click here to download the log file (file size is 1 KB in zip format)	1
Showing page 1 of 1 of log file	
Starting action Action. [MsgId: MMSG-15919] Action.c(6): Found resource "http://war/wall3.jpe" in HTML "http://war/" [MsgId: MMSG-26659] Action.c(6): Found resource "http://war/Images/logo.gif" in HTML "http://war/" [MsgId: MMSG-26659] Action.c(6): Found resource "http://war/Images/logo.gif" in HTML "http://war/" [MsgId: MMSG-26659] Action.c(6): Found resource "http://war/Images/logo.gif" in HTML "http://war/" [MsgId: MMSG-26659] Action.c(1): web_url("war") was successful, 112497 body bytes, 1040 header bytes [MsgId: MMSG-26386] Action.c(1): http://tink_time: 3.00 seconds. [MsgId: MMSG-15948] Action.c(1): http://tink_time: 2.00 seconds. [MsgId: MMSG-15948] Action.c(21): linking to "http://war/html/index.html", Target Frame="" [MsgId: MMSG-27994] Action.c(21): web_link("Httml TAGs.") was successful, 6464 body bytes, 249 header bytes [MsgId: MMSG-26386] Action.c(21): web_link("Httml TAGs.") was successful, 6464 body bytes, 249 header bytes [MsgId: MMSG-26386] Action.c(26): For: Message from HTML tags [MsgId: MER-17999] End auto log messages stack. [MsgId: MMSG-10544]	
Start auto log messages stack - Iteration 1. [MsgId: MMSG-10545] Action.c(55): hr_think_time: 2.00 seconds. [MsgId: MMSG-15948] Action.c(57): hotty: Transaction "Microsoft" ended with "Pass" status (Duration: 4.0299 Think Time: 4.0165). [MsgId: Action.c(57): hotty: Think_time: 9.00 seconds. [MsgId: MMSG-15948] Action.c(61): thinking to "http://dogbert/projects/apm/topaz2/index.htm", Target Frame="" [MsgId: MMSG-27994] Action.c(61): Detected non-resource "http://dogbert/projects/apm/topaz2/index.htm" in "http://dogbert/projects/apm/ Action.c(61): Detected non-resource "http://dogbert/projects/apm/topaz2/main_tree.htm" in "http://dogbert/projects/apm/ Action.c(61): web_link("Topaz") was successful, 27001 body bytes, 994 header bytes [MsgId: MMSG-26386] @Action.c(67): erro-22195: "web_find" failed. 0 occurrence(s) of "Amir" found (RightOf="my name is", LeftOf="Banet") End auto log messages ctark [MsgId: MMSG=10544]	
* The <u>Snapshot Viewer</u> is needed to view downloaded snapshots <u>Learn more about snapshot</u> Instructions:	2
 Click the snapsnot viewer link to launch the Snapshot Viewer setup file. Follow the on-screen instructions to install the Snapshot Viewer. 	
Refresh Close Help	-

The **View Snapshot on Error** button displayed next to a line of the Vuser log contains a snapshot of an error. To view error snapshots, see "Viewing Snapshots on Errors" on page 330.

Note: Only errors that originate from the Vuser script's action may be viewed in the source.

Click the **Close** button to close the activity log.

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- **6** To open a list displaying all Vuser notifications, click **All Notifications**.
- **7** To update the information in the Output window, click **Refresh**.
- **8** To clear all the errors in the GUI and the output file, click **Remove all messages**.

The Vuser Log Page

The Vuser log page displays run-time information for Vusers in the load test. In addition, if the **Generate Snapshot on Error** has been enabled in the Run-Time Settings (General:Miscellaneous tab), you can view snapshots of errors that occurred during the load test run. For more information on the Snapshot Viewer, see "Viewing Snapshots on Errors" on page 330.

To open the Vuser log:

- 1 Click a specific Vuser ID in the Vuser Details dialog box to open the Vuser activity log.
- **2** To download the Vuser log file to a local directory, click the **Download** button, and specify the directory to which you want to download the Vuser log file (this includes snapshot on error files).
- **3** To refresh the information in the Vuser log, click **Refresh**.

Viewing Snapshots on Errors

The Snapshot on Error option generates a snapshot, a graphical representation of the Web page, at the point when an error occurred during the load test run. If the Vuser log indicates that a step has a snapshot (the **View Snapshot on Error** button is displayed), you can view a snapshot of the error in the Vuser log, or download the snapshot and view it from a local directory. The Snapshot Viewer enables you to view these snapshots to help debug your test run.

Before using this feature, you must install the Snapshot Viewer on your desktop and enable the feature in the Run-time Settings.

Note: You cannot view a snapshot on an error if a Vuser is running on a UNIX load generator.

To install the Snapshot Viewer:

- ➤ In the Vuser log, click the Snapshot Viewer link, and follow the on-screen instructions.
- On the Downloads page (Miscellaneous > Downloads), click the Snapshot Viewer Download link, and follow the on-screen instructions.

To enable the snapshot on error option:

- **1** On the Load Test configuration page, click the **Workload** tab.
- **2** Click the **Edit Run-time Settings** button for a selected Vuser script to display its run-time settings. The Run-Time Settings dialog box opens.



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3 Select **General** > **Miscellaneous** in the left menu. The Miscellaneous page opens.



4 Select the Generate Snapshot on Error option.

Note: Check that the **Continue on Error** option is disabled. If **Continue on Error** and **Generate Snapshot on Error** are both enabled, no error snapshots will be generated.

For more information, see the section about configuring run-time settings in the *HP Virtual User Generator User Guide*.

To view error snapshots in the Vuser log:

1 In the Output window, click a specific Vuser ID to open the activity log for that Vuser.

/user html_err_war:1 Info - Microsoft Internet Explorer	_ 0
Activity log for Yuser: html_err_war:1	
Click here to download the log file (file size is 1 KB in zip format)	ŧ
howing page 1 of 1 of log file	_
Starting action Action. [MsgId: MMSG-15919] Action. c(6): Found resource "http://war/wall3.jpe" in HTML "http://war/" [MsgId: MMSG-26659] Action. c(6): Found resource "http://war/images/logo.gif" in HTML "http://war/" [MsgId: MMSG-26659] Action. c(6): Found resource "http://war/images/logo.gif" in HTML "http://war/" [MsgId: MMSG-26659] Action. c(6): web_url("war") was successful, 112497 body bytes, 1040 header bytes [MsgId: MMSG-26386] Action. c(15): hr_think.time: 3.00 seconds. [MsgId: MMSG-1948] Action. c(17): Notify: Transaction "HTML tags" started. [MsgId: MMSG-16999] Action. c(17): hotify: Transaction "HTML tags" started. [MsgId: MMSG-15948] Action. c(21): Linking to "http://war/html/index.html", Target Frame="" [MsgId: MMSG-27994] Action. c(21): Linking to "http://war/html/index.html", Target Frame="" [MsgId: MMSG-27994] Action. c(26): Error: Message from HTML tags [MsgId: MERR-17999] End auto log messages stack. [MsgId: MMSG-10544]	<u> </u>
Start auto log messages stack - Iteration 1. [MsgId: MMSG-10545] Action. (55): I_think_time: 2.00 seconds. [MsgId: MMSG-10548] Action. (57): Notify: Transaction "Microsoft" ended with "Pass" status (Duration: 4.0299 Think Time: 4.0165). [MsgId: Action. (51): Linking to "http://dogbert/projects/apm/topaz/index.htm", Target Frame="" [MsgId: MMSG-27994] Action. (61): Detected non-resource "http://dogbert/projects/apm/topaz2/index.htm" in "http://dogbert/projects/apm/ Action. (61): Detected non-resource "http://dogbert/projects/apm/topaz2/index.htm" in "http://dogbert/projects/apm/ Action. (61): Detected non-resource "http://dogbert/projects/apm/topaz2/main_tree.htm" in "http://dogbert/projects/apm/ Action. (61): Detected non-resource "http://dogbert/projects/apm/topaz2/main_them" in "http://dogbert/Projects/apm/ Action. (61): Detected non-resource "http://dogbert/ Bacter starkMassed_105441 Action.et approxed starkMassed_105441 Action.et ap	•
The <u>Snapshot Viewer</u> is needed to view downloaded snapshots <u>Learn more about snapsh</u>	ots
Instructions:	
 Click the Snapshot Viewer link to launch the Snapshot Viewer setup file. Follow the on-screen instructions to install the Snapshot Viewer. 	
Refresh Close Help	_

- **2** To download the Vuser log file to a local directory, click the **Download** button, and specify the directory to which you want to download the Vuser log file (including the Snapshot on Error files). The .INF and .HTML files are downloaded. The size of the zipped file is displayed.
- **3** Click the **View Snapshot on Error** button. Performance Center generates the snapshot on error (.SOE) file.

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- **4** After the snapshot on error file has been generated, the File Download dialog box opens. Click **Open** to view the snapshot directly, or save it for viewing at a later time. The selected snapshot opens in a new window.
- **5** To close the browser, click **Close**.

To view error snapshots in a downloaded log file:

➤ In the log directory of the downloaded file, right-click the .INF file you want to view, and select View Snapshots. The file opens in the Snapshot Viewer.

Chapter 22 • Viewing Vusers During a Load Test

Viewing Autostart Load Tests

You can view and manage Autostart load tests and their reports from the Autostart Viewer.

This chapter includes:

- ► About Autostart Load Tests on page 335
- ► Viewing Autostart Load Tests on page 336
- ► Reserving Additional Resources on page 338
- ► Viewing Autostart Load Test Reports on page 339

About Autostart Load Tests

The Autostart Viewer page provides information about load tests with autostart for all projects. Along with the general information provided in the main table, you can access reports on tests that have run and cancel tests that are scheduled to run.

The Autostart Viewer page is only a list of scheduled tests that provides information about tests. The actual scheduling of the autostart is done in the Timeslots page, while the configuring of the test is done when you create a new load test.

Viewing Autostart Load Tests

To open the Autostart Viewer, select **Project** > **Autostart Viewer**. The Autostart Viewer page opens.

Autostart Viev	ver		- Time on Server : 24-May-2005 9:10:16 AM ((GMT -8) PST)				
Currently Showing: 1 - 8 / 8	1						
₹ <u>A</u> utostart Date and Time	<u>U</u> ser Name	<u>T</u> est Name	Status	Duration	# <u>H</u> osts	Delete	
22-May-2005 12:00:00 PM	Cyber Test	windows resources	Before Collating Results	00:02	1		
22-May-2005 11:18:00 AM	Cyber Test	autostart test	Before Collating Results	00:09	1		
22-May-2005 11:00:00 AM	Cyber Test	windows resources	<u>Finished</u>	00:16	1		
22-May-2005 10:30:00 AM	Cyber Test	autostart test	Failed to Run	00:21	1		
22-May-2005 10:00:00 AM	Cyber Test	windows resources	<u>Did not Run</u>	00:30	1		
22-May-2005 9:38:00 AM	Cyber Test	windows resources	<u>Did not Run</u>	00:01	1		
18-May-2005 7:30:00 AM	Cyber Test	windows resources	<u>Finished</u>	00:15	1		
18-May-2005 7:00:00 AM	Cyber Test	windows resources	<u>Finished</u>	00:20	2		
N ote: To autostart a test please <u>configure a load test</u> with scheduler and go to the <u>Timeslots page</u> to schedule the test.							

The page displays a table of information on all scheduled tests, navigation arrows for the table, and a link to the Load Tests configuration and Timeslots pages.

The table supplies the following information that you defined when reserving the timeslot:

Field	Description
Autostart Date and Time	The date and time of the timeslot you reserve when you schedule a test to autostart.
Test Name	The name of the test that is scheduled to autostart. This is the same name that was given when the test was created.
Status	The status of the autostart test. Some of the information (Scheduled to run, Failed to Run) is specific for the autostart status, other information describes the tests' status in the test workflow. For more information on the test workflow, see "Changing a Test Run State" in the <i>HP Performance Center Administrator Guide</i> .
Duration	The duration of the test scheduled to autostart as defined when reserving the timeslot.
# Hosts	The number of Hosts assigned to the scheduled test as defined when reserving the timeslot.
×	Click the Delete button to cancel the scheduled test. The timeslot is cleared and the entry is removed from the Scheduled Tests page. Note: Only tests that have not started their run can be deleted.

Sorting Tests

When you open the Autostart Viewer page, the tests are sorted by the **Autostart Date and Time** key. It is also possible to sort the tests according to the **Test Name** or **# Hosts**.

To sort tests:

In the column by which you want the tests sorted, click the column heading. An arrow appears next to the column heading indicating if the tests are sorted in descending or ascending order.

When you click the heading again, the arrow reverses direction, and the tests are sorted in the opposite order of the values in that column.

Note: Sorting settings are saved per user, per project. The next time the same user enters the Autostart Viewer page in a specific project, the page displays results based on the most recent sort order.

Reserving Additional Resources

If you change the settings for a load test scheduled to run using Autostart (for example, you increase the number of load generators or Vusers required in the load test), the autostart may fail to run if there are insufficient resources available to run the test.

If the timeslot contains less resources than those required for the scheduled load test, a **Did not run** status will be displayed in the Autostart Viewer page.

Viewing Autostart Load Test Reports

The Autostart Load Test Report page displays an overview of load test performance, a link to the test's results, and a table of the schedule actions.

To open the Autostart Load Test Report page:

In the Autostart Viewer page table, click the status link of an active test name. The Autostart Load Test Report page for the test opens.

🚰 Autostart Load Test LT - Micro	osoft Internet Explorer			
Autostart Load T	est Report	Cla	ose Help	A
Load Test (LT)				
Started running at Duration (min) Vusers Scheduled Total Vusers Involved Max Concurrent Vusers Controller (#Vusers) Host List (#Vusers) Download Messages	6-May-2005 6:30:56 PM 44 50 50 50 Iabm1app06(50) Iabm1app03(0); Summary Report	View Results		
≜ Time	Status			
6-May-2005 6:30:05 PM	Start of AutoStarted test			
6-May-2005 6:30:39 PM	Test Initialization.			
6-May-2005 6:30:56 PM	Test started running.			
6-May-2005 7:15:39 PM	End of AutoStarted test			v

You can view and access the following information in the Autostart Load Test Report page:

- ➤ Load Test performance information. The information includes the start of the run, Vuser information, the Controller of the load test, and the names of any additional Hosts.
- ► **Download Messages**. Enables you to download a zip file containing all the error and notification messages.
- **Summary Report**. Opens the Analysis Summary page.

- ► View Results. Opens the Load Test Status page.
- ➤ Autostart Test actions. This information reports on the performance aspect of the test run, not on the actual running of the load test. The table gives a step by step list of the performance during the running of the test. The sortable Time column supplies the date and time of the action, while the Status column supplies a self-explanatory note of the action performed.

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Running a Load Test

When you run a load test, Performance Center generates load on the application you are testing, and measures the system's performance.

This chapter includes:

- ► About Running a Load Test on page 342
- ► The Load Test Run Page on page 343
- ► Starting a Load Test on page 353
- ► Manually Assigning Specific Load Generators at Run Time on page 363
- ► Configuring Schedule Settings from the Load Test Run Page on page 364
- ► Manually Adding Vusers to a Running Load Test on page 369
- ► Controlling Individual Vusers on page 373
- ► Adding and Modifying Vuser Groups on page 375
- ► Managing Load Generators on page 378
- > Altering Load Test Settings During the Run on page 381
- ► Creating or Modifying the Runtime Monitor Profile on page 386
- > Manually Releasing Vusers from a Rendezvous on page 388
- > Adding, Editing, and Viewing Vuser Scripts on page 389
- ► Stopping a Load Test Run on page 390

About Running a Load Test

When you run a load test, Vusers are assigned to their load generators and execute their Vuser scripts. During load test execution, Performance Center:

- > records the durations of the transactions you defined in the Vuser scripts
- > collects error, warning, and notification messages generated by the Vusers

You can run an entire load test unattended, or you can interactively select the Vuser groups and Vusers that you want to run. When the load test starts running, the Controller first checks the load test configuration information. Next, it invokes the applications that you selected to run with the load test. Then, it distributes each Vuser script to its designated load generator. When the Vuser groups are ready, they start executing their scripts.

While the load test runs, you can monitor each Vuser, view error, warning, and notification messages generated by the Vusers, and stop both Vuser groups and individual Vusers. During the load test you can instruct Performance Center to allow individual Vuser or the Vusers in a group to complete the iterations they are running before stopping, to complete the actions they are running before stopping, or to stop running immediately. For more information, see "Configuring Load Test Run-Time Settings" on page 284.

You can also activate additional Vusers while the load test is running, using the Add Vusers dialog box, or from the drop-down menu in the **Ready** or **Run** columns. You can also rerun Vusers that finished running or were aborted during the load test from the **Passed** column. For more information, see "Configuring Schedule Settings from the Load Test Run Page" on page 364.

The load test ends when all the Vusers have completed their scripts, when the duration runs out, or when you terminate it.

In addition, you can add, edit, and view Vuser scripts, and edit and view run-time settings, as required. Note that you can edit run-time settings for a script during a run only if the script has no Vusers currently running. Otherwise, you can only view the run-time settings. For details, see "Altering Load Test Settings During the Run" on page 381, and "Adding, Editing, and Viewing Vuser Scripts" on page 389.

The Load Test Run Page

On the Load Test Run page, you can control Vusers and Vuser groups and monitor their performance online. You can run all the Vusers and Vuser groups in a load test, or you can select the specific Vuser groups and Vusers that you want to run. The Load Test Run page contains settings that affect all scripts in your load test, and settings that affect individual scripts only.

From the Load Test Run page, you can:

- ► configure and modify load settings
- ► monitor run time data
- track test status
- ► view online monitor graphs

For an explanation of the different sections of the Load Test Run page, see "Load Test Status" on page 344, "Groups Table" on page 346, "Global Load Test Settings" on page 350, and "Online Graphs" on page 352.

To open the Load Test Run page:

In the Load Tests page, click the **Run Load Test** button, or in the Load Test configuration page, click **Start**. For information on starting a load test, see "Starting a Load Test" on page 353.



Load Test Status

The status bar at the top of the page displays the name of the user, the name of the project, the name of the running test, the stage that the Scheduler is performing, the next step of the Scheduler, and the status of the load test.



The possible schedule actions are: **Starting**, **Initialize**, **Delay After Initialization**, **Start Vusers**, **Duration**, **Stop Vusers**, **Not Active**.

The next steps of teh Schedulerinclude: Initializing, Starting, Stopping.

The load test status statement informs you of the status of the run. The possible statuses are: Scheduler Running, Running Vusers, Stopping, Finished, Down, Failed, Before Collating Results, Collating Results, Collating Failed, Before Analyzing Results, Analyzing, or Analysis Failed.

You can view a synopsis of the running load test from the links beneath the status bar.

Running Yusers: 0 Time: 00:36:55 Hits/sec: 8 Passed trans: 1227 Failed trans: 0 Errors: 0 Trans details

This information includes:

Command	Description
Running Vusers	Displays the number of Vusers currently running in the load test. For more information about the Running Vusers graph, see the <i>HP Performance Center Monitor Reference</i> .
Time	Displays the start Time, elapsed Time, and time remaining in the load test and timeslot. For more information, see "Load Test Time Information" on page 320.
Hits/Sec	Displays how many hits (HTTP requests) there have been to the Web server by Vusers during each second of the load test run. For more information about the Hits per Second graph, , see the <i>HP Performance Center Monitor Reference</i> .
Passed Trans	Displays the number of completed, successful transactions performed during the load test run. For more information about Transaction Monitor graphs, see the <i>HP Performance Center Monitor Reference</i> .
Failed Trans	Displays the number of completed, unsuccessful transactions performed during the load test run. For more information about Transaction Monitor graphs, see the <i>HP Performance Center Monitor Reference</i> .
Errors	Displays the number of Vuser errors that occurred during the load test run. For more information, see "Viewing the Output Window" on page 325.
Trans Details	Displays details of individual transactions from the load test run. For more information, see "Transaction Details" on page 321.

For more information, see "Monitoring Load Test Data" on page 318.

Groups Table

Beneath the load test status bar is a table containing the scripts, hosts, and the status of each Vuser involved in the load test. During a load test run, you use the groups table to monitor the actions of all Vusers and Vuser scripts in the load test. The status fields display the current state of each Vuser in the script.

🗄 Group:	Down	Init	Ready	Run	Rendez	Exiting	Passed	Failed	Stopped	Error
Total:	53	2	22	0	0	0	0	0	0	0
🛨 getvuserip 🔻	24 🔻		15 🔻							
🛨 purchaseor 🔻	29 🔻	2 🔻	7 🔻							

This table also allows you to configure settings that affect a specific Vuser. To perform an action on an individual Vuser, click the arrow next to the Vuser to display the Vuser menu. To perform an action on an individual script, click the arrow next to the script to display the Script menu.

Script Menu

To open the Script menu, click the arrow next to the script in the Groups table. You can perform the following script actions from the script menu:

Command	Description
Run-time Settings	Allows you to view Run-time Settings for each script. For more information, see "Configuring Run-Time Settings" on page 187.
Command Line	Allows you to send parameters to the script. For more information, see "Using Command Line Arguments" on page 189.

Note: You can only perform script actions when the load test is stopped.

Vuser Menu

The table below shows the possible actions that you can perform from the Vuser menu for each Vuser status:

Status	Description	Possible Actions
Down	The Vuser is down.	 Init X. Initializes the specified number of Vusers for the script. Run X. Runs the specified number of Vusers for the script in addition to the Vusers already running (zero at the start of a load test). Delete X. Deletes the specified number of Vusers for the script.
Init	The Vuser is being initialized on the host machine.	 Run X. Runs the specified number of Vusers for each script in addition to the Vusers already running (zero at the start of a load test). Stop X. Stops the specified number of Vusers for the scrip.
Ready	The Vuser already performed the init section of the script and is ready to run.	 Run X. Runs the specified number of Vusers for each script in addition to the Vusers already running (zero at the start of a load test). Stop X. Stops the specified number of Vusers for the scrip.

Status	Description	Possible Actions
Run	The Vuser is running. The Vuser script is being executed on a host machine. The number in parenthesis is the number of Vusers paused.	 Gradual Stop X. Stops the specified number of Vusers after they complete their current iteration/action. Stop X. Stops the specified number of Vusers for the script. Pause X. Pauses the specified number of Vusers. Run X. Runs the specified number of Vusers for each script in addition to the Vusers already running (zero at the start of a load test).
Rendez	The Vuser has arrived at the rendezvous and is waiting to be released by Performance Center.	 Gradual Stop X. Stops the specified number of Vusers after they complete their current iteration/action. Stop X. Stops the specified number of Vusers immediately.
Exiting	The Vuser has finished running or has been stopped, and is now exiting.	 Stop All. Stops all Vusers immediately.
Passed	The Vuser has finished running. The script passed.	 Reset X. Resets the status of the specified number of Vusers to Down
Failed	The Vuser has finished running. The script failed.	 Reset X. Resets the status of the specified number of Vusers to Down. Run X. Runs the specified number of Vusers for the script in addition to the Vusers already running (zero at the start of a load test). Init X. Initializes the specified number of Vusers for the script.

Status	Description	Possible Actions
Stopped	The Vuser stopped when the Stop command was invoked.	 Reset X. Resets the status of the specified number of Vusers to Down.
		 Run X. Runs the specified number of Vusers for each script in addition to the Vusers already running (zero at the start of a load test). Init X. Initializes the specified number of Vusers for the script.
Error	A problem occurred with the Vuser. Check the Output dialog box for an explanation of the error.	 Reset X. Resets the status of the specified number of Vusers to Down.

To perform a Vuser action using the Vuser menu:

- 1 Click the arrow next to a Vuser to display the Vuser menu. The Vuser menu with the possible Vuser actions opens.
- **2** Select the action that you want to perform (the selected action is highlighted).
- **3** Type the number of Vusers that you want to perform the action in the edit field (if required).

Note: The first time you open the Vuser menu, the edit field is empty. After you type the number of Vusers to perform an action, Performance Center remembers this number and displays it the next time you perform that action on Vusers with the same status.

4 Click the action, or press ENTER to perform the action.

Global Load Test Settings

The section to the right of the Groups table allows you to configure settings that are global and affect all of the scripts in your load test. You can perform the following actions:

- Run. Opens the Run Vusers dialog box, enabling you to activate additional Vusers. For more information, see "Manually Adding Vusers to a Running Load Test" on page 369.
- ➤ Stop. Opens the Stop Test dialog box, enabling you to stop the whole load test. For more information, see "Stopping a Load Test Run" on page 390.
- ➤ Vusers. Opens the Vusers dialog box, enabling you to view the status of each of the Vusers in a Vuser group. For more information, see "Controlling Individual Vusers" on page 373.
- Design. Opens the Load Test Design dialog box, allowing you to select from the following options:
 - Design Groups. Opens the Design Groups dialog box, enabling you to modify the groups that you designed at the design stage. You can change the number of Vusers in the load test, the load generator distribution, and the percentage or number of Vusers distributed to each script. For more information, see "Adding and Modifying Vuser Groups" on page 375.
 - ➤ Scheduler. Opens the Load Test Scheduler, enabling you to manually configure schedule settings. For more information, see "Configuring Schedule Settings from the Load Test Run Page" on page 364.
 - ➤ Load Generators. Opens the Generator Details and Assignment dialog box, enabling you to view the status and machine utilization of load generators in the load test, add load generators to the load test, and configure terminal sessions. For more information, see "Managing Load Generators" on page 378.

- ➤ Settings. Opens the Settings dialog box, where you can change, while a load test is running, the load test duration, Monitor Over Firwall machine settings, refresh frequency settings, and post-run analysis settings. For more information, see "Altering Load Test Settings During the Run" on page 381.
- ➤ Monitors. Opens the Monitors dialog box, where you can alter the runtime monitor profile during the load test run. For more information, see "Creating or Modifying the Runtime Monitor Profile" on page 386.
- Rendezvous. Opens the Rendezvous dialog box, where you can enable or disable and view general information about the rendezvous points in the load test. For more information, see "Viewing Rendezvous Information" on page 249 and "Manually Releasing Vusers from a Rendezvous" on page 251.
- ➤ Output. Opens the Output window, where you view error and notification messages from the load test run. For more information, see "Viewing the Output Window" on page 325.

Online Graphs

The online monitor graphs are used to display performance measurements for those resources being monitored in a load test. By default, three graphs are displayed beneath the Vuser Run table.



You can select the graphs you want to view, configure graph scale, and select how graph information is displayed. In addition, the legend beneath the graphs displays details about the maximum, average, minimum, and last values for each measurement, and the graph scale. You can sort all the measurements by one of these values. For more information, see "Viewing Online Monitor Graphs" on page 397, and "Customizing the Online Monitor View" on page 401.

Additionally, you can open an enlarged view of a graph in a separate window. For more information, see "Optimizing the Online Monitors View" on page 399.

Starting a Load Test

After you configure a load test, you can run it from the Load Tests page or Load Test Configuration page. To have sufficient resources available when you run the load test, you should reserve resources from the Timeslots page before starting the test. For details, see Chapter 5, "Working With Timeslots."

You can also run a load test that you saved or ran previously from the Load Tests page. For details, see "Viewing Load Tests" on page 47.

To start a load test:

- Solution On the Load Tests page, select a load test and click the **Run Load Test** button
 - ► On the Load Test configuration page, click **Start**.

For load tests with a reserved a timeslot, see "Starting a Load Test with a Reserved Timeslot" on page 354. For load tests without a reserved a timeslot, see "Starting a Load Test Without a Reserved Timeslot" on page 358.

Starting a Load Test with a Reserved Timeslot

If you reserved a timeslot, the Select Timeslot page opens displaying the reserved timeslots and the number of machines (and Vusers) that are required for the load test.

Selec	t Timeslot				
You have the following timeslots reserved. Please select the one to use for this load test. Click update to have Performance Center automatically update your timeslot to the required number of machines and load generators.					
Neede	d resources for load test: 1 load g	jenerator			
Availa	ble timeslots:				
	Start Time	Duration (hrs:min)	Machines		
\odot	6/27/2005 10:41:00 AM	1:48	1 (<u>View list</u>)	Update Duration	
0	6/27/2005 10:42:00 AM	0:48	1 (<u>View list</u>)	Update Duration	
0	Create new timeslot				
	Start	Go to Timeslots page	Cancel		

You can select which reserved timeslot you want to use for your test, or create a new timeslot. In addition, you can update the timeslot duration. If a timeslot has insufficient duration or resources, the field is shown in red. Click the update link to prolong the timeslot duration or to have Performance Center update the timeslot with the required number of machines.

If you manually assigned specific load generators to your test, you can view the load generator machines reserved in the timeslot by clicking the **View list** link in the Machines column.

To select a reserved timeslot and start the test:

 Select a reserved timeslot that has sufficient resources for the load test, and click Start. The load test initialization process begins.

To create a new timeslot and start the test:

1 Select **Create new timeslot**, and click **Start**. The Set Load Test Duration dialog box opens.

🚰 Set Load Test Duration Web Page Dialog	×
Set Load Test Duration	_
Please enter load test duration.	
hours 🚺 minutes	
OK Cancel	_

2 Type the desired duration of the timeslot, and click **OK**.

You can only reserve durations in half and whole hour increments. Performance Center checks that sufficient resources are available, and displays a message informing you whether the timeslot was reserved.

Note: If the Post-run Analysis setting is **Collate and analyze results**, Performance Center automatically adds an extra 15 minutes to the timeslot for processing results.

3 Click **Start**. The load test initialization process begins.

To update the duration of a reserved timeslot:

1 Click **Update Duration**. The Prolong Timeslots Duration dialog box opens.

🚰 Prolong Timeslot Duration Web Page Dialog 🛛 🛛 🔀
Prolong Timeslot Duration
Time remaining in the timeslot you selected: $1:12$ (hrs:min)
You can prolong the duration of the timeslot.
Set total duration to:
hours 0 v minutes
Note: Performance Center allocates the last 15 minutes of the timeslot to processing results.
OK Cancel

2 Type the total duration in the time fields, and click **OK**. Performance Center allocates the required resources if they are available, and displays a message informing you whether the timeslot was successfully updated.

Note: If the Post-run Analysis setting is **Collate and analyze results**, Performance Center allocates the last 15 minutes of a timeslot to result processing.

3 If the timeslot was successfully updated, select the updated timeslot.

If Performance Center was unable to allocates the required resources, click **Go to Timeslots page** to reserve a new timeslot to run the test. For details, see "Reserving Timeslots" on page 91.

4 Click **Start**. The load test initialization process begins.

To allocate additional load generators:

1 Click **Update Resources/Duration** to open the Update Timeslot Resource dialog box.

Performance Ce required numbe available).	nter will automatically update your timeslot with the er of machines and load generators (provided they a	e are
You can also pr	olong the timeslot duration.	
Time remaining	i in the timeslot you selected: 1:58 (hrs:min)	
Continue wi	thout changing duration	
C Set total du	ration to:	
1	hours 🛛 🖃 minutes	
Note: Performa timeslot to prod	nce Center allocates the last 15 minutes of the essing results.	

- **2** To prolong the timeslot duration, select **Set total duration**, and type the total duration in the time fields.
- **3** Click **OK**. Performance Center allocates the required resources (if they are available), and displays a message informing you whether the timeslot was successfully updated.

Note: If the Post-run Analysis setting is **Collate and analyze results**, Performance Center allocates the last 15 minutes of a timeslot to result processing.

4 If the timeslot was successfully updated, select the updated timeslot.

If Performance Center was unable to allocates the required resources, click **Go to Timeslots page** to reserve a new timeslot to run the test. For details, see "Reserving Timeslots" on page 91.

5 Click **Start**. The load test initialization process begins.

Starting a Load Test Without a Reserved Timeslot

If you did not reserve a timeslot, Performance Center displays the following notice:



You can reserve a new timeslot from the Timeslots page, or have Performance Center reserve a timeslot for you.

To have Performance Center automatically reserve a timeslot:

1 Click Proceed. The Set Load Test Duration dialog box opens.



2 Type the desired duration of the timeslot, and click **OK**.

You can only reserve durations in half and whole hour increments. Performance Center checks that sufficient resources are available, and displays a message informing you whether the timeslot was reserved.

Note: If the Post-run Analysis setting is **Collate and analyze results**, Performance Center automatically adds an extra 15 minutes to the timeslot for processing results.

3 Click **Start**. The load test initialization process begins.

Load Test Initialization Process

After you start a load test, Performance Center displays the steps taken to initialize the test.



Once the initialization steps are successfully completed, the Load Test Run page opens and Vusers start running.

Note:

- ➤ If you did not configure or enable load settings when designing your load test, you can configure load settings from the Load Test Run page. You must configure load settings at the beginning of the load test run in order to run Vusers in the load test. For details, see "The Load Test Run Page" on page 343.
- If Pause Scheduler at load test start is enabled in the Scheduler Options (Load Test configuration page > Workload tab), the scheduler opens in the Pause status. For more information, see "Manually Starting the Scheduler" on page 362.
If initialization fails, the page displays additional information to help you isolate the problem.

1	Looking for available resources.
	 ✓ Collecting loadtest details from database ✓ Locating available timeslot
	Initializing load test.
	 Loading session parameters from database Checking script validity Searching for controller Connecting to riba02 Launching controller on riba02 Configuring load test Connecting to load generators Opening terminal sessions Configuring load test groups Launching online analysis Configuring monitors
	Failed to initialize load test!
	Error: Unable to run load test. Please consult your administrator Event: -2147219770 Details: Unable to add new group to controller
	How would you like to proceed? \odot Report this error to the administrator and return to Load Test configuration page
	O Return to Load Test configuration page Go

Select one of the following options and click Go:

- Report this error to the administrator and return to the Load Test Configuration page. Enables you to send a message (in addition to the error details which are automatically sent) to the administrator, and returns to the Load Test configuration page.
- Return to the Load Test Configuration page. Returns to the Load Test configuration page.

Manually Starting the Scheduler

You can pause the Scheduler at the start of a load test, and manually start the Scheduler when you are ready to begin the test.

To pause the Scheduler at the start of a load test:

- **1** On the Load Test configuration page, click the **Workload** tab.
- **2** In the top right corner, click the **Scheduler Options** button.
- **3** Select **Pause scheduler at load test start**, and click **OK**.

When you start a load test with this option enabled, Performance Center displays the Scheduler in the **Pause** status, and displays a message that the test was initialized successfully.

To manually start the Scheduler, click **Continue** when you are ready to start the Scheduler.

🚰 Test is ready Web Page Dialog	×
Test Initialized successfully. Click 'Continue' to start the scheduler.	隽
Continue	

Note: If you set this option, the load test does not run in Autostart mode.

Manually Assigning Specific Load Generators at Run Time

When you designed the load test, if you selected the manual load generator distribution method with the option of assigning actual load generators manually at runtime (see "Load Generator Distribution" on page 180), Performance Center prompts you to assign a load generator to each virtual load generator when you start the load test run.

Note: If you assign load generators while the load test is running, the Scheduler will not run until you have manually configured the load generators. For more information, see Chapter 24, "Running a Load Test."

To manually assign a load generator at run time:

1 When you start the load test, the Map Virtual to Actual Load Generators dialog box opens.

Loau rest Groups			
% Group	Script Name	Virtual Generators	Туре
50 htmlerroronlazarus	HTMLerrorONIazarus	LG1	Web (HTTP/HTML)+
50 urlerroronlazarus	URLerrorONIazarus	LG2	Web (HTTP/HTML)+
Assign Actual Load Ge	nerators to Virtual Load Gei	nerators	
Assign Actual Load Ge Virtual Generator	nerators to Virtual Load Gei	Actual Generator	
Assign Actual Load Ge Virtual Generator LG1	nerators to Virtual Load Gei	Actual Generator	
Assign Actual Load Ge Virtual Generator LG1 LG2	nerators to Virtual Load Gei	Actual Generator No Generator	

- **2** You map virtual load generators to actual load generators in the lower area of the dialog box. For each virtual load generator select an actual load generator from the **Actual Generator** list. Keep the following in mind:
 - > Each virtual load generator must be assigned an actual load generator.
 - You cannot assign the same load generator to more than one virtual load generator.

To have Performance Center assign actual load generators to each virtual load generator, click **Automatic Assignment**.

- **3** To modify load generator assignments, select **No Generator** in the Actual Generator list, then reassign the load generator.
- **4** Click **OK** to save the settings and close the dialog box.

Configuring Schedule Settings from the Load Test Run Page

You can configure or modify a load test's schedule settings for all scripts or for a specific script by adding or stopping Vusers before or during the load test run from the Load Test Run page.

To configure or modify load behavior for all Vuser scripts:

1 On the Load Test Run page, click the **Design** button. The Load Test Design dialog box opens.



2 Click Scheduler. The Scheduler opens.

- **3** If you did not previously configure a schedule for the load test:
 - a Select Enable Scheduler.
 - **b** Configure the load behavior. For more information on configuring a load test schedule, see Chapter 11, "Configuring Scheduler Settings."
 - **c** Click **Start** to start the Scheduler, or **Close** to close the Scheduler and return to the Load Test Run page without altering the settings.

After you start the Scheduler, the schedule settings are applied to the load test.

4 To pause the Scheduler, click **Pause**.

Note: This only pauses the schedule timers. When you click **Pause**, the button changes to **Resume**. Click **Resume** to restart the timers.

- **5** To modify the load behavior:
 - **a** Click **Stop** to stop the Scheduler. No more Vuser are started. This has no effect on Vusers that are already running.
 - **b** Modify the schedule, as described in Chapter 11, "Configuring Scheduler Settings."
 - **c** Click **Start** to restart the Scheduler. When the Scheduler is restarted, changes affect only those Vusers currently in the **Down** state.

Note: Any changes you make to the schedule apply to all running Vusers. For example, if there are Vusers that have been running for 30 minutes and you change the duration from 40 to 60 minutes, the Vusers will run an additional 60 minutes.

To configure or modify load for a specific Vuser script:

On the Load Test Run page, you can select a Vuser script and do the following:

- Run Vusers for a specific script. Click the arrow in the Ready column for the script, type the number of Vusers you want to run, and click Run.
- Stop Vusers for a specific Vuser script. Click the arrow in the Ready or Run or column for the script, type the number of Vusers you want stop simultaneously, stop gradually, or pause and click the Stop, Gradually Stop, or Pause link respectively.
- ➤ Rerun Vusers for a specific Vuser script that finished running. Click the arrow in the Passed or Stopped column for the script, type the number of Vusers you want to rerun, and click Init, Run, or Reset.
- ➤ Rerun Vusers for a specific Vuser script that were aborted. Click the arrow in the Failed column for the script, type the number of Vusers you want to rerun, and click Init, Run, or Reset.

To configure or modify load for a specific Vuser:

1 In the Group table, click the "+" icon adjacent to a script name to display a list of the hosts on which the script is running.

🗄 Group:	Down	Init	Ready	Run	Rendez	Exiting	Passed	Failed	Stopped
Total:	7	0	5	5(0)	0	0	0	0	2
🗆 html_error 🛛 🔻	2 🕶		5 🕶	5(0) 🔻					
i labm1app03 (Cntrl.)	2 🗸		5 🕶	5(0) 🔻					
🛨 url_error 🛛 🔻	5 ▼								2 🔻

In the example, you see that the script **html_error** currently has five Vusers running.

The Group table also displays the host machines associated with the test.

2 To view messages related to a group of Vusers, click the arrow adjacent to the action of a Vuser group, and click **Show Vusers**. Performance Center opens the Vuser Details dialog box and displays each Vuser's ID and relevant details.

Vusers Details - Microsoft Internet Exp	orer	
Vusers Details		
Filter Vusers Groups = htmlerroronlazarus		Edit
Generators = All		- Color
Statuses = Run		Refresh
Vuser ID Status	Generator Details	
htmlerroronlazarus:3 Running	labm1app03	
htmlerroronlazarus:4 Running	labm1app03	
htmlerroronlazarus:5 Running	labm1app03	
htmlerroronlazarus:6 Running	labm1app03	
htmlerroronlazarus:7 Running	labm1app03	
සි Run Pause Stop	Gradual Stop	
	Close	
		v

3 To perform an action on a individual Vuser, select the check box next to the Vuser, and select an action. For more information, see "Controlling Individual Vusers" on page 373.

In addition to modifying Vuser load during a load test run, you can also alter load test settings (load test duration, number of hosts, and so forth) as desired.

Manually Adding Vusers to a Running Load Test

During a running load test, you can manually control the addition of new Vusers using the Run Vusers dialog box. You can select to distribute Vusers as follows:

- ➤ By number. You specify the number of new Vusers that can be added to the load test, and the load generators or groups to which these additional Vusers will be assigned to run.
- ➤ By percentage. You specify the number of new Vusers that can be distributed among the Vuser scripts according to the percentage you define, and the load generators or groups to which these additional Vusers will be assigned to run.

Note: At the beginning of a load test, Vusers are distributed to the load generators equally within the same group. When start or stopping Vusers, Performance Center distributes Vusers to the load generators relative to the number of Vusers on each the load generator. If you manually add more Vusers to a load generator during the load test, Performance Center takes this new amount into consideration, and distributes the next batch of Vusers accordingly.

To add Vusers to a running load test:

1 On the Load Test Run page, click the **Run Vusers** button. The Run Vusers dialog box opens.

🗿 Run Vusers - Microsoft Internet Explorer	_ <u> </u>
Run Vusers	<u>_</u>
Mode: Distribute Vusers by Group	
Group ¥users	
getvuserip 1	
purchaseorder 3	
	Relative Distribution
Perform the following action: Add new Vusers to Down 💽 GO	
Close Help	

- **2** Select one of the following modes for adding Vusers to the load test:
 - ➤ Distribute Vusers by Group. Displays the Vuser groups, enabling you to distribute Vusers to particular Vuser groups.
 - Distribute Vusers by Load Generator. Displays the load generator machines assigned to each group, enabling you to distribute Vusers to a group running on a particular load generator.
- **3** In the Vusers column, specify the number of Vusers on which you want to perform actions for each group or host.

4 To perform actions according to the percentage of the total number of Vusers, click **Relative Distribution**. The Relative Distribution dialog box opens, and displays the quantity of Vusers on which you want to perform actions in percentage terms.

🕘 Relative Distribution - Mic	rosoft Internet Explorer		_ 🗆 ×
Relative Distribution			
Perform action by percent	age on 4 Vusers		
			_
Group		Vusers %	_
getvuserip		25	
purchaseorder		75	
	OK Close	Help	v

Click **OK** to save the settings and close the Relative Distribution dialog box.

- **5** Select one of the following options, and click **GO**:
 - Add new Vusers to Down. Adds the specified number of Vusers in the Down status.
 - Initialize Vusers from Down. Adds and initializes the specified number of Vusers. Performance Center distributes the Vusers that you added to their designated load generators so that they are ready to execute their scripts.
 - Run Vusers from Down. Runs the specified number of Vusers from the Down status.
 - Run Vusers from Ready. Runs the specified number of Vusers from the Ready status.

- ► **Stop Vusers**. Stops the specified number of Vusers.
- **> Reset Vusers**. Resets the specified number of Vusers to the **Down** status.

Note: If the number of Vusers that you attempt to add exceeds the number of Vusers allocated for the run, Performance Center allocates additional Vusers if sufficient Vusers are available. Performance Center issues a warning if it is unable to reserve the requested number of Vusers.

6 Click **Close** to close the Run Vusers dialog box and return to the Load Test Run page.

Controlling Individual Vusers

You can also manipulate individual Vusers within the Vuser groups you have defined. This section describes how to initialize, run, stop, and reset individual Vusers.

To control individual Vusers:

1 On the Load Test Run page, click the **Vusers** button. The Vusers List dialog box opens with a list of the ID, Status, and Load Generator for all Vusers in the load test run.

🖉 Vusers List - Microsoft	Internet Explor	er				
¥user Details						
Filter Vusers Groups = getvus Generators = jolion, Statuses = Down,	Filter Vusers					
Currently showing:	1 - 10 / 77			1 - 10 🜔 🕖		
Vuser ID	Status	Generator	Details			
getvuserip:1	Ready	jolion				
getvuserip:2	Ready	jolion				
getvuserip:3	Ready	jolion				
getvuserip:4	Ready	jolion				
getvuserip:5	Ready	jolion				
getvuserip:6	Ready	jolion				
getvuserip:7	Ready	jolion				
getvuserip:8	Ready	jolion				
getvuserip:9	Ready	jolion				
getvuserip:10	Ready	jolion				
땮 다 Reset	Init R	un				
		Close				
				~		

- **2** You can control an individual Vuser as follows:
 - ► Select a Vuser and click **Init** to initialize it.
 - ► Select a Vuser and click **Run** to run it.
 - ➤ Select a Vuser and click **Stop** to stop it immediately from running.
 - ► Select a Vuser and click **Reset** to revert a Vuser's status to down.
 - ► To select all listed Vusers, click the **Select All** button.
 - ► To clear the selection, click the **Clear All** button.
- **3** To filter for individual Vusers, click **Edit**. The Active Filters dialog box opens.

🎒 Vusers List - Mic	rosoft Internet Exp	lorer	_ 🗆 🗵
Active Filters			<u> </u>
Groups	Generators	Statuses	
✓ med_rec			<u> </u>
🔽 test2			
✓ Rendezvous			
<u>®</u> ₽			X
	OK Clo	se	▼

Select the groups, load generators, and statuses that you want to filter, and click **OK**. The filtered Vusers are displayed in the Vuser Details section.

- **4** Click **Refresh** to refresh the status of Vusers at any time.
- **5** Click **Close** to close the Vuser List dialog box.



Adding and Modifying Vuser Groups

Before running the load test, you can modify the groups that you designed in the design stage from the Load Test Run page. You can change the number of Vusers in the load test, the host distribution, and the percentage or number of Vusers distributed to each script. You can also create new Vuser groups. During the load test run, you can create and add new Vuser groups to the load test.

Note:

- During a load test run, you cannot edit groups that have Vusers in the Running, Pausing, Init, or Ready mode.
- ➤ If you edit a group during run time (except for Run-time settings), this resets the Vusers to the **Down** status.

To modify or create Vuser Groups:

- 1 On the Load Test Run page, click the **Design** button. The Load Test Design dialog box opens.
- **2** Click **Design Groups**. The Design Groups dialog box for the load test opens.

🗿 Design Groups - Microsoft Internet Explorer provided by Hewlett-Packard						
68 🖿 🖉	7 🗙 🔛 🏹 🕵 🖬 🛛 LG: 1	Total Vusers: 10	Note: The number of Vusers that will run in the load test	is defined by the Scheduler.		
#	Script	Group Name	Load Generators	Туре		
10	Web_message	web_message	vmltqa16	Web (HTTP/HTML)		
10	5k_vugen_mst20	5k_vugen_mst20	Select load generators	Web Services		
10	Web_message	web_message_1	Select load generators	Web (HTTP/HTML)		
	Click here to add a new group	×				
			Sav	/e Cancel Close		

3 Modify the Design Groups settings as necessary.

To create a new Vuser group, specify the script, group name, number of Vusers, and assign load generators to the new group. For more information, see Chapter 10, "Designing Load Test Workloads."

Note: Duplicate Runtime Settings is limited to importing settings into the new group only.



4 To upload a Vuser script that is not on the list, click the **Upload scripts** button. The Upload a Vuser Script dialog box opens.

🚰 Upload Vuser Script Microsoft Internet Explorer	_ 🗆 🗙					
Upload a ¥user Script	*					
Select Yuser script(s) to upload. Note that the script must be in ZIP format and include all the files in the test script folder.						
	Browse					
	Browse					
	Browse					
	Browse					
	Browse					
Note: you can easily upload Vuser scripts from V connecting to Performance Center (PC) from Vug saving the scripts directly to PC.	ugen by en and					
Overwrite existing Scripts						
Upload Clear Form Close H	lelp					
	=					

Upload scripts as described in "Uploading Scripts to the Vuser Scripts Page" on page 130.

Note: You cannot remove scripts from the Selected Scripts list.

5 Click **OK** to save the settings and close the Design Groups dialog box. Vusers are distributed to groups and hosts and set in the **Down** state.

To disregard the changes and close the dialog box, click **Cancel**.

Note: An new Vuser group will not be included in the scheduling if Schedule by Group is active.

Managing Load Generators

During a load test, you can view the status and machine utilization of load generators in the load test, connect and disconnect load generators, add load generators to the load test, and configure terminal sessions from the Load Generator Details and Assignment dialog box.

To manage load generators during a load test:

- 1 On the Load Test Run page, click the **Design** button. The Load Test Design dialog box opens.
- **2** Click **Load Generators**. The Load Generator Details and Assignment dialog box opens.

🎒 Load Generator 🛛 Details and	d Assignment - Micro	osoft Internet Explorer	_ 🗆 🗙
Load Generator Status			*
Name	Status	Utilization	
🔲 labm1app01 (Controlle	r) Ready	🗣 Low	1
Disconnect Connect	Add Load Gene	erators	
Close	Refresh	Help	
			~

The Load Generator Details and Assignment dialog box provides the following information:

- ► Name. The name of the load generator machine.
- ➤ Status. The current status of the load generator machine. The following table describes the possible statuses of the load generator.

Status	Description	
Ready	The load generator is connected	
Connecting	The load generator is in the process of connecting	
Active	The load generator is running Vusers	
Down	The load generator is not connected	
Failed	A connection with the load generator could not be established	

- ➤ Utilization. Provides information on the percentage of total CPU processing capacity and virtual memory being used. This information helps you to assign your Vuser groups to load generators without overloading any one load generator.
- P
- **3** To change the terminal services configuration on a load generator, select the load generator and click the **Terminal Services** button. For more information, see "Configuring Terminal Sessions" on page 238.
- **4** To connect a load generator for the load test, select the load generator and click **Connect**. The load generator status changes from **Down** to **Ready** when the load generator is connected.

To disconnect a load generator, select the load generator and click **Disconnect**. The load generator status changes from **Ready** to **Down**.

- **5** To add a load generator machine to the load test, click **Add Load Generator**.
 - If you manually assigned specific load generators to your test, a dialog box opens displaying the requested number of load generators (if currently available) in the project's host pool.

¢1	Add Load Generator - Microsoft Internet Explorer							
	Add	Generat	ors					
		Name	Location	0/5	Purpose	Condition	Comments	
	V	montana	Default	Win2000/2003/XP	Controller + Load Generator	Operational		
	\Box	germ	Default	Win2000/2003/XP	Controller + Load Generator	Operational		
		loof	Default	Win2000/2003/XP	Controller + Load Generator	Operational		
								- 11
				0	K Close			

Select the load generator machines that you want to reserve for your load test run, and click **OK**. The dialog box closes and the load generators are added to the Load Generator Details and Assignment list.

► If Performance Center automatically assigned load generators to your test, the following dialog box opens.

Add Load Generators - Microsoft Internet Explorer		
Add Load Generators	<u> </u>	
Number of load generators to add:		
OK Close		
	7	

Type the number of load generators to add to the load test, and click **OK**. If the load generators are available, the dialog box closes and the load generators are added to the Load Generator Details and Assignment list. A message is issued if the load generators are not available.

- **6** Click **Refresh** to refresh the information in the Load Generator Details and Assignment dialog box.
- 7 Click **Close** to save the settings and close the dialog box.

Altering Load Test Settings During the Run

You can modify general settings while a load test is running from the Load Test Run page. Note that these changes only apply to the current run and are not saved for future runs of the load test.

You can make the following changes to general settings during the load test run:

- ► Change duration
- ► Editing Monitor Over Firewall Information
- ► Change refresh frequency
- ► Change the post-run analysis settings

Changing Duration

You can alter the duration of the load test during the load test run, using the Change Duration tab.

To change duration settings:

- **1** On the Load Test Run page, click the **Design** button. The Load Test Design dialog box opens.
- **2** Click **Settings**. The Settings dialog box opens.

3 Click the **Change Duration** tab.

🚰 Modify Test - Micr	osoft Internet Explore	r		
Change Duration	Server Monitors	Refresh frequency	Miscellaneous	
Alter Duration				
Load test wil	l end in: 8 min			
O Prolong load	id test by	min.		
O Shorten loa	ad test by	min.		
Free times	ot after test			
	ОК	Close		

4 To prolong the load test, select **Prolong load test by X min**, and type the number of minutes by which to prolong the load test.

Note: The ability to prolong your load test, may be limited by your timeslot reservation. For example, suppose you reserve a timeslot from 2:00-3:00 PM and some one else reserves the timeslot from 3:00-4:00 PM. At 2:50 you try to prolong your test by 15 minutes. The requested extension cannot be given because of the 3:00-4:00 PM reservation.

- **5** To shorten the load test, select **Shorten load test by "X" min** and type the number of minutes by which to shorten the load test.
- **6** To free the timeslot at the end of the test, select **Free the timeslot**. For more information, see "Freeing a Timeslot After a Test" on page 392.
- 7 Click **OK** to alter the duration settings, and again to confirm the change.
- **8** Click **Close** to close the Settings dialog box.

Editing Monitor Over Firewall Information

While the load test is running, you can change the status of a Monitor Over Firewall machine or add another monitor to the load test.

To modify the Monitor Over Firewall machines:

- **1** On the Load Test Run page, click the **Design** button. The Load Test Design dialog box opens.
- **2** Click **Settings**. The Settings dialog box opens.
- **3** Click the **Server Monitors** tab. Performance Center displays the Monitor Over Firewall machines that are monitoring the load test, as well as their connection status.

🖉 Settings - Microsoft Internet Explorer p	rovided by Hewlett	t-Packard			
Change Duration Server Monitors Refresh frequency Miscellaneous					
Edit Monitor Over Firewall machine	list				
Monitor Over Firewall machiness in load	test:				
Name	S	Status	Connect/ Disconnect		
mofw1	1	Down	₽t		
Add Monitor Over Firewall machine: m	ofw2 💌				
OK Clos	e Refresh	Help			

- To connect or disconnect a Monitor Over Firewall machine, click the Connect/Disconnect button.
- ➤ To add a Monitor Over Firewall machine to the load test, select it from the Add Monitor Over Firewall machine list.
- 4 Click OK.
- **5** Click **Close** to close the Settings dialog box.

Changing Refresh Frequency

You can alter the frequency for refreshing Vuser table during the load test run, using the Refresh Frequency tab.

To modify the default refresh rate:

- **1** On the Load Test Run page, click the **Design** button. The Load Test Design dialog box opens.
- **2** Click **Settings**. The Settings dialog box opens.
- **3** Click the **Refresh Frequency** tab.

🚰 Settings - Microsoft Internet Explorer	
Change Duration Server Monitors Refresh frequency	Miscellaneous
Refresh Frequency	
Do not refresh	
Select auto-refresh frequency:	
Due to system limitations, the actual refresh frequency may b frequency.	e lower than the specified
Refresh groups table every: 5 seconds 💌	
OK Close Help	

- **4** Select the frequency at which to refresh the Vuser groups table. Alternatively, select **Do not refresh** so that the table does not auto-refresh automatically.
- **5** Click **OK**, and click **Close** to close the Settings dialog box.

Changing the Post-Run Analysis Option

You can change the post-run analysis settings during the load test run, using the Miscellaneous tab.

To modify the post-run analysis settings:

- 1 On the Load Test Run page, click the **Design** button. The Load Test Design dialog box opens.
- **2** Click **Settings**. The Settings dialog box opens.
- **3** Click the **Miscellaneous** tab.

🕈 Settings - Microso	t Internet Explorer			
Change Duration	Server Monitors	Refresh frequency	Miscellaneous	
Miscellanous				
You can change the one of the following	e post-run analysis se j options:	ettings during the load	test run. You can ch	1005e
C Collate and a	nalyze results			
Collate only				
C Do not collate	results			
	OK		1	
	OK	Close Help		

- **4** Select one of the post-run analysis options:
 - Collate and analyze results. Performance Center collates the run data from the load generators and generates analysis data. This option takes the most time.
 - ► Collate only. Performance Center collates the run data from the load generators. This is the default setting.
 - ➤ Do not collate results. Frees the machines immediately after the load test ends. You can collate and analyze results at a later point from the Load Test Results page.

For more information on the post-run analysis options, see "Configuring Post-Run Analysis Settings" on page 101.

5 Click **OK** to save the post-run analysis option, and click **Close** to close the Settings dialog box.

Creating or Modifying the Runtime Monitor Profile

Performance Center enables you to monitor your load test while it is running. To monitor the run, you must define a monitor profile that incorporates all the monitors and servers that you want to monitor the run. This profile is known as the **runtime monitor profile**.

The runtime monitor profile is valid for the current run only, and can incorporate monitor profiles defined on a project level, a local monitor profile defined specifically for this load test, and even Monitor Over Firewall machines. These monitors profiles can be created and configured before running a load test, or during the load test run.

For more information about configuring monitor profiles for a load test, see Chapter 12, "Configuring Load Test Monitor Settings."

To create or modify a runtime monitor profile:

- **1** On the Load Test run page, click the **Design** button. The Load Test Design dialog box opens.
- **2** Click **Monitors**.
 - ➤ If no profile has been selected for load test, the Add Monitors page opens. Create the runtime monitor profile as described in "Creating Monitor Profiles" on page 111.
 - If monitor profiles were selected for the test before runtime, the Monitor Profile dialog box opens displaying the runtime monitor profile, which includes all the selected monitor profiles. Edit the runtime monitor profile as follows:
 - ➤ To add another monitor to the profile, click Add. Provide the server information and select the measurements to monitor in the same way you would when creating a new profile. For details, see "Creating Monitor Profiles" on page 111.
 - To edit details of a monitor server in the profile, click the Edit button next to the relevant server, modify the measurement selection, and click Save.
 - ► To delete a monitor server from the profile, click the **Delete Server** button next to the relevant server and click **OK**.

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- ➤ To delete a monitor from the monitor profile, click the Delete Monitor button next to the relevant monitor and click OK.
- **3** Click **Close** to close the Monitor Profile dialog box.

Note: To remove a specific measurement from a runtime monitor profile that consists of multiple monitor profiles, be sure to remove the same measurement from each monitor profile in which it is selected.

Manually Releasing Vusers from a Rendezvous

While you run a load test, you can manually release Vusers from a rendezvous before the Controller releases them.

To manually release Vusers from a rendezvous:

- **1** On the Load Test Run page, click the **Design** button. The Load Test Design dialog box opens.
- 2 Click **Rendezvous**. The Rendezvous page opens.

🖇 Rer	ndezvous - Microsoft Internet Explorer					
Reno	dezvous					
Curr	ently showing: 1 - 10 / 27			1 - 10	DD	
	Rendezvous Name	Status	Vuser Script Name		Policy	
	41-123456789012345678901	0 of 6	∃ Defined in 2 scripts:			
	42-123456789012345678901	0 of 6	∃ Defined in 2 scripts:		- *	
	43-123456789012345678901	0 of 9	∃ Defined in 3 scripts:		- *	
	All_kind_of_cGI_is_going	0 of 6	∃ Defined in 2 scripts:		- *	
	Case@sensitive	0 of 3	∃ Defined in 1 script:		- *	
	CASE@SENSITIVE	0 of 3	∃ Defined in 1 script:		- *	
	Case@Sensitive	0 of 3	∃ Defined in 1 script:		- *	
	CGI_request	2 of 6	∃ Defined in 2 scripts:		- *	
	examle_4_changing_the_de	0 of 6	∃ Defined in 2 scripts:		- *	
	example8_password_enteri	0 of 6	∃ Defined in 2 scripts:		- *	
Se	lect All Clear All		Enable Disab	le	Release	
	Close	Refresh	Help			

- **3** Select a rendezvous from the Rendezvous list.
- **4** Click **Release**. The Vusers in the rendezvous are released.

For more information, see Chapter 16, "Using Rendezvous Points."

Adding, Editing, and Viewing Vuser Scripts

You can add, edit, and view Vuser scripts during a load test run from the Load Test Run page. You can also view the run-time settings for a Vuser script.

To add a Vuser script during the load test run:

- **1** On the Load Test Run page, click the **Design** button. The Load Test Design dialog box opens.
- 2 Click **Design Groups**. The Design Groups dialog box opens.
- **3** Add a script as described in "Adding and Modifying Vuser Groups" on page 375.
- **4** After you add a script, click the **Select Load Generator** link, and specify a load generator to run the script.
- 5 Configure load settings for the new script as described in "Configuring Schedule Settings from the Load Test Run Page" on page 364.

To view or edit a running Vuser script during the load test run:

- **1** Select **Project** > **Vuser Scripts** to open the Vuser Scripts page.
- **2** Click the Vuser script that you want to edit. Performance Center opens the Script Actions dialog box.
- **3** Click the **Download Scripts** button. Performance Center prepares the script for download.
 - **4** Click **Download** to download the script. Specify the folder to which you want to save the script files.

Note that if you have VuGen installed on the machine to which you are downloading, Performance Center can open the file directly in VuGen.

5 View or edit the script, as required.

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When editing a running Vuser script, it is important to understand the way a load test accesses a script and its run-time settings. For detailed information, see "About Managing Vuser Scripts" on page 123.

- **6** After editing in VuGen, establish the Performance Center connection. For more information, see "Uploading a Vuser Script from VuGen" on page 141.
- 7 Select File > Save to upload the edited script to the Performance Center database.

To edit run-time settings for a Vuser script:

- **1** On the Load Test Run page, click the arrow next to a script, and select **Runtime Settings**.
- **2** Edit the run-time settings as required, and click **OK**.

The edited run-time settings replace the previous setting on the database server. For detailed information, see "About Managing Vuser Scripts" on page 123.

For more information about run-time settings, see Chapter 35, "Configuring General Run-Time Settings."

Stopping a Load Test Run

A load test stops running automatically when it reaches the end of the configured load test duration. At the end of the load test run, Performance Center performs the post-run analysis option that you selected in the Timeslots page. For more information, see "Configuring Post-Run Analysis Settings" on page 101.

You can manually stop a load test during a load test run, for example, to delay data collation and analysis until a more convenient time. After the load test has stopped, you will only be able to view test data in the analysis.

To stop a load test during its run:

1 On the Load Test Run page, click **Stop Test**. The Stop Run dialog box opens and displays the post-run analysis settings.

🖉 Stop Run - Microsoft Internet Explorer 📃 🗖 🗙
Stop Run
Choose one of the following options:
O Collate and analyze results
⊙ Collate only
O Do not collate results
□ Free current timeslot Note: After the load test has stopped, you will only be able to
view load test data in the Analysis.
Do you want to stop the run?
Stop Close

- **2** Select a post-run analysis option. For more information, see "Configuring Post-Run Analysis Settings" on page 101.
- **3** To free the timeslot at the end of the test, select **Free the timeslot**.
- **4** Click **Stop** to stop the load test, or click **Close** to close the Stop Test dialog box without stopping the run.

If you stop the load test, Vusers in the load test exit the load test gradually. The **Stop** button on the Load Test Run page changes to **Stop Now** button until all Vusers have exited.

5 To stop the load test immediately, click the **Stop Now** button. Performance Center immediately stops the load test.

After all the Vusers have exited the load test, Performance Center performs the specified post-run analysis action.

Freeing a Timeslot After a Test

To run a test, you must reserve a timeslot (see "About Project Resources and Reserving Timeslots" on page 82). What is important to note, is that your reservation assigns the requested number of hosts to your timeslot.

If there is a total of ten hosts, and you reserve a timeslot using eight, there are only two hosts available until the end of the timeslot. Since hosts are a limited resource, it is important to maximize their usage.

Let's say you reserve a three hour timeslot that starts at 3:00 PM and uses eight out of ten hosts. At the start of your timeslot, you begin a test that runs for two hours and twenty minutes. This means that at 5:20 PM, your test is finished, but the hosts are still locked to the timeslot. If someone else from your project needs to run a twenty minute test using four hosts, they won't know that there are actually eight free hosts that are dedicated to the unused portion of the reserved timeslot. They cannot run their test because there is an insufficient number of available hosts.

When you stop a load test, Performance Center gives you the option to free the timeslot at the end of the test, making the unused portion of the timeslot and the hosts assigned to it, accessible to other users.

In the above example, the user with the short test would be able to reserve a thirty minute timeslot, from 5:30-6:00, with a sufficient number of hosts to run their test.

Selecting **Free timeslot after test**, allows you to maximize your host and timeslot usage.

25

Online Monitor View

You monitor load test execution using the Performance Center online monitors. During a load test run, you can view graphs that display information about the load that Vusers generate on your Web server and other applications. Performance Center displays this data in real-time during test execution.

This chapter includes:

- ► Overview of Online Monitoring on page 394
- ► Setting Monitoring Options on page 396
- ► Viewing Online Monitor Graphs on page 397
- ► Managing Online Graphs on page 400
- ➤ Customizing the Online Monitor View on page 401
- ► Displaying Network Delay Data on page 405
- ► Drilling Down Diagnostics Data on page 407

Overview of Online Monitoring

When designing a load test, you configure monitors and the measurements that you want to view in the load test so that when you run the load test you can monitor information about the load that Vusers generate on your Web server and other applications.

Performance Center provides the following online monitors:

- ➤ The Run-Time monitor displays the number and status of Vusers participating in the load test, as well as the number and types of errors that the Vusers generate. It also provides the User-Defined Data Point graph that displays the real-time values for user-defined points in a Vuser script. For more information about Run-Time monitoring, see the *HP Performance Center Monitor Reference*.
- ➤ The Transaction monitor displays the transaction rate and response time during load test execution. For more information about Transaction monitoring, see the *HP Performance Center Monitor Reference*.
- ➤ The Web Resource monitor measures statistics at the Web servers during load test runs. It provides information about the number of Web connections, throughput volume, HTTP responses, server retries, and downloaded pages during the load test. For more information on the Web Resource monitor, see the HP Performance Center Monitor Reference.
- ➤ The System Resource monitors gauge the Antara FlameThrower, Windows, Unix, SiteScope, and Server ResourcesTUXEDO, SNMP, used during a load test. To activate the System Resource monitors, you must set the monitor options before you run your load test. For information on setting these options, see the HP Performance Center Monitor Reference.
- ➤ The Network monitor displays information about the network delays on your system. To activate the Network monitor, you must set up the network paths to monitor before you run your load test. For more information about Network monitoring, see the *HP Performance Center Monitor Reference*.
- ➤ The Firewall monitor measures statistics at the firewall servers during the load test. To activate the Firewall monitor, you must set up a list of resources to monitor before you run your load test. For more information about Firewall Server Performance monitoring, see the HP Performance Center Monitor Reference.

- ➤ The Web Server Resource monitors measure statistics at the Apache, Microsoft IIS, iPlanet (SNMP) and iPlanet/Netscape Web servers during the load test. To activate the Web Server Resource monitors, you must set up a list of resources to monitor before you run your load test. For more information, see the HP Performance Center Monitor Reference.
- ➤ The Web Application Server Resource monitors measure statistics at the Ariba, ATG Dynamo, BroadVision, ColdFusion, iPlanet (NAS), MS Active Server Pages, Oracle9iAS, SilverStream, WebLogic (JMX), WebSphere application servers during the load test. To activate the Web Application Server Resource monitors, you must set up a list of resources to monitor before you run your load test. For more information, see the HP Performance Center Monitor Reference.
- ➤ The Database Server Resource monitors measure statistics related to the SQL, DB2, Sybase, and Oracle servers. To activate the database server monitors, you must set up a list of measurements to monitor before you run your load test. For more information, see the HP Performance Center Monitor Reference.
- ➤ The Java Performance monitor measure statistics of Java 2 Platform, Enterprise Edition (J2EE) objects using the J2EE server machine. To activate the J2EE Performance monitor, you must set up lists of resources to monitor before you run your load test. For more information, see the *HP Performance Center Monitor Reference*.
- ➤ The Application Deployment Solutions monitor measures statistics of the Citrix MetaFrame XP and 1.8 servers during a load test run. To activate the Citrix MetaFrame XP monitor, you must set the monitor options before you run your load test. For information on setting these options, see the HP Performance Center Monitor Reference.
- ➤ The ERP/CRM Server Resource monitors measure statistics of the SAP, SAPGUI, SAP Portal, Siebel Server Manager, Siebel Web Server, and PeopleSoft (Tuxedo) during a load test run. To activate the ERP/CRM monitors, you must set the monitor options before you run your load test. For information on setting these options, see the HP Performance Center Monitor Reference.

- ➤ The Application Component monitors measure statistics of the Microsoft COM+ and Microsoft .NET CLR servers during a load test run. To activate the Application Component monitors, you must set the monitor options before you run your load test. For information on setting these options, see the HP Performance Center Monitor Reference.
- ➤ The Middleware Performance monitor measures statistics of the Tuxedo server during a load test run. To activate the Tuxedo monitor, you must set the monitor options before you run your load test. For information on setting these options, see the HP Performance Center Monitor Reference.
- ➤ The J2EE/.NET Diagnostics monitors provide information to trace, time, and troubleshoot individual transactions through J2EE/.NET Web, application, and database servers. To activate the J2EE/.NET Diagnostics monitors, you must set up the J2EE/.NET Diagnostics module to communicate with the mediator machine and define the servers that you want to monitor. For more information, see Chapter 34, "HP Diagnostics Integration with Performance Center."

Tip: At the conclusion of the load test, you can use HP Analysis, to view a summary and graphs of the data collected from these monitors during the load test run. For detailed information on the available graphs, see the *HP LoadRunner Analysis User Guide*.

Setting Monitoring Options

Before running your load test, you can set the data sampling rate, and debugging and frequency settings for the online monitors.

You set these options from **Project** > **Options** > **Monitors**. For more information, see "Setting Monitor Options" on page 281.
Viewing Online Monitor Graphs

During a load test run, you can view graphs that display information about the load test. This information is obtained from online monitors that are configured before or while running a load test.

This section describes:

- ▶ "Online Monitor View at a Glance" on page 397
- ► "Displaying Online Monitor Graphs" on page 398
- ➤ "Optimizing the Online Monitors View" on page 399

Online Monitor View at a Glance

When you start a load test (see "Starting a Load Test" on page 353), the Load Test Run page opens, displaying the **online monitor view**.



The online monitor view contains the graph tree, the graph display area, and the graph legend.

Graph Tree

The **graph tree** displays a list of the configured online monitors graphs.

Graph Display Area

The **graph display area** displays the online activity of the selected monitors. You can display up to six graphs in this area, and you can open displayed graphs in their own enlarged windows. You can freeze the graphs to view specific data and then resume viewing current data. You configure graph display properties in the graph display area.

Graph Legend

The **graph legend** is located below the graph display area. For any graph selected in the display area, the legend displays data about each measurement in the graph. You configure the measurement display properties in the legend.

Displaying Online Monitor Graphs

When you start running a load test, online monitor activity is displayed in the graph display area. You can select how many monitor graphs to display, and customize how to display the measurements in each graph. You can display graphs in separate windows, enabling you to view many graphs simultaneously. While viewing the graphs, you can change the refresh rates of the graphs. You can freeze graphs to study data displayed, and then resume watching the graph online.

Note: Performance Center saves the changes to your view so that the next time you run the load test, the changes you made are displayed. This enables you to configure a different online view for each load test according to the data you want to see.

To view a graph in the graph display area:

➤ In the graph tree, click the name of the graph you want to display. The graph is displayed in the graph display area and is highlighted by a blue border.

The graph legend below the graph display area displays the graph's details the scale of the graph, and the maximum, minimum, average, standard, and last values for each measurement in the graph. **Note:** A value of a measurement in the format **xE+y** denotes a value equivalent to $x * 10^{y}$.

To sort the measurements in the legend by one of these values, click the relevant column heading. An arrow icon is displayed beside the column heading, showing you whether the measurements are sorted in ascending (up arrow) or descending (down arrow) order.

Optimizing the Online Monitors View

When running a load test, you can optimize the online monitors view by:

- ► maximizing the online monitors pane
- ► opening graphs in their own windows

To maximize online monitors pane:

- Itide the graph tree by clicking the Hide Graph Tree button in the top right corner of the graph tree pane.
- Itide the Performance Center left menu by clicking the double arrow on the bottom left corner of the menu pane.
 - Expand the online monitors pane by dragging the upper border splitter upwards.

Down	Init	Ready	Run	Rendez	Exiting	Passed	Failed	Stopped	Error]	Run
0	0	0	0	0	0	0	0	10	0]	Stop
								3 🔻			
								3 🔻		1	Vusers
								4 ▼			Design
-	Output										
Running Vusers Transaction Response Time											
6											

To open a graph in a new window:

Select a graph and click the **Open in New Window** button.

A new graph window opens displaying the selected graph.

The new graph window has the same functionality as the online monitor view of the Load Test Run page. (See ""Customizing the Online Monitor View" on page 401.) Configuring graphs in this window does not affect the configuration of other graph windows.

Managing Online Graphs

You duplicate, rename, and delete monitor graphs from the graph tree. You can also configure graph display properties from the graph tree.

✓ When you select a graph, a small down arrow appears in the graph tree to the left of the graph name. When you click the arrow, a drop-down menu opens.

To duplicate a graph:

- **1** In the graph tree, select the graph you want to duplicate.
- **2** Click the down arrow next to the graph name, and select **Duplicate**. The duplicated graph is listed in the graph tree.
- **3** To display the graph in the graph display area, select it in the tree.

To rename a graph:

- **1** In the graph tree, select the graph you want to rename.
- **2** Click the down arrow next to the graph name, and select **Rename**.
- **3** Rename the graph and click **OK**.

To delete a graph:

1 In the graph tree, select the graph you want to delete.

Note: You can delete a duplicated graph only.

- **2** Click the down arrow next to the graph name, and select **Delete**.
- **3** Confirm that you want to delete the graph.

The graph is removed from the graph tree.

Customizing the Online Monitor View

You can customize your online monitors view to display graphs and data according to your needs. Performance Center saves these settings per user per load test. This means that:

- > You can define different display options for each load test.
- ➤ Each time you run a load test, Performance Center display the settings that you selected the previous time you ran that load test. Other users who run the same load test can select different display settings which are displayed when they run the load test.

This section describes:

- ▶ "Viewing Measurements in the Graph" on page 399
- ► "Selecting Number of Graphs to Display" on page 399
- ► "Configuring the Graph Display" on page 400
- ▶ "Refreshing the Graph Data" on page 401

Viewing Measurements in the Graph

Performance Center displays graphs with their default measurements. You can select which measurements to display and which ones to hide. You can display a measurement in bold and customize its color.

To configure a measurement's appearance:

- **1** Select a graph. The graph legend displays the measurements that appear in the graph.
- **2** Configure each measurement as follows:
 - To show or hide a measurement, select or clear the check box in the V column.
 - ➤ To display the measurement in bold in the graph, select the check box in the B column.
 - ➤ To change the color of a measurement, click the color box adjacent to the measurement, select a color or type a color code (hexadecimal) and click OK.

To highlight a measurement in the graph:

► Select the line in the graph or the measurement the legend.

Selecting Number of Graphs to Display

You can display one to six graphs in the graph display area.

To select a number of graphs to display:

■ In the graph display area, click the **# Graphs** button and select the number of graphs to display.

The graph display area is updated accordingly.

Configuring the Graph Display

You can select the interval over which to view a graph, set how to display the time on the x-axis, and select a scale to use for the graph.

To configure the graph display:

1 Select a graph.

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2 Click the **Graph Configuration** button.

The Graph Configuration dialog box opens.

3 Select the configuration options as follows:

Property	Description				
Granularity	The interval of the load test displayed in the graph:				
	Last minute; Last 3 minutes; Last 10 minutes; Last hour; Whole load test				
Time Display	The time displayed on the x-axis:				
	 Relative to load test start. Displays the amount of time that has elapsed since the beginning of the load test (in hours, minutes, and seconds) 				
	► Controller clock. Displays the time on the Controller clock.				
	► None. No clock or time is displayed.				
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	► With markers. Lines in the graph are marked with dots.				
	► Without markers. Lines in the graph are smooth.				
Display DNS	Network Delay Time graph only.				
names	Displays the DNS name of each measurement, in addition to its IP address.				
	Note: This option assumes that the Network Delay Time monitor was configured to enable display of network nodes by DNS names. For more information, see the <i>HP Performance Center Monitor Reference</i> .				

- **4** To apply the selected configuration options to all the graphs displayed in the window, select **Apply to all visible graphs**.
- 5 Click OK.

Refreshing the Graph Data

You can change the frequency at which Performance Center refreshes the displayed graph data.

To modify the refresh frequency of the graphs:



 Click the Refresh Frequency button, and select a rate at which Performance Center should refresh the graphs.



➤ To freeze the graphs in their current frames, click the Freeze Graphs button. To resume refreshing the graphs according to the selected refresh frequency, click the Resume Auto-Refresh button.

Displaying Network Delay Data

The Network Delay Time monitor graph shows the network path delay for the complete path between the source and destination machines. Each path defined in the Network Delay Monitor page is represented by a separate line with a different color in the graph.



You can also view the delay time of sub-paths and segments of the network paths.

To view delay time for each of the sub-paths of the network path:

1 Select the Network Delay Time graph.



- **2** Make sure that the full paths are displayed—click the **Network Breakdown** button and select **Full Paths**.
- **3** Select the path to break down.
- 4 Click the Network Breakdown button again and select Sub Paths.

The graph displays the delay time from the source machine to each of the nodes along the network path.

To view the delay time for each segment of the network path:

1 Select the Network Delay Time graph.



2 Make sure that the full paths are displayed—click the **Network Breakdown** button and select **Full Paths**.

- **3** Select the path to break down.
- 4 Click the Network Breakdown button again and select one of the following:
 - Segments of Areas. Displays the segments of the network path in an area graph.
 - Segments as Pie. Displays the segments of the network path in a pie graph.

Note: The segment delays are measured approximately, and do not add up to the network path delay which is measured exactly. The delay for each segment of the path is estimated by calculating the delay from the source machine to one node and subtracting the delay from the source machine to another node. For example, the delay for segment B to C is calculated by measuring the delay from the source machine to point C, and subtracting the delay from the source machine to point B.

Drilling Down Diagnostics Data

Important: This section assumes that your Performance Center system is configured to work with HP Diagnostics.

During a load test, you can view HP Diagnostics data for the whole load test or you can drill down to HP Diagnostics data from a particular transaction.

To view a summary screen of the load test run in HP Diagnostics:

► On the right of the Load Test Run page, click **Diagnostics**,

Running Yusers: 0 Time: 00:07:26 Hits/sec: 18 (last 60 sec) Passed trans: 512 Failed trans: 10 Errors												
🗄 Group:	Down	Init	Ready	Run	Rendez	Exiting	Passed	Failed	Stopped	Error	Run	
Total:	0	0	0	0	0	0	0	0	10	0	Stop	
🗄 medrec2 🔻									10 🔻		Vusers	
											Design	
Output												
Diagnostics												

HP Diagnostics opens, displaying the Scenario Summary dashboard view.

The **Scenario Summary** dashboard view displays monitoring versions of the transactions, server requests, load, and probe views for the current run. For more information about the working with HP Diagnostics, see the *HP Diagnostics User Guide*.

To drill down to HP Diagnostics data from a particular transaction:

- **1** In the graph tree, select the Transaction Response Time graph.
- **2** In the graph legend, click the transaction that you want to break down.
- **3** Click the **Transaction Breakdown** button.

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HP Diagnostics opens, displaying the Transactions view, which contains performance metrics and drill down options for the relevant transaction.

For more details about interpreting data in the Diagnostics Transactions view see the section that described the transaction views in the *HP Diagnostics User Guide*.

26

Analyzing a Load Test

When a load test is finished, Performance Center automatically organizes the load test data. The data can then be analyzed and placed into various graphs and reports, or downloaded to a local machine for analysis, then uploaded back to Performance Center.

This chapter includes:

- ► About Analyzing a Load Test on page 410
- ► Collating and Analyzing Load Test Data on page 412
- ► Viewing Load Test Results on page 417
- ➤ Viewing the Analysis Summary Report on page 423
- ► Integration with HP LoadRunner Analysis on page 427
- ► Downloading Result and Session Files on page 431
- ► Uploading Session Files and Reports on page 433

About Analyzing a Load Test

When a load test is finished, Performance Center performs post-run analysis according to the setting you selected in the Options tab of the Timeslots page (see "Configuring Post-Run Analysis Settings" on page 101). If you did not select a post-run analysis setting, Performance Center automatically collates the test data.

If you stop a load test before it is finished, you can override the post-run analysis option, and select to collate data immediately, collate and analyze data immediately, or delay collation until a later time. For more information on stopping load tests, see "Stopping a Load Test Run" on page 390. For more information on collating and analyzing results, see "Collating and Analyzing Load Test Data" on page 412.

After the load test data is collated and analyzed, you can view load test results in the default summary report and graphs.

Additionally, you can analyze load test data off-line, from any computer on which Standalone Analysis is installed. Standalone Analysis enables you to generate various graph views, merge graphs, drill down within graphs, change zoom level and granularity, and create custom reports and graphs to suit your particular needs.

To integrate with Standalone Analysis, you must connect Analysis to Performance Center. You can then download result and session files for analysis on a local machine. After analyzing the files, you can upload the session data and reports to Performance Center, and share the results with other users. For more information, see "Integration with HP LoadRunner Analysis" on page 427.

Note:

- Collating results may place excessive stress on a machine that is running a load test. Performance Center will alert you if a test is running on the Controller machine that will do the collating.
- When the Controller is collating and analyzing test data, it is not available for another load test scheduled for the same time.

Collating and Analyzing Load Test Data

At the conclusion of the test run, Performance Center performs post-run analysis. The table below shows the post-run analysis settings, and the corresponding run status and options available for viewing run data on the Load Tests Results page.

You set the post-run analysis settings in the Timeslots page > Options tab. For more information, see "Configuring Post-Run Analysis Settings" on page 101.

Post-Run Analysis Settings	Description	Run Status (Load Tests Page)	Available Options	Downloadable Files (Files and Reports tab)
Do not Collate results	Frees the machines immediately after the load test ends. You can collate and analyze results at a later time.	Before Collating Results	 Collate Results Delete Temporary Results Edit Load Test 	None
Collate Only	Performance Center collates the run data from the load generators and automatically deletes temporary results from them. You can download the raw results and manually analyze results at a later time.	Before Creating Analysis Data	 Analyze Results Delete Temporary Results Edit Load Test 	► Raw results file
	If Performance Center is unable to collate data, follow the instructions in the error message and collate the data again.	Failed Collating Results	 Collate Results Delete Temporary Results Edit Load Test 	None

Post-Run Analysis Settings	Description	Run Status (Load Tests Page)	Available Options	Downloadable Files (Files and Reports tab)
Collate and Analyze results	Performance Center collates the run data from the load generators and generates analysis data. After data is collated, Performance Center automatically deletes temporary results from the load generators and Controllers. You can display the results using analysis graphs and reports, or download them for analysis on a local machine.	Finished	 Download Logs Edit Load Test 	 Summary Report Results file Raw results file
	If Performance Center is unable to generate analysis data, you can download the raw results, and analyze them using Standalone Analysis.	Failed Creating Analysis Data	 Delete Temporary Results Edit Load Test 	➤ Raw results file

Note: If the **Delete Temporary Results** option is selected (selected by default) in the Administrations Site's General Settings page, Performance Center automatically deletes the temporary results from the load generators. To allow manual deletion of the temporary results, clear this option.

Collating Results

Performance Center collates the run data from the load generators. If you selected the **Do not collate results** post-run Analysis setting, Performance Center does not automatically collate the results, and you need to collate and then analyze the data before you can view test results.

To collate results:

1 On the Load Tests page, click the **Before Collating Results** link for the run. The Load Test Results page opens, displaying the following options on the right of the Files and Reports tab:

Load Test Description:							
Collate Results							
Delete Temporary Results							
Edit Load Test							

2 Click **Collate Results**. The Controller gathers the results from the load generators and merges the results into a single package. Performance Center automatically deletes the temporary results from the load generators.

Note: If a test is running on the Controller that will do the collating, Performance Center issues an alert. Click **OK** to proceed with collating results, or **Cancel** to defer collating and analyzing results.

3 At the end of result collation, you can analyze test results (see "Analyzing Results" on page 416), or download the raw results for analysis on a local Analysis machine.

For more information about using Standalone Analysis, see "Integration with HP LoadRunner Analysis" on page 427.

Failure to Collate Results

If there is a problem collating the load test data, an error message is displayed.

Load Test Description: 3 LGs free
Problem in collating results. Please recollate results again
Collate Results
Delete Temporary Results
Edit Load Test
User notes for the results:
×
Save Notes

Collate the results again, or follow the instructions in the error message.

Analyzing Results

After Performance Center collates load test results (see "Collating Results" on page 414), it must generate analysis data before you can view test results.

To analyze results:

1 On the Load Tests page, click the **Before Creating Analysis Data** link for the run. The Load Test Results page opens, displaying the following options on the right of the Files and Reports tab:

Load Test Description:	
Analyze Results	
Delete Temporary Results	
Edit Load Test	

2 Click **Analyze Results**. Performance Center generates analysis data and automatically deletes the temporary results from the load generators and the Controller. After Performance Center analyzes the load test data, you can view the results for the load test (see "Viewing Load Test Results" on page 417), or download the log files and summary report (see "Viewing the Analysis Summary Report" on page 423).

Note: If Performance Center is unable to analyze the load test data or to delete the temporary results automatically, the **Delete Temporary Results** link becomes available.

Failure to Create Analysis Results

If Performance Center is unable to analyze the load test data, an error message is displayed.

Load Test Description:							
Failed creating analysis data.							
Analyze Results							
<u>Delete Temporary Results</u>							
Edit Load Test							

You can download the raw results from Load Test Results page (see "File and Reports Table" on page 418), and analyze them using Standalone Analysis.

For more information about analyzing results using Standalone Analysis, see "Integration with HP LoadRunner Analysis" on page 427.

Viewing Load Test Results

If you selected **Collate and analyze results** in the post-run Analysis settings, (Timeslot page > Options tab) Performance Center automatically collates and analyzes the load test data. The status displayed on the right side of the Load Test Run page changes as the test results are collated and analyzed. At the end of result analysis, you can view the results, or to restart the test.

If you select to restart the test, the test begins again.

If you select to view the results of the test, the Load Test Results page opens. The Load Test Results page contains the following tabs:

➤ Files and Reports. Displays the summary report, result file, session files, and HTML reports, and allows users with the relevant permissions to upload files. Also displays links that let you collate/analyze test results, edit tests, and access test results. For more information, see "Files and Reports Tab" on page 418.

➤ Results vs. Targets. Displays the Load Test Targets and Results table which contains an analysis of the performance targets for the test with the results from the load test run. Also enables you to publish the load test results to the Dashboard. For more information, see "Results vs. Targets Tab" on page 420.

Files and Reports Tab

The Load Test Results page opens by default on the **Files and Reports tab** which displays:

- ➤ Files and Reports table. Displays load test result files, session files, and HTML reports, and allows users with the relevant permissions to upload files.
- ➤ Load Test Description area. Contain links that enables you to collate/analyze test results, edit tests, and access test results. Also provides area for user comments about the load test run.

File and Reports Table

You can access run result files that are automatically generated by Performance Center, and any other user-uploaded files from the Files and Reports tab.



After Performance Center has successfully collated and analyzed the result data, the Files and Reports table contains the following files:

- ➤ Report.html. A summary report of the data collected during the load test that is automatically generated by Performance Center. This file cannot be deleted, although you can replace it with an alternative HTML report uploaded from Standalone Analysis. For more information, see "Viewing the Analysis Summary Report" on page 423.
- ➤ Results.zip. Contains the Analysis Session files that are automatically generated by Performance Center. The Results.zip file can be deleted or replaced by uploading a different one.
- ► **RawResults.zip**. Contains the original raw result files, which can be used at anytime to analyze the run.
- ➤ In addition, the table might contains files that have been uploaded by users with the relevant permissions.

You can download any of these files from the table.

To download a file from the Files and Reports table:

➤ In the Files and Reports table, click the file name link, and save the file to your local file directory.

To upload a file to the Files and Reports table:

- **1** Click the **Upload Files** button. The Upload File dialog box opens.
 - **2** In the Upload File dialog box that opens, click **Browse** and select the file that you want to upload to Performance Center.
 - **3** (Optional) Type a comment about the file in the **Comments** box.
 - 4 Click Upload.

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5 Click **Close** to close the Upload File dialog box, and click the **Refresh** button in the Files and Reports tab to update the Files and Reports table.

To delete a file from the Files and Reports table:

➤ In the Files and Reports table, click the **Delete** button adjacent to the file you want to delete. The file is removed from the table.

Load Test Description Area

In the **Load Test Description** area, Performance Center displays the following options:

- ► **Collate Results**. Performance Center collates the run data from the load generators. For more information, see "Collating Results" on page 414.
- ➤ Analyze Results. Performance Center generates analysis data, and displays the results in analysis graphs and reports. For more information, see "Analyzing Results" on page 416.
- ➤ Download Logs. Enables you to download a zip file containing Vuser log files, error and notification messages, or a summary report of the data Performance Center collected during the load test. For more information, see "Downloading Load Test Data Files" on page 422.
- ➤ Delete Temporary Results. Enables you to delete temporary result files from the load generator machines. If the Delete Temporary Results option in the Administrator Site is selected, this option only appears before data collation and analysis.
- **>** Edit Load Test. Enables you to edit load test configuration settings.
- ➤ User Notes. Enables you to add user comments about the load test. To add a user note for the results, type your note in the User notes box, and click Save Notes.

Note: You can edit a load test, add user notes, and delete results even before collating and analyzing results.

Results vs. Targets Tab

The **Results vs. Targets tab** displays the name of the load test, the load test start time, and test duration.

The tab displays targets and results for load test runs with **Finished** status only. If you select a load test run that does not have the **Finished** status, you must collate and analyze the run data before you can view performance targets and results.

If you set performance targets using the SLA wizard, Load Test Targets and Results table shows performance targets that you specified for the test compared to the actual run results. Results marked in red show transactions that did not achieve their specified targets.

Load Test Perf_Test ran at 4-Dec-2008 12:02:01 PM for 1 minutes. (Run ID: 3394)								
Files and Reports Results vs. Targets								
Load Test Targets and Results (results/targets in	seconds)							
Transaction / Hits Per Second	Less than 3 HPS	Equals to or greater than 3 HPS						
transaction_response_time_Action_Transaction	transaction_response_time_Action_Transaction NA / 10 NA / 20							
transaction_response_time_vuser_end_Transaction	NA / 10	NA / 20						
transaction_response_time_vuser_init_Transaction	transaction_response_time_vuser_init_Transaction 0.007 / 10 0.006 / 20							
transaction_response_time_WebLoadTest_Trans_all	3.007 / 10	3.011 / 20						
Results marked in red indicate transactions that did not	perform as specified	in targets						
This run is not published to the Dashboard Publish								

Note:

- ➤ The Load Test Targets and Results table may contain approximate data if target values were set that cannot be actually measured. For example, if you specified load levels targets for 10, 20, and 30 running Vusers, and during the test only 10 and 30 Vusers ran, Performance Center calculates the value for 20 Vusers based on the results for 10 and 30 Vusers
- ➤ The transaction response time displayed in the dashboard automatically includes think time (if lr_think_time was part of the script's transactions). You can disable think time by selecting lgnore think time in the General:Think Time tab of the script's run-time settings the next time you run the test.

You can publish (or remove) the targets and results for the load test run to the Dashboard. For more information, see "Viewing Load Test Performance Targets and Results" on page 47.

Downloading Load Test Data Files

You can download a zip file containing Vuser log files, error and notification messages, or a summary report of the data Performance Center collected during the load test.

To download a zip file containing load test data:

 On the Load Test Reults page, in the Files and Reports tab, click the Download Logs link. The Download Test Results dialog box opens.

Download Test Results - Microsoft Internet Explorer										
Download files for test dashboard run at 28-Jun-2005 3:46:41 PM										
Download a zip file containing the Vuser log files:	Download Vuser Logs									
Download a zip file containing error and notification messages:	Download Messages									
Download a zip file containing the Summary report:	Download Report									
Close Help										

- **2** Select the type of data file that you want to download and save to your local directory.
 - Download Vuser Logs. Downloads a zip file containing all the Vuser log files.
 - Download Messages. Downloads a zip file containing the error and notification messages.
 - Download Report. Downloads a zip file containing the default Analysis Summary report.
- **3** Click **Close** to close the Download Test Results dialog box.

Viewing the Analysis Summary Report

After a load test run is completed and you have analyzed the data gathered during the run, you can view a summary report of the load test results.

In the Load Test Results page, in the Files and Reports table, click **Reports.html**.

Load Test Results									
Load Test Perf_Test ran at 8-Dec-2008 1:01:21 PM for 1 minutes. (Run ID: 3436)									
Files and Reports	Files and Reports Results vs. Targets								
<u>金</u>									
₹ <u>Time</u>	<u>User</u>	<u>File</u>		<u>Comment</u>	Delete				
8-Dec-2008 1:17:02 PM	Admin	Report.html		Default summary report cannot be deleted					
8-Dec-2008 1:17:02 PM	Admin	Results.zip			×				
8-Dec-2008 1:15:47 PM	Admin	RawResults.zip			×				

Performance Center displays an Analysis Summary report of the data collected during the load test.

🕼 LoadRunner											-	A
Analysis Reports		Analysis S	umma	ary						Per	iod: 1	.2-Ju
Summary												
Running Vusers		Project Name: Test Name:	e_project hp									
Vuser Summary		Test Description:	none									
Throughput		Run lime: Duration:	8 minute	uu/u: s and	5:26:1 8 sec	onds.						
Hits per Second		User Notes:	none									
Transactions per Second		Statistics Summ	ary									
Total Transactions per Second												
Transaction Summary		Maximum Running Vusers:			0	:	10 54.465	.096				
Errors per Second		Average Throughput (bytes/second):			0		111,38	:1				
Error Statistics		<u>Total Hits:</u>			Q.		798					
HTTP Responses per Second		Average Hits per Second:			0	. :	1.632			View H	ITTP	
Average Transaction Response Time		Total Errors	s: 🔍 3									
Transaction Response Time Under Load		5 Worst Transa	ictions									
Transaction Response Time (Distribution)		No valid SLA rules	for trans	actior	is ava	ilable						
Windows Resources		Scenario Behav	ior Over	Time								
Web Page Diagnostics		The SLA status of	the follow	uina m	0.35111	emen	te dier	haued	ouer	time '	You ca	
Connections		to analyze the tim	ne range.	nig ni	easur	ennen	(5 015)	лауец	over	unie.	iou ca	111 SE
Connections Per Second		Measurement Na	ame	Time	Rang	es						
Transaction Performance Summary		Application Under Errors	r Test	0	0	0	0	0+	0+	0+	0	0
Transaction Response Time (Percentile)				00:00:	00:00:	00:00:	00:01:	00:01:	00:02:	00:02:	00:03:	00:03:
HTTP Status Code Summary				8	25	5	20	ភ	15	6	5	35
Overlay of Running Vusers and Average Transaction Response Time	•	Transaction Su	mmary									

The summary report provides general information about load test execution, lists statistics about the load test run, and provides links to graphs containing load test data. The appearance of the summary report, and the information displayed, varies depending on whether you defined performance targets for your load test.

Performance targets define goals for the load test. Performance Center measures these goals during the load test and analyzes them in the summary page. For more information on performance targets, see Chapter 8, "Defining Performance Targets."

Note: A transaction that contains the "@" symbol in its name will not display performance targets results. To view results, rename the transaction so that it does not contain the symbol.

The summary report contains the following sections:

- Load Test Details. This section shows the basic details of the load test being analyzed.
- Statistics Summary. This section shows a breakdown of the transaction statistics.
- ➤ X Worst Transactions (Only if performance targets defined). The X Worst Transactions table shows the worst transactions in terms of how often the transactions exceeded the SLA boundary during the load test, and by how much.
- Scenario Behavior Over Time. This section displays the average errors per second received by the application under test per time interval.
- ➤ Where performance targets were defined, this section shows how each transaction performed in terms of the SLA over time intervals.
- Transaction Summary. This section displays a table containing the load test's diagnostics data. Included in this data is a percentile column (x Percent). This column indicates the maximum response time for that percentage of transactions performed during the run.
- ➤ HTTP Responses Summary. This section shows the number of HTTP status codes returned from the Web server during the load test, grouped by status code.

Note: There are additional Diagnostics sections that may appear at the end of the summary, depending on the configuration of your system.

Analysis creates a separate report for each one of the open graphs. To open a graph report, select the graph listed in the left menu. Each graph report displays the graph name, result location, filters, group by settings, granularity, and transaction legend. The report also provides a link to an Excel file containing the graph data.



For more details regarding the summary page, see the relevant section in the *HP LoadRunner Analysis User Guide*.

Integration with HP LoadRunner Analysis

HP LoadRunner Analysis lets you analyze load 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. A standalone version of Analysis is available from the Downloads page of the Performance Center User Site.

Analysis integrates with Performance Center to let you analyze data collected during a Performance Center run. You can download raw results and sessions for analysis on a local machine. After analyzing the data, you can upload the analysis data (Microsoft Word and HTML reports) to Performance Center to share the results with other users. The files and reports are available from the Load Test Results page.

For Analysis to access a Performance Center project, your version of Analysis must be properly configured, and you must connect Analysis to Performance Center.

Note: You must have the latest standalone installation of HP LoadRunner Analysis to use this feature.

To check for proper upload/download configuration in HP LoadRunner Analysis:

- **1** Start HP LoadRunner Analysis.
- 2 Select Tools.

If the menu item **Performance Center Connection** is available on the Tools menu, your version of Analysis is enabled to upload/download analysis files.

If your version of Analysis is not enabled to do uploads/downloads or if you do not have Analysis installed on your machine, you need to uninstall your older version, and install a newer version of Analysis. To uninstall Analysis, select it in **Control Panel > Add/Remove Program Files**, and click **Remove**.

To install Standalone Analysis or update an installed version of Analysis:

- **1** Select **Miscellaneous** > **Downloads**.
- **2** Click the **Standalone Analysis Download** link to install the full standalone version of Analysis. For more information, see "Downloads Page" on page 34.
- **3** Follow the download instructions.

Once you have a version of Analysis that is enabled, you can connect Analysis to Performance Center and upload and/or download files.

Connecting HP LoadRunner Analysis to Performance Center

You can connect Analysis to a Performance Center project at any time during an Analysis session.

The connection process has two stages. First, you connect Analysis to a local or remote Performance Center Web server. This server handles the connections between Analysis and the Performance Center project.

Next, you select the Performance Center project, load test, and load test run from/to which you want to download/upload files. Note that Performance Center projects are password protected, so you must provide a user name and a password.

To connect Analysis to Performance Center:

1 In Analysis, select **Tools** > **Performance Center Connection**. The Configure Performance Center Connection dialog box opens.

Configure Performance Center Connection				
URL:	Example : "http://PCserver/loadtest"			
User Name:				
Password:				
Remembe	r user name and password ect on start			
Help	Connect Cancel			

2 In the **URL** box, type the URL address of the Web server on which Performance Center is installed. The URL address should be in the format:

http://<server_name>/loadtest

3 Type your **User Name** and **Password**. Contact your Performance Center administrator if you need assistance.

To automate the login process, select **Remember user name and password**. The specified user name and password are saved to the registry, and displayed each time you open the dialog box.

4 To automatically open the connection to the Performance Center server when you start Analysis, select **Auto connect on start**. Analysis attempts to connect to Performance Center using the configuration information displayed.

5 Click **Connect** to connect to Performance Center. The Performance Center Connection dialog box displays the connection status.

Once the connection is established, all the fields are displayed in read-only format, and the **Connect** button changes to **Disconnect**.

Note: You cannot connect to Performance Center and Quality Center at the same time.

Disconnecting HP LoadRunner Analysis from Performance Center

You disconnect Analysis from the Performance Center Web server using the Configure Performance Center Connection dialog box.

To disconnect Analysis from Performance Center:

1 In Analysis, select Tools > Performance Center Connection. The Configure Performance Center Connection dialog box opens.

Configure Performance Center Connection				
URL:	http://loof/loadtest			
Hser Name:	Example : "http://PCserver/loadtest"			
Password:	XXXXX			
🔽 Rememb	er user name and password			
🗖 Auto con	neot on start			
Help	Disconnect Cancel			

2 Click the **Disconnect** button. Analysis disconnects from Performance Center, and the dialog box closes.

Downloading Result and Session Files

When Analysis is connected to a Performance Center project, you can download analysis result and session files stored on the Performance Center server. You locate result and session files according to their position in the projects tree.

When downloading a new session, Analysis prompts you for the load test result file (.lrr extension) to include in the download. To download an existing Analysis session with display information and layout settings for the active graphs, you specify an Analysis session file (.lra extension).

To download a results file to Analysis:

- 1 Connect to the Performance Center server. For more information, see "Connecting HP LoadRunner Analysis to Performance Center" on page 428.
- 2 In Analysis, select File > New. The Open Result File for New Analysis Session dialog box opens and displays the load test project tree on the Performance Center server.

Open Result File for New Analysis Session	×
Select Result file:	
File System OK Close	

Note: Performance Center displays only those projects that the user has rights to access.

<u>~</u>

3 Select the relevant result file by browsing the project, test, and run folders in the projects tree. Result files are identified by a result icon.

To expand the tree and view sublevels, double-click closed folders. To collapse the tree, double-click open folders.

To open a result file from the file system (while connected to Performance Center), click **File System**. The Open Result File for New Analysis Session dialog box opens displaying the file system. Browse to the directory of the file that you want to open, and click **Open**.

4 Click **OK** to download the file and analyze the results. The downloaded result file is saved to your temp directory. If the download fails, an error message is displayed.

To download a session file to Analysis:

- 1 Connect to the Performance Center server. For more information, see "Connecting HP LoadRunner Analysis to Performance Center" on page 428.
- 2 In Analysis, select File > Open. The Open Session dialog box opens and displays the load test project tree on the Performance Center server.

Open Session	×
Select Session file:	
ter- ^l Default ter- ^l Project 1 ter- ^l Project 2	
File System	Close

Note: Performance Center displays only those projects that the user has rights to access.


To expand the tree and view sublevels, double-click closed folders. To collapse the tree, double-click open folders.

To open a session file from the file system (while connected to Performance Center), click **File System**. The Open Existing Analysis Session File dialog box opens displaying the file system. Browse to the directory of the file that you want to open, and click **Open**.

4 Click **OK** to download the file and open the session. The downloaded session file is saved to your temp directory. If the download fails, an error message is displayed.

Uploading Session Files and Reports

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When Analysis is connected to Performance Center, you can upload Analysis session files and save them to a Performance Center project, or to the local file system. To save a session file to a Performance Center project, you give it a descriptive name and specify the directory to which you want to upload the file in the projects tree. If Analysis is not connected to Performance Center, you can save the session file to your local file system. Later, when Analysis s is connected to Performance Center, you can upload the file to Performance Center.

You can also upload Analysis HTML and Word reports and save them to a Performance Center project.

To upload an Analysis session file to a Performance Center project:

- 1 Connect to the Performance Center server. For more information, see "Connecting HP LoadRunner Analysis to Performance Center" on page 428.
- 2 In Analysis, select File > Save. The Performance Center Save As dialog box opens displaying the load test project tree on the Performance Center server.

Save As	×
n Project 1 Project 1 Project 2	
File name:	
File System	OK Close

Note: Performance Center displays only those projects that the user has rights to access.

3 Select the Performance Center project, load test, and run directory to which you want to upload the file.

To expand the tree and view sublevels, double-click closed folders. To collapse the tree, double-click open folders. Note that when you select a run, the sessions that belong to the run are displayed in the tree.

To save the session to the file system, click **File System**. Browse to the directory where you want to save the files, and click **Save**.

Note: You must disconnect from Performance Center before you can save a session on the file system.

- **4** In the **File name** box, type a name for the session file. Make sure that file names consist of English letters, digits, or the underscore character, and do not exceed 250 characters.
- **5** Click **OK** to upload the session file to Performance Center. A progress indicator displays the progress of the upload.

If the upload fails, an informative error message is displayed.

To upload a session file from the file system:

- 1 Connect to the Performance Center server. For more information, see "Connecting HP LoadRunner Analysis to Performance Center" on page 428.
- 2 In Analysis, select File > Open. The Performance Center Open Session dialog box opens displaying the load test project tree on the Performance Center server.

Open Session	×
Select Session file:	
File System	OK. Close

3 Click **File System**. The Open Existing Analysis Session File dialog box opens.

Open Existing Analysis Session File		? ×
Look in: 🔄 temp	- 🖻 🖶 🖛	
 nmiFiles raw_res rendezvous_S1 report siebel sitescope 	C stam ∰ new ∭ upload_session	
•		►
File name: upload_session	Оре	n
Files of type: Analysis Session files	Cano	el

- **4** Browse to the directory where the session file is saved, and click **Open**. The session opens in Analysis.
- 5 Select File > Save As. The Performance Center Save As dialog box opens displaying the load test project tree on the Performance Center server.
- **6** Continue with the upload procedures from step 3 of "Uploading Session Files and Reports" on page 433.

To upload an HTML Report:

- 1 Connect to the Performance Center server. For more information, see "Connecting HP LoadRunner Analysis to Performance Center" on page 428.
- 2 In Analysis, select File > Upload to Performance Center > New HTML Report. The Upload HTML Report dialog box opens.

Upload HT	AL Report		×
Select uplo	ad location:		
	fault ject 1 Load Test 2 Load Test 1 dogbert_test test1 (a) 29:Aug-2004 12:02:52 PM (a) Report (b) Report (c) Report (c) 2		
File name:	Report		
	Save as type: HTML		
Comment:			
		ОК	Close

- **3** In the Upload HTML Report dialog box, select the project, load test, and run directory to which you want to upload the HTML report.
- **4** In the **File name** box, type a name for the report. By default, the file name "Report" is displayed. The report name can only consist of English letters, digits, or the underscore character, and must not exceed 250 characters.

You can type a description of the report in the **Comment** box.

5 Click **OK** to create the HTML report and upload it to Performance Center. If the upload fails, an error message is displayed.

To upload a Word report:

- 1 Connect to the Performance Center server. For more information, see "Connecting HP LoadRunner Analysis to Performance Center" on page 428.
- 2 In Analysis, select File > Upload to Performance Center > Existing Microsoft Word Report. The Upload Word Report dialog box opens.

Upload Wor	d Report			×
File name:				Browse
Comment:				
Select uploa	d location:			
⊡ ⊡ ⊡ ⊡ ⊡ Pro	ault test 29-Aug-2004 12:05:09 Log 2004 Log 2004 Log 2004 L	PM		
			ОК	Close

3 Click the **Browse** button, and navigate to the Word report that you want to upload. The path of the selected report is displayed in the File name box.

You can add a description of the report in the Comment box.

- **4** In the **Select upload location** section, select the project, load test, and run to which you want to upload the report.
- **5** Click **OK**. Analysis uploads the Word report to Performance Center. If the upload fails, an error message is displayed.

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Trend Reports

Trend reports allow you to compare performance trends over time, thereby giving you better visibility and control of your application's performance.

This chapter includes:

- ► About Trend Reports on page 440
- ➤ Understanding Trend Report Components on page 440
- > Trend Reports Main Page at a Glance on page 441
- ► Creating Trend Reports on page 445
- ► Viewing Trend Reports on page 449
- ► Adding Load Test Runs to Trend Reports on page 451
- ► Viewing the Trended Load Test Runs on page 454
- > Customizing the Trended Runs Table on page 458
- ► Managing Trend Report Tabs on page 459
- ► Working with Trend Views on page 463
- ► Understanding Trend View Information on page 470
- ► Comparison Methods on page 475
- > Setting Trend Thresholds on page 478
- ➤ Custom Measurement Mapping on page 481
- ► Measurement Acronyms on page 488
- > Deleting Trend Reports on page 490

About Trend Reports

The Performance Center Trend reports provide you with the ability to compare performance trends over time, thereby giving you better visibility and control of your application's performance. Using trend thresholds, you can easily identify any performance regression and focus your analysis efforts accordingly.

Understanding Trend Report Components

Trend reports are made up of the following components:

- ➤ Trend view. A trend view is a display item that presents trending information for a particular performance metric, for example, transaction response time. You can customize the functionality of any individual trend view and select one of three display settings, either table view, line graph view, or stacked bar chart view. Trend views of similar categories can be grouped together under a single trend report tab.
- ➤ Trend report tab. A trend report consists of various tabs, where each tab can contain any number of trend views. The tabs are defined by a template which sets the name of the tab and automatically includes trend views that are related to its name.

The tabs are fully customizable. That is, you can modify any of the tab settings, and add or remove trend views to suit your needs.

Trend report template. Performance Center lets you create a trend report based on one of four predefined templates. Each template has a specific area of focus and provides a combination of tabs and trend views based on that focus.

Trend Reports Main Page at a Glance

From the main Trend Report page, (**Load Tests > Trend Reports**) you can create, view, duplicate, and delete trend reports.

Trend Reports				
* D X 				
Name 🔺	Description		Date Modified	
MyApp Demo			Dec 15 2008 02:25:50 PM	
MyApp Invoice Generation	This trend report covers Invoice Generation sub system tre	nds	Dec 14 2008 04:10:16 PM	
MyApp Performance	This trend report covers the performance trends of MyApp		Dec 14 2008 04:09:02 PM	
Displaying 10 r items per page (1 - 3 of 3)			« [_]/1 »	
Trend Report Information				
Name: MyApp Demo		Date Created: 12	2/14/2008 11:09:13 PM	
Description:		Date Modified: 12	2/15/2008 2:25:50 PM	
		Number of Trended Runs: 4		
			Save Restore	

The Trend Reports page contains the following components:

- ➤ Trend Reports Toolbar
- ➤ Trend Reports Table
- ► Trend Report Information Pane

Trend Reports Toolbar

You use the toolbar buttons to perform the following actions.

Function	Button	Enables you to
Create New Report	*	Create a new trend report
Duplicate Report	0=0	Duplicate the selected trend report
Delete Report	×	Delete the selected trend report
Refresh	Ф	Refresh the Trend Reports page

Trend Reports Table

Each row in the Trend Reports table represents a trend report. The Trend Reports table displays the following:

- ► **Report Name.** The name of the report.
- Description. Description of the report. Note: Due to size limitations, the description may be only partially displayed. In this case, place the cursor over the column and a tooltip displaying the entire description appears.
- **> Date Modified.** The date on which the report was last modified.

Sorting and Filtering the Reports

You can sort the reports in the table 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.

You filter the reports using the filter boxes below the column headings.

Note: Sorting and filtering settings are saved per user, per project. The next time the same user enters the Trend Report page in a specific project, the page displays results based on the most recent sort order and filter.

To filter the reports:

➤ In one of the filter boxes below the column headings, type the relevant text or select a value from the list. Press ENTER.

The table displays reports according to the selected filter option.

 You can filter these results further by entering additional filter values for other columns in the table.

Notes:

- ► The filter supports partial text entries. For example, if you entered th, the display list might include **Seth**, **Thomas**, and **Anthony**.
- ➤ The filter does not support regular expressions or the following characters: :; & * \ ' / # ~ , ? { } \$ % | <> + = ` ^ [] !

Trend Report Information Pane

When you select a report from the table, the report details are displayed in the Trend Report Information pane in the lower area of the page. You can edit the **Name** and the **Description** fields.

Note: To edit report details, you need to have **Edit Trend Report** permissions.

The details pane includes the following fields:

- ► Name. The name of the report.
- **> Description**. A description of the report.
- **> Date Created**. The date on which the report was last created.
- **> Date Modified.** The date on which the script was last modified.
- ► Last Modified By. The user who last modified the report.
- Number of Trended Runs. The number of trended runs included in the report.

To edit the Name or Description fields:

- **1** Type the relevant information in the **Name** or **Description** fields.
- **2** To revert back to the original details that were displayed before you modified them, click **Restore**.

To save your changes to the details, click **Save**.

Note: Each trend report name must be unique.

Creating Trend Reports

You create trend reports from the main Trend Report page.

To create a new trend report:

*

 On the Trend Reports page (Load Tests > Trend Reports), click the Create New Report button. The Trend Report creation page opens.

Trend Reports (Reports List	> Create New)	
General Details		
Name: Description:		
Contents and Layout		
Template	Description	
Transactions Trends Transactions and Monitors Trends Trend by Quality Attributes User Defined		Select this template to trend transaction related measurements. The following preconfigured trend views are provided: • Transaction Response Time • Transaction Pass/Fail Summary • Transactions per Second
		Create Cancel

- 2 In the General Details pane, enter a name and description for the report.
- **3** In the **Contents and Layout** pane, select a template to use for the report.

When you select a template from the **Template** list, a description of the selected template appears in the **Contents and Layout Description** area. For more information on the Trend Reports templates, see "Trend Reports Templates" on page 447.

4 Click **Create**. The trend report is created and the <Trend Report Name> Trend Report page opens.

rend Ove	Overview Performance System Performance			Availability	Availability Repeatability Stabi			Stability	lity 📑			
+ × - 1 * R = A												
		Ge	eneral Deta	ails		Workload Chara	acteri	stics	Pe	Performance Overview		
Run ID	Date	Run By	Duration	Trended Range	State	Trended ¥users	TPS	трм	Resp	onse Time	Success	EPS
Run In	rorma	tion		Durante								_
roject: nad Tes	t:			Run user notes: State:								

5 Add the load test runs to the report to view trending information. For more information, see "Adding Load Test Runs to Trend Reports" on page 451.

Trend Reports Templates

The Trend Reports templates provide predefined categories of trend views based on the focus of each template.

Note: Even though you can create a trend report using a template, the report remains fully customizable. That is, you can make any changes to the tabs and to the trend views they contain. For information on customizing a trend report, see "Managing Trend Report Tabs" on page 459 and "Working with Trend Views" on page 463.

The following templates are provided:

Transaction Trends

Th Transaction Trends template provides trend views that display trending information for the following measurements:

- ► Transaction response time
- ► Transaction summary
- ► Transactions per second

Transaction and Monitor Trends

The Transaction and Monitor 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

This template provides trend views that display the trending information from the point of view of quality attributes. The following table shows which measurements are trended and by which quality attribute the information is displayed:

Quality Attribute	Trended Measurement
Performance	Transaction response time (compared to baseline). For more information on comparison methods, see "Comparison Methods" on page 475.
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 475.
Repeatability	Transaction percentiles (compared to baseline). For more information on comparison methods, see "Comparison Methods" on page 475.
Stability	Errors Statistics
	Transaction Failures

User-Defined

This template provides only the basic layout for the trend report with no further predefined tab or trend view configuration.

For more information see:

- ► "Managing Trend Report Tabs" on page 459
- ► "Working with Trend Views" on page 463

Duplicating Trend Reports

You can duplicate a trend report with all its data.

To duplicate a trend report:

- **1** On the Trend Reports page, select the trend report you want to duplicate.
- **2** Click the **Duplicate Report** button. The Save Trend Report As dialog box opens.
- **3** Type the name of the duplicated trend report.
- 4 Click OK.

0=0

A duplicate of the selected trend report appears in the Trend Reports list.

Viewing Trend Reports

You view Trend Reports from the main Trend Reports page (Load Tests > Trend Reports).

A trend report consists of multiple trend views, where each trend view displays trending information for a particular performance metric, for example, Transaction Response Time.

The template on which the report is based, automatically groups the trend views into predefined categories, where each category appears as a separate tab on the report. The names of the tabs and the number of trend views in the report varies depending on the template you select. For more information, see "Trend Reports Templates" on page 447.

To view trend reports:

 On the main Trend Reports page (Load Tests > Trend Reports), in the Trend Reports Table, click the trend report you want to view. The <Trend Report Name> Trend Report page opens displaying the Trend Overview tab.

The Trend Overview Tab

The Trend Overview tab displays the load test runs trended in the report. The tab is common to all trend reports, irrespective of which template you selected.

Function	Button	Enables You To:
Add	+	Add load test runs to the trend report. For more information on adding load test runs, see "Adding Load Test Runs to Trend Reports" on page 451.)
Remove	×	Remove load test runs from the trend report.
Set as baseline	\sim	Set the selected load test run as the baseline run for comparing load test runs. For more information, see "Comparison Methods" on page 475.
Move run up	Î	Move the load test run up in the run order. Changing the position of the load test run in the order may have an effect on the comparison value when the Compare to previous method is selected. For more information, see "Comparison Methods" on page 475.
Move run down	Ţ	Move the load test run down in the run order. Changing the position of the load test run in the order may have an effect on the comparison value when the Compare to previous method is selected. For more information, see "Comparison Methods" on page 475.
Customize		Customize which columns appear in the Trended Runs table. For more information, see "Viewing the Trended Load Test Runs" on page 454.

The Trend Overview Toolbar.

Function	Button	Enables You To:
Set threshold		Set the threshold settings to be used for identifying performance improvements and regressions. For more information, see "Setting Trend Thresholds" on page 478.
Customize Measurement Mapping		Define and customize mapped measurements. For more information, see "Custom Measurement Mapping" on page 481.

Adding Load Test Runs to Trend Reports

You add load test runs to a trend report from the Trend Overview tab.

Notes:

- ➤ In order to add load test runs to the trend report, there must be a data processor present in your project pool.
- ➤ The process whereby Performance Center extracts the load test data from Analysis is very labor intensive on the data processor and may take anywhere from several minutes to over an hour. We recommend that you use a machine dedicated for this purpose.
- Performance Center extracts the load 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 Performance Center.

+ |

To add load test runs to a report:

- 1 On the main Trend Reports page (Load Tests > Trend Reports), in the Trend Reports table, select the trend report you want to add the load test runs to. The trend report opens displaying the Trend Overview tab.
- **2** Click the **Add runs to trend report** button. The Add Load Test Runs to Trend Report page opens.

Add Lo	oad Test d test runs to t	Runs to T	rend Report	t projects and diffe	rent load tests.		
Load T	est Runs						
Project: [Default	1	 Load Test: test1 				• Go
Select	Run ID 🔺	Time Range	Date	Duration	¥users	User Notes	
	1	0 - 14 min 🔟	12/21/2008 9:52:02 AM	14	10		
Diselaria	a 10 - a		-f 1)				// 1 // **
orsprayin		anis per page (1 - 1	01 1)				
Colorised Dorse to Torsed							
A Note:	only analyzed	test runs will app	pear in the table above. Add	runs to report ma	v		
🗥 take	several minute	25			,	AaaHe	eip Cancel

- **3** From the **Project** and **Load Test** lists respectively, select the project and load test that you want to trend.
- **4** Click **Go**. The Load Test runs table displays information for all analyzed instances of the load test you selected.

The Load Test Runs table displays the following information:

- ► **Run ID.** The run ID.
- ► **Time Range.** The time range within the run. For more information, see "Test Run Time Range" on page 453.
- ► Date. The date of the load test run.
- **> Duration**. The duration (in minutes) of the load test run.

- ► Vusers. The maximum number of running Vusers during the load test run.
- ► User notes. Any user notes for the test run.
- **5** Click **Add**. The selected load test runs are added to the Trend Overview tab and appear in the Trended Runs table. For more information on the Trended Runs table, see "Viewing the Trended Load Test Runs" on page 454.

Test Run Time Range

Y

The Time Range value in the Load Test Runs table represents the duration of the load test run that is selected for trending. By default the whole test run is selected. You can vary the selected time range for each individual load test.

To change the selected time range:

- 1 In the Test Runs table, select the load test run whose time range you want to modify.
- **2** In the **Time Range** column, click the filter button. The Define Time Range dialog box opens.



- **3** Select the desired time range option:
 - Trend Complete Run. Select this option to make all the data collected from the beginning to the end of the load test run available for trending.
 - Trend Part of Run. Select this option to make only part of the load 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.

Note: Think time in Transaction Response Time measurements is always excluded.

4 Click **OK**. The **Define Time Range** dialog box closes and the load test run information in the Load Test Runs table is updated accordingly.

Viewing the Trended Load Test Runs

You view the load test runs that have been added to the report in the Trended Runs table of the Trend Overview tab.

The Trended Runs table is divided into three sections. You can customize which columns appear in each section. For information on customizing the columns of the Trended Runs table, see "Customizing the Trended Runs Table" on page 458.

General Details section

The General Details display general information relating to the load test run. The following columns are available (The names of the columns as they appear in the table appear in parentheses):

- ► Run ID. The run ID. This column is displayed by default.
- ➤ Run Date (Date). The date of the load test run. This column is displayed by default.
- Run By. The name of the user who ran the load test. This column is displayed by default.

- Project Name (Project). The name of the project in which the load test was run.
- ► Load Test Name (Load Test). The name of the load test.
- ➤ Run Duration (Duration). The duration of the load test run, in minutes. This column is displayed by default.
- ➤ Trended Time Range (Trended Range). The time range within the load test run you selected. For more information, see "Test Run Time Range" on page 453.
- ► **Total Vusers in Run (Total Vusers).** The number of Vusers in the load test run, within the selected time range.
- ➤ Publish State (State). Indicates whether the load test run was successfully added to the report or not, either trended or not trended respectively. A load test run that was not successfully added appears in red and a tooltip displays the reason. This column is displayed by default.

Workload Characteristics Section

The purpose of this section is to provide you with enough information to identify whether the load test runs are similar in terms of overall 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 (as explained in "Test Run Time Range" on page 453) will most likely lead to different results.

The following columns are available:

- ➤ Total Number of Transactions (Transactions). The total number of transactions in the load test run that passed or failed within the selected time range. This column is displayed by default.
- ➤ Total Vusers in Trended Range (Trended Vusers). The maximum number of running Vusers within the trended time range. This column is displayed by default.
- ► Total Hits (Hits). The total number of hits per second within the trended time range.

- ► **Total Throughput (Throughput).** The average throughput within the trended time range.
- ➤ Hits per Second (HPS). The average number of hits per second within the trended time range.
- Throughput per Second (Throughput per Sec.). The amount of throughput per second within the selected time range.
- ➤ Passed Transactions per Minute (TPM). The number of transactions that passed per minute of the load test run within the selected time range. This column is displayed by default.
- ➤ Passed Transactions per Second (TPS). The number of transactions that passed per second of the load test run within the selected time range. This column is displayed by default.

Performance Overview Section

The Performance Overview section of the Trended Runs table contains 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 the baseline run, see "Comparison Methods" on page 475.

Note: Only overall summary trending information is shown in this section. More detailed information appears in the trend views.

The values displayed in this section are relevant only for the selected time range. Changing the selected time range (as explained in "Test Run Time Range" on page 453) will most likely lead to different results.

The following columns are available:

- ➤ Average Transaction Response Time (Response Time). The weighted average transaction response time for all the transactions within the selected time range. This column is displayed by default.
- ➤ Transaction Success Rate (Success). The percentage of the total amount of transactions that passed within the selected time range. This column is displayed by default.
- ► Errors per Second (EPS). The average amount of errors per second within the selected time range. This column is displayed by default.
- ► **Passed Transactions (Passed).** The actual amount of transactions that passed within the selected time range.
- ► Failed Transactions (Failed). The actual amount of transactions that failed within the selected time range.
- ► **Total Errors (Errors).** The total number of errors within the selected time range.

Run Information Pane

When you select a load test run in the Trended Runs table, the details of the run are displayed in the Run Information pane in the lower area of the page.

The Run Information pane displays the following information:

- ► **Project.** The name of the project in which the load test ran.
- **Load Test.** The name of the load test.
- **> Run User Notes.** User notes that were entered on the run results page.
- ➤ 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.

Customizing the Trended Runs Table

You can customize the appearance of the Trended Runs table.

To customize the appearance of the Trended Runs table:



1 In the Trend Overview tab toolbar, click the **Customize Table Columns** button. The Select Columns dialog box opens.

🗿 Select Columns - Microsoft Internet Explorer provided 💶 🗖 🗙
Select Columns for 'General Details' Section
Project Name Load Test Name Total Vusers in Run ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
Select Columns for 'Workload Characteristics' Section
Available Columns: Visible Columns:
Total Number of Transactions Total Hits Total Throughput Hits per Second Throughput per Second
Select Columns for 'Performance Overview' Section
Available Columns: Visible Columns:
Passed Transactions Failed Transactions Total Errors
OK Cancel

The Select Columns dialog box is divided into three areas, each area corresponding to a section of the Trended Runs table.

Each area contains two lists: One list containing the names of the columns that can be displayed (**Available Columns**), and another containing the names of the columns selected for the Trended Runs table (**Visible Columns**).

2 To display a column in the table, select it in the **Available Columns** box and click the right arrow button to move it to the **Visible Columns** box.



4 In the <Trend Report Name> Trend Report page, click the refresh button to refresh the report in order for the changes to take effect.

Managing Trend Report Tabs

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You can add a tab to a trend report, add a trend view to a trend report, as well as customize some of a tab's display settings.

For information about how to add a tab to a trend report, see "Adding a Tab to a Trend Report" on page 460.

To customize a tab's display settings, click the arrow button to the right of the tab name to open the Tab Editing menu. The Tab Editing editing menu enables you to do the following:

- ➤ Add Views to Tab. Lets you add trend views to the tab. For more information, see "Adding Trend Views to a Tab" on page 460.
- ► Edit Tab Title. Lets you edit the tab title. For more information, see "Editing Tab Titles" on page 462.
- ➤ Move Tab Left/Right. Lets you change the location on the tab in the trend Report. For more information, see "Repositioning Tabs in the Trend Report" on page 462.
- ➤ Delete this Tab. Lets you remove the tab from the trend report. For more information, see "Deleting Tabs" on page 463.

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Adding a Tab to a Trend Report

In addition to the tabs that are included when you select a trend report template, you can add a custom tab to the trend report.

To add a tab to a trend report:

- **1** On the row of tab names, click the **Add a new tab** button. The Add tab dialog box appears.
- **2** In the **Name** box, type a name for the new tab.
- **3** Click **OK**. The tab appears in the trend report next to the Trend Overview tab.

Adding Trend Views to a Tab

In addition to the trend views that are included by default when you selected a trend report template, you can add additional trend views to any tab in the report. You can customize the functionality of any individual trend view and select one of three display settings, either table view, line graph view, or stacked bar chart view. For information on customizing trend views after they have been added, see "Working with Trend Views" on page 463.

To add a trend view to a tab:

- **1** Next to the tab name, click the arrow button.
 - **2** From the menu, select **Add Trend Views to Tab**. The Add Trend Views to Tab dialog box opens.

Add Trend Views to Tab						
Transactions Trend Views ¥						
	Transaction Response Time - trends average and 90% response time values					
	Transaction Pass/Fail Summary - trends amount of pass, fail and stopped transactions					
	Transaction per Second - trends average transaction per second					
	Transaction Percentiles - trends median, 75%, 90% and 95% response time values					
Monitors Trend Views ¥						
	System Resources CPU Utilization - trends average CPU utilization of monitored application under test machines					
	System Resources Disk Utilization - trends average disk utilization of monitored application under test machines					
	System Resources Available Memory - trends available mega bytes of monitored application under test machines					
Other T	rend Views ¥					
	Web Resources - trends average hits per second and throughput overlaid with maximum running Vusers					
$\Box \mathrm{th}$	Errors Statistics - trends average amount of errors per second					
	Table View - blank table view. Use Select Measurements dialog to customize it after adding it					
	Line View - blank table view. Use Select Measurements dialog to customize it after adding it					
П ф	Stacked Column View - blank stacked column view. Use Select Measurements dialog to customize it after adding it. Note: recommended to use when trending up to 5 measurements in a single view					
	Add Cancel					

The Add Trend Views to Tab dialog box that opens contains a list of preconfigured trend views that you can add.

Note: All trend views can be fully customized to suit your needs once they have been added to the tab. For more information, see "Working with Trend Views" on page 463.

The trend views are divided into three categories:

- **> Transactions Trend Views.** Trend measurements related to transactions.
- > Monitors Trend Views. Trend measurements related to monitors.

- ➤ Other Trend Views. Trend measurements other than transactions and monitor measurments (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 any way you desire. For more information on customizing trend views and trend view display settings, see "Working with Trend Views" on page 463.
- **3** Select the trend views you want to add to the tab.
- **4** Click **Add**. The Add Trend Views to Tab dialog box closes and the selected trend views appear in the tab.

Editing Tab Titles

You can edit the title of a tab from the Edit Tab Title dialog box.

To edit a trend view's title:

- **1** Next to the tab name, click the arrow button.
 - **2** From the list, select **Edit Tab Title**. The Edit Tab Title dialog box opens.
 - **3** In the Name box, make the desired changes to the trend view's title.
 - **4** Click **OK**. The Edit Tab Title dialog box closes and Performance Center updates the trend view to reflect the change.

Repositioning Tabs in the Trend Report

You can change the position of a tab in the row of tabs in the trend report by shifting it to the left or the right.

To move a tab to the left or the right:

- **1** Next to the tab name, click the arrow button.
 - **2** From the menu, select **Move Tab Left/Right.** The tab moves to it's new position.

Deleting Tabs

You can delete a tab from the trend report.

To delete a tab:

- **1** Next to the tab name, click the arrow button.
 - **2** From the menu, select **Delete this Tab.** In the confirmation box that opens, click **OK**. The tab is removed from the report.

Working with Trend Views

A trend view is a display item that presents the trending information for multiple measurements. The templates that you select when creating trend report each provide some predefined trend views.

These trend views are customizable. That is, you can define specific comparison and display settings.

This section includes:

- ► "Customizing a Trend View" on page 464
- ► "Editing Trend Views" on page 464

Customizing a Trend View

You customize trend view settings from the toolbar in the top right corner of the trend view. The following table outlines the various toolbar functions:

Function	Button	Description:
Minimize or restore trend view's display	**	To minimize or restore a trend view to its previous display size, click the Minimize or Restore button. The direction of the arrow on the button indicates whether the button will minimize (upward) or restore (downward) the trend view.
Show maximized view		To maximize a trend view's display, that is, to have the trend view occupy the entire width of the tab, click the Maximize button.
Show normal view	Ð	To restore a maximized trend view to a normal display, that is, to have the trend view occupy half the width of the tab, click the Normal View button.
Edit trend view		To edit a trend view's display and comparison settings, you click the arrow button on the toolbar to open the editing menu. For more information on editing these settings, see "Editing Trend Views" below.

Editing Trend Views

You can edit a trend view's display and comparison settings from the trend view toolbar described above. To open the Trend View Editing Menu, click the arrow button on the toolbar. The editing menu enables you to do the following:

Note: The availability of the menu items depends on your selected display setting: table view, line graph view, or stacked bar chart view. For more information about the display options, see "Understanding Trend View Information" on page 470.

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- ➤ Select measurements. Lets you add measurements to the trend view. For more information, see "Selecting Trend View Measurements" on page 466.
- ► Edit Display Setting. Lets you change the appearance of the trend view. For more information, see "Editing Trend View Display Settings" on page 468.
- ► Edit Trend View Title. Lets you edit the title of a trend view. For more information, see "Editing Trend View Titles" on page 469.
- Compare to baseline/previous. (Table view only) Lets you change the comparison method displayed in the trend view. For more information, see "Comparison Methods" on page 475.
- Show difference as value/percentage. (Table view only) Lets you define how to display value differentials between load test runs in the trend view - as percentages or as values.
- ➤ Do not show difference. (Table view only) Lets you hide the value differentials between load test runs. We suggest that you use this setting when exporting the trend report to CSV format.
- Color Trends. (Table view only) Allows you to activate the trend report's threshold settings. For more information on defining thresholds, see "Setting Trend Thresholds" on page 478.
- ➤ Export to CSV. (Table view only) Lets you export the trend view to a CSV format.
- **> 3D Mode.** (Stacked bar chart view only) Lets you view the chart in 3D.
- ➤ Show Values. (Stacked bar chart view only) Lets you view the measurements values on the actual bar columns.
- > Delete trend view. Lets you delete the trend view.

Selecting Trend View Measurements

Each trend view has a default set of measurements that it trends. You can add additional measurements in the Measurements Configuration dialog box.

To select measurements to add to the trend view:

- **1** On the trend view toolbar, click the arrow button to open the Trend View Editing Menu.
- **2** Select **Select Measurements**. The Measurements Configuration dialog box opens.

Measurements Configuration -	Mic	oso	ft Internet Explorer provided by Hewlett-Packard 📃 🗖 🗙	
Select trend data:				
Trend data types Transaction Response Time				
<u>Transactions</u>			Name 🔺	
✓ Transaction Response Time				
Transactions per Second	_			
Transaction Summary			All	
Monitors			TRX_01_sut_01_eventssimulationutility	
User Defined Data Points			TRX_01_sut_01_eventsimulationutility_4	
Windows Resources			TRX_01_sut_01_eventsimulationutility_copy_1	
MS IIS			TRX_01_sut_01_eventsimulationutility_copy_1_1	
B Other			TRX_01_sut_01_eventssimulationutility_copy_2	
Bupping Yusers			TRX_01_sut_01_eventssimulationutility_copy_2_1	
Errors per Second			TRX_01_sut_01_eventssimulationutility_copy_0	
Web Resources			TRX 02 sut 01 eventssimulationutility	
	Dis	praying	(20 V Kems per page (1 - 20 or 33)	
	A Define automatic selection rule			
	Selects values to trend (Use CTRL + Left mouse click to select multiple items)			
	Minimum Maximum Average Median StdDeviation Percentie_75 Percentie_90 Percentie_95			
			OK Cancel Apply Help	

3 From the **Trend Data Types** pane on the left, select the measurement type you would like to add. The details of your selection appear in the table in the Measurement Selection area on the right.

The Trend Data Types pane contains a list of the measurements which are available for trending. Only measurements where data exists will appear.

There are three categories of data types:

- **> Transactions.** All transactions that contain data.
- > Monitors. All monitor related measurements that contain data.
- ► Others. Additional measurements.
- ➤ User-Defined. This node appears only if you have mapped any measurements. The user-defined mapped measurements appear in this section. For more information on mapped measurements, see "Custom Measurement Mapping" on page 481.
- **4** From the table in the Measurement Selection area, select the measurements you want to add to the trend view.

The table displays the following information:

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- Rule. An icon appears in this column to indicate that the measurement has already been selected using an automatic selection rule. For more information on automatic selection rules, see "Defining an Automatic Selection Rule" on page 468.
- Select Measurements. Contains check boxes for selecting measurements to be added to the trend view.
- ► Name. The name of the measurement.
- **5** From the list in the **Select Values to Trend** box, select which values of the selected measurements to include in the trend view.

Defining an Automatic Selection Rule

You can 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.

To define/remove an automatic selection rule:

1 Click the **Define automatic selection rule** link under the list of measurements. The Automatic Selection Rule dialog box opens.

R	utomatic Selection Rule elect measurements automatically by adding regular expression rule(s). xample: "CPU" Utilization" will automatically select measurements iat have 'CPU' and then 'Utilization' in their name.						
		Add					
		Remove					
		Close					

- **2** Add or edit a rule as follows:
 - ➤ To add a rule, in the top text box, type the regular expression that will define the automatic selection rule. Then click Add.
 - ➤ To remove a rule, in the list box, select the rule you want to remove, then click **Remove**. The rule is removed from the list.

Editing Trend View Display Settings

You can configure the display setting of a trend view from the Edit Display Setting dialog box. For more information on the trend view display settings, see "Understanding Trend View Information" on page 470.
Editing Trend View Titles

You can edit the title of a trend view from the Edit Trend View Title dialog box.

To edit a trend view's title:

- **1** From the Trend View Editing menu, select **Edit Trend View Title**. The Edit Trend View Title dialog box opens.
- **2** In the **Name** box, make the desired changes to the trend view's title.
- **3** Click **OK**. The Edit Trend View Title dialog box closes and Performance Center updates the trend view to reflect the change.

Deleting Trend Views

Select this option to remove the trend view from the tab.

To delete a trend view:

- **1** From the Trend View Editing Menu, select **Delete this Trend View**.
- **2** In the confirmation box that appears, click **OK**. The trend view is removed from the tab.

Understanding Trend View Information

A trend view displays trending information by comparing values of specific measurements over time, and by identifying changes in these values as either improvements or regressions in performance.

This section includes:

- ➤ "Selecting a Trend View Display Setting" on page 470
- ▶ "Table View Display Setting" on page 471
- ▶ "Line Graph Display Setting" on page 472

Selecting a Trend View Display Setting

You select which display setting to use from the Trend View Editing Menu:

To edit a trend view's display settings:

- **1** On the trend view toolbar, click the arrow button to open the Trend View Editing menu.
 - **2** Select **Edit Display Setting**. The Edit Display Setting dialog box opens.

The dialog box contains thumbnail images of the three display options. A blue frame appears around the current selection. The display options 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 "Table View Display Setting" on page 471.
- ➤ Line graph view. This view is suited for displaying trending information graphically over a timeline. For more information, see "Line Graph Display Setting" on page 472.
- ➤ Stacked bar chart view. This view displays trending information graphically over time. It is best suited for trending a small number of multiple measurements. For more information, see "Stacked Bar Chart Display Setting" on page 473.
- **3** Select a display option. The blue frame moves to the new selection.
- **4** Click **OK**. The Edit Display Setting dialog box closes and Performance Center updates the trend view to reflect the change.

Table View Display Setting

A trend view in **table view** displays the following columns:

Transaction Response Time	Transaction Response Time (Compare to baseline)						
Name	Tune	Average	Average				
		1 [Base]	5	4	3		
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%)		

- ► Name. The name of the measurement being compared.
- **• Type.** The type of measurement being compared
- Measurement comparison section. This section is subdivided into the following:
 - Measurement value name. The name of the measurement value being trended, for example, minimum, maximum, average, and so on. In the image shown above, it's the Average value of the Transaction Response Time measurement.
 - ➤ Measurement value. The actual value of the measurement being trended, and its comparison value; displayed per load test run. For more information see "Comparison Methods" on page 475.

Note: You can view threshold settings in the table view only. For more information on thresholds, see "Setting Trend Thresholds" on page 478.

Line Graph Display Setting

The **line graph** view is suited for displaying trending information graphically over a timeline.



The line graph allows you to visualize the performance trend over time, by making major performance improvements and regressions easily identifiable to the eye. The load test runs appear on the x-axis according to their run date, while the y-axis represents the unit of the measurement. For example, for the Transaction Response Time measurement, the y-axis value represents seconds, while for the transactions per second measurement, the value represents the number of transactions.

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 load 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 load test run.

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).

For information on managing the appearance of the line graph measurements, see "Managing Measurements" on page 474.

Stacked Bar Chart Display Setting

The **stacked bar chart** view is best suited for trending a small number of multiple measurements. It displays trending information graphically over time.



The stacked bar chart allows you to visualize the performance trend over time, by making major performance improvements and regressions easily identifiable to the eye. The load test runs appear on the x-axis according to their run date, while the y-axis represents the unit of the measurement. For 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. When you hold the cursor over a bar, a tooltip appears which displays the exact number of units for that measurement, correct for that load test run.

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.

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 load test run.

For information on managing the appearance of the stacked bar chart measurements, see "Managing Measurements" below.

Managing Measurements

You manage the appearance of measurements in the line graph and stacked bar chart from the legend below the graph.

🗏 Hid	E Hide Legend					
v	В	С	Туре	Function	Scale	Name
			WIN	Average	<u>1</u>	% C1 Time (Processor _Total):kentucky (kentucky)
			WIN	Average	<u>1</u>	% C2 Time (Processor _Total):kentucky (kentucky)
			WIN	Average	<u>1</u>	% C3 Time (Processor _Total):kentucky (kentucky)
			WIN	Average	<u>1000</u>	% DPC Time (Processor _Total):kentucky (kentucky
			WIN	Average	<u>1</u>	% Idle Time (Processor _Total):kentucky (kentucky

The legend displays the following information:

- ➤ V. Determines whether the measurement is visible. All measurements are displayed by default. Clear the check box to hide a measurement.
- ► **B.** (line graph only) Displays the measurement in bold.
- ➤ 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.
- ➤ Type. Contains an acronym that identifies the measurement type. For a full list of available acronyms, see "Measurement Acronyms" on page 488.
- **Function**. Displays the value of the measurement being trended.

➤ 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.

► Name. The name of the measurement.

Comparison Methods

You can choose how to compare measurements contained in a load test run for the purposes of trending.

This section includes:

- ► "Compare to Baseline" on page 475
- ► "Compare to Previous" on page 477

Compare to Baseline

When you select the **Compare to Baseline** comparison method, you select one load test run in the trend report, and define it as the baseline. This means that all measurements contained in the remaining load test runs in the report are compared to the measurements contained in the selected baseline run when determining trending information. When you view the specific measurement in the trend view, improvements and regressions in performance are identified relative only to the baseline.

As shown in the example below, the average Transaction Response Time measurement is being trended from four load test runs: **1**, **5**, **4**, and **3**.

Transaction Response Time (Compare to baseline)						
Name	Tuna	Average	Average			
	Type	1 [Base]	5	4	3	
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%)	

Load test run **1** has been defined as the baseline (as indicated by the word **Base** in brackets). The average transaction response times contained in the other load test runs are compared to load test run 1 only.

In load test run 1, the average transaction response time for TRX_01 was 2.045. The average transaction response time for the same transaction in load test run 5 was 4.073, which represents a slower response time and a regression in the performance of this measurement. The percentage difference between the two figures is displayed in brackets, in this case +99.17%.

Note: Value differentials between compared measurements can be displayed as percentages or as numbered values. You select either method from the Trend View Editing menu.

When the average transaction response time for a given transaction is **0**, the percentage of improvement in comparison to any transaction response time greater than **0** is displayed as -100%.

Tip: You can define specific measurement thresholds and assign a unique color to each threshold to facilitate identifying performance improvements and regressions. For more information, see "Setting Trend Thresholds" on page 478.

Setting the Baseline

To define a load test run as the baseline, select it in the Trended Runs table and click the **Set Run as Baseline** button.

You cannot set different load test runs as baselines for different trend views. Setting a load test run as the baseline is done on a global level and holds true across all trend views in the report.

Compare to Previous

An alternative method of comparing load test measurements is to identify improvements and regressions in performance by comparing the measurements in a load test to the measurements in the load test that immediately precedes it in the Trended Runs table.

For example, using the same load test runs as in the example above, when using the Compare to Previous method, run **3** is compared to run **4**. We can see that for transaction **TRX_01_sut_01_eventssimulationutility**, the transaction response time improved by -48.4%.

Transaction Response Time (Compare to previous run) 🔍 🗗 🛠					*		
Name	Tuno	Average	Average				
Name	Type	1	5	4	3		
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%)		



Note: Value differentials between compared measurements can be displayed as percentages or as numerical values. You select either method from the Trend View Editing menu.



To vary the comparison results when this method is selected, you can move the load test runs in the Trended Runs table up or down by selecting them and clicking the **Move Up** or **Move Down** buttons respectively.

Tip: You can define specific measurement thresholds and assign a unique color to each threshold to make it easier to identify performance improvements and regressions. For more information, see "Setting Trend Thresholds" on page 478.

Setting 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 the trend view in a predetermined color, easily 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 your selected comparison method) will appear in the trend view in the color you defined for improvements.

In the following example, the Compare to Previous comparison method is shown:

Transaction Response Time (Compare to previous run)					
Name	Tuna	Average			
name	туре	158685	158681	158679	158680
Action_Transaction	TRT	0.002	0.94 (+46900%)	0 (-100%)	0
All	TRT	0.002	0.311 (+15450%) <mark>0 (-100%)</mark>	0

The value of the average transaction response time of the

Action_Transaction in load test run **158681** is **46900%** higher than in load test run **158685**—a major performance regression. Because this percentage differential exceeds a threshold that was defined for major regressions, the value appears in red, the default color for major regressions.

The corresponding value for load test run **158679** represents a **100%** improvement on load test run **158681**. This percentage differential represents a significant improvement in performance and appears in green, the default color for improvements.

Note: Threshold definition and color settings are done on a global level and hold true across all trend views in the report.

To define trend thresholds and assign colors:



1 On the Trend Overview tab, click the **Set Thresholds** button. The Threshold Settings dialog box opens.

Threshold Settings - Microsof	Threshold Settings - Microsoft Internet Explorer provided by Hewlett-Packard					
Threshold Settings						
Set trend thresholds and colors to enabl	le easy identification of performa	nce improvements and regressio	ns.			
Measurement Type	Improvement	Minor Regression	Major Regression			
Transaction Response Time (TRT)	At least 20 % decrease	At least 40 % increase	At least 80 % increase			
Transactions per Second (TPS)	At least 50 % increase	At least 25 % decrease	At least 50 % decrease			
Transaction Summary Pass (TRS)	At least 50 % increase	At least 25 % decrease	At least 50 % decrease			
Transaction Summary Fail (TRS)	At least 50 % decrease	At least 25 % increase	At least 50 % increase			
Total Errors (ERR)	At least 50 % decrease	At least 25 % increase	At least 50 % increase			
Errors per Second (EPS)	At least 50 % decrease	At least 25 % increase	At least 50 % increase			
Hits (WEB)	At least 50 % increase	At least 25 % decrease	At least 50 % decrease			
Throughput (WEB)	At least 50 % increase	At least 25 % decrease	At least 50 % decrease			
			OK Cancel			

You use the Threshold Settings dialog box to define which percentage differentials between measurements constitute significant improvements or regressions in performance.

Note: You can define thresholds for the measurements displayed in the dialog box only.

2 For each measurement, set the improvement, minor regression, and major regression threshold percentages.

For example, if you would like to focus only on performance improvements greater that 50% for a specific measurement, then you can set that percentage as the threshold, that is, only percentage differentials greater than this threshold will be considered.

Note: Any percentage differential between the minor and major regression thresholds are considered a minor regression.

- **3** (Optional) To change the default color selection for a threshold, click the colored square next to the threshold name, and select a new color from the selection box and dlick **OK**.
- **4** Click **OK** to close the Threshold Settings dialog box.

Custom Measurement Mapping

Custom Measurement Mapping allows you to map measurements with different names to a new single measurement which your create.

This section includes:

- ▶ "Reasons to Use Custom Measurement Mapping" on page 481
- ► "Working with Custom Measurement Mapping" on page 483
- ► "Creating and Editing Mapped Measurements" on page 485
- ➤ "Viewing Mapped Measurement Information" on page 487
- ▶ "Duplicating Mapped Measurements" on page 487
- ► "Deleting Mapped Measurements" on page 487

Reasons to Use Custom Measurement Mapping

You use the Custom Measurement Mapping feature to reconcile inconsistent transaction or monitor names between load test runs, thereby allowing you to properly trend these measurements. See the following section for detailed examples.

Inconsistent Transaction Name

Consider the following example: You run a load test that contains the transaction **BuyBook**. A while later you run the load test again. However, in the time between the two load 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

As another example, consider the following scenario: You want to compare your application's performance on different operating systems or when running against different Web/application servers.

You run the load 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.

Working with Custom Measurement Mapping

You perform all custom measurement mapping related tasks from the Custom Measurement Mapping dialog box.



To open the Custom Measurement Mapping dialog box, click the **Custom Measurement Mapping** button on the Trend Overview tab's toolbar. The dialog box opens.

Custom Me	asuremen	t Mapping	g			
* □=□ X ¢	* D= X ¢					
Name 🛋		Data Type	Description			
123	Z3 Transaction 466					
map123		Transaction	456			
Displaying 5 💌	items per page (1 - 2 of 2)	≪ ⊥/1 ≫			
Mapping Infor	mation					
Name:	123					
Description:	456					
Data Type:	Transation	1				
Details:		-				
	RuniD	Туре	Name			
	Default		Pass del			
	158749	TPS	Pass del			
	158740	TPS	Pass del			
			Save Restore Help Close			

The Custom Measurement Mapping dialog box contains the following components:

Custom Measurement Mapping Toolbar

You use the toolbar buttons to perform the following actions:

Function	Button	Enables You To:
Create New Mapping	*	Create a mapped measurement. For more information, see "Creating and Editing Mapped Measurements" on page 485.
Duplicate Mapping	0=0	Duplicate a mapped measurement. For more information, see "Duplicating Mapped Measurements" on page 487.
Delete Mapping	×	Delete a mapped measurement. For more information, see "Deleting Mapped Measurements" on page 487.
Refresh	Φ	Refresh the Custom Measurement Mapping dialog box

Mapped Measurements Table

Displays a list of all the user-defined mapped measurements in the trend report. The list displays the following information for each mapped measurement:

- ► Name. The name of the mapped measurement.
- **> Data Type.** The data type of the mapped measurement.
- **> Description.** The description of the mapped measurement.

Mapping Information Pane

Displays detailed information for the selected mapped measurement. This pane displays the following information:

- ► Name. The name of the mapped measurement.
- **> Description.** The description of the mapped measurement.

- ► Data Type. The type of measurement. This can be Transaction, Monitor, or Other.
- Details table. Displays a list of all the load test runs and the measurements from each run that have been mapped to the new measurement. The load test runs appear in the table in the same order as they appear in the Trended Runs table.

The **Details** table displays the following information:

- ► **Run ID.** The run ID.
- ► **Type.** The measurement type.
- ► Name. The measurement name.

Creating and Editing Mapped Measurements

You use mapped measurements to reconcile inconsistent transaction or monitor names between load test runs. You add and edit mapped measurements in the Measurement Configuration dialog box.

To create a mapped measurement:

*

1 On the Custom Measurement Mapping page, click the **Create New Mapping** button. The Add New Mapping dialog box opens.

Add Nev	v Mapping			
Name:				
Description:				<u> </u>
				v
Data Type:	Transaction 💌			
Messages:				
		Add	Clear	Cancel

- **2** In the **Name** box, type the name of the new mapped measurement.
- **3** In the **Description** box, type a description of the new mapped measurement.
- **4** Select the type of measurement from the **Data Type** list: **Transaction**, **Monitor**, or **Other**.

5 Click **Add**. The mapped measurement name appears in the Mapped Measurements table.

Note: The remaining steps in the procedure can be used to edit an existing mapped measurement.

6 In the **Details** table in the Mapping Information pane, click in the cells to select the following information for each load test run in the table.

For example, if you were creating the mapped measurement described in the inconsistent transaction name example on page 481, you would enter the unique information for each load test run.

- ➤ Type. The type of measurement. For example, TRT (Transaction Response Time). For a full list of the available measurement types, see "Measurement Acronyms" on page 488.
- ➤ Name. The name of the measurement. For example BuyBook or TRX_01_BuyBook.

You use the **Default** row of the table to define **Type** and **Name** definitions to apply to all load test runs in the table. If you select information for the **Default** row and click **Save**, all empty fields for the other load test runs are automatically set to match the Default settings.

When you use the **Default** option, all future instances of the measurement are automatically mapped to these settings.

7 Click Save.

To edit a mapped measurement:

- **1** Select the measurement in the Mapped Measurements table.
- **2** Edit the details in the Details table, as described in step 6 above.
- 3 Click Save.

Viewing Mapped Measurement Information

To view trending information for a mapped measurement, you select the measurement from the **User Defined** node of the Measurements Configuration dialog box. For more information, see "Selecting Trend View Measurements" on page 466.

Duplicating Mapped Measurements

You can duplicate a mapped measurement, with all its data, within the trend report.

To duplicate a mapped measurement within the trend report:

- **1** In the Mapped Measurements table, select the measurement to duplicate.
- 2 On the Custom Measurement Mapping toolbar, click the Duplicate Mapping button. The Save Mapping As dialog box opens.
- **3** Performance Center automatically assigns a default name for the duplicate measurement, which you can edit as desired. In the **Save as** box, type the desired name of the duplicate measurement.
- 4 Click OK.

A duplicate of the selected mapped measurement appears in the Mapped Measurements table.

Deleting Mapped Measurements

You can delete any mapped measurement from the trend report.

To delete a mapped measurement:

1 On the Custom Measurement Mapping page, select the measurement to delete.



0=0

- **2** Click the **Delete Mapping** button.
- **3** In the confirmation box that appears, click **OK**. The measurement is removed from trend report.

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	Apache	APA
Kesources	MS IIS	IIS
	iPlanet	PLA

Data Type	Full Name	Initials
Web Application	Ariba	ARI
Server Resources	ATG Dynamo	ATG
	BroadVision	BDV
	ColdFusion	CFU
	MS ASP	ASP
	Oracle Application Server	OAS
	SilverStream	SST
	Weblogic	WL
	Websphere	WS
Database Server	DB2	DB2
Resources	Oracle	ORA
	MS SQL	SQL
	Sybase	SYB
ERP/CRM Server	SAP	SAP
Resources	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	COM+	СОМ
Components	.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

Deleting Trend Reports

You can delete trend reports from the Trend Reports page.

To delete a trend report:

- **1** On the Trend Reports page, select the trend report to delete.
- \times
- **2** Click the **Delete Report** button.
- **3** In the confirmation box that opens, click **OK**. The trend report is removed from Trend Reports page.

Part IV

Working with Diagnostics

28

Using Performance Center Diagnostics

Performance Center's J2EE/.NET and ERP/CRM diagnostics modules provide monitors that trace, time, and troubleshoot individual transactions that rapidly identify and pinpoint performance problems in J2EE, .NET, Siebel, Oracle 11i, and SAP environments. These monitors help you to maximize business process performance, scalability, and efficiency.

The diagnostics module monitors come with a set of customized Analysis reports. Using these reports, you can communicate your insights to developers and managers, ultimately accelerating problem resolution, while avoiding expensive hardware upgrades.

This chapter includes:

- ► Enabling Diagnostics on page 493
- ► Enabling the Web Page Breakdown on page 498

Enabling Diagnostics

You enable diagnostics from the **Diagnostics** tab in the Load Test configuration page.

You can use the Diagnostics tab to perform the following actions:

- Enable/disable Performance Center Diagnostics and select Performance Center Diagnostics modules
- > Set the distribution of Vusers in a load test
- > Configure the settings of the application under test

Before enabling the diagnostics settings:

- ➤ For ERP/CRM diagnostics, make sure that you have installed an ERP/CRM Mediator on a machine that resides in the same LAN as the monitored ERP/CRM server. For installation instructions, see the HP Performance Center System Configuration and Installation Guide.
- If you are monitoring over a firewall, you must install an MI Listener on a machine outside the firewall, and define the MI Listener in the Firewall
 Diagnostics Communicator field of the Administration Site's MI Listener page. For installation instructions, see the HP Performance Center System Configuration and Installation Guide. For details on defining the MI Listener, see the HP Performance Center Administrator Guide.
- ➤ Make sure that you have defined at least one mediator machine in the Diagnostics page of the Administration Site. You cannot enable a Diagnostics module if a mediator machine has not been defined. For details, see the section about setting up the diagnostics modules in the HP Performance Center Administrator Guide.

To enable Diagnostics for a load test:

1 In the Load Test configuration page, click the **Diagnostics** tab. The **Diagnostics** tab opens.

General	Workload	Monitors		Diagnostics	
Select the diagnostics tools that you want to use to identify and pinpoint performance problems in your Web, ERP/CRM, and J2EE/.NET applications.					
☑ Enable diagnostics					
Perform diagnostics breakdown on 1 % of all relevant Vusers participating in the current Load Test					
Offline Diagnostics					
✔ Web Page Diagnostics (Max. Vuser Sampling: 10%)		Disable			
🗕 Siebel Diagnostics (Max. Vuser Sampling: 10%)		Configure			
 Siebel DB Diagnostics (Max. Vuser Sampling: 10%) 		Configure			
 Oracle 11i Diagnostics (Max. Vuser Sampling: 5%) 		Configure			
- SAP Diagnostics (Max. Vuser Sampling: 100%)		Configure			
Offline & Online Diagnostics					
💞 J2EE/.NET Diagnostics (Max.	Vuser Sampling: 100%)	Configure			
		Save Start	Target.	Save As	Close

- **2** To enable transaction breakdown monitoring, select **Enable diagnostics**. You can disable diagnostics between load test runs without losing your settings by clearing the **Enable diagnostics** check box (provided that you saved your settings).
- **3** Specify the percentage of Vusers for which you want transaction breakdown to be performed. The percentage determines how many of the Vuser's transactions on the application server are reported to the Controller. Reducing this number reduces the overhead on the application server for Web Page and Oracle 11i diagnostics.

Note:

- The maximum transaction breakdown percentage is the lowest percentage of all the selected diagnostics types. For example, if Web Page Breakdown (maximum 10%) and Oracle 11i Diagnostics (maximum 5%) are selected, the maximum number of Vusers for which transaction breakdown will be performed is 5%.
- ➤ The minimum transaction breakdown is 1% or 1 Vuser per script, whichever is more. For example, if you enter a sampling value of 25% and run 12 Vusers in script1, 8 Vusers in script2, and 1 Vuser in script3, transaction breakdown will be performed on 3 Vusers in script1, 2 Vusers in script2, and 1 Vuser in script3.
- ➤ You cannot change the percentage value during a load test.
- **4** To enable and configure diagnostics, click the **Configure** button next to the appropriate diagnostics type for which you want transaction breakdown to be performed.
 - To enable Web Page Breakdown, see "Enabling the Web Page Breakdown" on page 498.
 - To configure Siebel Diagnostics, see Chapter 30, "Configuring Siebel Diagnostics."
 - To configure Siebel DB Diagnostics, see Chapter 31, "Configuring Siebel DB Diagnostics."
 - To configure Oracle 11i Diagnostics, see Chapter 32, "Configuring Oracle 11i Diagnostics."
 - To configure SAP Diagnostics, see Chapter 33, "Configuring SAP Diagnostics."
 - ➤ To configure J2EE/.NET Diagnostics, see Chapter 34, "HP Diagnostics Integration with Performance Center."

Note: If you run a script containing Vusers that are supported by more than one diagnostics type (for example Siebel-Web), the same Vusers will be monitored by all the diagnostics modules which support that Vuser type. This enables you to compare results generated in different diagnostics modules.

 \checkmark

After you configure and enable a diagnostics module, a check mark appears next to the diagnostics module, indicating that the diagnostics module is enabled in the current load test. If you disable the diagnostics module, the check mark is replaced by a minus sign (-).

5 Click **Save** in the Load Test configuration page to save and validate your settings.

Note: You can disable diagnostics between load test runs without losing your configuration settings by clearing the **Enable diagnostics** check box (provided that you saved your settings).

The Diagnostics dialog box is disabled during a load test run.

Enabling the Web Page Breakdown

Web Page Breakdown graphs provide you with performance information for each transaction and sub-transaction defined in your script. You enable the Web page breakdown feature from the **Diagnostics** dialog box of the Load Test configuration page, before running your load test. No configuration is required.

To enable Web Page Diagnostics:

- **1** In the Load Test configuration page, click the **Diagnostics** tab.
- **2** Select **Enable diagnostics**.
- **3** Set the percentage of Vusers to participate in the monitoring. The maximum number of Web Page Vusers on which Web page breakdown can be performed is 10%.

Note: If you have enabled other diagnostics types, the percentage of Vuser participation cannot exceed the maximum of any of the selected diagnostics types.



- **4** Check that Web Page Breakdown is selected (default setting). If it is not selected, click the **Enable** button next to Web Page Breakdown. The minus sign (-) is replaced by a check mark indicating that Web Page Breakdown is selected.
- 5 Click Save to save and validate your settings.

For more information about analyzing Web Page Breakdown graphs, see the *HP LoadRunner Analysis User Guide*.

To disable Web Page Diagnostics:

Click the **Disable** button next to Web Page Breakdown. A minus sign (-) replaces the check mark and the button changes to **Enable**.

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Introducing ERP/CRM Diagnostics

Performance Center's ERP/CRM diagnostics modules provide detailed performance information to help you rapidly identify and pinpoint performance problems in Siebel, Oracle, and SAP environments.

The ERP/CRM Transaction Breakdown Diagnostics modules come with a set of customized Analysis reports. Using these reports, you can communicate your insights to developers and managers to accelerate resolution, while avoiding expensive hardware upgrades.

This chapter includes:

- ► About Performance Center ERP/CRM Diagnostics on page 500
- ► ERP/CRM Diagnostics Module Architecture on page 501
- ► ERP/CRM Diagnostics Types on page 502
- ► Working with Performance Center ERP/CRM Diagnostics on page 504
- ► Connecting to a Remote Server on page 505
- ► Viewing Diagnostics Results on page 507

About Performance Center ERP/CRM Diagnostics

During a performance test, Performance Center's 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 Performance Center modules help organizations to:

- > Trace the application components exercised by business processes
- Rapidly isolate application components that have a significant impact on end-user experience
- Provide developers with precise data on how to make performance improvements

Such precision pinpointing of performance problems directly translates into significant business value:

- > Quicker and more efficient performance testing cycles
- > Decreased time to problem resolution by development
- Better-performing applications that are optimized to meet the needs of the business

ERP/CRM Diagnostics Module Architecture

The ERP/CRM Diagnostics architecture is composed 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. The mediator must be installed on a machine that resides in the same LAN as the monitored ERP/CRM server, and preferably on a dedicated server. We do not recommend installing the mediator on a Siebel, Oracle, or SAP server that is involved in the load test. For more information on installing the ERP/CRM Mediator, see the HP Performance Center System Configuration and Installation Guide.

Note: For Siebel DB diagnostics, it may take a long time to copy the files from the application server to the mediator, and then from the mediator to the results directory. During the first copying stage, the Summary Data Processing dialog box is displayed.

➤ Controller. Before load test execution, the Controller machine transfers all server information to the mediators and distributes the percentage of Vusers that will participate in the monitoring. After load test execution, the Controller collects the aggregated transaction data files from the mediator machines 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.

- ► 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 diagnostic graphs and reports. For more information about the diagnostic graphs, see the *HP LoadRunner Analysis User Guide*.

ERP/CRM Diagnostics Types

Performance Center provides ERP/CRM diagnostics solutions for Siebel, Oracle and SAP systems.

Siebel Diagnostics

The diagram below shows transaction breakdown on a Siebel CRM system.



Performance Center's Siebel Diagnostics are split into the following modules:

- ➤ Siebel Diagnostics Module. Enables you to breakdown 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 for each part of the transaction. Siebel-Web Vusers support Siebel diagnostics. For more information, see Chapter 30, "Configuring Siebel Diagnostics."
- ➤ Siebel DB Diagnostics Module. Enables you to view the SQLs for each transaction, identify the problematic SQL queries of each script, and identify at what point problems occurred. Siebel DB diagnostics support Siebel-Web Vusers. For more information, see Chapter 31, "Configuring Siebel DB Diagnostics."

Oracle Diagnostics

Oracle Diagnostics help you pinpoint performance problems on Oracle NCA systems. The diagnostics information drills down from the transaction, to the SQL statements and the SQL stages of each statement. Oracle NCA Vusers support Oracle DB diagnostics. For more information, see Chapter 32, "Configuring Oracle 11i Diagnostics."

SAP Diagnostics

SAP Diagnostics help you 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. For more information, see Chapter 33, "Configuring SAP Diagnostics."

Working with Performance Center ERP/CRM Diagnostics

To use Performance Center's ERP/CRM diagnostics, follow these steps:

1 Prepare for generating diagnostics data.

Make sure that the ERP/CRM Mediator is installed and configured. The mediator collects and processes the diagnostics data.

For information on installing the ERP/CRM Mediator, see the *HP Performance Center System Configuration and Installation Guide*. For information on configuring the ERP/CRM Mediator in the Administration Site, see the section that describes setting up the diagnostics modules in the *HP Performance Center Administrator Guide*.

2 Configure the server machine to enable the diagnostics feature.

For more information, see "Configuring Siebel Diagnostics on the Application and Web Servers" on page 510 (Siebel Diagnostics), "Enabling Server Logging on the Siebel Server" on page 520 (Siebel DB Diagnostics), and "Enabling Server Logging on the Oracle Server" on page 527, and "Selecting the Oracle NCA Application Version" on page 529 (Oracle DB Diagnostics).

3 Prepare the server machine to generate diagnostics data and communicate with the mediator machines.

For more information, see "Setting Up the Siebel Diagnostics Module" on page 514, "Setting Up the Siebel DB Diagnostics Module" on page 522, "Setting Up the Oracle 11i Diagnostics Module" on page 530, and "Setting Up the SAP Diagnostics Module" on page 536.

4 Collect and prepare the diagnostics data.

During the load test, the mediator collects the data and processes the diagnostics information.

5 Create the results.

After the load test, the Controller machine collects the aggregated data from the Mediator machines and collates the results.
6 Present the data.

Use the Analysis graphs to view the diagnostics data and drill down to the problematic areas. For more information about ERP/CRM Transaction Breakdown graphs, see the *HP LoadRunner Analysis User Guide*.

Connecting 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 machine where trace/log files are stored. This section describes how you connect to remote Windows or UNIX servers.

Connecting to a Remote Windows Server

For Windows platforms, the user should have administrator privileges.

When working on a remote Windows server, the mediator first tries to add a connection to that machine with the details supplied by the user. This configuration should give administrator permissions to the remote machine.

If the Mediator machine is already connected to the server machine with a different configuration, it will use the existing connection to the server. This may lead to an error if the user is a non-administrator.

To solve this conflict you may select one of the following solutions:

- > Change the LoadRunner Agent to work as a service and not as a process.
- > Close existing connections from the Mediator to the server.

These connections can use **servername****sharename** in the Windows Explorer, or a specified mount in My Computer.

To check whether connections exist, open the Command prompt and run the following command:

net use

To remove a connection, remove the mount, and run the following command:

```
net use \\servername\sharename /DELETE
```

 You may use your own created connection to the log directory by supplying the UNC-path to the log directory and marking the OS as WINDOWS.
When the Mediator runs, it will not try to create a connection, but rely on the given UNC-path instead.

Connecting to a Remote UNIX Server

Before using the remote shell (RSH) through the Mediator, verify that:

- ► RSH and RCP daemons are running on the UNIX server.
- ➤ The user has permission to run remote shell commands. To check this, type the following at the DOS command prompt:

rsh <server machine name> -I <UNIX user login name> -n <command>

For example:

rsh my_unix -I my_name -n "cd ~;pwd"

➤ No output is generated after executing the RSH command. Due to a bug in the RCP UNIX command, 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.

Viewing Diagnostics Results

To view transaction breakdown results, you run Performance Center Analysis to analyze the data gathered during the run. You perform analysis from the Load Test Results page. For more information on using the analysis, see Chapter 26, "Analyzing a Load Test."

You can use the Analysis transaction breakdown graphs and reports to view the performance data and drill down to pinpoint problem areas in any layer of the application. For more information about Performance Center Transaction Breakdown Diagnostics graphs, see the *HP LoadRunner Analysis User Guide*. Chapter 29 • Introducing ERP/CRM Diagnostics

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Configuring Siebel Diagnostics

Siebel Diagnostics enable you to breakdown 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 percent of time spent for each part of the transaction. Siebel-Web Vusers support Siebel Diagnostics.

This chapter includes:

- Configuring Siebel Diagnostics on the Application and Web Servers on page 510
- ► Configuring Diagnostics where the Web Server is Inside a DMZ on page 512
- > Copying Files from the Siebel Application Server to the Mediator on page 513
- ➤ Setting Up the Siebel Diagnostics Module on page 514

Note: Siebel Diagnostics (Siebel Application Response Measurements) supports Siebel application servers versions 7.53 and 7.7.

Configuring Siebel Diagnostics on the Application and Web Servers

To configure Siebel Application and Web servers for transaction breakdown, you need to do the following:

- Enable Siebel diagnostics on all Siebel Application and Web servers involved in the load test
- ► Optimize server performance settings
- Generate a list of Siebel server IDs (required for Siebel Application servers only)

To enable Siebel diagnostics:

1 Set the environment variable on the Siebel server to:

SIEBEL_SarmEnabled=true

2 Restart the server.

To optimize server performance:

You can change the maximum memory caching and file size using the following variables:

SIEBEL_SarmMaxMemory= <bytes> SIEBEL_SarmMaxFileSize = <bytes>

SIEBEL_SarmMaxMemory 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 setting SIEBEL_SarmMaxMemory= 50000 for low loads on the server and SIEBEL_SarmMaxMemory= 1000000 for high loads on the server. A low load on the server is 20 Vusers or less, and a high load is more than 100 Vusers. For SIEBEL_SarmMaxFileSize, the recommended file size is from 5000000 for low loads on the server to 25000000 for high loads on the server. If more than one Siebel log file is generated on the server every 10 seconds, you should increase the SIEBEL_SarmMaxFileSize.

Note: Before running a load test, delete Siebel Diagnostics logs from all servers involved in the load test.

To generate Siebel Server IDs:

On the Siebel application server, open a command window and run the 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 for the Add Siebel Server page. For more information, see step 8 of "Setting Up the Siebel Diagnostics Module" on page 514.

Configuring Diagnostics where the Web Server is Inside a DMZ

If you are using an application server in the internal network and a Web (file) server in a DMZ (a "neutral zone" that separates an internal network from a public one that is used to prevent outside access to a company's private data), you must install the mediator on the internal (over firewall) LAN, and enable SMB/CIFS communication from the internal machine to the file server in the DMZ. SMB/CIFS are the file sharing services that use the NBT (NetBIOS over TCP/IP) as the transport protocol.

To enable the NBT protocol between the client (over firewall machine) and the file server, use the following port configuration:

File Sharing Service	Port
SMB/CIFS over NBT	TCP 139 (SMB)
CIFS over TCP/IP (Direct SMB)	TCP 445

For example, configure the firewall settings as follows:

Service enabled: "nbsession" for TCP 139 connection.

Service enabled: "Microsoft-ds" for TCP 445 connection.

Note: CIFS over TCP 445 (direct SMB over TCP/IP) is optional with Windows 2000 and above (since it is a more secure way of communicating with the file server). To enable CIFS over TCP/IP, you must disable the NetBIOS over TCP/IP protocol using the operating system configuration.

Copying Files from the Siebel Application Server to the Mediator

After configuring the application server, you need to copy the files listed below from the Siebel Application server **\bin** directory to either the **<LR mediator installation>\bin** directory, or any other directory in PATH on the Siebel mediator machine.

► For Siebel 7.53, copy the following files:

► sarmanalyzer.exe	► sslcsym.dll
► msvcr70.dll	► sslcshar.dll
► sslcver.dll	► sslcosa.dll

► For Siebel 7.7, copy the following files:

► libarm.dll	► sslcosd.dll
► msvcr70.dll	► sslcrsa.dll
► sslcacln.dll	► sslcscr.dll
► sslccore.dll	► sslcshar.dll
► sslcevt.dll	► sslcsrd.dll
► sslcos.dll	► sslcsym.dll
► sslcosa.dll	► sslcver.dll

Setting Up the Siebel Diagnostics Module

To generate transaction breakdown data, you set up the Siebel Diagnostics module to communicate with the mediator machine and define the servers that you want to monitor. You can then enable the diagnostics module and specify the sampling percentage of transaction data to include in the diagnostics graphs, as described in "Enabling Diagnostics" on page 493.

Note: For meaningful transaction breakdown results, you should define every action as a transaction in the Vuser script Run-time Settings. To generate valid transaction breakdown data, you should 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**.

To set up the Siebel Diagnostics module:

- **1** On the Load Test configuration page, click the **Diagnostics** tab. The Diagnostics tab opens.
- **2** Make sure that **Enable diagnostics** is selected.
- **3** Set the percentage of Vusers to participate in the monitoring. The maximum number of Siebel Vusers on which breakdown can be performed is 10%.

Note: If you have enabled other diagnostics types, the percentage of Vuser participation cannot exceed the maximum of any of the selected diagnostics types.

4 In the **Offline Diagnostics** section, click the **Configure** button next to **Siebel Diagnostics (Max. Vuser Sampling: 10%)**.

The Siebel Configuration dialog box opens displaying any previously saved data.

Siebel Configuration - N	🛎 Siebel Configuration - Microsoft Internet Explorer 📃 🗖 🗙		
🗹 Enable Siebel Diag	gnostics		
Mediator			
Name: pan	Test Mediate	or	
Server	Platform	Log Directory	
wsqws	Windows	wsw	Ø
Delete		Add Serv	er
	OK Ca	ncel	

5 Select **Enable Siebel Diagnostics** to enable all the other fields in the dialog box.

To disable the Siebel DB Diagnostics module, clear the **Enable Siebel Diagnostics** check box. The information in the dialog box (if any) is displayed in gray and is read only.

6 From the **Mediator** list, select the mediator machine used to collect and process the Siebel diagnostics data. Only one mediator machine is supported for each diagnostics module.

Note: Mediators must be predefined on the Administrator site. For more information, see the *HP Performance Center Administrator Guide*.

- 7 To test the connection between the Web server (User) and the mediator, click Test Mediator. The Web server attempts to connect to the mediator. The connection status is displayed in the dialog box.
- 8 Click Add Server to define a Siebel server to monitor. The Add Siebel Server dialog box opens.

🎒 Add Siebel Server	- Microsoft Intern
Server Name:*	
Server Type:*	Application 💌
Server ID*	
Platform:*	Windows
Log Directory:*	
User Name:*	
User Password:	
Domain:*	
OK Cancel	

Note: The Add Server button is disabled if no mediator has been defined.

- **9** Type or select the following Siebel server information in the Add Siebel Server dialog box:
 - **Server Name**. Type the name of the Siebel server.
 - **Server Type**. Select the Siebel server type (Web or Application).
 - ➤ Server ID. Type the Siebel server ID (for Siebel application servers only). For information on generating a list of server IDs, see "Configuring Siebel Diagnostics on the Application and Web Servers" on page 510.
 - ► **Platform**. Select the Siebel server platform (Windows, Solaris, AIX, HAPX, or LINUX).

- ➤ Log Directory. Type a location where the Siebel application saves the log files. The log files can be saved in a shared log directory on the Siebel server or in a separate folder.
- ► User Name. Type the user name of the machine where log files are stored.

Note: For Windows platforms, the user should have administrator privileges. See "Connecting to a Remote Windows Server" on page 505 for more information. For UNIX platforms, see "Connecting to a Remote UNIX Server" on page 506.

- ► User Password. Type the user password (optional).
- **Domain**. Type the Siebel Server domain (for Windows platforms only).

Click **OK**. The Add Siebel Server dialog box closes and the server information is added to the list of Siebel servers.

10 In the Siebel Configuration dialog box, select the check box in the left column for each Siebel server that you want to enable in the session.

To disable a server from the session, clear the check box for the desired server.

- **11** To edit server information, click the **Edit** button. The Add Siebel Server dialog box opens displaying the server information. Edit the desired fields, then click **OK**.
 - **12** To delete a Siebel server, select the server and click **Delete**. The server is removed from the Siebel server list.
 - **13** Click **OK** to save your settings and close the Siebel Configuration dialog box. A check mark icon appears next to Siebel Diagnostics in the Diagnostics page, indicating that it is enabled.

Chapter 30 • Configuring Siebel Diagnostics

31

Configuring Siebel DB Diagnostics

Siebel DB Diagnostics help you to 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 what point problems occurred. Siebel-Web Vusers support Siebel DB Diagnostics.

This chapter includes:

- ► Preparing the Script on page 519
- ► Synchronizing Times on page 520
- ► Enabling Server Logging on the Siebel Server on page 520
- ➤ Setting Up the Siebel DB Diagnostics Module on page 522

Preparing the Script

When preparing your script for transaction breakdown, add think time at the end of each transaction using the ratio of one second per hour of testing.

To avoid session ID conflicts, make sure that the Vusers log out of the database at the end of each session.

Synchronizing Times

To check that the correlation of SQLs to transactions is correct, you should synchronize server times before performing transaction breakdown.

On a Windows Siebel server, you synchronize the time with the Siebel Gateway server by running the following command from the Load Generator machine:

```
net time \ <Gateway name> /set /y
```

Replace **<Gateway name>** with the name of the Siebel Gateway.

On Unix Siebel servers you can synchronize the time 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 time.
- Change the time on the Load Generator machine so that it will be synchronized with the UNIX Siebel Gateway server.
- ➤ Configure the time difference in Analysis. For more information see the section that describes Siebel DB diagnostics graphs in the *HP LoadRunner Analysis User Guide*.

Enabling Server Logging on the Siebel Server

Before you set up the Siebel DB diagnostics module on the Controller, you must configure the Siebel server to create the database log files.

To enable logging on the Siebel server:

1 On the Siebel server, open a command window and run the command:

<Siebel bin directory>\srvrmgr /g <gateway server> /s <Siebel server> /e <enterprise server name> /u <username> /p <password> **2** Type 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>

For the Call Center, type **sccobjmgr_enu** as the component name. For example:

change evtloglvl ObjMgrsqllog=4 for comp sccobjmgr_enu

To disable logging on the Siebel server:

On the Siebel server, type the following commands:

change evtlogIvI ObjMgrsqllog=0 for comp <component name>

change evtlogIvI EventContext=0 for comp <component name>

change evtloglvl ObjMgrSessionInfo =0 for comp <component name>

Note: Before running a load test, delete log files from all servers involved in the load test.

Setting Up the Siebel DB Diagnostics Module

To generate transaction breakdown data, you set up the Siebel DB Diagnostics module to communicate with the mediator machine and define the servers that you want to monitor. You can then enable the diagnostics module and specify the sampling percentage of transaction data to include in the diagnostics graphs, as described in "Enabling Diagnostics" on page 493.

Note: For meaningful transaction breakdown results, you should define every action as a transaction in the Vuser script Run-time Settings. To generate valid transaction breakdown data, you should 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**.

To set up the Siebel DB Diagnostics module:

- **1** On the Load Test configuration page, click the **Diagnostics** tab. The Diagnostics tab opens.
- **2** Make sure that **Enable diagnostics** is selected.
- **3** Set the percentage of Vusers to participate in the monitoring. The maximum number of Siebel Vusers on which breakdown can be performed is 10%.

Note: If you have enabled other diagnostics types, the percentage of Vuser participation cannot exceed the maximum of any of the selected diagnostics types.

4 In the Offline Diagnostics section, click the Configure button next to Siebel DB Diagnostics (Max. Vuser Sampling: 10%).

The Siebel DB Configuration dialog box opens displaying any previously saved data.

🗿 Siebel DB Configuration - Microsoft Internet Explorer 📃 🗖 🗙		
Enable Siebel DB Configuration		
Mediator		
Name: Superman 💌 Test Mediator		
Server Platform Log Directory		
Delete Add Server		
OK Cancel		

5 Select **Enable Siebel DB Diagnostics** to enable all the other fields in the dialog box.

To disable the Siebel DB Diagnostics module, clear the **Enable Siebel DB Diagnostics** check box. The information in the dialog box (if any) is displayed in gray and is read only.

6 From the **Mediator** list, select the mediator machine used to collect and process the Siebel diagnostics data. Only one mediator machine is supported for each diagnostics module.

Note: Mediators must be predefined on the Administrator site. For more information, see the *HP Performance Center Administrator Guide*.

- 7 To test the connection between the Web server (User) and the mediator, click Test Mediator. The Web server attempts to connect to the mediator. The connection status is displayed in the dialog box.
- **8** Click **Add Server** to define a Siebel server to monitor. The Add Siebel DB Server dialog box opens.

🕘 Add Siebel DB Serv	er - Microsoft Int 💶 🗖 🗙
Server Name:* Platform:* Log Directory:* User Name:* User Password: Domain:* OK Cancel	Windows

Note: The Add Server button is disabled if no mediator has been defined.

- **9** Type the following Siebel server information in the Add Siebel DB Server dialog box:
 - **Server Name**. Type the name of the Siebel server.
 - ► **Platform**. Select the Siebel server platform (Windows, Solaris, or HAPX).
 - ➤ Log Directory. Type a location where the Siebel application saves the log files. The log files can be saved in a shared log directory on the Siebel server or in a separate folder.
 - ► User Name. Type the user name of the machine where log files are stored.

Note: For Windows platforms, the user should have administrator privileges. See "Connecting to a Remote Windows Server" on page 505 for more information. For UNIX platforms, see "Connecting to a Remote UNIX Server" on page 506.

- ► User Password. Type the user password (optional).
- **> Domain**. Type the Siebel Server domain (for Windows platforms only).

Click **OK**. The Add Siebel DB Server dialog box closes and the server information is added to the server list in the Siebel DB Configuration dialog box.

10 In the Siebel DB Configuration dialog box, select the check box in the left column for each Siebel server that you want to enable in the session.

To disable a Siebel server from a session, clear the check box in the left column for the desired server.

11 To edit server information, click the **Edit** button. The Add Siebel DB Server dialog box opens displaying the server information. Edit the desired fields, then click **OK**.

- **12** To delete a Siebel server, select the server and click **Delete**. The server is removed from the Siebel server list.
- **13** Click **OK** to save your settings and close the Siebel DB Configuration dialog box. A check mark icon appears next to Siebel DB Diagnostics in the Diagnostics page, indicating that it is enabled.

Chapter 31 • Configuring Siebel DB Diagnostics

32

Configuring Oracle 11i Diagnostics

Oracle Diagnostics help pinpoint performance problems on Oracle 11i NCA systems. The diagnostics information drills down from the transaction, to the SQL statements and the SQL stages of each statement. Oracle NCA Vusers support Oracle 11i Diagnostics.

This chapter includes:

- ► Enabling Server Logging on the Oracle Server on page 527
- > Selecting the Oracle NCA Application Version on page 529
- ➤ Setting Up the Oracle 11i Diagnostics Module on page 530

Enabling Server Logging on the Oracle Server

Verify that the trace diagnostics are enabled, disable the Enable Diagnostics password request, and set the trace file size to unlimited. By default, trace diagnostics are enabled on the Oracle server during installation. In addition, to help Performance Center deal with the Oracle application diagnostics password, you can either set the diagnostics password in the Vuser script or disable the password request on the application server.

To check that trace diagnostics are enabled:

- **1** Log on to the Oracle application server with administrator privileges, and select the module you want 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 **Site** and **Profiles** with **No Values**, type %Diagnostics% in the **Profiles** field, then click **Find**.
- **5** If any diagnostics profiles are disabled (denoted by a "Yes" in the **Site** column), change the setting to "No".
- **6** Save your settings.

To 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:

1 On the Oracle server, run the following command in the SQL editor:

Alter system set max_dump_file_size=2048000;

2 Edit the init*.ora file on **\$ORACLE_HOME**\admin\<sid>\pfile\init<sid>.ora. Find the line of the parameter, change its value, then save the file.

Note: Verify that you have enough disk space on the database server since these trace files can be very large.

To 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.

To disable the Enable Diagnostics password request:

- **1** Log on to the Oracle application server with administrator privileges, and select the module you want 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 type the required user name. In the **Profile** field, type %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.

Selecting the Oracle NCA Application Version

The Oracle diagnostics module supports Oracle NCA versions 11.5.0 and later. type the version of your Oracle application server in VuGen's run-time settings to enable the built-in trace mechanism. To check the version of your Oracle server, log in to the Oracle server and click **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 **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 UI.
- Before enabling the diagnostics module, delete old trace log files from all servers involved in the load test.
- Real users should not work on the Oracle server while the diagnostics module is running, as this may affect transaction breakdown results.

Setting Up the Oracle 11i Diagnostics Module

To generate transaction breakdown data, you set up the Oracle 11i Diagnostics module to communicate with the mediator machine and define the servers that you want to monitor. You can then enable the diagnostics module and specify the sampling percentage of transaction data to include in the diagnostics graphs, as described in "Enabling Diagnostics" on page 493.

Note: For meaningful transaction breakdown results, you should define every action as a transaction in the Vuser script Run-time Settings. To generate valid transaction breakdown data, you should 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**.

To set up the Oracle 11i Diagnostics module:

- **1** On the Load Test configuration page, click the **Diagnostics** tab. The Diagnostics tab opens.
- **2** Make sure that **Enable diagnostics** is selected.
- **3** Set the percentage of Vusers to participate in the monitoring. The maximum number of Oracle Vusers on which breakdown can be performed is 5%.

Note: If you have enabled other diagnostics types, the percentage of Vuser participation cannot exceed the maximum of any of the selected diagnostics types.

4 In the **Offline Diagnostics** section, click the **Configure** button next to **Oracle 11i Diagnostics (Max. Vuser Sampling: 5%)**.

The Oracle 11i Configuration dialog box opens displaying any previously saved data.

Oracle 11i Configuration -	Microsoft Internet Expl	orer 📃 🗖
Oracle 11i Configuration	1	
🔲 Enable Oracle 11i Dia	agnostics	
Mediator		
Name: XSXS	Test Medi	ator
Server	Platform	Log Directory
Delete		Add Server
	OK Cancel	Help

5 Select **Enable Oracle 11i Diagnostics** to enable all the other fields in the dialog box.

To disable the Oracle 11i Diagnostics module, clear the **Enable Oracle 11i Diagnostics** check box. The information in the dialog box (if any) is displayed in gray and is read only.

6 From the **Mediator** list, select the mediator machine used to collect and process the Oracle diagnostics data. Only one mediator machine is supported for each diagnostics module.

Note: Mediators must be predefined on the Administrator site. For more information, see the *HP Performance Center Administrator Guide*.

- 7 To test the connection between the Web server (User) and the mediator, click Test Mediator. The Web server attempts to connect to the mediator. The connection status is displayed in the dialog box.
- **8** Click **Add Server** to define an Oracle server to monitor. The Add Oracle Server dialog box opens.

Note: The Add Server button is disabled if no mediator has been defined.

- **9** Type the following Oracle server information in the Add Oracle Server dialog box:
 - **Server Name**. Type the name of the Oracle server.
 - ► **Platform**. Select the Oracle server platform (Windows, Solaris, or HAPX).
 - ➤ Log Directory. Type 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.
 - ► User Name. Type the user name of the machine where trace files are stored.

Note: For Windows platforms, the user should have administrator privileges. See "Connecting to a Remote Windows Server" on page 505 for more information. For UNIX platforms, see "Connecting to a Remote UNIX Server" on page 506.

- ► User Password. Type the user password (optional).
- **> Domain**. Type the Oracle server domain (for Windows platforms only).

Click **OK**. The Add Oracle Server dialog box closes and the server information is added to the list of Oracle servers.

10 In the Siebel Configuration dialog box, select the check box in the left column for each Oracle server that you want to enable in the session.

To disable an Oracle server from a session, clear the check box for the desired server.

11 To edit server information, click the **Edit** button. The Add Oracle Server dialog box opens displaying the server information. Edit the desired fields, then click **OK**.

- **12** To delete an Oracle server, select the server and click **Delete**. The server is removed from the Oracle server list.
- **13** Click **OK** to save your settings and close the Oracle 11i Configuration dialog box. A check mark icon appears next to Oracle 11i Diagnostics in the Diagnostics page, indicating that it is enabled.

Chapter 32 • Configuring Oracle 11i Diagnostics

Configuring SAP Diagnostics

SAP Diagnostics help you to rapidly identify and resolve DBA, Network, WAS, Application, and OS/HW problems in your SAP system.

This chapter includes:

- ► SAP Diagnostics Overview on page 535
- ► SAP Diagnostics Supported Environments on page 536
- ➤ Setting Up the SAP Diagnostics Module on page 536

SAP Diagnostics Overview

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 load test run.

Vuser Coloring

SAP Diagnostics works for replay of 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.

SAP Diagnostics Supported Environments

The following table outlines the supported versions and required Kernel patches for the SAP Application Server and the SAPGUI Client:

	Supported Version	Required Kernel Patch
SAP Application Server	4.6C; 4.6D	Kernel Patch 1984 (released on 11/01/05, SAP note 0451251)
	4.7 and higher	No patch required.
SAPGUI Client	SAPGUI for Windows 6.20	Minimum patch level: 48
	SAPGUI for Windows 6.40	Minimum patch level: 2

Setting Up the SAP Diagnostics Module

To generate transaction breakdown data, you set up the SAP Diagnostics module to communicate with the mediator machine and define the servers that you want to monitor. You can then enable the diagnostics module and specify the sampling percentage of transaction data to include in the diagnostics graphs, as described in "Enabling Diagnostics" on page 493.

Note:

- ► When using SAP Diagnostics, ensure that a SAPGUI client is installed on the same machine as the ERP/CRM Mediator.
- To generate valid transaction breakdown data, you should manually define the transactions in the Vuser script rather than using automatic transactions. In the Run-Time Settings' General: Miscellaneous node, clear the following options: Define each action as a transaction and Define each step as a transaction.

To set up the SAP Diagnostics module:

- **1** On the Load Test configuration page, click the **Diagnostics** tab. The Diagnostics tab opens.
- **2** Make sure that **Enable diagnostics** is selected.
- **3** Set the percentage of Vusers to participate in the monitoring. The maximum number of SAP Vusers on which breakdown can be performed is 100%.

Note: If you have enabled other diagnostics types, the percentage of Vuser participation cannot exceed the maximum of any of the selected diagnostics types.

4 In the **Offline Diagnostics** section, click the **Configure** button next to **SAP Diagnostics (Max. Vuser Sampling: 100%)**.

The SAP Configuration dialog box opens displaying any previously saved data.

SAP Configuration -	Microsoft Internet Explorer	
SAP Configuration		
🗹 Enable SAP Diagi	nostics	
Mediator		
Name pan	•	
Server Properties	;	
Server Host Name	aaaa System Router String 212121212	
User Name	wqswq System # 12	
User Passowrd	****	
Client #	211	
	Validate OK Cancel	

5 Select **Enable SAP Diagnostics** to enable all the other fields in the dialog box.

To disable the SAP Diagnostics module, clear the **Enable SAP Diagnostics** check box. The information in the dialog box (if any) is displayed in gray and is read-only.

6 In the **Mediator** section, select the mediator machine used to collect and process the SAP diagnostics data. Only one mediator machine is supported for each diagnostics module.

Note: Mediators must be predefined on the Administrator site. For more information, see the *HP Performance Center Administrator Guide*.

- 7 In the Server Properties section, type the following SAP server information:
 - ► Server Host Name. The name of the SAP server.
 - ► User Name. The name of the SAP client.
 - ► User Password. The password for the SAP client.
 - ► Client #. The number of the SAP client machine.
 - System Router String. The system router string of the SAP server (optional).
 - ► System #. The system number of the SAP server.
 - ► **Route String**. The system route string of the SAP server (optional).
- 8 Click Validate to check that the server is connected properly.

When you click **Validate**, the Controller produces a report of all the servers that are available for diagnostics through the Server Host. The report is displayed in the Output window. If the validation process fails, an error window opens displaying detailed error messages.

Note: Errors that occur during the validation process may not occur during the load test run.



9 Click **OK** to save your settings and close the SAP Configuration dialog box. A check mark icon appears next to SAP Diagnostics in the Diagnostics page, indicating that it is enabled.

Chapter 33 • Configuring SAP Diagnostics
34

HP Diagnostics Integration with Performance Center

This chapter describes the Performance Center integration with HP Diagnostics.

This chapter includes:

- About HP Diagnostics Software Integration with Performance Center on page 542
- ► Setting Up the HP Diagnostics Software Module on page 542
- ► Configuring Performance Center to Use HP Diagnostics on page 543

For detailed information about setting up Performance Center to use HP Diagnostics, see the *HP Performance Center Administrator Guide*.

For detailed information about viewing diagnostics data while running a load test, see "Drilling Down Diagnostics Data" on page 407.

About HP Diagnostics Software Integration with Performance Center

The HP Diagnostics integration with Performance Center allows you to monitor and analyze the performance of Java 2 Enterprise Edition (J2EE), .NET-connected, SAP, Oracle, and other complex environments.

During a load test run, you can drill down into HP Diagnostics data for the whole load test or for a particular transaction. After the load test run, you can use HP LoadRunner Analysis to analyze offline diagnostics data generated during the load test.

For detailed information about viewing diagnostics data, see the *HP Diagnostics User Guide*.

Setting Up the HP Diagnostics Software Module

Important: Before you can use HP Diagnostics with Performance Center, you need to make sure that you have specified the Diagnostics Server details in the Performance Center Administration Site. For details, see the *HP Performance Center Administrator Guide*.

Configuring Performance Center to Use HP Diagnostics

To capture Diagnostics metrics in a load test, you need to configure the Diagnostics parameters for the load test and select the probes that will be included in the load test. You provide this information on the Load Test Configuration page of the Performance Center User Site.

To configure the Diagnostics parameters for a load test:

- **1** On the Load Test configuration page, click the **Diagnostics** tab. The Diagnostics tab opens.
- **2** Make sure that **Enable diagnostics** is selected.
- **3** Set the percentage of Vusers to participate in the HP Diagnostics (J2EE/.NET Diagnostics) monitoring.

The maximum percentage of Vusers for which HP Diagnostics (J2EE/.NET Diagnostics) data can be collected is 100%, unless you have enabled other types of diagnostics. In this case, the percentage of Vuser participation in HP Diagnostics (J2EE/.NET Diagnostics) cannot exceed the maximum of any of the other types of diagnostics that you enabled.

For example, if you enabled **Web Page Diagnostics**, which has a maximum user participation of 10%, the percentage of Vuser participation for HP Diagnostics (**J2EE/.NET Diagnostics**) cannot exceed 10%.

The minimum amount of Vusers for which HP Diagnostics (J2EE/.NET Diagnostics) data can be collected is 1% or 1 virtual user per script.

4 In the **Offline and Online Diagnostics** section, click **Configure** to open the J2EE/.NET Configuration dialog box.

J2EE7.NET Configuration - Microsoft Internet Explorer					
J2EE/.NET Configuration					
	Enable J2EE/.	NET Diagnostics			
	Select Probes:				
	<u>Enabled</u>	<u>Name</u> ₹	<u>Group</u>	<u>Host Name</u>	
		pennew	Default	pen.mercury.global	
 There is a firewall between the mediator and the Controller. Use the MI Listener for collating results. Monitor Server Requests <u>Troubleshoot diagnostics for J2EE/.NET connectivity</u> OK Cancel Help					

Note: This dialog box is read-only while a load test is running.

5 Select Enable J2EE/.NET Diagnostics.

- **6** In the **Select Probes** list, select the probes to be included in your load test.
 - > Select the check box adjacent to each probe that you want to monitor.
 - ➤ To disable a probe for the duration of a load test, clear the check box.

Note: You must enable at least one probe in order to save the HP Diagnostics configuration.

7 If the Diagnostics Server (or a Diagnostics Server in Mediator mode in a distributed environment) is located behind a firewall, select There is a firewall between the mediator and the Controller.

If you are monitoring over a firewall, make sure that you have installed an MI Listener on a machine outside the firewall, and that you specify the IP address of the MI Listener on the Performance Center Administration Site's MI Listeners page, in the **Firewall Diagnostics Communicator** field. For installation instructions, see the *HP Performance Center System Configuration and Installation Guide*. For details on defining the MI Listener, see the *HP Performance Center Administrator Guide*.

8 To capture a percentage of server requests which occur outside the context of any Vuser transaction select **Monitor server requests**x.

The server requests will be captured at the same percentage as was selected for the percentage of Vusers on Diagnostics Distribution dialog box.

Note: Enabling this functionality imposes an additional overhead on the probe.

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.

To investigate any issues that you have with the connections between the Diagnostics components, click the **Troubleshoot diagnostics for J2EE/.NET connectivity** link. This will open the HP Diagnostics System Health Monitor in a new browser window.

9 Click **OK** to confirm your selections and to close the J2EE/.NET Diagnostics Configuration dialog box.

10 Click **Save** on the Load Test configuration page to save and validate your settings and complete the configuration.

Note: For more information about configuring Diagnostics to work with a firewall see the *HP Diagnostics Installation and Configuration Guide*.

Part V

Configuring Vuser Script Run-Time Settings

Configuring General Run-Time Settings

Before you run a load test, you can configure its behavior using run-time settings. You can configure general settings and protocol-specific settings.

For information about the protocol-specific settings, see Chapter 36, "Configuring Protocol-Specific Run-Time Settings."

This chapter includes:

- ► About Run-Time Settings on page 549
- ► Run Logic Settings on page 551
- ► Pacing Settings on page 553
- ► Log Settings on page 555
- ► Think Time Settings on page 558
- ► Miscellaneous Settings on page 560

About Run-Time Settings

After you record a Vuser script, you can configure its run-time settings. The run-time 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 run-time 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 run-time settings to specify how many times the Vuser should repeat a set of actions. To open the run-time settings:

- **1** Open a project and select **Load Tests > Manage**.
- **2** Click the **Workload** tab to see the list of scripts. If there are no scripts listed, click **Click here to add a new group**, and add a script from the list.
- **3** Click the **Edit Runtime Settings** button. The Run Logic options are displayed.

🗿 project_1 - Run-Time Settings - Microsoft Internet Explorer provided by Hewlett-Packa 💷 🛛				
General	General:Run Logic			
Run Logic Pacing Log Think Time Miscellaneous Browser Browser Emulation Network Speed Simulation Internet Protocol Preferences Proxy Download Filters	 Init user_init Run Insert Action Action End Wuser_end Move Up Move Down Properties 			
	OK Use Defaults Cancel			

4 Select the run-time setting link that you want to set.

See the following sections to understand the meaning and the impact of each run-time setting.

The General runtime settings described in this chapter, apply to all types of Vuser scripts. They include:

- ► Run Logic Settings
- ► Pacing Settings
- ► Log Settings
- ► Think Time Settings
- ► Miscellaneous Settings

Run Logic Settings

Note: Run Logic settings are not available to certain protocols, such as Windows Socket, Sybase, and Oracle 2-tier.

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.

To configure the Run Logic settings:

1 In the Run-Time Settings window, click **Run Logic**.

🗿 web_test - Run-Time Settings - Microsoft Internet Explorer provided by Hewlett-Packard 🗉 🖬 🔀				
General	General:Run Logic			
Run Logic Pacing	Init Insert Action			
<u>Think Time</u> <u>Miscellaneous</u>	Run Insert Block Action Action2 Delete			
Browser Browser Emulation Network Speed Simulation	Block0 Move Up Action2 Action3 Move Down			
Internet Protocol Preferences Proxy	End vuser_end			
<u>Download Filters</u>	Hint:			
	Proxy Click on this link to configure relevant options			
	OK Use Defaults Cancel			

- **2** In the **Run** section, select the action or block that you want to manipulate.
- **3** Set the sequence of the action. Click the appropriate button on the right side of the window—Move Up, Move Down, Insert Action, and so on.
- **4** Click **OK** to save the settings and close the window.

Pacing Settings

The Pacing Runtime settings let you control the number of iterations and the time between them. You can use one of the following methods:

- ➤ 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.
- ➤ 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 iteration—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 8 seconds and the delay was 7 seconds.

To configure the Pacing settings:

1 In the Run-Time Settings window, click **Pacing**.

🔮 ws_test - Run-Time	Settings - Microsoft Internet Explorer provided by Hewlett-Packard 🛛 🗐 🛛
ws_test - Run-Time General Pacing Log Think Time Miscellaneous Network Speed Simulation	Settings - Microsoft Internet Explorer provided by Hewlett-Packard ■ ■ General:Pacing Number of Iterations: 1 Start new Iteration As soon as the previous iteration ends After the previous iteration ends with a fixed delay Delay of sec: 60 After the previous iteration ends with a random delay Delay of sec: 60 After the previous iteration ends with a random delay Delay of sec: 90 At random interval Delay at range of sec: Hint:
	OK Use Defaults Cancel

- **2** In the **lteration Count** section, specify the number of times to repeat the script's **Run** section.
- **3** In the **Start New Iteration** section, select the desired pacing method. When applicable, provide a delay time or a range of times.
- **4** Click **OK** to save the settings and close the window.

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.

Disabling 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.

Setting the Log Detail Level

You can specify the type of information that is logged:

Standard Log. Creates a standard log of functions and messages sent during script execution to use for debugging. Disable this option for large load 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.

 Extended Log. Creates an extended log, including warnings and other messages. Disable this option for large load 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. See "Setting the Log Cache Size" below.

Setting the Log Cache Size

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.

To configure the Log settings:

1 In the Run-Time settings window, click **Log**.

🔮 ws_test - Run-Time	Settings - Microsoft Internet Explorer provided by Hewlett-Packard 🛛 🗐 😫
Speed Simulation	Settings - Microsoft Internet Explorer provided by Hewlett-Packard General:Log Disable logging Standard log Extended log Parameter substitution Data returned by server Advanced trace Send messages only when an error occurs Advanced Advanced Advanced Advanced Always send messages
	Hint: Disable Logging Once you verify that your script is functional, disable logging to conserve resources.
	OK Use Defaults Cancel

- **2** Click **Disable logging** to stop the logging. By disabling logging, you may be able to conserve resources.
- **3** Select the desired type of logging: **Standard** or **Extended**. If you chose **Extended log**, enable the desired sub-options. Even without enabling any of the sub-options, the Extended log contains more details than the Standard log.
- **4** In the **Log Options** section, indicate when to send messages—always or only when an error occurs. Click **Advanced** options to set the size of the log cache.
- **5** Click **OK** to save the settings and close the window.

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 8 seconds before performing the next action:

Ir_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.

To configure the Think Time settings:

1 In the Run-Time Settings window, click **Think Time**.

🔮 web_test - Run-Tim	e Settings - Microsoft Internet Explorer provided by Hewlett-Packard 🗐 🛽
 web_test - Run-Tim General Run Logic Pacing Log Think Time Miscellaneous Browser Browser Emulation Network Speed Simulation Internet Protocol Preferences Proxy Download Filters 	 Bestings - Microsoft Internet Explorer provided by Hewlett-Packard General: Think Time Think Time options Ignore think time Replay think time as recorded Modify replay think time Multiply recorded value by (seconds): 1.00000 Use random percentage of recorded think time Min % 50 Max % 150 Limit think time To (seconds) 1
	Click on this link to configure relevant options OK Use Defaults Cancel

- **2** Select the desired think-time option:
 - ► Ignore think time. Replay the script ignoring all Ir_think_time functions.
 - Replay the think time as recorded. Use 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. Use 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.

- ➤ Use random percentage of the recorded think time. Use 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%).
- **3** To limit the think time's maximum value, select **Limit think time to** and specify a time. You can use this option in conjunction with the other options.
- **4** Click **OK** to save the settings and close the window.

Miscellaneous Settings

You can set the following Miscellaneous runtime options for a Vuser script:

- ► Error Handling
- ► Multithreading
- ► Automatic Transactions

Error Handling

- ➤ 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 lf 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.

It is not recommended to enable both the **Continue on Error** and **Generate Snapshot on Error** options in a load test environment. This configuration may adversely affect the Vusers' performance.

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.

Note: The following protocols are not threadsafe: Sybase-Ctlib, Sybase-Dblib, Informix, Tuxedo, and PeopleSoft-Tuxedo.

- ► To enable multithreading, click **Run Vuser as a thread**.
- ➤ To disable multithreading and run each Vuser as a separate process, click Run Vuser as a process.

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.

Alternatively, if you run each Vuser as a thread, the Controller host launches only one instance of the driver program (such as **mdrv.exe**), for every 50 Vusers (by default). This driver process/program launches several Vusers, each Vuser running as a thread. These threaded Vusers share segments of the memory of the parent driver process. This eliminates the need for multiple re-loading of the driver program/process saves much memory space, thereby enabling more Vusers to be run on a single load generator.

Automatic Transactions

You can instruct the Controller host to handle every step or action in a Vuser script as a transaction. This is called using automatic transactions. The Controller assigns the step or action name as the name of the transaction. By default, automatic transactions per action are enabled.

- To disable automatic transactions per action, clear the Define each action as a transaction check box. (enabled by default)
- To enable automatic transactions per step, check the Define each step as a transaction check box. (disabled by default)

If you disable automatic transactions, you can still insert transactions manually during and after recording.

To configure the Miscellaneous settings:

1 In the Run-Time Settings window, click **Miscellaneous**.

🗿 web_test - Run-Time Settings - Microsoft Internet Explorer provided by Hewlett-Packard 🗉 🖾				
General	General:Miscellaneous			
Run Logic	Error Handling			
Log	Continue on error			
Think Time	Fail open transactions on Ir_error_message			
<u>Miscellaneous</u>	Generate snapshot on error			
Browser	A Multithreading			
Browser Emulation	🔘 Run Vuser as a process			
Speed Simulation	Run Vuser as a thread			
Internet Protocol	Automatic Transactions			
Preferences	Define each action as a transaction			
Proxy	Define each step as a transaction			
Download Filters				
	Hint:			
	Move the mouse over any item to see its description			
	Move the mouse over an item to see its description			
	OK Use Defaults Cancel			

- **2** Enable the desired options.
- **3** Click **OK** to save the settings and close the window.

36

Configuring Protocol-Specific Run-Time Settings

Before you run a load test, you can configure its behavior using run-time settings. You can configure general settings and protocol-specific settings.

For general information about run-time settings, see Chapter 35, "Configuring General Run-Time Settings."

This chapter includes:

- ► About Protocol-Specific Run-Time Settings on page 564
- ► Advanced Settings on page 565
- ► Browser Emulation Settings on page 568
- ► Classpath Options on page 572
- ► Client Emulation Settings on page 573
- ► Configuration Settings on page 576
- ► Download Filter Settings on page 578
- ► Gateway Settings on page 580
- ► SAPGUI Settings on page 583
- ► Java VM Settings on page 586
- ▶ .NET Environment Settings on page 588
- ► Preferences (Internet) on page 590
- ► Proxy Options on page 599
- ► Radius Settings on page 603
- ► RTE Settings on page 605

- ► Server and Protocol Settings on page 607
- ► Speed Simulation Settings on page 608
- ► Timing Settings on page 610

About Protocol-Specific Run-Time Settings

Before replaying a Vuser script, you can configure its run-time settings. The run-time settings define the way the script runs, using setting that are specific for your particular environment.

Since run-time settings are protocol-specific, you will notice that not all runtime settings are available.

This following list shows the protocol-specific run-time settings in alphabetical order. For a list of the General run-time settings that apply to all protocols, see Chapter 35, "Configuring General Run-Time Settings."

Run-Time Setting	Protocol(s) / Category
Advanced Settings	Web Services / JMS
Browser Emulation Settings	Internet Protocols / Browser
Classpath Options	Java / Java Environment Settings
Client Emulation Settings	Oracle NCA / Oracle NCA
Configuration Settings	Citrix ICA / Citrix
Download Filter Settings	Internet Protocols / Internet Protocol
Gateway Settings	WAP, MMS / WAP
SAPGUI Settings	SAPGUI / SAPGUI
Java VM Settings	Java / Java Environment Settings
.NET Environment Settings	Microsoft .NET / .NET
Preferences (Internet)	Internet Protocols / Internet Protocol
Proxy Options	Internet Protocols / Internet Protocol
Radius Settings	WAP, MMS / WAP

RTE Settings	Terminal Emulation / RTE
Server and Protocol Settings	MMS (Multimedia Messaging Service)
Speed Simulation Settings	Internet Protocols, NCA / Network
Timing Settings	Citrix ICA / Citrix

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.

Performance Center lets you configure some of those resources through the run-time settings. You can set options in the area of VM (Virtual Machine), the JMS connections, and message timeouts.

VM

- ➤ 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

JMS

- ► 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. For 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.
- ➤ Number of JMS connections per process. The number of JMS connections per mdrv process, or Vuser. All Vusers sharing a connection will receive the same messages. The default is 1, and the maximum is 50 Vusers. The less connections you have per process, the better your performance.
- ➤ Receive message timeout options. The timeout for received messages. The default is No wait.
 - 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. (default)
 - Specify the timeout in seconds. Manually specify a timeout value for the message. If the timeout expired and no message arrived, the operation fails.

User defined timeout. Specify the amount of seconds to wait for the message before timing out. The default is five seconds.

Automatically generate selector. Generates a selector for the response message with the correlation ID of the request (No by default). Each JMS message sent to the server has a specific ID. Enable this option if you want Performance Center to automatically create a selector that includes the message ID.

To configure the JMS settings:

1 In the Run-Time settings window, click **Advanced** under the JMS section.

🖉 ws_test - Run-Time Set	tings - Microsoft Internet Explorer	_ 🗆 🗵
General Run Logic Pacing Log Think Time Miscellaneous Network Speed Simulation Internet Protocol Preferences Proxy Download Filters JMS Advanced Web Services Toolkit Options	JMS: Advanced VM VM VUse external VM JVM Home 9%JDK_HOME% Classpath 9%CLASSPATH% JMS Additional VM Parameters JNDI initial context factory JNDI provider URL JMS connection factory JMS security principal JMS security credentials Number of JMS connections per process Infinite wait No wait Specify the timeout in seconds Hint: Move the mouse over an item to see its description	
	OK Use Defaults	Cancel

- Specify your VM preferences.
- Set the JMS options.
- Define the timeout options.
- Click **OK** to save the settings and close the window.

Browser Emulation Settings

You use the **Browser Emulation** settings to set the browser properties of your testing environment. You can set the browser properties in the following areas:

- ► User-Agent (browser to be emulated)
- ► Simulate browser cache
- ► Download non-HTML resources
- ► Simulate a new user on each iteration

User-Agent (browser to be emulated)

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.

Simulate browser cache

This option instructs the Vuser to simulate a browser with a cache. A cache is used to keep local copies of frequently accessed documents and thereby reduces the time connected to the network. 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 virtual users, 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.

Browser Setting	Run-Time Setting
Every visit to the page	Select Simulate Browser Cache and enable Check for newer versions of stored pages every visit to the page.
Every time you start Internet Explorer	Select Simulate Browser Cache only
Automatically	Select Simulate Browser Cache only
Never	Select Simulate Browser Cache and disable Check for newer versions of stored pages every visit to the page.

You can modify your Run-Time settings to match your browser settings for Internet Explorer, as follows:

Download non-HTML resources

This option 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

This setting 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.

To configure the Browser settings:

1 In the Run-Time settings window, click Browser Emulation.



- **2** Accept the default browser or specify a custom one.
- **3** Set the browser cache options.
- **4** Indicate whether to download non-HTML resources.
- **5** Select whether to simulate a new user for each iteration.
- 6 Click OK to save the settings and close the window.

Classpath Options

The **Classpath** settings lets 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.

To configure the Classpath settings:

1 In the Run-Time settings window, click **Classpath**.

🤌 java_test1 - Run-Time	Settings - Microsoft Internet Explorer	_ 🗆 🗵
java_test1 - Run-Time General Pacing Log Think Time Miscellaneous Java Environment Settings Java YM Classpath	Settings - Microsoft Internet Explorer Java Environment Settings:Classpath Classpath Classpath Entries:	
	Hint: Classpath Click on this link to configure relevant options	
	OK Use Defaults	Cancel

- **2** Specify the **Classpath Entries**—type in the path of the additional classes. Separate multiple entries with a semicolon.
- **3** Click **OK** to save the settings and close the window.

Client Emulation Settings

The Oracle NCA Client Emulation run-time settings let you specify the communication parameters for your NCA client. You should configure the settings to accurately emulate your Oracle NCA environment.

You can set the following options:

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.

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.

- ► Enable Heartbeat. By default, a heartbeat signal is sent to the server. To disable it, clear the check box.
- ► **Frequency.** The frequency of the heartbeat signal. The default is 120 seconds.

Forms

You can specify the version of the Oracle Forms server detected during recording.

➤ Version. 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. To configure the Client Emulation settings:

1 In the Run-Time settings window, click **Client Emulation** under Oracle NCA.

🚰 nca_test - Run-Time Settings - Microsoft Internet Explorer	
General Run Logic Pacing Log Think Time Miscellaneous Network Speed Simulation	Oracle NCA:Client Emulation Socket mode Timeout (seconds) -1 Pragma Mode Max retries 5 Retry interval (ms) 100
Dracle NCA <u>Client Emulation</u>	 Include retry intervals in transaction Enable Heartbeat Frequency (seconds) 120 Forms Version Diagnostic Applications Version 11.5.6 and up
	OK Use Defaults Cancel

- **2** In the **Socket mode** section, set the network timeout value in seconds. To instruct the client to wait indefinitely for a server response, use the default value of -1.
- **3** When working in Pragma mode, specify the number of retries **Max Retries**, (**IfError** messages) for the client to accept before issuing an error. The default is 5. If desired, specify retry options.
- **4** To send a a heartbeat to the Oracle NCA server, select **Enable Heartbeat**. In the next line, specify a frequency in seconds for the sending of the heartbeat. The default is 120 seconds.
- **5** When using the Oracle database breakdown, specify the Oracle Application version.
- 6 Click **OK** to accept the settings and close the window.

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.

You can set options in the following areas:

- 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).
- 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.
To set the Configuration Run-Time Settings:

1 Click the **Configuration** link in the Run-Time setting screen.



- **2** Set the desired client configuration options. These settings 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.
- **3** Click **OK** to accept the settings and close the window.

Download Filter Settings

The Download Filters run-time 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.

A **URL** is the complete URL address of a Web site, beginning with http:// or https://. **Host** is the name of the host machine with its domain, such as www.hp.com.

Host suffix is the common suffix for several host names, such as hp.com. This is useful where you have several Web sites on a common domain.

If you specify the sites to exclude, the Vuser downloads resources from all Web sites except for those specified in the list. If you specify the sites to include, the Vuser filters out resources from all Web sites except for those in the Include list. To configure the filter settings:

1 In the Run-Time settings window, click **Download Filters**.

🖉 web_test - Run-Time S	ettings - Microsoft Internet Explorer	
General	Internet Protocol:Download Filters	
Run Logic Pacing	O Include only addresses in list	
Loq	• Exclude addresses in list	
Think Time	Filter list + - Edit	
Miscellaneous		
Browser Browser Emulation		
Network		
Speed Simulation		
Internet Protocol <u>Preferences</u>		
Proxy		
<u>Download Filters</u>		
	Hint:	
	Lists the Web sites or hosts from which Vusers can download resources during replay	
	OK Use Defaults Can	cel

- **2** Select the desired option: **Include only addresses in list** or **Exclude addresses in list**.
- **3** Add entries to the list. To add an entry, click the plus sign. The Add Item dialog box opens.

🥙 Add Item V	Web Page Dialog	N		×
Type:	Data:	43		
URL -				
		ок	Cancel	

Select a filter type: **URL**, **Host**, or **Host Suffix**, and type the filter data, such as a URL. When entering a URL, make sure to type a complete URL beginning with **http:**// or **https:**//. Click **OK**.

- **4** To edit an entry, select it and click **Edit**.
- **5** To delete and entry, select it and click the minus sign. To delete all entries, click **Remove All**.
- 6 Click **OK** to save the settings and close the window.

Gateway Settings

You use the **Gateway** link to set the WAP Gateway settings. You can set options in the following areas:

Connection Options

The connection options specify the method that the Vuser uses to connect to the WAP gateway.

- > WAP Gateway. Run the Vusers accessing a Web server via a WAP Gateway.
- ► HTTP Direct. Run the Vusers run 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 Vuser 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 Vuser in the same mode.

If you are running the script in WAP 1.x (WSP), you can specify several connection and advanced options.

Gateway Connection Mode

The connection mode settings apply to WAP version 1.x (WSP) connections.

- Connection-oriented Mode. Set the connection mode for the WSP session to Connection-Oriented.
- Connectionless Mode. Set the connection mode for the WSP session to Connectionless.
- **Enable security.** Enable a secure connection to the WAP gateway.

To set the Gateway Run-Time Settings:

- 1 Click the Gateway link in the Run-Time setting screen, under WAP.
- **2** To replay the script in WSP mode (not HTTP), select **WAP Gateway**.
- **3** Specify an IP address and port for the gateway. You can also use the default port.
- **4** Select a WAP version: **WAP 1.x (WSP)** or **WAP 2.0 (HTTP)**.
- 5 For WAP 1.x (WSP), select a connection mode—Connection-oriented or Connectionless. To indicate a secure connection mode, select the Enable Security option.
- **6** For WAP 1.x (WSP), expand the **Advanced** node to set the client capabilities and other advanced gateway options. For more information about the Advanced Gateway options, see the *HP Virtual User Generator User Guide*.
- **7** Click **OK** to accept the settings and close the window.

Advanced Gateway Options

Open the **Advanced** option in the Gateway run-time settings to configure the WAP Capabilities and other advanced Gateway options.

- ➤ 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.
- Acknowledge headers. Returns standard headers that provide information to the gateway (disabled by default).
 - ➤ Server SDU buffer size. The largest transaction service data unit that may be sent to the server during the session (4000 by default).
 - Client SDU buffer size. The largest transaction service data unit that may be sent to the client during the session (4000 by default).
 - 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 (disabled by default).
- Support Cookies. Provide support for saving and retrieving cookies (disabled by default).
- ► WTP Segmentation and Reassembly. Enables segmentation and reassembly (SAR) in WTP, Wireless Transport Protocol. (True by default).
 - ➤ WTP Retransmission Time. The time in seconds that the WTP layer waits before resending the PDU if it did not receive a response. (5000 by default).
- ► WTLS Abbreviated Handshake. Use an abbreviated handshake instead of a full one, when receiving a redirect message. (False by default).

- ➤ WTLS Deffie Hellman. Use the Deffie Hellman encryption scheme for WTLS (Wireless Transport Layer Security) instead of the default scheme, RSA. (False by default).
 - ➤ 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. (4096 by default).

SAPGUI Settings

The SAPGUI run-time settings let you set the general settings for a SAPGUI Vuser script. Performance Center uses these settings when running the script.

- > 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 run-time 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 load test.
- ➤ 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 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. For more information, see "SAPGUI Advanced Run-Time Settings" on page 585.

To configure the SAPGUI Run-Time Settings:

1 In the Run-Time settings window, click **General** under SAPGUI.

🖉 sap_test - Run-Time Se	ttings - Microsoft Internet Explorer	_ 🗆 🗙
Sep_test - Run-Time Se General <u>Run Logic</u> <u>Pacing</u> <u>Log</u> <u>Think Time</u> <u>Miscellaneous</u> Network <u>Speed Simulation</u> <u>SAPGUI</u> <u>General</u>	SAPGUI:General Log messages on error Image: Send status bar text Image: Send active window title Image: Performance Image: Show SAP dient during replay Image: Take ActiveScreen snapshots during replay Advanced Set advanced options	
	Hint: Move the mouse over any item to see its description Move the mouse over an item to see its description OK Use Defaults (Cancel

- 2 In the Log messages on error section, select one or more message sources: Send status bar text or Send active window title.
- **3** In the **Performance** section, select the **Show SAP client during replay** check box to show the SAPGUI user interface during replay.
- **4** In the Advanced section, click **Options** to set a timeout for the **SAPfewgsvr.exe** process.
- **5** Click **OK** to save the settings and close the window.

SAPGUI Advanced Run-Time Settings

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.

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SAPGUI: Advanced Options			
Replay using running SAPlogon application			
🔲 Set SAPfewgsrv process timeout	t i i i i i i i i i i i i i i i i i i i		
Timeout to SAPfewgsrv (sec):	300		
Hint:			
Replay using running SAPlogon application Instructs replay to use currently running SAPlogon application.			
	OK Use Defaults Close		

- ► **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. The default is 300 seconds.

Java VM Settings

For Java scripts, you provide information about the Java virtual machine settings in the Java VM section. The following settings are available:

- ► Virtual Machine settings
 - ► 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 JDK specified below during replay.
- Additional VM Parameters. Type any optional parameters used by the virtual machine.
 - ► Using Xbootclasspath parameters. Replays the script with the Xbootclasspath /p option.
- ► Class Loading Settings
 - ➤ 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.

To configure the Java VM settings:

1 In the Run-Time settings window, click Java VM.



- **2** Specify the **Virtual Machine settings**—use internal logic to locate the JDK or manually indicate the JDK.
- **3** If applicable, specify additional VM parameters and whether to use Xbootclasspath parameters.
- 4 Select a Class Loading settings.
- **5** Click **OK** to save the settings and close the window.

.NET Environment Settings

The .NET environment run-time settings let you specify information about the application, such as its base path and the location of its configuration file.

AUT Configuration

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 that 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.

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.

Concurrency

➤ 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 load 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*.

To configure the .NET Environment settings:

1 In the Run-Time settings window, click **.NET Environment**.

🙋 remotingsimple1 - Run-	Time Settings - Microsoft Internet Explorer	
General Pacing Log Think Time Miscellaneous .Net .NET Environment	Net: .NET Environment AUT configuration AUT Application Base Path V:\aut\.NET remoting\us\32\TypesSimple\bin\Debug\Typ Concurrency AppDomain Per Vuser true	∖ esSim
	NET Environment Click on this link to configure relevant options OK Use Defaults Canc	el
	OK Use Defaults Canc	el

- **2** Set the base folder of the DLLs in the **AUT Application Base Path** box.
- **3** Set the path of the recorded application in the **AUT Configuration File** box.
- **4** The recommended setting for **AppDomain Per Vuser** is true, the default.
- **5** Click **OK** to accept the settings and close the window.

Preferences (Internet)

You use the **Internet Protocol Preferences** Run-Time Settings, to control the Vusers in the following areas:

- ► Image and Text Checks
- ► Generating Web Performance Graphs
- ► Advanced Web Run-Time Options

Image and Text 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.

Generating 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 the 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.

Advanced Web Run-Time Options

➤ WinInet Replay. Instructs Vusers to use the WinInet replay engine instead of the standard Sockets replay. There are two HTTP replay engines: Socketsbased (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 load 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 load 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 Run-Time viewer create snapshots more accurately and display them quicker.

Additional Options for Internet Preferences

Click the **Options** button in the Advanced section of the Preferences Run-Time settings, 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.

нттр

- ► **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 (enabled by default).

- ➤ Accept-Language request header. Provides a comma-separated list of accepted languages. For example, en-us, fr, and so forth.
- ► 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 (default value is 120 seconds). Note that 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 value is 120 seconds).

- ➤ 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 is 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 that by accepting compressed data, you may significantly increase the CPU consumption. The default is to accept gzip, deflate compression.

General

- ➤ 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 Vuser 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 (No, by default). For more information, see the *HP Virtual User Generator User Guide*.
- 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 (disabled by default).
- ➤ 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 that 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.

- 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. The default is 12K bytes. The maximum size is 0x7FFF FFFF.
- ► **Print NTLM information.** Print information about the NTLM handshake to the standard log.
- Print SSL information. Print 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. The default is 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. The default is 2.
- ContentCheck values in UTF-8. Store the values in the ContentCheck XML file in UTF-8.

Authentication

- ➤ 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 is 0).
- ➤ Disable NTLM2 session security. Use full NTLM 2 handshake security instead of the more basic NTLM 2 session security response (default is No).
- ► 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 is No).
- ➤ 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 is No).

Log

- 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.

Web (Click and Script) Specific

- ► General
 - ► Home Page URL. The URL of the home page that opens with your browser (default is about:blank).
 - ► **DOM-based snapshots.** Generates snapshots from the DOM instead of from the server responses (**Yes** by default).

- 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. The default is No, issuing a warning message only after a JavaScript error, but continuing to run the script.
- 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.
- ► Timers
 - 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 is 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 is 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 is 30 seconds).
 - ► Reestablish setInterval at end of step. 0 = No; 1 = Once; 2 = Yes.

► History

- ➤ History support. Enables support for the window.history object for the test run. The options are Enabled, Disabled, and Auto. The Auto option (default) instructs Vusers to support the window.history object only if it was used in the first iteration. Note that by disabling this option, you improve performance.
- ► Maximum history size. The maximum number of steps to keep in the history list (default is 100 steps).
- > Navigator Properties
 - navigator.browserLanguage. The browser language set in the navigator DOM object's browserLanguage property. The default is the recorded value. 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. The default is the recorded value. 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. The default is the recorded value. Scripts created with older recording engines, use en-us by default.
- ► Screen Properties
 - screen.width Sets the width property of the screen DOM object in pixels (default is 1024 pixels).
 - screen.height Sets the height property of the screen DOM object in pixels (default is 768 pixels).
 - screen.availWidth Sets the availWidth property of the screen DOM object in pixels (default is 1024 pixels).
 - screen.availHeight. Sets the availHeight property of the screen DOM object in pixels (default is 768 pixels).
- ► Memory Management
 - 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 is 16384 bytes).

- ➤ Memory Manager for dynamically-created DOM objects. Yes—Use the Memory Manager for dynamically-created DOM objects. No—Do 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 is 256 KB).
- ► JavaScript Stack memory size (KB). Specifies the size of the JavaScript stack memory in kilobytes (default is 32 KB).

To configure the Web Preferences settings:

1 In the Run-Time settings window, under the Internet Protocol section, click Preferences.



2 Set the desired options in the Checks, Graphs, and Advanced categories.

- **3** To set advanced options, click the **Options** button. Read the hints to determine if the option is recommended for your test.
- **4** Click **OK** to save the settings and close the window.

Proxy Options

You use the **Proxy** Run-Time Settings to set the proxy-related settings. The following proxy options are available in the Run-Time settings.

- ► 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.
- ➤ Use custom proxy. Use a custom proxy server. for all Vusers. You can supply the actual proxy server details or the path of a proxy automatic configuration script (.pac file) that enables automatic configuration. (See "Setting the Automatic Proxy Configuration" on page 599.)

To supply the details of the server, you specify its IP address or name and port. You can specify one proxy server for all HTTP sites, and another proxy server for all HTTPS (secure) sites.

After providing the proxy information, you can specify Authentication information for the proxy server, and indicate Exceptions to the proxy rules.

Setting the Automatic Proxy Configuration

Automatic Proxy Configuration is a feature supported by most browsers. This feature allows 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. You can instruct Performance Center or your Internet Explorer browser to work with a configuration script. You specify a file for the automatic proxy configuration, so that when the Vuser runs the test, it uses the rules from the proxy file.

To specify a configuration script in Performance Center:

- 1 In the **Run-Time** settings window, and click the **Proxy** link.
- **2** Select **Use custom proxy** and select the **Use automatic configuration script** option. Specify the location of the script.

To specify a configuration script in Internet Explorer (IE):

- **1** Select **Tools** > **Internet Options**, and select the Connections tab.
- 2 Click the LAN Settings button. The LAN Settings dialog box opens.
- **3** Select the **Use automatic configuration script** option, and specify the location of the script.

Authentication

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.

Exceptions

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.

To configure the Proxy settings:

1 In the Run-Time settings window, under the Internet Protocol section, click Proxy.

General	Internet Protocol:Proxy
Run Logic Pacing	O No proxy (direct connection to the Internet)
Log	C Obtain the proxy settings from the default browser
Think Time	O Use custom proxy
Miscellaneous	Use automatic configuration script
Browser	Address:
Browser Emulation	✓ Use proxy server
Speed Simulation	HTTP (Address of proxy to use)
Internet Protocol	Port 0
<u>Preferences</u>	HTTPS(Address of proxy to use)
<u>Proxy</u>	Port 0
Download Filters	Use same proxy server for all protocols
	Exceptions Exceptions
	Authentication Authentication
	Hint:
	For all vusers, make the connection to the internet directly, without using a proxy server.
	OK Use Defaults Cancel

- **2** Select the desired proxy option: No proxy, Obtain the proxy settings from the default browser, or Use custom proxy.
- **3** If you specified a custom proxy:
 - ► indicate the IP addresses for the HTTP and HTTPS proxy servers
 - To use a pac or JavaScript file to indicate the proxy, select the Use automatic configuration script option and specify the script location. You can specify either a web location beginning with http:// (for example, http://hostname/proxy.pac), or a location on the file server, for example, C:\temp\proxy.pac.

- **4** To specify URLs that you want Vusers to access directly, without the proxy server, click **Exceptions** and then supply the list of these URLs. In the Exceptions dialog box, you can also specify direct access to local (Intranet) addresses.
- **5** If the proxy server requires authentication, click **Authentication**, and then supply the relevant password and user name.
- **6** Select the **Use the same proxy server for all protocols** check box to use the same proxy server for all Internet protocols (HTTP, HTTPS) rather than specifying a specific server for secure sites.
- 7 Click **OK** to accept the settings and close the window.

To track the behavior of the Vusers, generate a log during text execution and view the Execution Log tab or the mdrv.log file. The log shows the proxy servers that were used for each URL. In the following example, the Vusers used a direct connection for the URL australia.com, but the proxy server aqua, for the URL http://www.MyLab.com.

```
Action1.c(6): t=1141ms: FindProxyForURL returned DIRECT
Action1.c(6): t=1141ms: Resolving australia.com
Action1.c(6): t=1141ms: Connecting to host 199.203.78.255:80
...
Action1.c(6): t=1281ms: Request done "http://australia.com/GetElementByName.htm"
...
Action1.c(6): web_url was successful, 357 body bytes, 226 header bytes
Action1.c(15): web_add_cookie was successful
Action1.c(17): t=1391ms: FindProxyForURL returned PROXY aqua:2080
Action1.c(17): t=1391ms: Auto-proxy configuration selected proxy aqua:2080
Action1.c(17): t=1391ms: Resolving aqua
Action1.c(17): t=1391ms: Connecting to host 199.203.139.139:2080
...
Action1.c(17): t=1578ms: 168-byte request headers for "http://www.MyLab.com/"
(RelFrameId=1)
Action1.c(17): GET http://www.MyLab.com/ HTTP/1.1\r\n
```

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 and 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 makes it easier 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 run-time settings:

- ➤ Network Type. Accounting network type: GPRS (General Packet Radio Service) or CSD (Circuit-Switched Data).
- ► IP Address. IP address of the Radius server.
- > Authentication port number. Authentication port of the Radius server.
- > Accounting port number. 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. The default is 120 seconds.
- ► **Retransmission retries.** The number of times to retry after a failed transmission. The default is 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. The default is 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.

To set the WAP Radius options:

- **1** Click the **Radius** link under WAP in the Run-Time settings window.
- **2** Select an accounting **Network type**: GPRS (General Packet Radio Service) or CSD (Circuit-Switched Data).
- **3** Type the **IP address** of the Radius server in dot form.
- **4** Type the **Authentication Port number** and **Accounting Port number** of the Radius server.
- **5** Type in the **Secret key** for Radius or Accounting Authentication.
- **6** Type a **Connection Timeout** value.
- **7** Specify the number of **Retransmission retries**.
- **8** Specify whether you want the Vusers to **store attributes returned by the server to parameters**.
- **9** Click **OK** to accept the settings and close the window.

RTE Settings

Terminal Emulator run-time 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.

Modifying 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**.

To set the maximum number of times that a Vuser will try to connect, type a number in the **Maximum number of connection attempts** box in the RTE Run-Time settings. By default, a Vuser will try to connect 5 times.

Specifying an 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. To connect using the device name (that is contained within the com_string parameter of the **TE_connect** function), select the **Use original device name** option in the RTE Run-Time settings.

The original device name setting only applies to IBM block-mode terminals. By default, Vusers use original device names to connect.

Setting the Typing Delay

The delay setting determines how Vusers execute **TE_type** functions.

To specify the amount of time that a Vuser waits before entering the first character in a string, type a value in the First key box, in milliseconds.

To specify the amount of time that a Vuser waits between submitting successive characters, type a value in the Subsequent keys box, in milliseconds.

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.

Configuring the 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

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) in the Timeout section of the RTE Run-Time settings.

The default timeout value is 60 seconds.

Stable Time

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) in the Stable time box of the RTE Run-Time settings. The default stable time is 1000 milliseconds.

To configure the RTE settings:

1 In the Run-Time settings window, click **RTE**.



- **2** Specify the relevant setting as described above.
- **3** Click **OK** to save the settings and close the window.

Server and Protocol Settings

The following section describes the run-time settings specific to MMS (Multimedia Messaging Service) Vusers. These run-time setting allow you to configure the **Server and Protocol** settings. You can set the following options:

- ► 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. The default value is 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. (default)
 - Per Send or Receive. Connect and disconnect at the beginning and end of each message.
 - ► None. Do not use automatic WAP connections.
- ➤ Default Sender address. The default address sent in the Sender header. The default is +999999.

To set the MMS Server and Protocol settings:

- 1 Click the Server and Protocols link under the MMS Run-Time settings.
- **2** Select the desired values as explained above.
- **3** Select **Miscellaneous** from the Run-Time settings tree, under **General**.
- **4** Under Multithreading, select **Run Vuser as a process**.
- **5** Click **OK** to accept the settings and close the window.

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. The following options are available:

- ➤ 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.

To configure the Network settings:

1 In the Run-Time settings window, click **Speed Simulation**.

🖉 ws_test - Run-Time Set	tings - Microsoft Internet Explorer
General	Network:Speed Simulation
Pacing	Metwork Speed
Think Time	O Use maximum bandwidth
Miscellaneous	C Use bandwidth
Network	Select speed : 14.4 Kbps (Analog modem)
Speed Simulation	C Use custom bandwidth (bps)
	Set the bandwidth :
	Hint:
	Set the bandwidth Specify bandwidth limit for the Vuser to emulate. The bandwidth should be specified in bits.
	OK Use Defaults Cancel

- **2** Specify a network setting. When relevant, specify the applicable bandwidth.
- **3** Click **OK** to save the settings and close the window.

Timing Settings

The Citrix Timing run-time 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.

1 In the Run-Time settings screen, under Citrix, click the Timing link .

🖉 citrix_test1 - Run-Time	Settings - Microsoft Internet Explorer	_ 🗆 🗙
General Run Logic Pacing Log Think Time Miscellaneous Network Speed Simulation Citrix Configuration Timing	Citrix: Timing Timeout Connect time 180 Waiting time 60 Typing rate 150	
	Hint: Timeout Move the mouse over an item to see its description	
	OK Use Defaults (Cancel

- **2** Indicate the **Connect Time**, the time in seconds to wait idly at an established connection before exiting. The default is 180 seconds.
- **3** Indicate the **Waiting Time**, the time in seconds to wait idly at a synchronization point before exiting. The default is 60 seconds.
- **4** Specify a **Typing rate**, the delay in milliseconds between keystrokes.
- **5** Click **OK** to accept the settings and close the window.

Part VI

User Management
37

Introducing User Management

The User Management module enables you to view and manage project information, user information, and project-user-role assignments, and view project-related user roles and privileges.

Note: To manage users, projects, and project-user-role assignments in the User Site, a Performance Center administrator must grant you the appropriate permissions from the Administration site. For more information, contact your Performance Center administrator.

- ➤ For more information about viewing and managing Performance Center users, see Chapter 38, "Users."
- ► For more information about user roles, see Chapter 28, "User Roles."
- ➤ For more information about viewing and managing Performance Center projects, see Chapter 40, "Performance Center Projects."
- ► For more information about managing project-user-role assignments, see Chapter 41, "Privilege Management."

Chapter 37 • Introducing User Management

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Users

This chapter describes how to view and manage Performance Center users.

This chapter includes:

- ► Understanding User Information on page 616
- ► Managing Your Personal Details on page 617
- ► Users Page at a Glance on page 618
- ► Managing Performance Center Users on page 620

Understanding User Information

You view and manage your personal details and other users' details on the Personal Details and Users pages. This information includes the user's login details, personal details, and other general information.

	Detail	Description	
Login Details	User Name	The user's user name for logging in to Performance Center.	
	Password Confirm Password	The user's password for logging in to Performance Center.	
		(Not available when adding LDAP/SSO users, where the password is stored in the records of the respective system.)	
	Account Expiration	 Account Expires. The expiration date of the user account. 	
		 Account Never Expires. The user account never expires. 	
Details	Full Name	The user's full name.	
	Email	The user's email address.	
Personal	Additional Data	Any additional relevant information about the user.	
uo	User Creator	The name of the user who created the user account—recorded automatically when the user is created. It cannot be edited.	
ormati	Status	The status of the user— Active or Not active .	
l Inf		(Not editable for LDAP/SSO users.)	
Genera		Note: A user with a Not Active status cannot log in to Performance Center.	
	Creation Date	The date the user account was created in the system.	

Managing Your Personal Details

You view your personal details on the Personal Details page.

If you have **Edit Personal Information** privileges, you can also edit your personal details.

To view and edit your personal details:

1 On the Performance Center left menu, select User Management > Personal Details.

Personal Details					
User Details	for User Name: A	dmin			
User Name:	Admin	Full Name:	Admin	User Creator:	Admin
Password: Confirm Password O Account Expires	••••••	Email: Additional Data:	bob.smith@hp.com Do Not change User Status.	Status: Creation Date:	Active
Account Never Expires				Save	Restore

- **2** Edit your details. (See "Understanding User Information" on page 616.)
- **3** To revert back to the original details without saving your changes, click **Restore**.

To save your changes, click Save.

Users Page at a Glance

The Users page displays a list of all the users in your current project.

To access the Users page, on the Performance Center left menu, select **User Management > Users**.

Users	5						
* X	Φ						
User Id	▲ User Name	2		Full Name		Status	Expires
							•
1	Admin			Admin		 ✓ 	
2	oleg			Oleg Gilenko	,	 Image: A set of the set of the	
3	benny			Benny Mizra	chi	 ✓ 	
4	efrat			Efrat Mininb	erg	 Image: A second s	
5	ayala			Ayala Alon		 ✓ 	
6	menny			Menny Mena	ahemov	×	
7	michal			Michal Cohen		 ✓ 	
8	rnuriel			Roy Nuriel		×	
9	katya			Ekaterina No	vikova	 ✓ 	
10	vova			Vova Chukha	alenok	 Image: A second s	
Displaying	10 💌 iten	ns per page (1 - 10	of 22)				≪ <u>1</u> /3 ≫
User In	formation fo	or User Name: /	Admin				
User Nam	ie:	Admin		Full Name:	Admin	User Cre	ator: Admin
Password		•••••	•••••	Email:	Admin@mercury.com	n Status:	Active
Confirm Password		Additional Data	-	Creation	Date: Jul 9 2008		
O Account Expires							
⊙ Accoun	O Account Never Expires Save Restore						

The Users page includes the following components:

► User list. Displays all of the users in your current project.

By default the table displays 10 users at a time. To change the number of users displayed in the list, select the appropriate number in the **Displaying** <**n>** items per page area. You can display 10, 15, or 20 users per page.

22	steve_paris	Steve Paris	×	
37	syedh	Syed Hussainy	 Image: A second s	
Displaying	10 🔹 items per page (1 - 10 of 3	20)	~~	1 /32 »

➤ User Information pane. Displays the details of the user selected in the list.

Refreshing the List of Users

 $|\phi|$

➤ To refresh the list of users, click the **Refresh** button on the toolbar.

Sorting and Filtering the List of Users

➤ You can sort the users 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.

> You can filter the users using the filter boxes below the column headings.

In the filter boxes below the column headings, type the relevant text or select values from drop-down lists. Press ENTER. The table displays users according to the selected filter options.

Notes:

- The filter supports partial text entries. For example, if you type th, the filter results might include Seth, Thomas, and Anthony. The filter does not support regular expressions or the following characters: :; & * \ ' / # ~ ,? { } \$ % | <> + = `^[]!
- Sort order and filter settings are saved per user, per project. The next time you access the Users page in a specific project, the page displays your most recent sort order and filter.

Managing Performance Center Users

You view and manage Performance Center users in your projects from the Users page. You can modify or delete users, and create users.

Note: You must have the appropriate user management privileges to perform these tasks, as described in the sections below.

Creating Users

If you have **Create user** privileges, you can create Performance Center users in your projects.

To create a user:

- **1** On the Performance Center left menu, select **User Management > Users**.
- **2** On the Users page, click the **Add New User** button on the toolbar. The Add New User dialog box opens.

*

- **3** Enter the new user's details. (See "Understanding User Information" on page 616.)
 - **a** Enter a user name and password for the new user. Re-enter the password for confirmation.

Note: When creating LDAP or SSO users, the password fields are not available. The password is taken from the user records in the respective system.

- **b** Enter the user's full name, email address, and any additional details.
- **c** Select an expiration option:
 - ➤ To set an expiration date for the user account, select Account Expires, click the calendar icon, and select a date. The expiration date must be later than the current date.
 - ➤ To create a user account that never expires, select Account Never Expires.
- **d** Select a status for the user—Active or Non Active.

Note: A user must have the **Active** status in order to log in to Performance Center.

4 Click **Add**. The user is added to the list of users and is automatically assigned to the current project with the role, **Guest**. For more information about project-user-role assignments, see Chapter 41, "Privilege Management."

Editing User Information

If you have **Edit user** privileges, you can edit user information.

To edit a user's details:

- 1 On the Performance Center left menu, select User Management > Users.
- **2** Select the user whose details you want to edit. The details are displayed in the User Information pane.

Note: To edit details of users assigned to the Performance Center or All Projects containers, you must have **Edit user** privileges in the Administration Site. For more information, contact your Performance Center administrator.

- **3** Edit the details. (See "Understanding User Information" on page 616.)
- **4** To revert back to the original details without saving your changes, click **Restore**.

To save your changes, click Save.

Deleting Users

If you have **Delete user** privileges, you can delete users from Performance Center.

To delete a user:

- 1 On the Performance Center left menu, select User Management > Users.
- **2** Select the user you want to delete, and click the **Delete User** button on the toolbar.

Note: To delete users assigned to the Performance Center or All Projects containers, you must have **Delete user** privileges in the Administration Site. For more information, contact your Performance Center administrator.



3 Click **OK** to confirm that you want to delete the user.

The user is deleted from the list of users.

Chapter 38 • Users

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User Roles

This chapter describes roles in Performance Center. Roles are groups of permissions assigned to users. A role determines what information a user is allowed to access, and which tasks the user can perform.

This chapter includes:

- ► User Roles Page at a Glance on page 626
- ► Understanding User Roles on page 627
- ► Canned Roles on page 628
- ► Understanding Role Permissions on page 630
- ► Assigning Roles to Users on page 636

User Roles Page at a Glance

You view user roles on the Roles page (User Management > Roles).

Note: To access the Roles page in the User Site, you must have Assign user to role and/or Remove user from role privileges.

In the User Site, the Roles page displays Project roles in read-only format. The roles are displayed on the left, and the role properties on the right.

Project	LT Adviser Properties					
Role: Filter	Name: LT Adviser Description: Canned user - load test adviser user can view run screen, view groups and graphs, and perform manual operations on vusers Permissions					
En <u>Foiect Manager</u>	Load Testing Design Load Test Managemen Create load test Edit load test Delete load test Edit acript Edit script details Delete script Edit script	Resource Management	Load Testing Run time Dashboard Management Configure SLAs Configure SLAs Delete SLAs Delete SLAs Dilete SLAs Dilet			
	Messages					

Note: You cannot edit or delete the roles, nor create new roles.



The list of roles displays **canned roles** which are predefined groups of permissions, and **user-defined roles**, that is, roles made up of user-defined groups of permissions.

Understanding User Roles

Performance Center has two types of roles:

- Performance Center roles. Allow users to perform Performance Center administrative tasks, including:
 - Management of Performance Center assets, that is, projects, users, roles, and license information
 - Management of Performance Center system resources, that is, hosts, host pools, timeslots and runtime information
 - ► General server administration

Note: Performance Center roles can be viewed and managed in the Administration Site only. In the User Site, you can perform limited Performance Center administrative tasks including user management, project management, and project-user-role assignment only. To do this, a Performance Center administrator must grant you the appropriate permissions in the Administration Site. For more information, contact your Performance Center administrator.

- ► **Project roles.** Allow users to perform project-related tasks, including:
 - > Managing project-related resources, that is hosts and timelsots
 - Defining load test settings, monitor profiles, Dashboard settings, and other general settings
 - Defining load test run-time settings for tasks that you can perform on running load tests

Performance Center has **canned roles** which are predefined groups of permissions. For more information about the canned roles in Performance Center, see "Canned Roles" on page 628.

Roles can also be **user-defined**, that is, made up of user-defined groups of permissions. For more information about creating and managing user-defined roles, see the *HP Performance Center Administrator Guide*.



<u>2</u>1

Filtering Roles

To locate a specific role, you can filter the list of roles by role name.

To filter the list of roles:

- **1** In the **Role** box, enter the name of the role you are looking for.
- **2** Click **Filter**. The list displays all the roles whose names contain the string that you entered.

Note: The filter supports partial text entries. For example, if you enter th, the display list might include **Seth**, **Thomas**, and **Anthony**.

To clear the filter:

► In the **Role** box, clear the text and click **Filter**. All the roles are redisplayed.

Canned Roles



Performance Center comes packaged with predefined roles, called **canned roles**. For example, the **Project Manager** role is a canned role that grants a user permission to perform all project management tasks.

The following table describes the canned roles that are built into Performance Center.

Canned Role	Description	
Administrator (Performance Center role - Administration Site only)	 Privileges: Can perform Performance Center administration —project/user/roles/licence management Can manage Performance Center resources— hosts and servers, events Can manage reports and general Performance Center administration settings 	
Project Manager (Project role)	 Manages the engagement between the LOB (Life of Business) and the COE (Center of Excellence). Not expected to perform any load testing (although he has permissions to do so), but rather ensures that the project works as planned. Privileges: Can manage projects and project resources Can manage reports, Dashboard, events 	
Power Tester (Project role)	 Load testing user. Can manage limited resource tasks. Privileges: Can configure and run load tests Can share/import/export project-related assets Can publish to Dashboard Can reboot machines 	
Tester (Project role)	Load testing user. No resource management privileges. Privileges: ➤ Can configure and run load tests	

Canned Role	Description
LT Adviser (Project role)	 Privileges: Can monitor load test runs, Vuser groups, graphs Can perform manual operations on Vusers and Vuser groups
Guest (Project role)	 Privileges: Can edit personal details and configure own graphs Can monitor load test runs, graphs, Vuser groups

Understanding Role Permissions

Roles include permissions for performing administrative or project-related tasks in the Performance Center system.

Some permissions are directly associated with other permissions. If a role includes such a permission, it automatically includes the associated permissions too.

For example, creating a load test is directly associated with editing a load test, so if a role includes the **Create load test** permission, it automatically includes the **Edit load test** permission too.

This section describes:

- ► "Performance Center Role Permissions" on page 631
- ► "Project Role Permissions" on page 632

Performance Center Role Permissions

This section describes permissions for administrative tasks that you can perform from the User Site.

Note: To view and edit these permissions, you must be logged in to the Administration Site with the appropriate Role Management privileges.

Permission	Description	
Project Management		
Create project	Allows the user to create projects	
	Associated with:	
	► Edit project	
Edit project	Allows the user to edit projects	
Delete project	Allows the user to delete projects	
User Management		
Create user	Allows the user to create Performance Center users.	
	Associated with:	
	► Edit user	
	► Edit user personal information	
Edit user	Allows the user to edit user details	
	Associated with:	
	► Edit user personal information	
Delete user	Allows the user to delete users	
Assign user to role	Allows the user to assign roles to users, and to change user-role assignments	
Domotio usor from rolo	Allows the user to remove user role assignments	
Kentove user from fole	from projects, and to change user-role assignments	
Edit personal information	Allows the user to edit personal information	

For information about permissions for administrative tasks in the Administration Site only, see the *HP Performance Center Administrator Guide*, or contact your Performance Center administrator.

Project Role Permissions

This section describes permissions for project-related tasks.

Load	Testing	-	Design	Permissions
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Permission	Description
Load Test Management	
Create load test	Allows the user to create load testsAssociated with:➤ Edit load test
Edit load test	Allows the user to edit load tests
Delete load test	 Allows the user to delete load tests Associated with: Delete run Delete timeslot Delete monitor profile Delete run results
Upload script	Allows the user to upload scripts from VuGen
Edit script details	Allows the user to edit script details on the User Site Vuser Scripts page
Delete script	Allows the user to delete scripts

Permission	Description		
Monitor Profile Management			
Create monitor profile	Allows the user to create monitor profiles		
	Associated with:		
	► Edit monitor profile		
Edit monitor profile	Allows the user to edit monitor profiles		
Delete monitor profile	Allows the user to delete monitor profiles		
Dashboard Management			
Configure SLAs	Allows the user to create and edit service level agreements		
Delete SLAs	Allows the user to delete service level agreements		
Publish SLA statuses	Allows the user to publish service level agreement statuses to the Dashboard		
General			
Edit user personal data	Allows the user to edit personal information		
Download applications	Allows the user to download applications from the Downloads page		
Integration with VuGen	Allows the user to enable integration with Standalone VuGen		
	Associated with:		
	► Upload scripts		
Integration with Analysis	Allows the user to enable integration with Standalone Analysis		

Permission	Description	
Timeslot Management		
Create timeslot	Allows the user to create timeslots	
	Associated with:	
	► Edit timeslot	
Edit timeslot	Allows the user to edit timeslots	
Delete timeslot	Allows the user to delete timeslots	
Create Autostart	Allows the user to configure the Autostart feature	
	Associated with:	
	► Run load test	
	► Create timeslot	
	► Edit timeslot	
Resource Management		
Reboot machine	Allows the user to reboot Performance Center servers/hosts	
Check host	Allows the user to check the status of Performance Center servers/hosts	
Kill process	Allows the user to end running processes on Performance Center servers/hosts	
Edit host (partial)	Allows the user to change the state of Performance Center hosts on the User Site	

Project Resource Management Permissions

Permission	Description			
Run-Time Operations				
Run load test	Allows the user to run load tests (create runs)			
Stop run	Allows the user to stop runs			
Delete run	Allows the user to delete runsAssociated with:➤ Delete run results			
Manual operation during run	Allows the user to change run-time settings during a run			
Add run notes	Allows the user to add summary information about a run			
Collate/Analyze results	Allows the user to collate or analyze run resultsAssociated with:➤ Stop run			
Upload files to Results page	Allows the user to upload files to the Load Test Results page			
Configure scenario schedule	Allows the user to create load test schedules			
Delete run results	Allows the user to delete load test results			

Load Testing - Run-Time Permissions

Assigning Roles to Users

In order to access Performance Center, a Performance Center user must be assigned at least one role in at least one active project.

If you have **Assign user to role** privileges, you can assign roles to users in your projects. You create project-user-role assignments on the Privilege Management page.

To access the Privilege Management page from the Roles page, click the **Assign Project-User-Role** button. For details on assigning roles to users in Performance Center projects, see Chapter 41, "Privilege Management."

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Performance Center Projects

This chapter describes how to manage projects in Performance Center. Project details includes a project's name, status, Vuser limit, machine limit, and other information about the project. You can view, add, edit, and delete project information.

This chapter includes:

- ► Viewing Project Information on page 637
- ► Managing Performance Center Projects on page 640

Viewing Project Information

If you have Project Management privileges, you can view and manage your projects in the User Site. The Projects page displays a list of all of your active projects.

To access the Projects page, on the Performance Center left menu, select **User Management > Projects**.

The **Project Information** pane below the list of projects displays information about the project selected in the list. This information includes:

Detail	Description
Project Name	The name of the project.
Project Status	The status of the project in the Performance Center system. The status can be Active or Not Active .
	Note: In order to log in to Performance Center, at least one of the projects to which a user is assigned must be active .

Detail	Description	
Running Vusers on Controller	Enables users to run Vusers on the Controller. This provides greater flexibility when resources are scarce.	
	To give users more control in advanced projects, the Allow project users to override this selection option allows project users at the administration level to override the Running Vusers on Controller setting.	
	Note: For best results, running Vusers on dedicated load generators is recommended. Running Vusers on the Controller can overload the machine and affect load test results.	
Vuser Limit	The maximum number of Vusers a project can run at once. The total number of Vusers used by all of the project's concurrent load tests must not exceed this limit.	
Machine Limit	The maximum number of host machines a project can use at once. The total number used by all of the project's concurrent load tests must not exceed this limit.	
Concurrent Runs	The maximum number of concurrent runs allowed within the project.	
Host Pool	Specification of what class of host machines should be assigned to the project for load tests. If you have administrative privileges, you can edit the set of available pools. For details, see the <i>HP Performance Center Administrator</i>	
Creation Date	The date and time the project was created in the system	
Expiration Date	The date and time the project's validity expires	
Use Target IP Definitions	Allows the user to define IP addresses to use as targets for load testing. For details, see "Using IP Addresses" on page 642.	
J2EE\.NET Diagnostics Server	The J2EE\.NET Diagnostics Server selected for the project. For details on adding J2EE\.NET Diagnostics Servers to Performance Center, see the <i>HP Performance Center</i> <i>Administrator Guide</i> .	

Sorting the List of Projects

You can sort the projects in the list 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.

Filtering the List of Projects

To locate a specific project, you can filter the list of projects by project name.

To filter the list of projects:

- **1** In the **Find project** box, enter the name of the project. The filter supports partial text entries. For example, if you enter th, the display list might include **Seth**, **Thomas**, and **Anthony**.
- **2** Click **Find**. The list displays all the projects whose names contain the string that you entered.

To clear the filter:

> Click the **Show All** button. All the projects are redisplayed.

Notes:

- ➤ The filter supports partial text entries. For example, if you type th, the filter results might include Seth, Thomas, and Anthony. The filter does not support regular expressions or the following characters: :; & * \ ' / # ~ , ? { } \$ % | <> + = `^[]!
- ➤ Sorting and filtering settings are saved per user, per project. The next time you access the Projects page in a specific project, the page displays your most recent sort order and filter.

Managing Performance Center Projects

You manage Performance Center projects from the Projects page.

Note: To manage Performance Center projects, you must have Project Management privileges. For more information, see "Performance Center Role Permissions" on page 631.

This section includes:

- ► "Creating Performance Center Projects" below
- ► "Editing Project Information" on page 644
- ► "Deleting Performance Center Projects" on page 644

Creating Performance Center Projects

If you have **Create project** privileges, you can create Performance Center projects.

To add a project:

- **1** On the Performance Center left menu, select **User Management > Projects**.
- **2** On the Projects page, click **Add New Project**. The Project Information pane (below the list of projects) changes to Add mode and displays an empty Project Information form.
- **3** Enter details of the new project. (See "Viewing Project Information" on page 637.)
 - **a** Enter a name for the project.
 - **b** Select the **Project Status**—either **Active** or **Not Active**.
 - c Select whether to allow Vusers to run on the Controller.
 - > Under Running Vusers on Controller, select Disable or Enable.
 - ➤ To allow Vusers to override this selection, select Allow project users to override selection.

- **d** In the **Vuser Limit** box, enter the maximum number of Vusers a project can run at a time.
- **e** In the **Machine Limit** box, enter the maximum number of host machines a project can use at a time.
- **f** In the **Concurrent Runs** box, enter the maximum number of concurrent runs allowed within a project.
- **g** From the **Host Pool** list, select the class of host machines that should be assigned to the project.
- **h** Set an expiration date for the project.
 - ➤ Under Expiration Date, click the Select expiration date link. A calendar window opens. Select the desired date and time (this must be later than the current date), and click Set. The calendar closes and the account expiration date is updated.
 - ➤ To create a project that never expires, select **Never Expires**.
- **i** To use IP addresses as targets for load testing, select the **Use Target IP Definitions** option. Later, you must define the IP addresses to use as targets for load testing. For details, see "Using IP Addresses" below.
- **j** If you are working with HP Diagnostics, select a **J2EE**\.**NET Diagnostics Server** from the list. For more information about adding Diagnostics Servers to Performance Center, see the *HP Performance Center Administrator Guide*.
- **4** Click **Add**. The project is added to the list, and you are assigned to the project with the role **Guest**.

Using IP Addresses

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 1111111 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** (or in binary form, **1111111 1111111 1111111 1111111**), 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 load tests.

Defining Target IP Addresses

If a project is set to **Use Target IP definitions**, you must define a target IP address. The project's load tests are targeted to these addresses. If no addresses are defined, the project's load tests cannot run.

By default, this option is not selected, and the project can target its tests to any IP address.

To limit your load test to one or more individual IP addresses, type the IP addresses along with the following mask address: **255.255.255.255**.

To limit your load test to a network of target IP addresses, type the correct IP and Subnet mask combination that your network administrator has provided for your organization.

To define target IP addresses for a project:

- **1** On the Projects page, select the project from the list. The Project Information pane displays the selected project's information.
- **2** If **Use Target IP Definitions** has not been selected, click **Edit** to change the Project Information area to edit mode, and select it.
- 3 Click Save.
- **4** Below the Project Information pane, click **Define Target IP**. The Define Target IP Addresses for Project dialog box opens.

🗿 Target IP - Microsoft Internet Explorer 📃 🔲 🗙				
Define Target IP Addresses for Project: CrSPrOjeCt				
Define target IP and mask addresses for load testing in Project CrsProject.				
Note: If the 'Use Target IP Definitions' checkbox is checked, and IP addresses aren't defined, load tests for this Project will not run in Performance Center. Please define IP target addresses or uncheck the 'Use Target IP Definitions' checkbox. New Line				
IP Address	Mask			
	255 . 255 . 255 . 255	8		
Save Close				

- **5** In the **IP Address** column, enter a target IP address.
- **6** To add another IP address, click **New Line** and enter the address.
- **7** To edit an address, place the cursor in the box you want to edit, and type the new address.
- X
- **8** To delete a line, click the **Delete Line** button for the relevant IP address.
- 9 Click Save to save changes and close the dialog box.

Editing Project Information

If you have **Edit project** privileges, you can edit project information.

To edit a project's details:

- **1** On the Performance Center left menu, select **User Management > Projects**.
- **2** On the Projects page, select the project whose information you want to edit.
- **3** Click **Edit**. The Project Information pane changes to Edit mode.
- **4** Edit the information in the editable fields. (See "Viewing Project Information" on page 637.)

Note: If you edit the project's host pool allocation, reserved timeslots may not appear in the Timeslots page.

5 Click **Save** to save changes to the project's information.

Deleting Performance Center Projects

If you have **Delete project** privileges, you can delete Performance Center projects.

Notes:

- If you delete the project you are currently logged in to, you will automatically be logged out of the system.
- Deleting a project also deletes associated load test results, test definitions, Vuser scripts, and monitor profiles from the system.

To delete a project:

- **1** On the Performance Center left menu, select **User Management > Projects**.
- **2** On the Projects page, select the project you want to delete and, below the Project Information pane, click **Delete**.
- **3** Click **OK** to confirm that you want to delete the project.

The project is deleted from the list of projects.

Chapter 40 • Performance Center Projects

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Privilege Management

The Privilege Manager stores all the project-user-role assignments in Performance Center.

This chapter includes:

- ► About Privilege Management on page 647
- > Accessing the Privilege Manager on page 648
- > Privilege Manager at a Glance on page 648
- > Managing User Privilege Assignments on page 649

About Privilege Management

The Privilege Manager enables you to assign users with selected privileges to manage Performance Center resources and assets or to manage Performance Center projects.

After you have defined users, user roles, and projects in Performance Center, you use the Privilege Manager to create associations between these elements.

The Privilege Management page lists these associations and is a portal to the pages where these associations are managed.

Accessing the Privilege Manager

You access the Privilege Manager directly from the Performance Center left menu or from the Roles page.

Note: To access the Privilege Manager in the User Site, you must have **Assign** user to role and/or **Remove user from role** privileges.

- To access the Privilege Manager from the Performance Center left menu, select User Management > Privilege Management.
- ➤ To access the Privilege Manager from the Roles page, below the Role Properties pane, click the Assign Project-User-Role button.

Privilege Manager at a Glance

In the User Site, the Privilege Manager displays a list of all of your active projects on the left, and the User-Roles table on the right. When you select a project, the User-Roles table displays the users assigned to that project, and the roles assigned to them in that project.

Using the Privilege Manager, you can:

- View all the users assigned to a project, and the roles assigned to them in that project
- ► Assign users to a project
- ► Change roles assigned to users in a project
- ► Remove users assigned to a project
Managing User Privilege Assignments

You use the Privilege Manager to assign users to Performance Center projects, and manage their roles therein.

Note: You must have **Assign user to role** and/or **Remove user from role** privileges to perform these tasks, as described in the sections below.

This section includes:

- ➤ "Assigning Users to Performance Center Projects" on page 649
- ► "Changing User-Role Assignments" on page 651
- ▶ "Removing Users from Projects" on page 652

Assigning Users to Performance Center Projects

If you have **Assign user to role** privileges, you can assign users to projects where they can manage project-related tasks.

Assigning users to a project involves a two-fold operation:

- ➤ Selecting a project to which to assign the users
- Assigning roles to users that allow them to perform tasks in the selected project

To assign users to a project:

- 1 On the Performance Center left menu, select User Management > Privilege Management.
- **2** On the Privilege Management page, select the project to which to assign the users.

The User-Roles table on the right lists all the existing user-role assignments in the selected project.

3 Below the User-Roles table, click **Assign New User**. The Assign New User-Role to <project> dialog box opens.

4 In the **Role** list, select a role that you want to assign to users.

Users already assigned this role are displayed in the Assigned to users boxes.

- Users assigned this role in the selected project are displayed in the Project Assignment box.
- Users assigned this role for all projects (through the Administration Site) are displayed in the All Projects Assignment box.
- **5** In the **Available users** list, select the users to whom you want to assign the selected role.

Tip: You can filter the **Available users** list by entering a user name (or part thereof) in the **User** box, and clicking **Filter**.

Click the single right-arrow button to move the selected user to the **Assigned to users** box. Alternatively, to move all of the available users simultaneously, click the double right-arrow button.

- 6 Click Apply.
- **7** To assign another role to users in the project, repeat steps 4 through 6.
- **8** Click **OK**. The Assign New User-Role dialog box closes, and the User-Role table displays the new user-role assignments for the selected project.

Changing User-Role Assignments

If you have both **Assign user to role** and **Remove user from role** privileges, you can change the roles assigned to users in a project.

To change the roles assigned to a user:

- 1 On the Performance Center left menu, select User Management > Privilege Management.
- **2** On the Privilege Management page, select the project in which you want to change the user's roles.

Note: Roles assigned to a user in one project can differ from roles assigned to the same user in a different project.

- **3** In the User-Roles table, select the user whose roles you want to change.
- **4** Below the User-Roles table, click **Change User Roles**.

Note: The **Change User Roles** button is enabled when **one user only** is selected in the User-Roles table.

5 The Change User-Role Assignments in <project> dialog box opens, displaying the user that you selected.

In the Roles table, all the roles available for the selected project are displayed, and the roles already assigned to the user are selected.

6 Select roles to assign to the user and clear the roles that you want to take away from the user.

Note: Roles assigned to the user for all projects are displayed in read-only format. To change these roles, you must perform this procedure in the **All Projects** container in the Administration Site. If you have user management privileges in the User Site only, contact your Performance Center administrator to perform this task for you.

7 Click **Assign**. The Change User-Role Assignments dialog box closes, and the changes are displayed in the User-Roles table.

Removing Users from Projects

If you have **Remove user from role** privileges, you can remove a user from a project. Removing a user from a project deletes all the user-role assignments for the user in that project, and deletes the user from the Users page.

You can also remove yourself from other projects to which you are assigned, but not from the project in which you are currently working.

To remove a user from a project:

- 1 On the Performance Center left menu, select User Management > Privilege Management.
- **2** On the Privilege Management page, select the project from which you want to remove the user.

3 In the User-Roles table, select the user you want to remove. You can select one or multiple users.

Note: If the user has roles that are marked with an asterisk (*), to remove the user you must perform this procedure in the **All Projects** container in the Administration Site. If you have user management privileges in the User Site only, contact your Performance Center administrator to perform this task for you.

4 Below the User-Roles table, click **Remove Assignment**.

Note: The **Remove Assignment** button is enabled only if **at least one user** is selected in the User-Roles table.

5 In the message box that opens, click **OK** to confirm that you want to remove the user.

The user and the role assignments for the user are deleted from the User-Roles table, and the user is deleted from the list of users on the Users page.

Chapter 41 • Privilege Management

Part VII

Troubleshooting

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Troubleshooting Performance Center Assets

This chapter provides information on troubleshooting problems related to managing Performance Center assets.

This chapter includes:

- ► Cannot Create Monitor Profile on page 657
- ► Cannot Save Measurements on page 658
- > Cannot Import Monitor Profile/Vuser Script on page 659
- ➤ Cannot Download and Open Script on page 660
- > Analysis Performance Center Server Connection Failed on page 664

Cannot Create Monitor Profile

Error message: Monitor is not licensed or was not installed.

Troubleshooting

The problem is because of a misconfiguration of the host license on the utility server.

- ► Reset the system as follows:
 - a In the Administrator Site, select System Configuration > Server Configuration.
 - **b** Click **Reset**.
 - **c** Try to create the monitor profile again.

 If the problem persists, contact HP Software Support (<u>http://www.hp.com/go/hpsoftwaresupport</u>).

Cannot Save Measurements

Problem description: During configuration of a monitor, after you select the measurements that you want to monitor and you click **Save**, instead of saving the monitor, Performance Center goes back to the Choose Monitor page.

Troubleshooting

This problem usually occurs when you select a large number of measurements. To resolve this issue, you need to increase the value of the **AspMaxRequestEntityAllowed** property in the IIS metabase. This property specifies the maximum number of bytes allowed in the entity body of an ASP request.

Note: For more information about the **AspMaxRequestEntityAllowed** property, see the Microsoft Terminal Services documentation: <u>http://www.microsoft.com/technet/prodtechnol/WindowsServer2003/Library/IIS/a</u> <u>6401b5e-c902-4035-90aa-ee46c270d357.mspx?mfr=true</u>, or <u>http://support.microsoft.com/kb/327659</u>

To increase the value of the AspMaxRequestEntityAllowed property:

1 Run the following command from the command line:

cd <IIS_installation_drive>:\inetpub\adminscripts.

where **<IIS_installation_drive>** is the hard disk where IIS is installed.

2 To view the current value of the **AspMaxRequestEntityAllowed** property, run the following command:

cscript adsutil.vbs get w3svc/ASPMaxRequestEntityAllowed.

3 To increase the value of the **AspMaxRequestEntityAllowed** property, run the following command:

cscript adsutil.vbs set w3svc/ASPMaxRequestEntityAllowed <maximum value>.

where **<maximum value>** is the maximum value, in bytes, that you want to set for the **AspMaxRequestEntityAllowed** property.

4 Run the following command:

iisreset.

5 To verify that the value of the **AspMaxRequestEntityAllowed** property has changed, run the following command again:

cscript adsutil.vbs get w3svc/ASPMaxRequestEntityAllowed.

Note: If you are still not able to save the measurements in the monitor profile, increase the value of the **AspMaxRequestEntityAllowed** property further.

For more information about this issue, see the Microsoft support Web site: <u>http://support.microsoft.com/kb/327659</u>

Cannot Import Monitor Profile/Vuser Script

Error message: Failed to import Monitor Profile/Vuser Script <asset name>. For more information, see the Event Log.

Troubleshooting

This problem might occur when, during the import process, another user has deleted the asset or modified its name.

Wait a few minutes and try again.

Cannot Download and Open Script

Error message: Windows cannot access the specified device, path, or file. You may not have the appropriate permissions to access the item.

Troubleshooting

The problem could be that the registry key associated with VuGen is corrupted or not defined.

- **1** Select **Start > Run** and type **reged**it to open the registry.
- **2** Locate the following keys:
 - ► HKEY_CLASSES_ROOT\uszfile\shell\open\command.
 - ► HKEY_CLASSES_ROOT\usrfile\shell\open\command.
- **3** Make sure that the correct files are associated with the keys.
 - ► USZ key: <PC home>\bin\VugenLauncher.exe
 - USR key: %systemroot%\mercuryTestLauncher.exe, or
 PC home>\bin\Vugen.exe
- **4** Make sure that all backslashes are correct: \ and not /.
- **5** Make sure all inverted commas are correct (there should be four in total).

If the problem persists, try applying the following as a reg file on the machine:

Windows Registry Editor Version 5.00
[HKEY_CLASSES_ROOT\.usz] @="uszfile"
[HKEY_CLASSES_ROOT\.usr] @="usrfile"
[HKEY_CLASSES_ROOT\usrfile] @="Virtual User Test"
[HKEY_CLASSES_ROOT\usrfile\DefaultIcon] @="C:\\Program Files\\HP\\Performance Center\\bin\\vugen.exe,1"
[HKEY_CLASSES_ROOT\usrfile\shell]
[HKEY_CLASSES_ROOT\usrfile\shell\open]
[HKEY_CLASSES_ROOT\usrfile\shell\open\command] @="C:\\WINDOWS\\system32\\MercuryTestLauncher.exe\" \"%1"
[HKEY_CLASSES_ROOT\uszfile] @="Vugen Launcher"
[HKEY_CLASSES_ROOT\uszfile\DefaultIcon] @="C:\\Program Files\\HP\\Performance Center\\bin\\VugenLauncher.exe,1"
[HKEY_CLASSES_ROOT\uszfile\shell]
[HKEY_CLASSES_ROOT\uszfile\shell\open]
[HKEY_CLASSES_ROOT\uszfile\shell\open\command] @="C:\\Program Files\\HP\\Performance Center\\bin\\VugenLauncher.exe\" \"%1"
[HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\FileE xts\.usr] "Application"="MercuryTestLauncher exe"
[HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\FileE xts\.USZ]

"Application"="VugenLauncher.exe"

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\.usr] @="usrfile"

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\.usz] @="uszfile"

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\usrfile] @="Virtual User Test"

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\usrfile\DefaultIcon] @="C:\\Program Files\\HP\\Performance Center\\bin\\vugen.exe,1"

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\usrfile\shell]

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\usrfile\shell\open]

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\usrfile\shell\open\command] @="C:\\WINDOWS\\system32\\MercuryTestLauncher.exe\" \"%1"

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\uszfile] @="Vugen Launcher"

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\uszfile\DefaultIcon] @="C:\\Program Files\\HP\\Performance Center\\bin\\VugenLauncher.exe,1"

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\uszfile\shell]

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\uszfile\shell\open]

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\uszfile\shell\open\command] @="C:\\Program Files\\HP\\Performance Center\\bin\\VugenLauncher.exe\" \"%1"

Uploading Script From VuGen Fails

Problem description: Uploading a script from VuGen fails. An error message is provided.

Troubleshooting

- 1 Make sure the machine is not configured to use a proxy server. If it is, disable the proxy server by searching the registry for the **ProxyEnable** key in the **Internet Settings** folders and setting this key to zero.
- 2 Check whether there are upload timeouts due to a slow network connection. In the <Performance Center installation>\dat directory, there is a configuration file called OrchidCommUtils.dat that holds the integration communication settings. To change the default timeout (60 sec.), you must enable the http_timeout_secs key and change its value.

If neither of the above troubleshooting options helps, you can create a log file that provides more information and send it to Customer Support (<u>http://www.hp.com/go/hpsoftwaresupport</u>). To create the log file, enable the **log_file** key.

Cannot Upload Script From VuGen

Problem description: Cannot upload a new script created in Standalone VuGen. Get following error: **Failed to upload script**.

Troubleshooting

This problem occurs when Standalone VuGen, Standalone Analysis, and the Standalone Load Generator are installed on the same machine, and the Standalone Load Generator was installed last.

Workaround: To upload the script, use the Upload all files option.

Analysis - Performance Center Server Connection Failed

Problem description: Connection from Anaylsis to Performance Center server fails with error message: **Connection to <PC Server> failed**.

Troubleshooting

Note: This behavior might be inconsistant among different users.

This problem is usually related to an HTTP timeout.

When a user who belongs to a large number of projects/scripts tries to connect to the Performance Center User Site server, the time taken to generate the list of projects/scripts exceeds the HTTP timeout.

To increase the HTTP timeout parameter:

- On the Analysis machine, open the following file: dat\OrchidCommUtils.dat.
- **2** Locate the line containing the following string: **http_timeout_secs**.
- **3** Uncomment the line by removing the semicolon (;).
- **4** Change the value of the paramater from **60** to **180**.

Troubleshooting Load Test Design

This chapter provides information on troubleshooting problems related to designing load tests.

This chapter includes:

► Cannot Save Load Test (Error -ORA-03106) on page 665

Cannot Save Load Test (Error -ORA-03106)

Error message: Fatal two-task communication protocol error.

Troubleshooting

This error sometimes occurs after you change the run time settings when working with an Oracle database. The new details are not saved to the database, although a successful save was indicated.

The cause might be a mismatch between the character set of the Oracle client and the Oracle server.

- Make sure the NLS_LANG on the client and server match. They should be the same type or be of a type that can be converted.
- ► Consult with the database administrator on this issue.

Chapter 43 • Troubleshooting Load Test Design

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Troubleshooting Starting Load Tests

This chapter provides information on troubleshooting related to starting load tests.

This chapter includes:

- Timeslot Issue No Available Load Generators (Error -2147219273) on page 668
- ➤ Timeslot Issue No Available Controllers (Error -2147219274) on page 669
- ► Failed to Launch Controller (Error -2147220032) on page 670
- ► Controller Cannot Connect to Database (Error -2147219979) on page 671
- ► Not Enough Disk Space on Controller (Error -2147220152) on page 671
- ► Browser Stuck While Initializing Load Test on page 672
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- ► License Issue -Concurrent Runs on page 673
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- ➤ Unable to Run Load Test that Is Already Active on page 674
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- Cannot Run Load Test on Controller with Windows XP Non-Admin System User on page 679
- ➤ Cannot Run Load Test with UNIX Load Generator on page 680

Timeslot Issue - No Available Load Generators (Error -2147219273)

Error message: Could not reserve timeslot. There are no available load generators.

Troubleshooting

1 On the User Site Hosts page (**Project** > **Hosts**), check whether any load generator hosts appear and make sure that their status is operational.

If no load generators appear, or if they have a status other than operational, contact your administrator.

2 If operational load generators appear on the Hosts page, check on the User Site Timeslots page (Project > Timeslots) to see when the load generators are available.

If the load generators are not available during the desired timeslot, try to reorganize the timeslots so that the necessary resources are available for your load test.

Before you reorganize the timeslots, you should look at all the tests that you have scheduled in your system and consider the following factors:

- timeslot utilization. Some tests may have more timeslots reserved than is necessary, or there may be timeslots that have been reserved for no reason.
- test importance. Less important tests can be moved to different timeslots to make space available for the more important tests.
- ➤ irrelevant tests. Check whether there are tests scheduled that are no longer relevant and can be removed from the timeslot schedule.

Note: On the Administration Site Hosts page (**Resources** > **Hosts**), your administrator can enable the Controller host to also act as an additional load generator. In general, this is not recommended practice and is only appropriate for load tests that have a very small number of Vusers.

Timeslot Issue - No Available Controllers (Error -2147219274)

Error message: Could not reserve timeslot. There is no available Controller.

Troubleshooting

1 On the User Site Hosts page (**Project** > **Hosts**), check whether any Controller hosts appear and make sure that their status is operational.

If no Controllers appear, or if they have a status other than operational, contact your administrator.

2 If operational Controllers appear on the Hosts page, check on the User Site Timeslots page (Project > Timeslots) to see when the Controllers are available.

If the Controllers are not available during the desired timeslot, try to reorganize the timeslots so that you can make the necessary resources available for your load test.

Before you reorganize the timeslots, you should look at all the tests that you have scheduled in your system and consider the following factors:

- timeslot utilization. Some tests may have more timeslots reserved than is necessary, or there may be timeslots that have been reserved for no reason.
- ➤ test importance. Less important tests can be moved to different timeslots to make space available for the more important tests.
- ➤ irrelevant tests. Check whether there are tests scheduled that are no longer relevant and can be removed from the timeslot schedule.

3 If the Controller machine is also designated as a data processor, the Controller may not be available due to a failed analysis or publish operation in a previous test.

If an analysis/publish operation fails, the machine on which this action was performed remains allocated to the analysis/publish action, and the machine cannot be used as a Controller.

If this is the case, you need to cancel the allocation to the specified machine(s) as follows:

- **a** In the Test Runs page (**Site Management > Test Runs**), check which runs are being analyzed or published. In the case of publishing, this might be a few runs.
- **b** Click **Deallocate Hosts** in the Test Runs page. The Deallocate Hosts dialog box opens.
- **c** Select **Deallocate Analysis host** and click **OK**. Repeat this procedure for each test run from which you want to deallocate hosts.

Failed to Launch Controller (Error -2147220032)

Error message: Failed to launch the Controller.

The above error message also includes more details about the specific problem with the Controller license.

Troubleshooting

Contact your administrator to verify why there is problem with the Controller license. You can view and update license information on the Administration Site License page (**System Configuration > License**).

For more information about licenses, see the section about configuring and viewing license information in the *HP Performance Center Administrator Guide*.

Controller Cannot Connect to Database (Error -2147219979)

Error message: Controller cannot connect to database. Contact your administrator to remove the Controller from the host list and add it again to reset configuration.

Troubleshooting

When you receive this error, it usually means that something changed on the Controller host machine. This could be due to someone reformatting or reinstalling the Controller.

Your administrator needs to reset the Controller configuration by removing the Controller from the Administration Site Hosts page (**Resources** > **Hosts**) and then adding it again.

Not Enough Disk Space on Controller (Error -2147220152)

Error message: Not enough disk space left on Controller machine system disk 'C:\'.

Troubleshooting

You need to make disk space available on the Controller host machine. For more information about the host system requirements, see the section about system component requirements in the *HP Performance Center System Configuration and Installation Guide*.

Browser Stuck While Initializing Load Test

Problem description: During the initialization of a load test, the browser gets stuck.

Troubleshooting

- **1** Restart your test as follows:
 - **a** Close your browser.
 - **b** Open your browser again and log in to the Performance Center User Site.
 - **c** Start the test again
- **2** If your browser gets stuck again, restart the relevant host machines as follows:
 - **a** Close the Performance Center User Site.
 - **b** Restart the host machines (load generators and Controllers) that you are using in this test.
 - **c** Open the Performance Center User Site, log in, and start the test again.
- **3** If your browser gets stuck again, check with your administrator if there are any problems with the utility server that could be causing these issues.
- **4** If you are still experiencing problems, contact Customer Support (<u>http://www.hp.com/go/hpsoftwaresupport</u>) for assistance.

Failure to Initialize Load Test

Problem description: When trying to run a load test, the test fails to initialize.

Troubleshooting

- **1** Start the test again.
- **2** If initialization still fails, restart the relevant Controller host machines as follows:
 - a Close the Performance Center User Site.
 - **b** Restart the Controller host machines that you are using in this test.
 - c Open the Performance Center User Site, log in, and start the test again.
- **3** If initialization still fails, try to assign a different Controller host (if available) to your test.

If this solves the problem, contact Customer Support (<u>http://www.hp.com/go/hpsoftwaresupport</u>) to check why the test did not work with the original Controller host.

4 If you are still experiencing problems, contact Customer Support for assistance.

License Issue -Concurrent Runs

Error message: Your Performance Center license does not support the number of concurrent runs.

Troubleshooting

Since you have exceeded the overall number of concurrent runs supported by your Performance Center license, you must do one of the following:

- Ask your administrator to rearrange the scheduling of the load tests to make sure that you are not exceeding the overall number of concurrent runs supported by your license.
- Upgrade your Performance Center license to enable support of more concurrent runs.

License Issue – Concurrent Users (Error -2147219264)

Error message: Your Performance Center license does not support the number of concurrent users.

Troubleshooting

Since you have exceeded the overall number of concurrent users supported by your Performance Center license, you must do one of the following:

- Ask your administrator to rearrange the number of Vusers that are being used concurrently in all the projects so that some Vusers can be made available for your test.
- ► Reduce the number of Vusers for your test.
- Upgrade your Performance Center license to enable support of more Vusers.

Unable to Run Load Test that Is Already Active

Error message: Unable to create new load test run. There is already an identical active load test.

Troubleshooting

If a load test is running, you cannot run the same load test (with identical settings) concurrently. As a workaround, you can copy the settings of the test that you want to run and change the name.

If there are enough host resources to run both tests concurrently, you should be able to run the new test.

Note: You copy a test on the Load Tests configuration page (**Load Tests** > **Manage**) of the Performance Center User Site. For more information about copying load tests, see the section about copying a load test in the *HP Performance Center User Guide*.

Cannot Initialize Load Test (Error -2147219790)

Problem description: You start the load test and get an error that the load test cannot be initialized.

This problem can occur for any of the following reasons:

- ► Scripts Are Inaccessible
- ➤ Unable to Instantiate 'OrchidResourceDB' Component

Scripts Are Inaccessible

The scripts are inaccessible so the load test fails to initiate.

Error message: Cannot access the load test scripts. Please check load test definitions.

Troubleshooting

The script may be inaccessible for any of the following reasons:

- ► The script was deleted.
- ► The script was moved to a different directory.
- ➤ There is a network problem preventing access to the script.
- Security/permissions issues could be preventing access to the script directory.

Unable to Instantiate 'OrchidResourceDB' Component

The load test fails to start. When it reaches step "**searching for controller**," get the following error:

Failed to initialize load test! Error: Unable to run load test.2147219790Details: Activation attempt [1]: Unable to instantiate 'OrchidResourceDB' component; Activation attempt [2]: Unable to instantiate 'OrchidResourceDB' component; Activation attempt [3]: Unable to instantiate 'OrchidResourceDB' component

In the Administration Site, the Event Log displays an error which ends with "RunFixer: Unknown error 0x800A000D] Type mismatch ."

Troubleshooting

- **1** Log in to the specific Controller machine that failed.
- **2** In the Services window, make sure the "DataCollectionAgent" service is running.

Session Activation Fails

Error message: Session activation failed. Reported from method: 'SA:AllocResourcesAndStartSes'; Session ID: #; Reason:

Troubleshooting

- 1 Verify that there is network connectivity between the host and the Web server. The latency should be less than 20 ms to and from all Performance Center machines, excluding the load generators.
- 2 Check the Event Viewer administrative tool on both the Web server and Controller machines (Start > Settings > Control Panel > Administrative Tools > Event Viewer).

License Manager Component Cannot Be Instantiated

Error message: Cannot run the load test. Unable to instantiate License Manager component.

Troubleshooting

If you receive the above error, remove the **PCIMkipper** process and perform an IIS reset.

Unable to Instantiate License Manager Component - HTTPS (SSL)

Problem Description: When trying to run a load test you get the following error: **Cannot run the Load Test. Unable to instantiate License Manager component.**

Troubleshooting

You may get this error after configuring your server to work with HTTPS (SSL).

- 1 On the Utility Server, open the IIS Manager (Start > Control Panel > Administrative Tools > Internet Information Services).
- **2** In the WebSites/Default Web Site directory, right-click **PCWS** and click **Properties**.
- **3** On the **Directory Security** tab, under **Secure Communication**, click **Edit**.
- **4** Make sure that **Require Secure Channel SSL** is not selected.
- 5 Click OK.
- **6** Reset IIS.

Cannot Run Load Test on Controller - Non-Admin System User

Problem description: When the system user is a non-administrative user, if you try to run load test on a Controller for the first time, the load test does not run.

Troubleshooting

Before running load tests on a Controller for the first time, you must log on to the host machine with a user that has administrator privileges, open the Controller manually, and then close the Controller. The next time you try to run a load test on the Controller, the load test should run successfully.

To open the Controller manually:

- **1** From the command line, run **wlrun**. The Controller opens.
- **2** Close the Controller.

Cannot Run Load Test Over Secure Channels

Problem description: When you try to run a load test over secure channels, the load test cannot initialize because cannot connect to Controller or load generator.

Troubleshooting

Verify that the load test cannot run due to a security mismatch by trying to run the same load test with the same hosts from a local Controller.

If a Security Key Mismatch error is displayed in the error log, then the keys do not match, and you need to align the security keys on all the machines.

Load Test Run Fails. Load Generator Status Change to Resource Failure

Problem description: When trying to run a load test over secure channels, the load test fails to run and the load generator status changes to **Resource Failure**.

Troubleshooting

When trying to run a load test over secure channels, if the security keys on the Controller and load generator do not match the load test run fails, and the status of the load generators changes to **Resource Failure**. To re-enable the load generators, you must manually reset the status on each affected load generator to Operational.

Cannot Run Load Test on Controller with Windows XP – Non-Admin System User

Problem description: If the system user is a non-administrative user, you cannot run a load test on a Controller host in a Windows XP environment.

Troubleshooting

Workaround: Add the system user to the machine's COM security settings.

To add the system user to the COM security settings:

- 1 Select Start > Run, and type dcomcnfg. The Components Services window opens.
- **2** Under Console Root\Component Services\Computers, right-click My Computer and select Properties.
- **3** In the My Computer Properties dialog box, click the **COM Security** tab.
- **4** Under **Access Permissions**, click **Edit Default**, and add the system user with full access to the default security.

- **5** Under Launch and Activation Permissions, click Edit Default, and add the system user with full access to the default security.
- **6** In the My Computer Properties dialog box, click **OK**.

Cannot Run Load Test with UNIX Load Generator

Error message: Failed to initialize load test.

Troubleshooting

If Performance Center cannot connect the load generator to the Controller, manually change the **wlrun7.ini** file as follows:

- **1** Open the **wlrun7.ini** file in a text editor.
- 2 Change HostUnixDontUseRSH from 0 to 1.
- **3** Try to rerun the test.

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Troubleshooting Running Load Tests

This chapter provides information on troubleshooting problems related to running load tests.

This chapter includes:

- > Data Processor Error When Publishing Load Test on page 682
- ► Load Test Seems to Run, But Is Not Actually Running on page 682
- ► Load Test Does Not Run All Vuser Groups on page 683
- ► Vuser Group Does Not Start Running on page 683
- ► Load Test Does Not Stop Running on page 684
- ➤ User Site is Sluggish During a Load Test on page 684
- > Online Graphs Stop Displaying During a Load Test on page 684
- Transaction Response Time Graph Not Showing Correct Time Interval on page 685
- ➤ New Vusers Stop Initiating During a Load Test on page 686
- ► Failed to Run Load Test Scripts Created with .NET Add-On on page 687
- ► Vusers Are Stuck in Initialization on page 688
- ► Vuser Replay Fails on page 689
- > Connection to Database Timed Out on page 693
- ► Orchid Monitor Error on page 694
- ➤ Cannot Run Load Test with Non-Admin User on page 694
- ➤ SiteScope Server Fails to Retrieve Data from Hosts/Servers on page 695
- ► Failure to Run Load Test on page 696

Data Processor Error When Publishing Load Test

Problem description: When trying to publish a load test from a pool with no data processor, an error link appears by the test run in the Load Tests page.

Troubleshooting:

- **1** In the Administrator Site, add a data processor to the pool assigned to the project.
- **2** In the User Site, on the Load Test Results page's Results vs. Targets tab, click **Publish**. This cancels the publishing process.
- **3** Republish the results. The error message disappears.

Load Test Seems to Run, But Is Not Actually Running

Problem description: You are unable to run a load test. The Performance Center error message states that a test is currently running, but no tests are actually being run.

Troubleshooting

- **1** Verify whether a load test is actually running on the target Performance Center Controller host.
- **2** If no test is actively running, reset the host state using the Performance Center Administration Site, as follows:
 - **a** From the Performance Center left menu, select **Site Management** > **Test Runs**. The Test Runs page opens.
 - **b** Select the relevant run from the test runs table.
 - **c** In the test runs toolbar, click the **Fast Recovery** button.

This cleans the state of hosts in the database, and makes the problematic host available for future load tests. If the host is in **Resource Failure** state and cannot be used in your load test, see "Troubleshooting Hosts and Servers" on page 721.



Load Test Does Not Run All Vuser Groups

Problem description: Performance Center did not run all the Vuser groups defined in the load test.

Troubleshooting

Performance Center supports running up to 47 Vuser groups in a load test run.

Vuser Group Does Not Start Running

Problem description: The Vuser group in the load test does not start running.

Troubleshooting

This problem occurs if a Vuser group is scheduled to run after a Vuser group that is set to run indefinitely.

If Group A is set to run indefinitely, and Group B is scheduled to run after Group A, then Group B will run only if you do one of the following:

- ► Stop Group A manually
- ► Add a Stop Vusers action to Group A's schedule
- Modify Group B's Start Group action to start running after a specified amount of time

Load Test Does Not Stop Running

Problem description: Vusers in the load test do not stop running.

Troubleshooting

If a load test schedule does not have a Stop Vusers action, the load test does not stop running.

Possible causes:

- ► The Stop Vusers action was deleted
- ➤ With load tests scheduled to run indefinitely in Performance Center versions 8.1 or earlier, during migration no Stop Vusers action is created, since the Vusers are not meant to stop running

Solution: Check the Actions defined in the Actions grid of the load test's schedule. If no Stop Vusers action is defined, the schedule continues to run indefinitely. To stop running the load test, define a Stop Vusers action in the load test schedule.

User Site is Sluggish During a Load Test

Problem description: The Controller machine may be over-utilized.

Troubleshooting

See "New Vusers Stop Initiating During a Load Test" below.

Online Graphs Stop Displaying During a Load Test

Problem description: The Controller machine may be over-utilized.

Troubleshooting

See "New Vusers Stop Initiating During a Load Test" on page 686.
Transaction Response Time Graph Not Showing Correct Time Interval

Problem description: When running a scenario, the Transaction Response Time graph displays the whole load test duration, instead of the time interval it is configured to display.

For example, in the illustration below, the graph is configured to display the last three minutes, but it still displays the whole load test duration.

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				00:07:0	00 00:	08:00	00:09:00	
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		Calleer]	2.031	2.058	0	2.051	
	transactionu	1	0.266	- 0.203	0.204	0	0.206	

Troubleshooting

This occurs if transactions selected in the graph legend did not run during the configured time interval.

In the above example, the vuser_init_transaction finished running at the beginning of the run, but it is selected in the graph legend so it is still being displayed.

To display the correct time interval on the Transaction Response Time graph, ensure that transactions that did not run during the configured time interval are not selected in the legend.



New Vusers Stop Initiating During a Load Test

Problem description: During a load test, new Vusers stop initiating.

Troubleshooting

The Controller machine may be over-utilized.

- **1** Make sure that you are not running any Vusers on the Controller machine.
- **2** Check that the machine is responsive and CPU utilization on the Controller machine during a load test is below 100%.
- **3** Disable any software that may interfere with the Performance Center Controller, file server, or Web server. This includes any auditing or virus scanning software.

- **4** If CPU utilization is high, check whether:
 - ➤ the online.exe process is consuming excessive CPU. If it is, this means that you might have too many active remote viewing sessions (for example, many people are watching the load test from different browsers). To fix this problem, either decrease the frequency at which the load test viewing sessions are refreshed (from each individual client browser), or decrease the number of concurrent viewing sessions for the current or problematic load test.
 - ➤ the wlrun.exe process is consuming excessive CPU. If it is, check whether your load test is:
 - producing many error messages. If it is, reduce the number of error messages by resolving the reasons for the error messages.
 - producing many logging messages (for the Controller). If it is, disable or reduce the logging level, or avoid using log statements (such as lr_message) that send messages to the Controller's output window.
 - running scripts without any think times, and thus producing a lot of data that is sent back to the Controller.

If CPU consumption cannot be reduced for the load test, consider upgrading your Controller hardware.

Failed to Run Load Test - Scripts Created with .NET Add-On

Problem description: Running scripts with protocols such as vbNet (VB.NET Template), CsNet (C#.NET Template), VcNet (C++.NET Template) that were created with the .NET add-on (visual studio 2003 or 2005) fails.

Troubleshooting

This problem is related to .NET security definitions with the use of a UNC path (see <u>http://social.msdn.microsoft.com/forums/en-US/winformssetup/thread/f1b4f239-4c53-43a4-89b2-31c1d666ccac/</u>).

In Performance Center, scripts are stored on the File Server. When running Vusers from Performance Center, the host machine accesses Vuser scripts stored on the File Server using UNC paths.

To run a load test with these scripts, run the following command from the command line on the host machine:

%windir%\Microsoft.NET\Framework\v2.0.50727\caspol -m -cg LocalIntranet_Zone -allcode FullTrust

Vusers Are Stuck in Initialization

Problem description: Vusers are stuck in initialization, or never run at all. This can occur if you made modifications to a script and overwrote the existing script in Performance Center. Although you uploaded the script, the new run-time logic of the script is not updated for the load tests that see the script.

When the load test is run with the updated script, a pop-up window is displayed in **wlrun.exe** on the Controller. To verify this, run **wlrun.exe** on the Controller as an **interactive user** (see "Option 3: Launch wlrun.exe manually from the Controller host machine" on page 725 for configuration details).

Example: A load test named **TestLoadTest** refers to a script named **Test** that contains four sections: **vuser_init**, **action1**, **action2**, and **vuser_end**. If you modify the **Test** script so that it includes only three sections—**vuser_init**, **action3**, and **vuser_end**—and overwrite the previous **Test** script by uploading the modified script to Performance Center, the Vusers will not run when you run **TestLoadTest**. This is due to the fact that the old script's run-time logic remains and the load test still "thinks" that there are two actions sections, **action1** and **action2**, as opposed to the one action section in the updated script, **action3**.

Troubleshooting

Option 1:

- 1 When modifications are made to a script, change the name of the script by adding a version number to it. For example, **TestScript_1** can be changed to **TestScript_2**. This way, when you upload the updated script, the current script remains, and the load test will still run.
- **2** Create a new load test, and add the new version of the script to it.

Option 2:

When modifications are made to a script, remove the script from the load test, then add it to the load test again.

Note: Option 1 is recommended, as it enables you to keep track of your script and load test configuration changes.

Vuser Replay Fails

Problem description: Vusers are not picking up the correct environment settings and replay fails.

Troubleshooting

Option 1: Check the environment settings and software installation

The load generator machines on which the test is running must have the correct software installed and the proper environment variables set for the user.

For Microsoft Media Player:

- 1 Log in to the load generator as the Performance Center system user and run Windows Media Player Install for Windows Media.
- **2** Check the System environment variable **Path** to make sure that the Windows Media Player path is set correctly. Reboot, if necessary, for the correct settings to take effect.

3 On the load generator machine, use VuGen to run the script and test it.

For Java:

- 1 Log in to the load generator machine as the Performance Center system user.
- **2** Make sure that the **Path** environment variable for both **User** and **System** do not have an instance of Java Virtual Machine. Performance Center retrieves the JVM information from the registry.
- **3** If the script replays on the VuGen machine on which the script was created, copy the machine's **CLASSPATH** environment variable_and place it in the **System** environment variable area of the load generator machine.
- **4** On the load generator machine, run a simple script using VuGen to get the environment variable settings. Add the following lines to verify that the environment variables are set correctly:

char *env; env = getenv("PATH"); Ir output message("%s",env);

Note: Make sure that you add the protocol definition char* getenv(char*); at the top of the script file.

For Citrix:

- **1** Make sure that the Citrix client is installed on the load generator machine.
- **2** Run the script through VuGen on the load generator machine.

For Databases:

Make sure that you have the appropriate database client installed on the load generator machine, and the appropriate settings in the System **Path** environment variable.

For Tuxedo:

- **1** Make sure that the Tuxedo client is installed on the load generator machine.
- **2** Verify that the following environment variables are set under **System**:
 - ► Path. Add the tuxedo\bin directory to this variable.
 - TUXDIR. The root directory of the TUXEDO installation. It is called ROOTDIR in TUXEDO 4.2 and earlier versions of TUXEDO. This environment variable is mandatory on the NT platform (For example: TUXDIR=D:\PSHr755\tuxedo).
 - NLSPATH. Contains sub-directories to support the localization of system messages, along with message catalogs for the default locale (U.S. English). This environment variable is also mandatory on the NT platform (For example: NLSPATH=\$TUXDIR\locale\c).
 - ➤ WSNADDR. The address of the TUXEDO server (may need to be set). In pre-TUXEDO 6.3 versions this is in hex—for example,
 Ox0002ffffc7cb4ebd. The 0002 indicates the IP, ffff indicates the port number, and cbcb4ebd indicates the IP address of the machine that contains the server. TUXEDO 6.3 also allows a more mnemonic way of indicating the server's address. This environment variable is mandatory on the NT platform (For example: WSNADDR=199.35.108.119:7000).
 - ➤ ULOGPFX. Prefix for the TUXEDO log file (may need to be set). The name of the log file includes the current date represented as a six-digit number—for example, 081797 for August 17, 1997. The ULOGPFX can contain a directory name as well as part of the file name itself (For example: ULOGPFX=/u/markn/ul).

Note: Make sure that you add the protocol definition **char* getenv(char*)**; at the top of the script file.

Option 2: Configure the Controller to work as an interactive user

Running a GUI script in Performance Center may cause HP WinRunner or HP QuickTest Professional to crash due to the configuration of **Wlrun.Engine**. To rectify this situation, configure the Controller to work as an interactive user.

To configure the Controller to work as an interactive user:

- **1** Make sure the **wlrun** process is not running on the machine.
- **2** Select **Start** > **Run** and type dcomcnfg.
- **3** Press ENTER to display the list of DCOM applications.
- **4** In the displayed application list, right-click **wlrun.LrEngine** and select **Properties**.
- **5** In the **Identity** tab, select **The interactive user**.
- **6** Click **OK** twice to close both dialog boxes.
- 7 Log in to the machine in the Performance Center environment as the system user. This user, which is installed with Performance Center, is displayed in the General Settings page of the Administration Site.

Connection to Database Timed Out

Error Message: The connection to database timed out.

Problem description: The load test cannot run. Performance Center runs slowly when configured with Oracle 9i or 10g server/client and an error may be displayed in the Administration Site stating that the connection to database timed out.

Troubleshooting

1 Make sure that you are accessing the database through **TNSNAMES** and not **ONAMES**, which can lead to a noticeable and ever-increasing time delay connecting to the database. This time delay does not exist if **TNSNAMES** is used.

To use **TNSNAMES**, change its priority within the **SQLNET.ORA** file by editing the **<Oracle installation directory>\network\admin\sqlnet.ora** file and setting the **NAMES.DIRECTORY_PATH** as follows:

NAMES.DIRECTORY_PATH = (TNSNAMES,ONAMES)

Note that **TNSNAMES** must be the first entry in the **DIRECTORY_PATH**.

- 2 Comment out the line SQLNET.AUTHENTICATION_SERVICES= (NTS) within the <Oracle installation directory>\network\admin\sqlnet.ora file located on the database server machine.
- **3** Validate connection performance to the Performance Center database. Run the **TcQA_CheckDatabaseConnection.vbs** script (available as a download from the Customer Support Web site Knowledge Base, ID39475) to quantify the performance of the connection to the Performance Center database. Make sure that the connect times are constant and low.

The following is an example of a sample output:

```
Database Connection String: Provider=SQLOLEDB.1;User
ID=OrchidUser;PWD=orchid;Initial Catalog=MI_LRDB;Data
Source=samurai\mssqla;QuotedID=No Statistics:
Attempt #1: Connect= 1 secs, Query= 2 secs
Attempt #2: Connect= 1 secs, Query= 1 secs
Attempt #3: Connect= 2 secs, Query= 1 secs
Attempt #4: Connect= 2 secs, Query= 1 secs
Attempt #5: Connect= 2 secs, Query= 1 secs
```

Orchid Monitor Error

Problem description: Error from Orchid monitor in Error Window during the run.

Troubleshooting

The Windows Remore Registry Service should be running on the host machine.

- 1 Select Start > Programs > Administrator Tools > Services to open the services window.
- **2** Search for the Remote Registry Service
- **3** Make sure the service's status is **Started** and is set to **Automatic**.

Cannot Run Load Test with Non-Admin User

Problem description: You cannot run a load test with a non-administrative system user, or after a user is changed.

Troubleshooting

- **1** Verify that all the required services are running.
- **2** Try to run **alagentservice** and **magentservice** using the following commands:

➤ alagentservice

%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 system user.

➤ magentservice

%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 system user.

- **3** If the load test fails in the first step, check the **LRFS** folder. If there is a problem configuring the **LRFS** folder, try restarting the machine.
- **4** Check the identity of the COM objects, especially **OrchidActiveSession** and **wlrun.lrengine**. The identity should be the Performance Center system user.

SiteScope Server Fails to Retrieve Data from Hosts/Servers

Problem description: If you change the system user to a non-administrative user and then enable SiteScope on any of the Performance Center servers or hosts, SiteScope cannot retrieve all required data.

Troubleshooting

Manually configure an administrative user on the SiteScope server so that it has permissions to monitor the server/hosts machines and retrieve all the required data.

To configure an administrative user on the SiteScope server:

1 In your browser, type the URL for SiteScope as follows:

http://<sitescope_server>:8888/sitescope

where **sitescope_server** is the name of your SiteScope server.

- **2** At the top of the SiteScope page, click **SiteScope**.
- **3** Click **Remote Windows**.
- **4** From the list, select the relevant machine and click **Edit**.
- **5** In the **Login** and **Password** fields, type the login name and password of a system user with administrative privileges.
- 6 Click Update.

Failure to Run Load Test

Problem description: The load test fails to run. This may occur as a result of problems with the .NET Framework installation.

Troubleshooting

Repair the .NET Framework installation as follows:

- 1 Select Start > Run.
- **2** Type the following command:

c:\WINDOWS\Microsoft.NET\Framework\v2.0.50727\aspnet_regiis.exe -i

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Troubleshooting WAN Emulation

This chapter provides information on troubleshooting problems related to WAN Emulation.

This chapter includes:

- ► WAN Emulation Is Already Running on page 697
- > Duplicate Monitor Graphs with Empty Counters Appear on page 698
- ► Load Test is Stuck in init Phase on page 698
- Cannot Run WAN Emulation on Load Generator That Is Also the Controller on page 699
- ► User Site Gets Stuck when Starting Load Test Configured with WAN Emulation on page 699

WAN Emulation Is Already Running

Problem description. If you kill the **LR_Bridge.exe** or **magentproc.exe** processes on a load generator to stop a load test, the next time you define WAN Emulation settings and run a load test on that load generator, you will receive a message that WAN Emulation is already running on it.

Troubleshooting

When you kill the processes on a load generator to stop the load test, you must manually terminate the WAN Emulation as well. If you do not manually stop the WAN Emulation and later try to run another load test on the same load generator, the load generator will still be emulated without you being aware of it. We strongly recommend that you manually terminate the WAN Emulation to prevent this scenario.

Duplicate Monitor Graphs with Empty Counters Appear

Problem Description. A duplicate of the Windows Resources monitor appears with empty counters.

Troubleshooting

If you manually add metrics in addition to those that are automatically added, you will see a duplicate of the Windows Resources monitor with empty counters representing the manually added metrics.

Load Test is Stuck in init Phase

Problem description. Load Test is stuck in the init phase.

Troubleshooting

- ➤ If you try to run a load test with the WAN Emulation but the 3rd party software is not installed on the load generator, then the load test might get stuck in the init phase. In this case, check the 3rd party software error message and consult the relevant 3rd party software installation documentation.
- ➤ If you are working with the WAN Emulator in professional mode, and you specify a location for the .ntx file on a machine where there are no Performance Center User privileges, when you try to run the load test it will get stuck during the init phase.

When working in professional mode, make sure that .**ntx** file is located on a machine that has Performance Center User privileges.

Cannot Run WAN Emulation on Load Generator That Is Also the Controller

Problem description. You receive an error message that you cannot run WAN Emulation on a load generator that is also the Controller.

Troubleshooting

 Make sure that the option to allow running Vusers on the Controller in the project is disabled.

User Site Gets Stuck when Starting Load Test Configured with WAN Emulation

Problem description. You configure a load test to run with WAN Emulation, but the User Site gets stuck when you start the load test run.

Troubleshooting

► Restart the Controller.

Chapter 46 • Troubleshooting WAN Emulation

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Troubleshooting Autostart

This chapter provides information on troubleshooting errors related to autostarting load tests.

This chapter includes:

- ► License Validation Failed on page 702
- ► Timeslot Validation Failed on page 702
- ► Load Test is Already Active on page 703
- ► Load Test Exceeded Timeslot on page 704
- ► Cannot Instantiate Session Activator Component on page 705
- ► Cannot Activate Load Test Run on page 705

License Validation Failed

Error Message: License Validation Failed.

Troubleshooting

Each load test's activation is validated against the Performance Center license limitations for the number of Vusers, machines, and concurrent runs, as well as project limitations and the license's expiration date.

- Check if the Performance Center license or the project settings were modified. If they have been modified, reschedule the load test according to the new settings.
- > Check if the Performance Center license has expired.

Timeslot Validation Failed

Error message: Timeslot validation failed. Please make sure that timeslot duration is at least 20 minutes.

Troubleshooting

Reserve a new timeslot for the load test that has at least 20 minutes available.

Load Test is Already Active

Error Message: There is already a run executing for this load test.

Troubleshooting

A load test can have one of the following states: Ready, Running, Stopping, Collating Results, or Creating Analysis Data. Each of these states is considered an Active state. A load test can only have one Active state at any one time. If you try to run a load test that already has an Active state, you will receive the above message.

If the current state is Ready, Running, or Stopping, reset the load test using the HP Performance Center Administration site as follows:

- a From the Performance Center left menu, selectSite Management > Test Runs. The Test Runs page opens.
- **b** Select the relevant run from the test runs table.
- **c** In the test runs toolbar, click the **Fast Recovery** button.

This cleans the state of the load test and makes the host available for future load tests.

If the current state is Collating Results, use the fast recovery feature as described above, and then deactivate the collator process as follows:

- **a** On the Administrator Site, select **Site Management > Test Runs**. The Test Runs page opens.
- **b** Select the relevant run from the test runs table.
- **c** In the test runs toolbar, click the **Deactivate collator process** button. The Deactivate Collator dialog box opens.
- **d** Click **OK** to confirm that you want to deactivate the collator process. A dialog box opens confirming that the process was deactivated.
- e Click **Close** to close the dialog box.



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If the current Active state is Creating Analysis Data, use the fast recovery feature as described above, and then kill the process to free up more resources as follows:

- **a** On the User site, select **Project** > **Hosts**. The Hosts page opens.
- **b** In the Hosts table, click the relevant host. The Host Details page opens.
- **c** In the Host Details page, select the processes tab.
- **d** In the relevant process's **Kill** column, click **Kill Process**.

Note: The Creating Analysis Data process is very CPU and I/O intensive. Killing this process should be considered only in the event you have not been able to resolve the problem in any other way.

Load Test Exceeded Timeslot

Error Message: Load test <test name> exceeded its timeslot. Executing run failed to stop in a timely manner.

Troubleshooting

This usually occurs when you reserve consecutive autostart timeslots that share resources, or where the first defined load test is very CPU and/or I/O intensive and/or has a large number of Vusers scheduled to run at the same time. This can cause the first load test to overrun its timeslot and as a result the second load test will not run.

When reserving consecutive autostart timeslots:

- ➤ Make sure that you leave a suitable time interval between the timeslots.
- ➤ Do not select the Collate and Analyze Results or Collate Only post run analysis options for the first timeslot.

Cannot Instantiate Session Activator Component

Error Message: Unable to instantiate Session Activator Component.

Troubleshooting

This is an indication of an internal error.

- ► Reset the User Site and/or the Utility and/or the Host Machine.
- ► If that does not resolve the problem, contact HP Support.

Cannot Activate Load Test Run

Error Message: Unable to activate and start load test run.

Troubleshooting

- ► Check Session Activator Errors:
 - ► Run the load test manually to try resolve issues that arise.
 - When reserving the timeslot, do not select Manual machine selection.
 Select Automatic instead.
 - ► Check the load test for run time settings errors.

Chapter 47 • Troubleshooting Autostart



Troubleshooting Post Load Test

This chapter provides information on troubleshooting issues that may arise after running a load test.

This chapter includes:

- > Cannot Find Data Processor to Publish Load Test Results on page 707
- ► Failure to Launch Online Analysis on page 708

Cannot Find Data Processor to Publish Load Test Results

Problem description: When trying to publish load test results to the Dashboard, you get an error that Performance Center cannot find a data processor.

Troubleshooting

- **1** Log on to the Performance Center Administration Site and edit the host so that it also functions as a data processor. (For more information, see the *HP Performance Center Administrator Guide*.)
- **2** In the User Site, refresh the Dashboard page.
- **3** If Performance Center still cannot find the data processor, unpublish the results and republish them.

Failure to Launch Online Analysis

Problem description: Performance Center cannot launch online Analysis when the Controller does not have access to the Utility Server. The run initialization fails.

Troubleshooting

- Check the DNS settings to make sure you can ping the Utility Server from the Controller.
- ➤ In the case of an Oracle database, make sure the tnsnames.ora is defined properly.

Cannot Export Trend View Information to CSV Format

Problem description. Performance Center fails to export the information contained in a trend report's trend view to CSV format.

Troubleshooting

Check your Internet Explorer settings as follows:

- **1** On your machine, select **Tools** > **Internet Options**.
- **2** Select the **Security** tab.
- 3 Click Custom Level.
- **4** Under **Downloads**, make sure that the **Automatic Prompting for File Downloads** setting is set to **Enable**.

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Troubleshooting Accessing the Performance Center Sites

This chapter provides information on troubleshooting Web-related problems.

This chapter includes:

- ► Login Fails on page 709
- ➤ User Site Does Not Exist After Initial Configuration on page 711
- ► Unable to Log In to the Administration/User Site on page 712
- ► Administration Site Page Cannot Be Displayed on page 713
- ► Cannot Connect to Administration or User Site on page 714

Login Fails

Logging in to Performance Center fails in the following cases:

- ▶ "New Users Cannot Log In to Performance Center" on page 710
- "Cannot Log In to Performance Center with Any User or Administrator Account" on page 710

New Users Cannot Log In to Performance Center

Problem description: New users cannot log in to Performance Center. Get the following error: **The system could not retrieve your personal information**. **Please contact your administrator**.

Troubleshooting

This usually happens after upgrading the database.

Make sure that the **Default** project exists in Performance Center and is enabled.

- **1** Open the database, and locate the Companies table.
- **2** Make sure that for **Default** project, **state** is set to **1**.

If not, run the following line on the database:

update MI_LRDB.companies set state=1 where companyID=1

Cannot Log In to Performance Center with Any User or Administrator Account

Problem description: You cannot log in to Performance Center with any user or administrator account.

Troubleshooting

- **1** Make sure that you type the correct user name and password. The password is case-sensitive. The default administrator account is **Admin**, **Admin**.
- **2** There may be a problem with the encryption and decryption of the password.
 - Open Documents And Settings\All Users\Application Data\Microsoft\Crypto\RSA\MachineKeys and delete the entry that begins with f9416f003254e610da1f9bad8e4c383_.
 - Restart IIS. Select Start > Programs > Administrative Tools > Services.
 Select IIS Admin Service and click Restart Service.

- **3** Make sure that both the Administration Site and the User Site are configured to run with the same account credentials as the Performance Center Web services virtual directories. For more information about troubleshooting Web services, see the relevant section in the *HP Performance Center Administrator Guide*.
- **4** Check that you are able to connect to the database server from the Utility Server and the Web Server. Download the **TcIN_AdoDBTester.exe** utility from the HP Software Support site's Self-solve Knowledge Search (http://support.openview.hp.com/selfsolve/documents) (ID: **39475**).
- **5** Make sure that the maximum number of connections to the database server has not been exceeded. Run **Perfmon.exe** or the database server's management tool to verify the number of connections. You should contact your database administrator if you need further assistance.

User Site Does Not Exist After Initial Configuration

Error message: 'Page Not Found' (displayed in browser).

Problem description: After the initial configuration of Performance Center (using <u>http://<servername>/admin/initialfs.htm</u>), the Performance Center User Site is created through the Server Configuration page in the Administration Site (**System Configuration > Server Configuration**). In this case, after the User Site (<u>http://<servername>/LoadTest</u>) has been created, it does not exist on the Performance Center server.

Troubleshooting

If the Performance Center Web server was corrupted or reinstalled, launch Internet Service Manager and check if the **LoadTest** virtual directory is defined.

1 If **LoadTest** is defined, but points to the wrong directory, delete the **LoadTest** virtual directory and continue with the following step.

If **LoadTest** is not defined, log in to the Performance Center Administration Site and check if an entry exists for **User Site Servers** on the Server Configuration page (under **System Configuration** > **Server Configuration**). If the name of the server is not displayed under **User Site Servers**, add it and save your changes. Try to log in to the User Site (http://<servername>/ loadtest).

- 2 From the User Site machine, connect to the database or user schema using Microsoft SQL, Oracle Enterprise Manager, or any SQL client and check the Web Server entry in the GlobalData table of the MI_LRDB tablespace/ database. If the Web Server entry contains the name of the server on which you want to install the Performance Center User Site, remove the server name.
- 3 Log in to the Performance Center Administration Site and define User Site Servers on the Server Configuration page (under System Configuration > Server Configuration).

Unable to Log In to the Administration/User Site

Problem description: You are unable to log in to the Administration Site or the User Site. The system appears to "spin."

Troubleshooting

(IIS 5 only) Make sure that both the Administration Site and the User Site are set to Application Protection level High (isolated) in the Internet Services Manager. For more information, see "Option 1 (IIS 5 only): Set the Application Protection level to High (isolated)" on page 762.

- **2** Make sure that the permissions level for the **IWAM_<SERVER>** user is set correctly. For more information, see "Option 2: Set the Correct Permissions Level for the IWAM_<SERVER> user" on page 763.
- **3** Make sure that the IWAM password for the IIS account is synced. If this is the first time you are logging in after installing Performance Center, the installation might have been corrupted due to IIS configuration problems. This can happen when installing a Windows service pack and/or updates before IIS is installed. In this case IIS is not updated (this is a Microsoft limitation). For more information, see the section about "Error: Method ~ of object ~ Failed During Installation" in the *HP Performance Center Troubleshooting Guide*.

Administration Site Page Cannot Be Displayed

Problem description: You receive an error message indicating that the Administration Site page cannot be displayed, or the Administration Site is not displayed correctly.

Troubleshooting

- If the Administration Site is not displaying correctly, recreate the Administration Site by running <Performance Center installation directory>\bin\AdminInstaller.exe1
- ► If you receive an error that the page cannot be displayed:
 - **a** Close the current browser. Relaunch the browser and try to open the Administration Site again.
 - b Select Tools > Internet Options from the menu. In the General tab, click Settings. In the Check for newer versions of stored pages section, make sure that the Every visit to the page option is selected.
 - **c** Clear the browser cache and cookies.
 - **d** If the problem is still not resolved, try to open the Administration Site from a different machine.
 - **e** Reset IIS by choosing **Start > Programs > Administrative Tools > Services**, locating **IIS Admin Service**, and clicking **Restart Service**.

Cannot Connect to Administration or User Site

Problem description: When trying to connect to the Administration or User Site Web servers, you receive a **Service unavailable** or **You are not authorized to view this page** error message.

Troubleshooting

- **1** Verify that the Administration Site virtual directory user exists.
- **2** Verify that the user has all the required policies.
- **3** Verify that the application pool is not locked. If it is, consult the event viewer for an explanation.
- **4** Verify that the security policy configuration of the customer domain is compatible with the the configuration of your Performance Center environment.

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Troubleshooting Terminal Sessions

This chapter provides information on troubleshooting problems related to terminal sessions.

This chapter includes:

- ► Unable to Create Terminal Sessions on the Load Generator on page 716
- > Controller and Load Generator Cannot Communicate on page 718
- Running a GUI Script in HP Performance Center Causes HP WinRunner or HP QuickTest Professional to Crash on page 718
- Unable to Set Terminal Services for a Machine Name Added as an IP Address/ Domain Name on page 719

Unable to Create Terminal Sessions on the Load Generator

Error message: Cannot create terminal sessions on the load generator. There might be a problem with logon credentials.

Troubleshooting

- 1 Verify that the correct terminal server login settings are selected. For information about verifying the settings, see "Configuring Terminal Services Logon Settings" on page 235.
- 2 If you encounter a network connection error stating that the user is not mapped to the drive on the terminal server machine (see graphic below), create a separate terminal services profile for each user that is used to log in to a terminal server session. For more information, see the Microsoft Terminal Services documentation (http://technet2.microsoft.com/ windowsserver/en/technologies/featured/termserv/default.mspx).

Restori	ng Network Connections	×			
	An error occurred while reconnecting F: to \\cdserver\cd726 Microsoft Windows Network : No password supplied.				
	\square Do not try to restore the connection in the future.				
	Do not display further error messages.				
	Continue restoring connections?				
	Yes <u>N</u> o				

- **3** Verify that the correct Client Settings are selected:
 - **a** Select Start > Programs > Administrative Tools > Terminal Services Configuration > RDP-TCP. Right-click RDP-TCP, and select Properties to open the RDP-TCP Properties dialog box.
 - **b** In the RDP-TCP Properties dialog box, select the **Client Settings** tab.

c Make sure that **Use connection settings from user settings** is disabled.

RDP-Tcp Properties								
General Remote Control	Logon Settings Client Settings	Sessions Network Adapte	Environment r Permissions					
Connection Use connection settings from user settings Connect client drives at logon Connect client printers at logon Default to main client printer								
Disable the following: Drive mapping Windows printer mapping LPT port mapping COM port mapping Clipboard mapping Audio mapping								
	OK	Cancel	Apply					

4 If the run fails to create terminal services, open the terminal services from a specific host and make sure there are no pop-up messages when you log in as the Performance Center user. By default, the Performance Center user is a local user, MI_LRDB, unless the system user was changed from the General Settings page of the Administration site (System Configuration > General Settings > Change User).

Controller and Load Generator Cannot Communicate

Problem description: There is no connection between the Controller and the load generator on the terminal server.

Troubleshooting

- **1** Verify that the terminal server is installed correctly.
- 2 Verify that there are active sessions on the Terminal Services Manager (Start > Programs > Administrative Tools > Terminal Services Manager).
- **3** If you are using an existing terminal session, verify that the Performance Center agent icon appears in the terminal server's system tray. This indicates that the agent is running.
- 4 Make sure that the Performance Center user has **Create Global Object** privileges when running a terminal server session on a Windows Server 2003, Windows XP SP2, or Windows 2000 Server SP4 machine. Add the Performance Center Administrators group (or the group to which the Performance Center user belongs) to the **Create Global Object** privilege, under **Local Security Policies\Users Rights** on the terminal server machine.

Running a GUI Script in HP Performance Center Causes HP WinRunner or HP QuickTest Professional to Crash

Problem description: The DCOM configuration of **Wlrun.Engine** causes HP WinRunner or HP QuickTest Professional to crash while running a GUI script in Performance Center.

Troubleshooting

Workaround: Configure the Controller to work as an interactive user.

- **1** Make sure that the **wlrun** process is not running on the machine.
- **2** Select **Run** from the Windows Start menu and type dcomcnfg.
- **3** Press ENTER to display the list of DCOM applications.

- **4** In the displayed application list, right-click **wlrun.LrEngine** and select **Properties**.
- **5** In the **Identity** tab of the dialog box, select **The interactive user**.
- 6 Click **OK** twice to close both dialog boxes.
- **7** Log in to the machine in the Performance Center environment as the system user. This user, which is installed with Performance Center, is displayed in the General Settings page of the Administration Site.

Unable to Set Terminal Services for a Machine Name Added as an IP Address/Domain Name

Problem description: When your environment is configured with a local user (in the General Settings page of the Administration Site), 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.hp.com**).

Troubleshooting

Workaround: Delete the host from the Hosts page of the Administration Site, and add the host machine again using the host name only.

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Troubleshooting Hosts and Servers

This chapter provides information on troubleshooting host-related problems.

This chapter includes:

- ► Host in Resource Failure on page 722
- ► Unable to Add a Load Generator Due to High Latency on page 728
- > Problems Changing SiteScope Server in Administration Site on page 729
- ➤ SiteScope Server Fails to Monitor the MS-SQL Database on page 730
- ► Failure to Add Host on page 731
- ► Failure to Reboot Host from Administration Site on page 733
- ► Not Enough Server Storage Available on page 734

Host in Resource Failure

Problem description: The host is in Resource Failure status.

Troubleshooting

Option 1: Check the host connections

Check the connections between your project's hosts and the machines within your system using the Check Hosts operation in the Hosts page of the Administration Site (**Resources > Hosts > Check Hosts**) or User Site (**Project > Hosts > Check Hosts**).

🎒 Check I	losts - Micros	oft Internet Exp	orer provided by Hewlett	-Packard				
Chec	k Hosts	;				Close Help Check Hosts		
•	Host Name	Ping to Host	Over Firewall Status	File Server	Database	Ping URL		
V -+	controller1	×	N/A	 ✓ 	 ✓ 	N/A		
☑ 🗧	lt-pc02	N/A	¥	N/A	N/A	N/A		
 ✓ - Controller - Controller +Load Generator - Data Processor Result Status: It-pc02 								
Ping to Host: Over Eirewall Status:			/A oppected					
File Ser	ver:	. N	/A					
Databas	e:	N	/A					
Ping to	UKL:	IN,	(A					

► If Ping to Host fails:

- ➤ Make sure the host is up and running, and is connected to the network. Check the routing table (netstat -r) and make sure that requests to this host are properly routed.
- ➤ Make sure that the host's IP address can be properly resolved.
- Verify that the ping to the target host from the Performance Center Web server, utility server, and database is below 20 ms.

If your firewalls or hosts ignore ICMP requests (pings), use HTTP requests to validate response times from the host to the Web server (a simple LoadRunner web_url(...) request to <u>http://<server>/loadtest/</u>).
 Alternatively, open a browser and type http://<server>/loadtest in the address field.

► If the file server fails:

- ➤ Make sure that the host can ping the file server.
- Make sure that the Performance Center system user has access to LRFS share on the file server. You can verify this in any of the following ways:
 - ► In the command line, execute the following:

```
net use \\fileserver\LRFS / user:
<Performance_Center_user><Performance_Center_user_password>
```

Log in to the host machine as the Performance Center system user, and in the command line, execute the following:

% net use \\fileserver\LRFS

If the above operation fails, check the error message and resolve the problem. Contact your Windows administrator for assistance.

- ➤ Make sure that the security settings on LRFS share allow the HP Performance Center system user full control.
- Make sure that the Performance Center system user can create, update, and delete files from LRFS share.
- ➤ Make sure that the Performance Center Web server can launch applications on the host. For more information, see "Troubleshooting Web Service Connectivity" on page 749.

► If the database fails:

- Check the <HP Performance Center>/bin/globals.ini file and make sure that the connection string is correct for the database you are using.
- See the troubleshooting for "Login to Oracle Database Server Hangs" on page 762.
- Verify ADODB connectivity to the database as described in "Login to Database Server Fails" on page 764.

Option 2: Check the Performance Center version

Make sure that the version of Performance Center service pack level and feature pack level on all your host and server machines are the same as those on the Performance Center Web and Utility servers. That is, all Performance Center hosts and servers MUST be at the same service pack and feature pack level.

Check the registry entry under [HKEY_LOCAL_MACHINE\SOFTWARE\Mercury Interactive\LoadRunner\CurrentVersion] for the following variables:

- ► Major
- ► Minor
- ► ServicePack

Note: Any patches applied to one machine must be applied to all machines if and when applicable.

Option 3: Launch wlrun.exe manually from the Controller host machine

If the host check succeeds, but the host is still not operational, launch the Controller manually from the Controller host machine as follows:

- **1** Log in to the host machine.
- **2** Configure the **wlrun.LrEngine** application to run as an interactive user:
 - ► Launch **dcomcnfg.exe**.
 - ➤ In the Application tab, select wlrun.LrEngine from the list of DCOM applications.
 - ► Click **Properties** to view the properties for **wlrun.LrEngine**.
 - ► In the **Identity** tab, set the user account to **The interactive user**.
 - ► Click **OK** and close the **DCOMCNFG** window.

Note: When you are finished with this step, set **wlrun.LrEngine** back to its original identity. By default, this is This User with the Performance Center user name and password. If you used a different identity, restore it.

- **3** Launch the Controller (**wlrun.exe**) from the **<HP Performance Center>/bin** directory (on the Controller host).
- **4** If an error message is displayed during the startup of the Controller, resolve the error message before continuing. For Performance Center to utilize the Controller properly, no error messages should be displayed during startup.

5 Create a new, simple load test and reference the scripts from the **LRFS share** (on the Performance Center file server). Run the load test with one or two users to verify that the Controller works.

Note: Scripts uploaded to the Performance Center LRFS reside in the **fileserverLRFS<ProjectID>\Scripts** directory. To obtain the **<ProjectID>**, select **User Management > Projects**.

The following is an example path to the **USR** file for a script named **MyTest**: \\myserver\LRFS\2\Scripts\MyTest\MyTest.usr

- **6** Close the Controller (**wlrun.exe**).
- **7** From the Performance Center User Site, launch a simple load test.
 - Check whether the following processes are displayed in the Task Manager on the Controller host:
 - > OrchidActiveSession.exe OR ORCHID~1.exe
 - ► WLRUN.EXE
 - Check whether the Controller is displaying a dialog box that requires user input before the Controller can proceed with the load test. Address the reasons for the dialog box being displayed, and make sure that no dialog boxes are displayed when re-running the load test from Performance Center.

Examples of dialog boxes that may be displayed include License Has Expired, Monitor Not Licensed, and Host is Over-Utilized.

If you are unsure how to resolve the problem indicated in the dialog box, contact the Customer Support Web site (<u>http://www.hp.com/go/</u><u>hpsoftwaresupport</u>) for assistance.

Note: When you are finished with this step, set **wlrun.LrEngine** back to its original identity. By default, this is **This User** with the Performance Center user name and password. If you used a different identity, restore it.

Option 4: Reinstall Performance Center host on the host machine

If all of the above steps fail to resolve the problem, reinstall the Performance Center host on the host machine.

- 1 Uninstall Performance Center (Start > Settings > Control Panel > Add/ Remove Programs). (This is really the Performance Center host.)
- 2 Delete HKEY_LOCAL_MACHINE\SOFTWARE\Mercury Interactive from the registry.
- **3** Clean the Performance Center machine, as described in the section about cleaning Performance Center machines in the *HP Performance Center System Configuration and Installation Guide*.
- **4** Re-install the Performance Center host. For more information, see the *HP Performance Center System Configuration and Installation Guide*. Make sure that you install the same version of Performance Center as is installed on your Web server.

Note: Do not install an Performance Center server (such as a Utility Server, Web Server, or File Server) on the same machine as the Performance Center host (such as a data processor, Controller, or load generator).

Unable to Add a Load Generator Due to High Latency

Problem description: You are unable to add a load generator host due to high network latency or the network policy.

You may have a problem adding a host to the Performance Center Administration Site as a load generator if the host has a ping time greater than 50 ms. This applies only to hosts added as load generators.

Troubleshooting

- **1** Create a temporary host location over a firewall.
 - **a** On the Host Locations page, click **Add Host Location**.
 - **b** In the **Host Location** field, type **TempOverFirewall**.
 - **c** Set **Located over Firewall** to **Yes**. (By using the **Located over Firewall** option, many checks that are performed on host machines will not be performed.)
 - d Click OK.
- **2** Add a new host to the temporary location.
 - **a** On the Hosts page, click **Add Host**.
 - **b** In the **Name** field, type add.
 - c In the Purpose field, select Load Generator.
 - **d** From the **Location** list, select **TempOverFirewall**.
 - **e** From the **Host Pool** list, select the correct host pool.
 - **f** Click **Save**, and then click **OK** to confirm.
 - **g** Select the host that was added from the host list.
 - h Change the location to the correct location. (Placing the host in the over firewall location was done just to bypass some checking that Performance Center does when adding host machines.)
 - i Click OK. In the next two message boxes that are displayed, click OK.
- **3** Repeat Step 2 for all load generators that have high network latency.

Problems Changing SiteScope Server in Administration Site

Problem description: You are unable to change the SiteScope server details on the Server Configuration page in the Administration Site (**System Configuration** > **Server Configuration**). When you type a new SiteScope server in the **SiteScope Server** box and click **Save**, you receive one of the following error messages:

- ► Service unavailable
- ➤ An unspecified error occurred while processing your request. Try to refresh your browser or to open another browser instance.

Troubleshooting

- 1 On the Server Configuration page (System Configuration > Server Configuration), clear the contents of the SiteScope Server box and click Save.
- **2** In the **SiteScope Server** box, type the name of the new SiteScope server and click **Save**.

Note: As a result of this action, Performance Center host or server groups may have been created on the new SiteScope server. We recommend that you remove these groups from the SiteScope server.

- **3** Re-enable SiteScope monitoring on the relevant Performance Center hosts and servers.
 - To enable SiteScope monitoring for a host, open the Hosts page (Resources > Hosts), and click the relevant host. In the Properties tab, click Edit and select Enable SiteScope Monitoring.
 - To enable SiteScope monitoring for a server, open the Servers page (Resources > Servers), and click the relevant server. In the Properties tab, click Edit and select Enable SiteScope Monitoring.
- **4** Reconfigure the SiteScope alert settings on the Alerts Configuration page (System Configuration > Alerts Configuration).

SiteScope Server Fails to Monitor the MS-SQL Database

When using a SiteScope server to monitor a Performance Center farm working with Microsoft SQL Server 2005, SiteScope fails to monitor the database service.

SiteScope Data					
State	Name	Status			
0	MEMORY	24% used, 4305MB free, 4.37402 pages/sec			
•	SERVICE 'RemoteManagement Agent Service'	running			
Q,	SERVICE 'MSSQLSERVER'	not installed			
•	SERVICE 'Performance Center TaskManager Service'	running			
	SERVICE 'Performance Center Disk Cleaner'	running			

Troubleshooting

This problem is caused due to a discrepancy in the service names between the Microsoft SQL Server 2000 and Microsoft SQL Server 2005. By default, Performance Center is configured with the service name of Microsoft SQL Server 2000.

- If SiteScope was already added to monitor the Performance Center farm, and was enabled to monitor the database server (from the Administrator Site > Servers page), disable SiteScope from monitoring the database server.
- **2** Change the SQL Server's service name in Performance Center by running the following SQL statement on the Performance Center database:

UPDATE SiSMonitors SET Instance='SQL Server (MSSQLSERVER)' WHERE Instance='MSSQLSERVER'

3 Re-enable SiteScope to monitor the database server.

Failure to Add Host

Problem description: Add host fails.

This may occur as a result of any of the following problems:

- ► Cannot Add Host as a Performance Center Host
- > Performance Center Incorrectly Asks for Administrator Account
- ► System User Passwords Do Not Match
- ► .NET Framework
- ► Oracle Database Connection

Cannot Add Host as a Performance Center Host

Problem description: When trying to add a host, you receive an error stating that HP Performance Center cannot identify the host as an Performance Center host.

Troubleshooting

Verify that the **ManagmentUtil.exe COM** object is defined as the Performance Center system user.

Performance Center Incorrectly Asks for Administrator Account

Problem description: Failure to add hosts is often mistakenly accompanied by a request for administrator account credentials.

Troubleshooting

- **1** Make sure the Default Web Site directory in IIS is defined with port **80** and **IP address** is set to **(All Unassigned)**.
- **2** Make sure that IIS is configured properly.
 - ➤ IIS 5.0.x: In the Default Web Site > PCWS folder's Properties, make sure that Application Protection is set to High.

- ► IIS 6.0.x:
 - Make sure that Application Pools > PCWSAppPool exists. If not, create it with default options.
 - In the Default Web Site > PCWS folder's Properties, make sure that the application pool selected is PCWSAppPool.
 - In the Web Service Extensions, make sure that the following are allowed:

Active Server Pages; ASP.NET v2.0.50727; Server Side Includes

If any of them are not allowed, allow them and reset IIS.

3 Make sure the **ServerManagerWS** Web Service is available (see "Testing Web Service Connectivity" on page 750).

System User Passwords Do Not Match

The Performance Center system user credentials on the new host machine must be the same as those of the Performance Center system user on the rest of the Performance Center system.

If the system user exists on the host with a different password, Performance Center will not add the host to the system. Before attempting to add a host, Make sure that the credentials match.

.NET Framework

There may be a problem with the .NET Framework installation.

Repair the .NET Framework installation as follows:

- 1 Select Start > Run.
- **2** Type the following command:

c:\WINDOWS\Microsoft.NET\Framework\v2.0.50727\aspnet_regiis.exe -i

Oracle Database Connection

If you are working with Oracle, this problem might be related to the Oracle database connection.

Verify that the following connection works from the host server machine:

% sqlplus <username>/<password>@<connect_string>

If the command fails, check the TNS entry on the host machine (in the <**Oracle_client installation directory**>\network\admin\tnsnames.ora file). This should be the same as the TNS entry on the database server (in the <**Oracle_server installation directory**>\network\admin\tnsnames.ora file).

If the TNS entry is different to that of the database server, you need to copy the TNS entry from the database server to the host.

Failure to Reboot Host from Administration Site

Problem description: When a host is rebooted from the Hosts page of the Administration Site, the host has been rebooted, but the host state is not updated accordingly.

Troubleshooting

Reset IIS as follows:

- 1 Select Start > Run.
- 2 Type iisreset.
- 3 Press Enter.

Not Enough Server Storage Available

Problem description: The following error message appears in the Analysis results and Performance Center logs (<Performance Center installation>\orchidtmp\LTLogger\ANALYS~1\log.txt) on the host machine:

"Not enough server storage is available to process this command."

Troubleshooting

This error occurs when the value of the IRPStackSize entry in the machine's registry is too low.

Important: The following procedure contains steps that instruct you how to modify the registry. Serious problems might occur if you modify the registry incorrectly. Therefore, make sure that you follow each step carefully. For added protection, back up the registry before you modify it. Then, you can restore the registry if a problem occurs. For more information about how to back up and restore the registry, see the following article in the Microsoft Knowledge Base: 322756 (http://support.microsoft.com/kb/322756/) How to back up and restore the registry in Windows.

To increase the value of the IRPStackSize registry entry:

- 1 Select Start > Run, type regedit, and click OK.
- **2** Locate the following registry subkey:

 $\label{eq:hkey_local_machine} \\ HKey_local_machine\\System\\ CurrentControlSet\\ Services\\ LanmanServer\\ Parameters$

- **3** If the IRPStackSize entry is not present in this subkey:
 - **a** From the Edit menu, select New > DWORD Value.
 - **b** Type IRPStackSize, and press ENTER.

Note: Type IRPStackSize exactly as it appears. The value name is case sensitive.

- **4** Select **IRPStackSize** and, from the Edit menu, select **Modify**.
- **5** In the **Data Value** box, type a higher value, and click **OK**.

Values may range from 0x1 to 0xC. These values are equivalent to 1 to 12 in decimal notation.

If the problem persists after you have completed this procedure, gradually increase the value of **IRPStackSize** until you find the minimum value that resolves the problem. Using a value that is higher than necessary might waste system resources.

Other factors can also lead to this error message. If problems persist after you have used all the valid values for IRPStackSize, restore IRPStackSize to its original value, and seek another explanation for the error Chapter 51 • Troubleshooting Hosts and Servers

Troubleshooting Monitors

This chapter provides information on troubleshooting problems related to Performance Center monitors.

This chapter includes:

- ► Cannot Create a Monitor on page 737
- ► Cannot Save Measurements on page 739
- ► Port Required for J2EE Monitor Is Already Taken on page 740
- ► J2EE Monitor Initialization Errors on page 741
- ➤ Cannot Save SiteScope Monitors with Many Counters on page 741

Cannot Create a Monitor

Problem description: You are unable to create a specific monitor.

Troubleshooting

1 Make sure that the user trying to access the machine to monitor exists on this machine and has proper privileges. Usually **IUSR_METRO** will be the user attempting to monitor.

For example, if you add the **Windows Resources** monitor, the user **IUSR_METRO** must exist on the machine to be monitored and must have proper access rights.

- **2** Some monitors require certain clients to reside on the Utility Server and the Controller.
 - ► For BroadVision, JDK must be installed.
 - ► For WebLogic, JDK and the **weblogic.jar** file must be present.
 - ► For Oracle, the Oracle Client must be installed.
 - ➤ For DB2, the DB2 administrative client must be installed. (OS390 is not supported.)
- **3** Make sure the agent required for a particular monitor is running on the machine that you want to monitor.
- **4** For COM+, make sure that the COM+ probe is running on the machine that you want to monitor.
- **5** Some monitors require access to a particular URL, from both the Performance Center utility server and the Controller, for monitoring purposes.
 - ► For Apache, this URL is: <u>http://<server>:<port>/server-status:auto</u>
 - ➤ For Websphere 4.x & 5.x, this URL is: <u>http://<server>:<port>/wasPerftool/</u> <u>ervlet/perfservlet</u>

Cannot Save Measurements

Problem description: During configuration of a monitor, after you select the measurements that you want to monitor and you click **Save**, instead of saving the monitor, Performance Center goes back to the Choose Monitor page.

Troubleshooting

This problem usually occurs when you select a large number of measurements. To resolve this issue, you need to increase the value of the **AspMaxRequestEntityAllowed** property in the IIS metabase. This property specifies the maximum number of bytes allowed in the entity body of an ASP request.

Note: For more information about the **AspMaxRequestEntityAllowed** property, see the Microsoft Terminal Services documentation: <u>http://</u><u>www.microsoft.com/technet/prodtechnol/WindowsServer2003/Library/IIS/</u><u>a6401b5e-c902-4035-90aa-ee46c270d357.mspx?mfr=true</u>, or <u>http://</u><u>support.microsoft.com/kb/327659</u>

To increase the value of the AspMaxRequestEntityAllowed property:

1 Run the following command from the command line:

cd <IIS_installation_drive>:\inetpub\adminscripts.

where **<IIS_installation_drive>** is the hard disk where IIS is installed.

2 To view the current value of the **AspMaxRequestEntityAllowed** property, run the following command:

cscript adsutil.vbs get w3svc/ASPMaxRequestEntityAllowed.

3 To increase the value of the **AspMaxRequestEntityAllowed** property, run the following command:

cscript adsutil.vbs set w3svc/ASPMaxRequestEntityAllowed <maximum value>.

where **<maximum value>** is the maximum value, in bytes, that you want to set for the **AspMaxRequestEntityAllowed** property.

4 Run the following command:

iisreset.

5 To verify that the value of the **AspMaxRequestEntityAllowed** property has changed, run the following command again:

cscript adsutil.vbs get w3svc/ASPMaxRequestEntityAllowed.

Note: If you are still not able to save the measurements in the monitor profile, increase the value of the **AspMaxRequestEntityAllowed** property further.

For more information about this issue, see the Microsoft support Web site: <u>http://support.microsoft.com/kb/327659</u>

Port Required for J2EE Monitor Is Already Taken

Problem description: The J2EE monitor communicates with Performance Center, by default, using port 2004 and this port is already taken.

Troubleshooting

Select another port as follows:

1 On the application server machine, open the <J2EE Monitor installation directory>\dat\monitor.properties file and change the port number specified for the webserver.monitor.port property.

2 On the Performance Center host machine, open the <Performance Center installation directory>\dat\monitors\xmlmonitorshared.ini file and change the port number specified in mon_j2ee section under the DefaultPort key.

J2EE Monitor Initialization Errors

Problem description: You are receiving application server initialization errors, such as **UnsupportedClassVersionError**, **NoSuchMethodError**, or **NoClassDefFoundError**.

Troubleshooting

There might be a conflict between the JDK version specified using the J2EE Monitor Initializer, and the actual JDK version used in the application server launch.

Make sure that you selected the correct JDK that is currently being used by the application server. Note that if you switched the application server to work with a different JDK, you must run the J2EE Monitor Initializer again.

Cannot Save SiteScope Monitors with Many Counters

Problem description: You get an error when trying to save a SiteScope monitor profile where the monitor has many counters.

Troubleshooting

This error occurs when there are more than 160 counters on the SiteScope monitor. The error occurs because the value of the IIS parameter, **ASPMaxRequestEntityAllowed**, which defines the maximum size of the Asp page body section, is not high enough. To solve this error, increase the value of the parameter.

To increase the value of the IIS parameter:

- **1** Log in to the User Site server machine.
- 2 On the Command line, change the directory to the IIS installation directory, C:\Inetpub>\AdminScripts.

- **3** Run the following commands from the user server and from the utility
 - **a** Check the current parameter value.

cscript adsutil.vbs get w3svc/ASPMaxRequestEntityAllowed

b Set a higher value for the parameter:

cscript adsutil.vbs set w3svc/ASPMaxRequestEntityAllowed 8000000

c Check that the parameter value was updated.

cscript adsutil.vbs get w3svc/ASPMaxRequestEntityAllowed

Troubleshooting Web Problems

This chapter provides information on troubleshooting Web-related problems.

This chapter includes:

- ► HTTP 500.x Internal Server Error on page 743
- ➤ Cannot Find Server or DNS Error on page 746
- ➤ Maintenance Service Causes IIS Resets on page 747
- ► HTTP/1.1 100 Continue Randomly Appears on page 747
- ➤ Internet Explorer Closes When Selecting Script For Vuser Group on page 748

HTTP 500.x – Internal Server Error

Error message: The page cannot be displayed (HTTP 500.x Internal Server Error).



Troubleshooting

- 1 Reset IIS by choosing Start > Programs > Administrative Tools > Services, locating IIS Admin Service, and clicking Restart Service.
- **2** (**IIS 5 only**) If you cannot restart IIS, reboot the machine.

Make sure that both the Administrator Site and the User Site are set to **Application Protection** level **High (isolated)** in the Internet Services Manager. To set the protection level, see "Option 1 (IIS 5 only): Set the Application Protection level to High (isolated)" on page 762.

- **3** Make sure that the anti-virus software is not checking the Performance Center installation directory and sub-directories and thereby causing the error. In addition, make sure that the anti-virus program is not checking the file server directory (generally LRFS).
- **4** If you are still receiving an error, perform the following steps to see a more detailed error:

On the client machine:

- **a** Open Internet Explorer.
- **b** Select **Tools** > **Internet Options**.
- **c** Click the **Advanced** tab.
- **d** Under the **Browsing** section, deselect **Show Friendly HTTP Error Messages**.

On the server machine:

- a Select Start > Programs > Administrative Tools > Internet Information Services Manager to open the IIS manager.
- **b** Expand Web Sites.
- c Select Default Web Site.
- **d** Select the virtual directory relevant to the server's purpose: **Admin** for Administration Site Server, **Loadtest** for User Site Server.
- **e** Right click the selected directory and click **Properties**. The <directory> Properties dialog box opens.
- **f** Click **Configuration**. The Application Configuration dialog box opens.

- **g** Click the **Debugging** tab.
- **h** Select Send detailed ASP error messages to client.
- i Click **OK** to close the Application Configuration dialog box.
- **j** Click **OK** to close the <directory> Properties dialog box.
- **k** Restart IIS by right clicking the server's name in the tree. Select **All tasks** > **Restart IIS**.

At this point you should have a different, more detailed error message. Try to address the problem indicated in the message, or contact HP Customer Support with this message and all information related to the problem.

Cannot Find Server or DNS Error

Error message: The page cannot be displayed (Cannot find server or DNS Error).



Troubleshooting

- 1 Make sure that you entered the correct URL address.
- 2 Verify that you have access to the Web server.
 - ► Use the ping command if you do not have a firewall blocking ICMP requests to your Web servers.
 - > From a command prompt, execute: ping <Web server>
 - > From a command prompt, execute: ping <IP Address of Web server>

- **3** On the Web server, verify that IIS is up and running:
 - **a** Select Start > Programs > Administrative Tools > Services.
 - **b** Make sure that **IIS Admin Service** is **Started** and that **Startup type** is set to **Automatic**.
 - **c** Make sure that **World Wide Web Publishing Service** is **Started** and that **Startup type** is set to **Automatic**.
- **4** Reset IIS by choosing **Start > Programs > Administrative Tools > Services**, locating **IIS Admin Service**, and clicking **Restart Service**.

Maintenance Service Causes IIS Resets

Problem description: IIS is reset every 10 minutes by the maintenance service. The maintenance service log shows that the HTTP call to **MemorySize.asp** had a timeout (60 sec.) and after three retries, the service reset IIS (as it was designed to do).

Troubleshooting

Make sure that the Utility Server is not configured to work through a proxy that might block the HTTP call. To disable the proxy setting, search the registry for the key **ProxyEnable** in the Internet Setting folders and set this key to zero.

HTTP/1.1 100 Continue Randomly Appears

Problem description: The message **HTTP/1.1 100 Continue** randomly appears in the middle of a response stream.

Troubleshooting

If you installed the User Site server or Administration Site server on a Windows Server 2003 SP1 machine, download the Microsoft patch from the the Microsoft Support site (<u>http://support.microsoft.com/kb/898708</u>). This patch addresses a known Microsoft issue, when running IIS 6.0 on a Windows Server 2003 machine.

Internet Explorer Closes When Selecting Script For Vuser Group

Problem description: When trying to select a script for a new Vuser group, Internet Explorer closes.

Troubleshooting

When you are designing Vuser groups, there must always be at least one available script in the Scripts list. If you try to select a script and the list is empty, it triggers a known defect in IE7 [version 0.5730.13CO], causing the browser to close.

Make sure that at least one Vuser script has been uploaded to the current project. For more information on uploading Vuser scripts to Performance Center, see Chapter 7, "Managing Vuser Scripts."

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Troubleshooting Web Services

This chapter provides information on troubleshooting Web service-related issues.

This chapter includes:

- ► Troubleshooting Web Service Connectivity on page 749
- ➤ Testing Web Service Connectivity on page 750

Troubleshooting Web Service Connectivity

This section provides troubleshooting for Web service connectivity issues.

Important: The following troubleshooting tips apply to the Web service requester agent machine.

After each troubleshooting attempt described below, you can test your Web service connectivity using the test described in "Testing Web Service Connectivity" on page 750.

To troubleshoot Web service connectivity:

- **1** Verify that the PCWS virtual directory exists in IIS.
- **2** If you are using IIS 6, verify that the **ASP.NET V2.0** extension was installed and allowed in IIS.
- **3** If you are using IIS 6, verify that the **PCWSAppPool** application pool is not locked. If it is locked, you can consult the event viewer for an explanation.

- 4 If you are using IIS 5, grant full access permission for IWAM_<Machine_name> in the <Windows directory>\temp directory.
- **5** Verify that the Performance Center system user exists on the machine.
- **6** Verify that the following policies are defined for the Performance Center system user:
 - ► Batch logon rights
 - ► Service logon rights
 - ► Access this computer from the network

Testing Web Service Connectivity

After you troubleshoot Web service connectivity, you can test your Web service connectivity by trying to access the Performance Center **ConfigWS** Web services on the requester agent machine.

To test Web service connectivity:

1 On the requester agent machine, type the following URL:

http://<provider agent machine>/PCWS/ConfigWS.asmx

2 In the **Enter Network Password** box, type your Performance Center system user login details.

The ConfigWS Web service page opens.



Note: If this page does not open, there is still a problem with the Web service connectivity and you should continue to troubleshoot this issue.

3 Click the **IsAvailable** operation.

4 On the IsAvailable operation page, click **Invoke**.



If this action returns a value of **True**, the Web service connectivity is operational.

Troubleshooting System Identity

This chapter provides information on troubleshooting system identity-related issues.

This chapter includes:

- ► Administrator Account Requested on page 754
- ► Error in Adding Permissions to Folder/Registry on page 754
- ► Identity References Cannot Be Translated on page 755
- ➤ Server/Host Configuration Problems on page 755
- Admin Tasks Take a Long Time/Time-Out/ ThreadAbortException on page 756
- ➤ Conflicting Credentials when Changing Users on page 757
- Oracle Database Cannot Change System User to Non-Admin User on page 757
- Remote Management Agent Service Disabled After Changing System User on page 758
- ► Load Generator Standalone Limitations on page 759

Administrator Account Requested

Problem description: An administrator account is requested even if the Performance Center system user is an administrator.

Troubleshooting

- **1** Verify that you can access the Web service using the browser.
- **2** Verify that the system user exists on the machine.
- **3** Check whether the **ASP.NET V2.0** extension was installed and allowed in IIS.
- **4** Verify that you have the **PCWS** virtual directory.

Error in Adding Permissions to Folder/Registry

Problem description: You receive an error when adding permissions to one of the file/folders or registry keys.

Troubleshooting

- **1** Try to reconfigure the use case again (by clicking the **Reconfigure** button in the System Identity utility).
- **2** Reboot the machine and click the **Reconfigure** button in the System Identity utility.
- **3** Clean out all the unrecognized users from the folder/registry.

Identity References Cannot Be Translated

Error message: Some or all identity references could not be translated.

Problem description: You receive the above error in trying to configure the system.

Troubleshooting

- 1 Verify that the configuration user is not the same user with which you are logged in to the system. If you are logged in to the system with the configuration user, log off and then log in again with a different user.
- **2** Reset IIS on the machine on which you received the error.

Server/Host Configuration Problems

Error message: System.Web.Services.Protocols.SoapException: Server was unable to process request. Unable to generate a temporary class.

Problem description: This error can occur when trying to configure a server or host using the System Identity utilility.

Troubleshooting

Grant full access permission for the IWAM_<Machine_name> user in the <Windows directory>\temp directory.

Admin Tasks Take a Long Time/Time-Out/ ThreadAbortException

Problem description: In the following cases, a time-out event or ThreadAbort exception occurs or the action takes a long time:

- The system user is a non-administrative user (lockdown) and you try to add a host.
- The system user is an administrative user and you try to a change it to a non-administrative (lockdown) user.

Troubleshooting

Click **Reconfigure** to configure the system user again.

If the problem persists:

In "lock-down mode," permissions are granted to specific directories, files, and registry keys that Performance Center requires in order to run. Check the **Security** tab of these resources for deleted users/groups (SIDs). These deleted SIDs increase the time it takes to perform tasks such as granting permissions to a resource. To reduce the performance time for these tasks, clean out all the deleted SIDs.

If the problem still persists, you need to configure the system user manually. For details, see the section about configuring the Performance Center system user manually in the *HP Performance Center Administrator Guide*.
Conflicting Credentials when Changing Users

Error message: The credentials supplied conflict with an existing set of credentials.

Problem description: This error can occur when using the System Identity utility to change the system user.

Troubleshooting

Verify that the configuration user is not the same user with which you are logged in to the system. If you are logged on to the system with the configuration user, log off and then log on again with a different user.

Note: This problem may be caused due to a Microsoft limitation. For more information, see the Microsoft TechNet Web site (<u>http://www.microsoft.com/</u><u>technet/prodtechnol/windows2000serv/reskit/w2000Msgs/3860.mspx?mfr=true</u>).

Oracle Database – Cannot Change System User to Non-Admin User

Problem description: When working with an Oracle database, you cannot change the system user to a non-administrative system user.

Troubleshooting

Before changing the system user to a non-administrative user, you need to disable the Oracle Client's **SQLNET Authentication Services** option on each of the Performance Center servers and hosts.

To disable the SQLNET Authentication Services option:

1 Open the **<Oracle installation directory>\network\admin\sqlnet.ora** file and locate the following line:

SQLNET.AUTHENTICATION_SERVICES = (NTS)

- **2** At the beginning of this line, insert a **#** symbol.
- **3** Save the file.

Remote Management Agent Service Disabled After Changing System User

Problem description: After you change the system user to a non-administrative system user, the Remote Management Agent service is disabled.

Troubleshooting

You need to remove the service and restart it with the new Performance Center system user's credentials.

- **1** Restart the machine.
- **2** Run the Remote Management Agent service using the following command:

%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 system user.

Load Generator Standalone Limitations

This section specifies a number of scenarios of changing the system user, and the load generator standalone limitations associated with each scenario.

Scenario 1

- You changed the system user for all servers and hosts in the Performance Center environment.
- ► You did not add the changed user manually to Load Generator machine.
- ➤ The default Performance Center system user, IUSR_METRO, exists on the Load Generator machine.

Feature	Availibilty
Sitescope monitoring	Works with IUSR_METRO credentials
Default load test monitoring	Does not work
Remote management (reboot and install patch)	Works with IUSR_METRO credentials (type username and password upon request)

Scenario 2

- You changed the system user for all servers and hosts in the Performance Center environment.
- > You added the changed user manually to the Load Generator machine.
- ➤ The default Performance Center system user, IUSR_METRO, exists on the Load Generator machine.

Feature	Availibilty
Sitescope monitoring	Works with IUSR_METRO credentials
Default load test monitoring	Works with changed user credentials
Remote management (reboot and install patch)	Works with IUSR_METRO credentials (type username and password upon request)

Scenario 3

- You changed the system user for all servers and hosts in the Performance Center environment.
- ► You added the changed user manually to the Load Generator machine.
- ➤ You removed the default Performance Center system user, IUSR_METRO, from the Load Generator machine.

Feature	Availibilty
Sitescope monitoring	Does not work
Default load test monitoring	Works with changed user credentials
Remote management	Does not work
(reboot and install patch)	Workaround : Remove service and reinstall service with changed user credentials. For details, see "Remote Management Agent Service Disabled After Changing System User" on page 758.

Troubleshooting Databases

This chapter provides information on troubleshooting problems that occur with database in the Performance Center system.

This chapter includes:

- ► Login to Oracle Database Server Hangs on page 762
- ► Login to Database Server Fails on page 764
- ► Database/User Schema Creation Fails on page 766
- ► Warning Message Received During MS-QL Database Migration on page 767
- ► Conflict Warnings Received During Database Migration on page 767

Login to Oracle Database Server Hangs

Error message: Trying to log on to database server.

Troubleshooting

> Option 1 (IIS 5 only): Set the Application Protection level to High (isolated)

Make sure that the **Application Protection** level is set to **High (isolated)** in the Internet Services Manager in both the Administration Site and User Site.

To set the application protection level:

1 Select Start > Programs > Administrative Tools > Internet Services Manager. The Internet Information Services dialog box opens.



- **2** In the Tree directory, expand **Default Web Site** and right-click **Admin**. Click **Properties** to open the Admin Properties dialog box.
- **3** Click the **Virtual Directory** tab.

4	In the Ap	plication	Protection	box,	select Hi	gh ((Isolated).
---	-----------	-----------	------------	------	-----------	------	-------------

Admin Properties	<u>? ×</u>					
Virtual Directory Documents Directory Security HTTP Headers Custom Errors						
When connecting to this resource, the content should come from:						
 A directory located on this computer 						
C A share located on another computer						
\bigcirc A redirection to a <u>U</u> RL						
Logal Path: D:\Program Files\Mercury Interactive\Perfor Browse						
Script source access						
Application Settings						
Application name: TC_AdminSite	Remove					
Starting point: <default site="" web="">\Admin</default>	Configuration					
Execute Permissions: Scripts and Executables						
Application Protection: High (Isolated)	Unjoad					
Low (IIS Process) Medium (Pooled) High (Isolated)						
OK Cancel Apply	, Help					

5 Repeat steps 2 through 4 for the User Site. In step 2, right-click **LoadTest** instead of **Admin**.

Option 2: Set the Correct Permissions Level for the IWAM_<SERVER> user

Problems with logging on might be caused by a permissions level problem with the **IWAM_<SERVER>** user. By default, this account is set to the **Guest** permissions level. However, the **IWAM_<SERVER>** user must have read/ execute privileges on the Oracle home directory and all of its sub-directories.

To set the correct permissions level:

- **1** In Windows Explorer, right-click the Oracle home directory and select **Properties**.
- **2** Click the **Security** tab.
- **3** Click **Add** and add the **IWAM_<SERVER>** user.
- 4 Check Read & Execute.
- **5** Click **OK**.

Login to Database Server Fails

Error message: Operation terminated. Error description: Login to the database server failed. Check if user name and password are correct.

Troubleshooting

- **1** Verify that the database server host name, type, user name, and password are correct. Consult your database administrator if you are unsure.
- **2** Check whether you can connect to the database server from the Administration Site server using the command line SQL client:
 - ► For MS SQL Server:

% osql –U <username> -P <password> -S <serverID>

For example:

```
% osql –U sa –P manager –S DBSERVER\LRTCDB
```

If your Microsoft SQL Server is configured with integrated security, make sure that the Microsoft SQL Server has an operating system account for **IUSR_METRO** (password: **MIOrchid#1**), and is allowed access to the database. **IUSR_METRO** is the default account under which the Performance Center Web server runs.

► For Oracle Server:

% sqlplus <username>/<password>@<connect_string>

For example:

% sqlplus system/manager@LRTCORA

If the above command fails, check your TNS entry in the **<Oracle** installation directory>\network\admin\tnsnames.ora file.

An example of a TNS entry is shown below:

```
LRTCORA =
(DESCRIPTION =
(ADDRESS_LIST =
(ADDRESS = (PROTOCOL = TCP)(HOST = TCDBSERVER)(PORT 1521))
)
(CONNECT_DATA =
(SERVICE_NAME =LRTCORA)
)
)
```

- **3** Test the ADODB connectivity to the database:
 - **a** Download the **TcIN_AdoDBTester.exe** utility from the HP Software Support site's Self-solve Knowledge Search (http:// support.openview.hp.com/selfsolve/documents) (ID: **39475)**.
 - **b** Run the utility to test the ADODB connectivity to the database.
 - ➤ Update the username, password, and server fields in the connection string:

For MS SQL Server, use the Provider=SQLOLEDB.1;... connection string.

For Oracle Server, use the Provider=MSAORA.1;... connection string.

- ► Set a valid SQL statement (based on current database tables).
- Execute the statement and check the response. If an error occurs, address the error message appropriately.
- **4** If you are working with Oracle Server, check that Oracle Client is installed properly:
 - a Check whether the ORACLE_HOME registry entry under [HKEY_LOCAL_MACHINE\Software\Oracle] is correct. It should be pointing to the Oracle Client installation.
 - **b** Remove SQLPLUS.EXE from the <**Performance Center installation directory**>**DB** directory.
- **5** Verify that the version of MDAC is at least 2.8 SP1.

6 Verify that the database or user schema was actually created by checking whether the **db_results.txt** file exists in the **%temp%** directory of the Administration Site server. Note that this file is available only after system configuration. In addition, you can check whether the **MI_LRDB** database or user schema exists by logging in to the database/user schema.

Note: If you are able to log on to the User Site after system configuration, the database or user schema was most likely created properly.

Database/User Schema Creation Fails

Problem description: You cannot create a Performance Center database or user schema.

Troubleshooting

Try to create the database or user schema by running the SQL files located in the **DbSetup** directory of the Administration Site server.

- ➤ For MS SQL Server, run TestCenter.sql to create the database and InitDefinitions.sql to initialize the tables.
- For Oracle Server, run TC_oracle.sql to create the user schema and InitDataOracle.sql to initialize the tables.

Warning Message Received During MS-QL Database Migration

Problem description: The following warning message appears in the log file **<DB_Migration_directory>\PC_V9_1.log** when performing an MS-QL database migration:

Warning: The table 'Companies' has been created but its maximum row size (8227) exceeds the maximum number of bytes per row (8060). INSERT or UPDATE of a row in this table will fail if the resulting row length exceeds 8060 bytes.

Troubleshooting

This message is related to a size limit that is related to the Project Options. Since this size limit will not be utilized, you can disregard this message.

Conflict Warnings Received During Database Migration

Problem description: The following messages might appear in the log file **<DB_Migration_directory>\PC_V9_0.log** when performing a database migration:

DELETE statement conflicted with COLUMN REFERENCE constraint 'FK_ResultTransactions_RunPublishedResults'. The conflict occurred in database 'MI_LRDB', table 'DashboardResultTransactions', column 'RunResultId'.

DELETE statement conflicted with COLUMN REFERENCE constraint 'FK_GoalTransactions_TestGoals'. The conflict occurred in database 'MI_LRDB', table 'DashboardGoalTransactions', column 'TestGoalld'.

Troubleshooting

These messages appear when performing database migration of Performance Center 8.14 and earlier. These warnings relate to features that are no longer relevant in the current version of Performance Center. You can disregard these messages. Chapter 56 • Troubleshooting Databases

Glossary

This document lists terminology that is used throughout HP Performance Center.

Administration Site

The Administration Site provides overall resource management and technical supervision of the system. The administrator performs functions such as assigning user privileges, creating projects, and managing resource usage through the Administration Web site.

Agent

See Performance Center Agent.

alert

A notification that HP Performance Center sends to make designated users aware of performance issues. Alerts are sent by e-mail.

Analysis

An HP tool for viewing performance analysis data in reports and graphs.

Analysis Integration

Standalone Analysis integrates with Performance Center to let you quickly and easily analyze data collected during a Performance Center run. Load test data can be analyzed off-line by connecting to Performance Center from Standalone Analysis and downloading result and session files. After analyzing the data, you can upload the session files and reports to Performance Center.

authentication

A process that enables access to resources. To authorize access to resources, applications first need to authenticate the source of the request. Authentication is the process by which the identity of a subject is verified, and must be performed in a secure fashion. Authentication typically involves the subject demonstrating some form of evidence to prove its identity. Such evidence may be a password, fingerprint, or signed data using a private key.

Autostart

A feature that starts a load test run automatically. An Autostart test automatically begins the run at the start of the timeslot it is associated with.

availability

The percentage of time that a business process, monitored infrastructure component, or service is up and running.

business process

A series of steps typically performed in applications, which are emulated using scripts recorded with HP recording tools and run by the HP Performance Center host machines. For example, load generators run scripts that describe the activity that is to be monitored on the end-user machines. A script consists of transactions—an action or a set of actions that you are interested in measuring. By combining several transactions, you can define a business process to provide you with data for a complete activity.

CA

Certification Authority – A trusted third-party organization or company that issues digital certificates used to create digital signatures and public-private key pairs.

certificate

A stream of bytes that represent a signed authorization from a trusted source that is used to perform an SSL encryption.

Citrix Agent

An agent installed on the server machine that enhances VuGen's capabilities in identifying Citrix client objects.

Collation

At the conclusion of the test run, the load generators send the results back to the Controller. The Controller merges all the load generator results into a single package in a process called "collation".

Command Line

Using the Command Line interface, you can pass arguments to instruct the Controller how to behave. This enables you to configure load test settings without having to manually define them using the UI.

Container

A Performance Center object that contains Performance Center resources, assets, and other Performance Center containers.

Controller

A machine that is used to design and manage a load test. During a test, the Controller issues instructions to the load generators including which scripts to run, how many Vusers to run per script, and Start Vuser timing. At the conclusion of the test run, the Controller collates the results. There is only one Controller per load test.

Dashboard

The HP Performance Center Project Dashboard provides an overview of your project's status, as well as the drill-down capability to view individual load test performance. The status and performance data are relative to the target criteria you establish for your application.

Data Processor

A Data Processor machine is used for publishing information to the Project Dashboard. Although it is possible to set a machine as a Controller and a Data Processor, it is not recommended.

Database Server

The database server forms the infrastructure for persistent data within Performance Center. The database server holds information on users, projects, host information, and load tests.

Diagnostics

Performance Center's diagnostics modules provide monitors that trace, time, and troubleshoot individual transactions that rapidly identify and pinpoint performance problems in J2EE, .NET, Siebel, Oracle, and SAP environments. These monitors help you to maximize business process performance, scalability, and efficiency.

EJB

Enterprise JavaBeans[™] – A component architecture for the development and deployment of object-oriented, distributed, enterprise-level applications. Applications written using the Enterprise JavaBeans architecture are scalable, transactional, and secure.

File Server

The file server forms the infrastructure for persistent data within Performance Center. The file server holds the test scripts and test results.

granularity

Determines how many measurement samples the HP Performance Center displays in reports. By default, reports are limited to a maximum of 31 samples. Thus, for example, if you select the **Day** time range and the **minutes** granularity, since there are 1,440 minutes in a day and a maximum of 31 samples on a graph, the granularity ranges from **every 47 minutes** (1440/31=46.4, rounded up to 47) to **every 59 minutes** (above 59 minutes, you use the **hour** granularity unit).

Additional examples:

If you select the **Day** time range and a granularity of **every 1 hour**, HP Performance Center displays the report using 24 samples (1 hour x 24 = 1 day).

If you select the **Month** time range and a granularity of **every 1 week**, HP Performance Center displays the report using 4 samples (1 week x 4 = 1 month).

GUI Vuser

GUI Vusers operate graphical user interface (GUI) applications. These applications can run in a Microsoft Windows environment. Each GUI Vuser that you develop emulates a real user by submitting input to, and receiving output from, GUI applications. GUI Vusers are created using HP's GUI testing tools: HP WinRunner (for Microsoft Windows applications) and HP QuickTest Professional (for Web applications). You can run only a single GUI Vuser on a Windows-based load generator. Use terminal sessions to run multiple GUI Vusers.

host

A machine which can be used to control or run Vusers, and process collected data. Each host machine can be designated as a Controller, load generator, or Data Processor.

Host Checkup Service

The Host Checkup Service detects hosts in the resource failure status and recovers them (if possible) to the operational status.

Host License

The HP Performance Center license which is automatically installed on the hosts as you add them to the system.

ICF

Windows Firewall, previously known as Internet Connection Firewall or ICF. See Personal Firewall.

IIS Maintenance Services

IIS Maintenance Services verify that IIS is operational, performs IIS memory checks, and restarts IIS in case of memory leakage or if the specified memory limit is exceeded.

IIS Restart

Restarts IIS at a set time every day. Restarting IIS increases Performance Center stability and is highly recommended. IIS Restart does not affect running tests, and users can reconnect to tests and view progress.

INF file

An information file that opens in the Snapshot Viewer, enabling you to view a snapshot of an error from the Vuser log. See also SOE file.

Initialization

The state of preparing Vusers and load generators for a load test run ("Init"). Initializing Vusers before Start Vuser reduces CPU consumption and helps provide more realistic results. The length of the initialization state varies between Vusers.

IP address

A unique address that identifies a host on a network. It identifies a computer as a 32-bit address that is unique across a Transmission Control Protocol/Internet Protocol (TCP/IP) network. An IP address is usually represented in dotted-decimal notation, which depicts each octet (eight bits, or one byte) of an IP address as its decimal value and separates each octet with a period. For example, 172.16.255.255.

IP Spoofing

A feature that enables Vusers running on a single machine to be identified by many IP addresses. The server and router recognize the Vusers as coming from different machines and as a result, the testing environment is more realistic.

J2EE

Java 2 Enterprise Edition – The J2EE platform manages the infrastructure and supports the Web services to enable development of secure, robust, and interoperable business applications.

J2EE application

Any deployable unit of J2EE functionality. This can be a single module or a group of modules packaged into an .ear file with a J2EE application deployment descriptor. J2EE applications are typically engineered to be distributed across multiple computing tiers.

JBoss

An Open Source, standards-compliant application server implemented in 100% pure Java that is based on the J2EE specification.

JDBC

Java Database Connectivity – An industry standard for database-independent connectivity between the Java platform and a wide range of databases. The JDBC interface provides a call-level API for MS SQL-based access.

JNDI

Java Naming and Directory Interface – A standard extension to the Java platform, providing Java technology-enabled applications with a unified interface to multiple naming and directory services in the enterprise.

JSP

Java Server PageTM – An extension to the Java servlet technology developed by Sun.

Layer

A layer is defined as the generic term given to signify J2EE resources that can be grouped together for meaningful analysis, and for display in the Diagnostics pages. Examples of layers: entity beans, servlets, JDBC, and so forth; classes that inherit from a common ancestor; components that adhere to a specific API; classes that provide a common service; and custom classes with a common significance.

load generator

A machine on which Vusers are run during a load test. There can be any number of load generators for a given load test. Load generators are configured inside a Host Pool with other load generators and at least one Controller.

Load Preview

Displays a graph of the load behavior you defined in the Scheduler. See also Scheduler.

measurement

A data unit that measures performance.

HP Virtual User Generator

A tool for recording virtual user (Vuser) scripts. VuGen creates a Vuser script by recording the actions that you perform on a client application. When you run the recorded script, the resulting Vuser emulates the user activity between the client and server. Vuser scripts include functions that measure and record system performance during load-testing sessions. During a load test run, you can monitor application performance.

monitor

A component used by HP Performance Center to collect data.

Monitor Profile

The server resource monitoring settings for a load test that can be used by any test in your project. A monitor profile includes the type of monitors to run, the servers whose resources you want to monitor, and the measurements you want to monitor on each server.

MI Listener

A component that serves as router between the Controller and the Performance Center Agent. The MI Listener receives data from the Performance Center Agent at regular intervals. During the course of the load test, the Controller solicits the data from the MI Listener to process as run-time data.

Monitor Over Firewall machine

Used to monitor the servers that are located over a firewall. The Performance Center Agent runs on the Monitor Over Firewall machine and reports its information to the MI Listener either directly or through a proxy server, depending on the system configuration.

Monitor Server

The application under test (AUT) server that you are monitoring.

Net use trust

To monitor the application under test (AUT), you must have a trust between the Utility server\Host and the AUT, otherwise you will not be able to take measurements and create a monitor profile. This trust is provided by the user supplying an administrator user name and password on the AUT.

node

In Dashboard, an entry in a hierarchical tree in the Dashboard, representing a group, subgroup, monitor, transaction, and so forth.

Patch

A modification or update to Performance Center that contains bug fixes or feature enhancements.

Performance Center Agent

The Performance Center Agent runs on the load generator machines and Monitor Over Firewall machines and enables communication between the Controller, load generators, Monitor Over Firewall machines and MI Listeners (in firewall configurations). The agent receives instructions from the Controller to initialize, run, pause, and stop Vusers. At the same time, the agent also relays data on the status of the Vusers back to the Controller. The Performance Center Agent also enables communication between the Controller and terminal sessions (if the agent is configured with terminal sessions enabled). See also Terminal Session.

Performance Center License

The Performance Center License—a function of your Vuser limit, concurrent runs limit, and expiry date—enables you to use the Performance Center. You receive the license key when you purchase Performance Center, and you type the license key in the Administration Site after installing all Performance Center components.

Personal Firewall

Windows Firewall, previously known as Internet Connection Firewall or ICF, is a built–in basic firewall included as a Windows 2000/ Windows XP networking feature. It is a protective boundary that monitors and restricts information that travels between your computer and a network or the Internet. Note: HP Performance Center supports Windows XP Service Pack 2 provided the firewall is turned off (the firewall is turned on by default).

Pop-up Blocker

When you install Windows 2003/XP SP2, Pop-up Blocker is turned on in Internet Explorer and set to the medium setting, which blocks most automatic pop-ups. If Pop-up Blocker blocks pop-up windows that you open deliberately in Performance Center by clicking a link, you should turn it off when using Performance Center.

Raw results

The raw results file contains the original raw analysis data which is automatically generated by Performance Center during a load test run. You cannot delete the raw results file.

Remote Management Agent

The Remote Management Agent enables you to manage remote machines from the Administration or User Site (for example, view login information, install patches, and reboot hosts/servers). The Remote Management Agent is automatically installed when performing a Performance Center Server or Host installation.

Rendezvous Points

Rendezvous points instruct Vusers to wait during test execution for multiple Vusers to arrive at a certain point, so that they may simultaneously perform a task. Rendezvous points are inserted into Vuser scripts to emulate heavy user load on the server.

report

A presentation of data collected by the HP data collectors. HP Performance Center reports display a variety of data that enable you to track and analyze the performance of monitored applications and infrastructure components.

Run-Time Settings

Settings that enable you to define the way that the script runs, and emulate different kinds of user activity. Run-time settings are applied to Vusers when a script is run using VuGen or the Controller.

Scheduler

A component that enables you to set the timing aspects of the load test run. You can set the start time, the duration of the load test or Vuser groups within the load test, and the initialization, start Vuser, and stop Vuser times.

script

The actions that a Vuser performs during the load test run are described in a Vuser script. An action or a set of actions that you want to measure are represented by a transaction. You record and save scripts in HP Performance Center recording tools, such as HP Virtual User Generator.

session data

Session data is automatically generated by Performance Center and displays information and layout settings for the active graphs. You can delete or overwrite the session data file.

SiteScope

An HP Performance Center data collector used for collecting performance data from network, application, database, and Web servers.

SiteScope measurement

A measured SiteScope value. Transaction time, database query time, and CPU utilization are all examples of SiteScope measurements.

SiteScope monitor

A set of configurations that enables the collection of data for one aspect of the monitored environment (for example, a specific type of server). A monitor reports a status of OK, warning, or error, based on criteria that you can control.

Snapshot

A graphical representation of the Web page, at the point when an error occurred during the load test run. If the Vuser log indicates that a step has a snapshot, you can view a snapshot of the error from the Vuser log, or download the snapshot and view the entire page/ individual frames in the Snapshot Viewer. You can also view an individual frame from an active run. See also Snapshot Viewer.

Snapshot Viewer

The Snapshot Viewer enables you to view snapshot on error pages captured from Web Vusers during load test runs. This viewer displays snapshots from files of .SOE and .INF extension. The Snapshot Viewer can be downloaded from the Download page of the Performance Center User Site.

SOE file

A Snapshot On Error (.SOE) file is a GNU-Zipped file containing one or more snapshots represented by .INF files. Each snapshot can contain several frames and sub-frames, and can be viewed using the Snapshot Viewer.

SSL

Secure Sockets Layer, the leading security protocol that encrypts and decrypts a message for online transmission and authentication.

Start Vuser

Settings that define how you start running Vusers within a load test.

Stop Vuser

Settings that define how you stop Vusers within a load test.

System User Account

Performance Center uses the system user to communicate between components and activate processes from components on a remote machine. The administrator can configure the system user for all servers and hosts in the Performance Center environment from the General Settings page.

Terminal Session

A client session on a terminal server. A terminal server client can have multiple terminal sessions running simultaneously, thereby overcoming the limitation of being able to run only a single GUI Vuser on a Windows-based load generator. By opening a terminal session for each GUI Vuser, you can run multiple GUI Vusers on the same application. You can configure terminal sessions during load test configuration or at run time.

Timeslot

A timeslot is used to reserve the hosts and Vusers required to run a load test for your application. Reserving a timeslot sets aside resources to run a load test.

transaction

Any series of steps that an end user performs in an application, whose performance you want to monitor. Transactions are recorded using HP Virtual User Generator recording tools and saved in scripts. When replayed, transaction response time and availability data is collected. You view transaction performance data in HP Performance Center reports.

transaction breakdown

A function of HP Performance Center that enables transaction response time data to be broken down and viewed according to time spent on the network, server, and client.

transaction response time

The time it takes for a prerecorded transaction to be completed.

User Site

The User Site is the window used to design, execute, and monitor load tests. The users create tests, reserve resources, run tests, and receive analysis information through the User Site.

User Status

User Status is used to determine user access to Performance Center. A user with Active status can log in to Performance Center. A user with Non-Active status cannot log in to Performance Center. User Status is displayed in the Personal Information and Users page of the Privilege Manager.

Utility Server

The Utility server provides a centralized location for specific information that can exist only once within the system. The License Manager, AutoRun schedules, and Monitor Profiles reside on the utility server.

Virtual Load Generator

A Virtual Load Generator is an automatically generated placeholder name for an actual load generator that will run the script. When creating a load test, you can select automatic or manual distribution of scripts to machines. If you select manual script distribution, you select the actual load generator that you want to assign to each virtual load generator at run time.

Virtual User Generator

A tool for recording virtual user (Vuser) scripts. The scripts are run by Business Process profiles to emulate end-user experience and monitor application performance.

Vusers

Performance Center replaces human users with virtual users or Vusers. When you run a load test, Vusers emulate the actions of human users working with your application. See also GUI Vuser.

VM

Virtual Machine – A "machine within a machine" that mimics a real Java processor, enabling Java bytecode to be executed as actions or operating system calls on any processor regardless of the operating system.

Windows Firewall

See Personal Firewall.

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