HP LoadRunner

for the Windows and UNIX operating systems

Software Version: 9.00

LoadRunner Installation Guide

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Software Release Date: June 2007

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Table of Contents

Welcome to This Guide

Welcome to the *HP LoadRunner Installation Guide*. HP LoadRunner, a tool for performance testing, stresses your entire application to isolate and identify potential client, network, and server bottlenecks.

This guide describes how to install and set up HP LoadRunner.

How This Guide Is Organized

This guide contains the following chapters:

Chapter 1 Before You Install

Provides you with the information that will help you prepare for the LoadRunner installation process, including system requirements.

Chapter 2 Installing LoadRunner on Windows

Describes how to install either the full version or separate features of LoadRunner on a Windows machine.

Chapter 3 Viewing and Modifying a License

Describes how to enter, modify, or view LoadRunner license information.

Chapter 4 Introducing the UNIX Installation

Discusses the installation steps and system requirements for installing the load generator on a UNIX platform.

Chapter 5 Installing LoadRunner on UNIX

Describes how to install the load generator on a UNIX platform.

Who Should Read This Guide

This guide is intended for users who need to install and set up LoadRunner.

Readers of this guide should have some knowledge of system administration.

LoadRunner Online Documentation

LoadRunner includes the following online documentation:

- **Readme.** Provides last-minute news and information about LoadRunner. You access the Readme from the **Start** menu.
- **Books Online/Printer-Friendly Documentation.** Includes PDF versions of the guides. Select **Help** > **Books Online**.
- **Online Help.** Available from specific LoadRunner windows by clicking in the window and pressing **F1** or clicking the **Help** button.
- **LoadRunner Online Help** includes:
  - **Error Codes Troubleshooting.** Provides clear explanations and troubleshooting tips for Controller connectivity and Web protocol errors. It also provides general troubleshooting tips for Winsock, SAPGUI, and Citrix protocols.
  - **LoadRunner Agent Configuration Tool Online Help.** Provides help on the Agent Configuration Tool, accessed by clicking the **Help** button in the Agent Configuration dialog box (**Start** > **LoadRunner** > **Advanced Settings** > **Agent Configuration**).
  - **LoadRunner Controller Automation COM and Monitor Automation Reference.** An interface with which you can write programs to run the LoadRunner Controller and perform most of the actions available in the Controller user interface. You access the reference from the LoadRunner online documentation.
- **LoadRunner Function Reference.** Gives you online access to all of LoadRunner's functions that you can use when creating Vuser scripts, including examples of how to use the functions. Check HP's Customer Support Web site for updates to the *HP LoadRunner Online Function Reference*.

Additional Online Resources

Knowledge Base. This site enables you to browse the Customer Support Knowledge Base and add your own articles. The URL for this Web site is http://support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp.

Customer Support Web site. This site enables you to access the Knowledge Base, post to and search user discussion forums, submit support requests, download patches and updated documentation, and more. The URL for this Web site is http://support.mercury.com. You can also access this Web site from the **Help** menu.

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Terminology

Vuser	A virtual user—a LoadRunner-created user that emulates a human user.
Load Generator machine	The workstation used to host the LoadRunner Vusers.
Controller machine	The machine used to host the LoadRunner Controller.
Vuser Group	A collection of Vusers with common characteristics, such as the machine on which they run, or the client that they use.

Typographical Conventions

This guide uses the following typographical conventions:

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

1

Before You Install

This chapter provides you with the information that will help you prepare for the LoadRunner installation process. Before you install LoadRunner, please review the system requirements.

Introducing the LoadRunner Windows Installation

Your LoadRunner DVD includes a setup program that guides you through the process of installing LoadRunner's components. The setup program installs LoadRunner on the hard disk of a single-user computer.

You can choose to install the full LoadRunner configuration, the virtual user components, or server side components and add-ins. If you choose the full LoadRunner configuration, you can select a complete or a custom configuration. Choosing custom configuration lets you specify which LoadRunner components to install.

For information about installing LoadRunner on a Windows machine, see Chapter 2, "Installing LoadRunner on Windows."

Introducing the UNIX Installation

You can install the LoadRunner Load Generator component on a UNIX platform to run virtual users. The UNIX virtual users interact with the LoadRunner Controller, installed on a Windows machine.

For more information, see "Introducing the UNIX Installation" on page 49.

Windows System Requirements

This section describes the minimum system requirements necessary for installing LoadRunner or one of the LoadRunner components on a Windows machine.

Note: For HP Diagnostics system requirements, refer to the *HP Diagnostics Installation and Configuration Guide*.

For HP SiteScope system requirements, refer to the *HP SiteScope Deployment Guide*.

LoadRunner Full Installation System Requirements

Component	Requirement
Computer/ Processor	Pentium III or higher (Pentium IV recommended) 1 GHz or higher (2.4 GHz recommended)
Operating System	➤ Windows 2000 service pack 4 ➤ Windows XP Professional service pack 2 with Firewall disabled ➤ Windows 2003 SP2
Memory	1 GB
Hard Disk Space	2 GB
Browser	IE 6.0 SP1 or higher

VuGen Standalone System Requirements

Component	Requirement
Computer/ Processor	Pentium III or higher (Pentium IV recommended) 1 GHz or higher (2.4 GHz recommended)
Operating System	➤ Windows 2000 service pack 4 ➤ Windows XP Professional service pack 2 with Firewall disabled ➤ Windows 2003 SP2
Memory	512 MB (1 GB recommended)
Hard Disk Space	1 GB
Browser	IE 6.0 SP1 or higher

Analysis Standalone System Requirements

Component	Requirement
Computer/ Processor	Pentium III or higher (Pentium IV recommended) 1 GHz or higher (2.4 GHz recommended)
Operating System	➤ Windows 2000 service pack 4 ➤ Windows XP Professional service pack 2 with Firewall disabled ➤ Windows 2003 SP2
Memory	512 MB (1 GB recommended)
Hard Disk Space	1 GB
Browser	IE 6.0 SP1 or higher

Load Generator Standalone System Requirements

Component	Requirement
Computer/ Processor	Pentium III or higher (Pentium IV recommended) 1 GHz or higher (2.4 GHz recommended)
Operating System	➤ Windows 2000 service pack 4 ➤ Windows XP Professional service pack 2 with Firewall disabled ➤ Windows 2003 SP2
Memory	Dependant on protocol type and system under test. For example, Web protocol generally requires 4 MB per non-multi-threaded Vuser and 512 KB per multi-threaded Vuser.
Hard Disk Space	1 GB
Browser	IE 6.0 SP1 or higher

Note: For information about installing the Load Generator on a UNIX platform, see "Introducing the UNIX Installation" on page 49.

Prerequisite Software

Before you can install LoadRunner, the following prerequisite software needs to be installed:

- MSI 3.1 (Windows Installer)
- .NET Framework 2.0
- WSE 2.0 SP3 for Microsoft .NET
- WSE 3.0 for Microsoft .NET
- MSXML 6.0 Parser
- VC++ 2005 Redistributable

➤ Microsoft Data Access Components 2.8 SP1

Note: When you run the LoadRunner installation wizard, if the prerequisite software is not already installed on your computer, the wizard detects which software is missing and provides the option to install it.

2

Installing LoadRunner on Windows

This chapter describes how to install either the full version or separate components of LoadRunner on a Windows machine.

Performing the Installation

Before you install LoadRunner, review the pre-installation information, including the system requirements, described in Chapter 1, "Before You Install."

Note: Before installing LoadRunner, be sure to uninstall any previous versions of LoadRunner.

You cannot install LoadRunner on a machine that contains an existing standalone installation of either Analysis, Virtual User Generator, or Service Test.

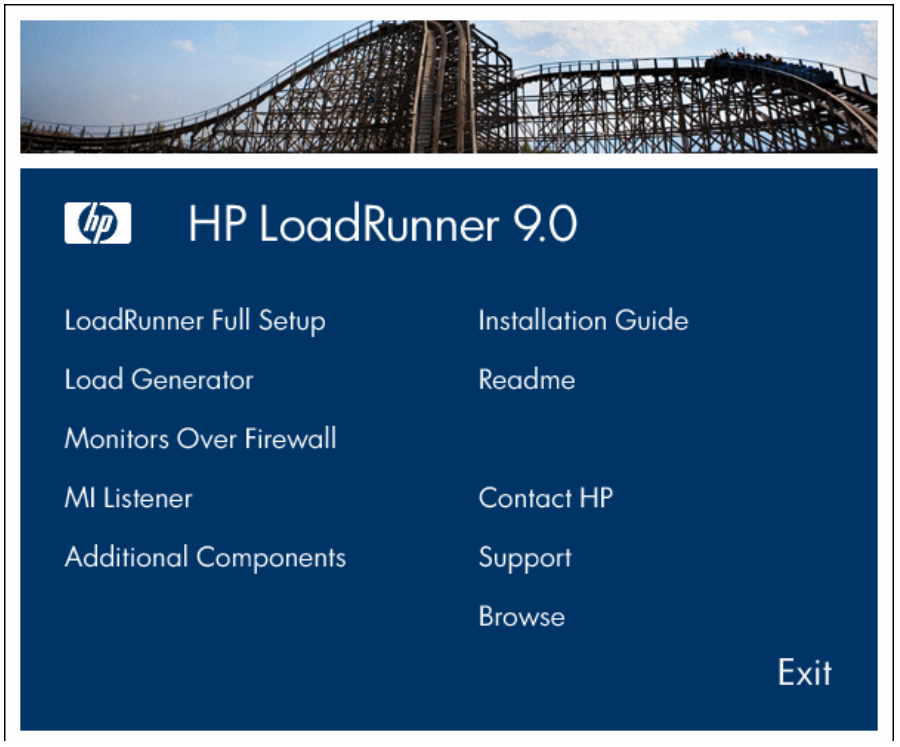
To install LoadRunner or an additional component:

1 Run the setup.exe file in the root directory of the installation disk.

Note: If the LoadRunner installation directory is located on a network drive, the network drive needs to be mapped before you can run the installation. You cannot use the UNC (Universal Naming Convention) path to run the installation.

Due to a known Microsoft issue, if you are installing LoadRunner from a mapped network drive and you are using a Remote Desktop connection, you may receive an error that prevents you from running the installation. To install LoadRunner using a Remote Desktop connection, copy the installation directory to the local drive and run the installation locally.

The LoadRunner Setup program begins and displays the installation menu page.



2 Select the desired installation option.

From the installation menu page, select one of the following options:

➤ **LoadRunner Full Setup.** Provides the option to install the main LoadRunner features and components including the Controller, the Virtual User Generator (VuGen), Analysis, and the Load Generator. Use this option for the machine that controls the Vusers.

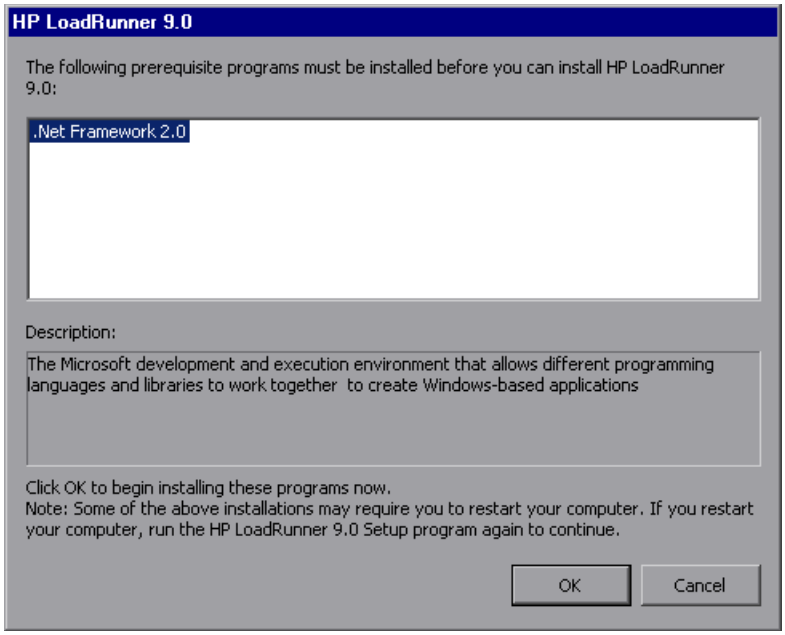
Note: To install a standalone version of VuGen, select the **LoadRunner Full Setup** installation and use the **Custom Installation** option to select **VuGen**.

- **Load Generator.** Installs the components needed for running virtual users to generate load, and the MI Listener. Use this option for machines that are used only to generate load and not to control Vusers.
- **Monitors Over Firewall**. Installs the components on the agent machine for monitoring over the firewall. For more information, refer to the "Using Firewalls" chapter in the *HP LoadRunner Controller User's Guide*.
- **MI Listener.** Installs the components needed on the MI Listener machine used in running Vusers over a firewall and monitoring over a firewall. For more information, refer to the "Using Firewalls" chapter in the *HP LoadRunner Controller User's Guide*.
- **Additional Components.** Opens the **Additional Components** folder located in the root folder of the installation disk. From this folder, you can install the following components:
  - Citrix Replay Agent
  - Microsoft COM+ Server Monitor Probe
  - HP Performance Validation SDK
  - IDE Add-ins
  - MQ Tester
  - MSDE
  - SAPGUI Spy
  - SAPGUI Verify Scripting
  - Verify RFC User
  - Sitescope

  For a description of each of these components see "Installing Additional Components" on page 36.

3 If necessary, install prerequisite software.

Specific software, for example, .NET Framework 2.0, needs to be installed before you can install LoadRunner. If the prerequisite software is not already installed on your computer, the following screen opens.



Click **OK** and follow the on-screen instructions to install the listed software before continuing with the LoadRunner installation. If you click **Cancel**, the installer will exit because LoadRunner cannot be installed without the prerequisite software.

Note: For the full list of prerequisite software, see “Prerequisite Software” on page 16.

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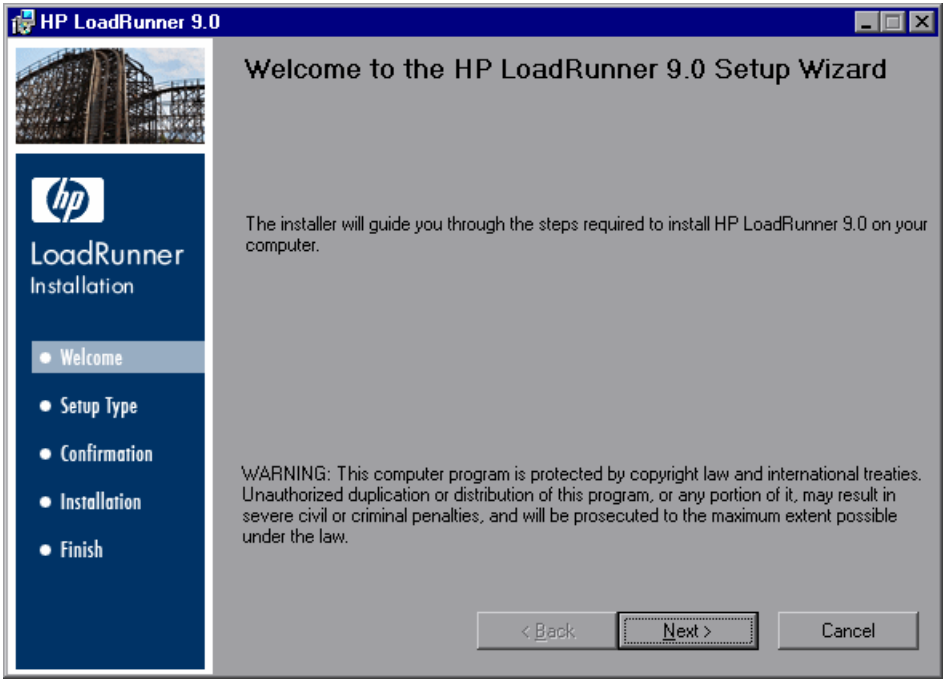
4 Start the installation.

The LoadRunner Setup Wizard opens, displaying the welcome page.



Click **Next** to proceed.

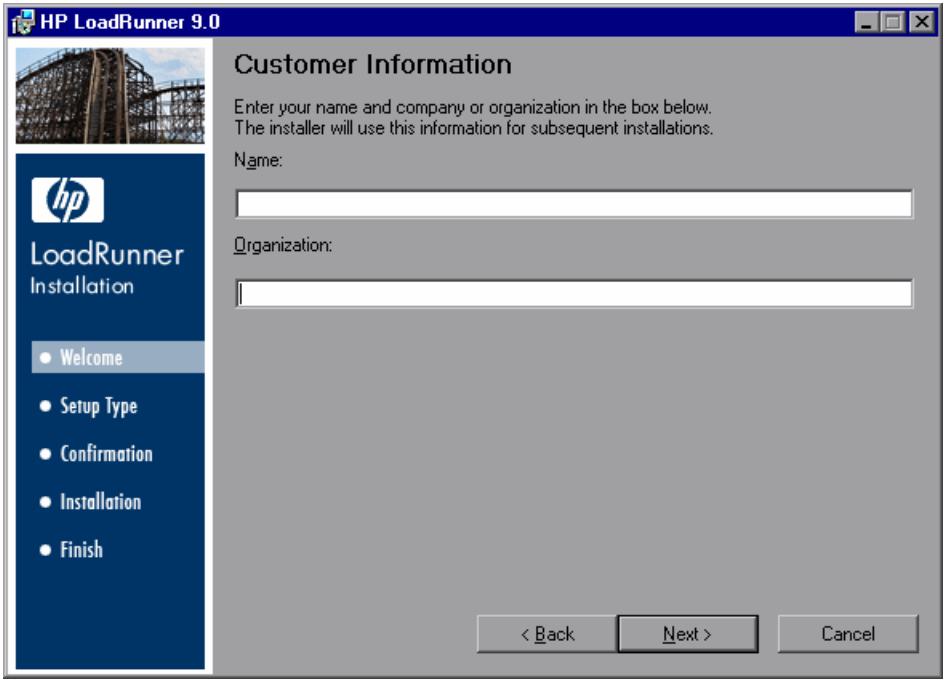
5 Review the License agreement.

If the terms of the license agreement are acceptable to you, choose **I Agree**.

Click **Next** to proceed.

6 Register the LoadRunner Installation on your computer.

In the Customer Information page, enter your name and organization name.



Click **Next** to proceed.

Next Step: If you are installing either the Load Generator, Monitors Over Firewall, or MI Listener as standalone components, and you are not running the LoadRunner Full Setup option, skip to step 9 on page 29.

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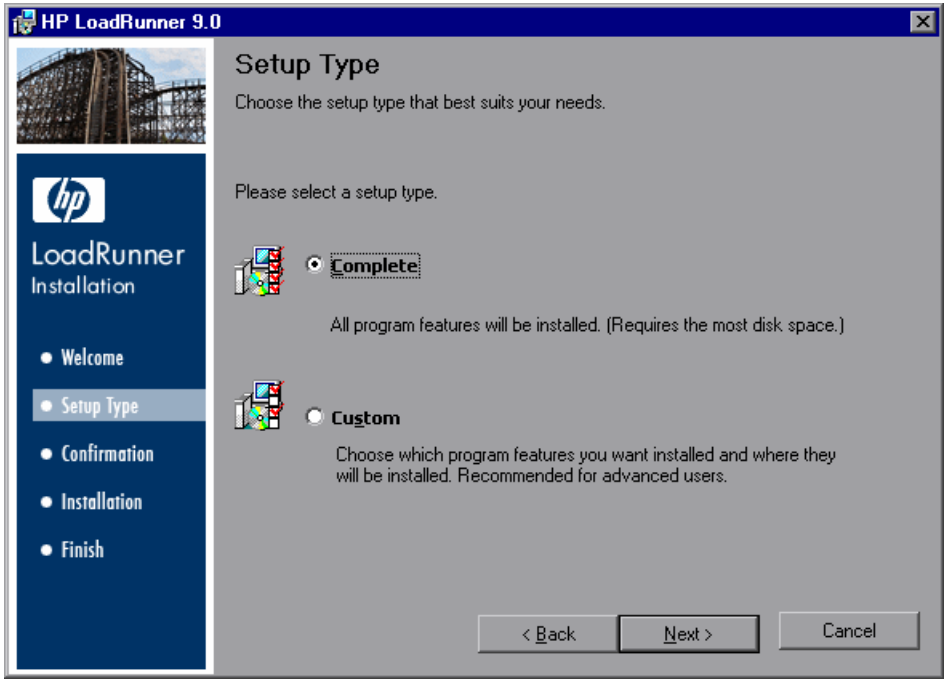
7 Select a setup type. (Only for LoadRunner Full Setup)

In the Setup Type page, choose between a **Complete** or **Custom** setup.



- **Complete.** Installs all of the LoadRunner features. Use this option for the machine that controls the Vusers.
- **Custom.** Install only the LoadRunner features that you want to install.

Click **Next** to proceed.

Next Step:

- If you selected Complete setup, skip to step 9 on page 29.
- If you selected a Custom setup, continue below.

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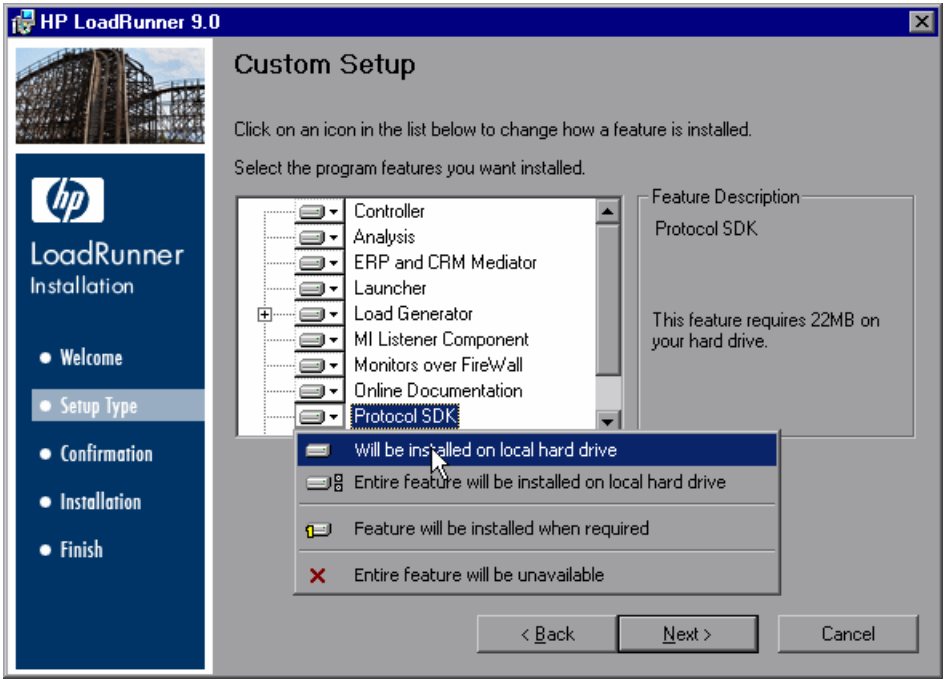
8 Select features to install. (Only for Custom setup)

If you chose to perform a Custom installation of LoadRunner, select the LoadRunner features that you want to install.



By default, all the features are selected for installation. To select a different option (for example, excluding the feature), click the arrow next to the feature and select one of the following options from the menu that opens:

- **Will be installed on local hard drive.** This is the default option. The feature is installed on your hard drive.
- **Entire feature will be installed on local hard drive.** For features that contain sub-features, this option selects all sub-features to be installed.
- **Feature will be installed when required.** The feature is not installed but there is an option to install it later. When you try access the feature later, you receive a message asking you if you want to install it.
- **Entire feature will be unavailable.** The feature is not installed and cannot be accessed later.

Note: For a description of the available LoadRunner features, see "Custom Installation Options" on page 34.

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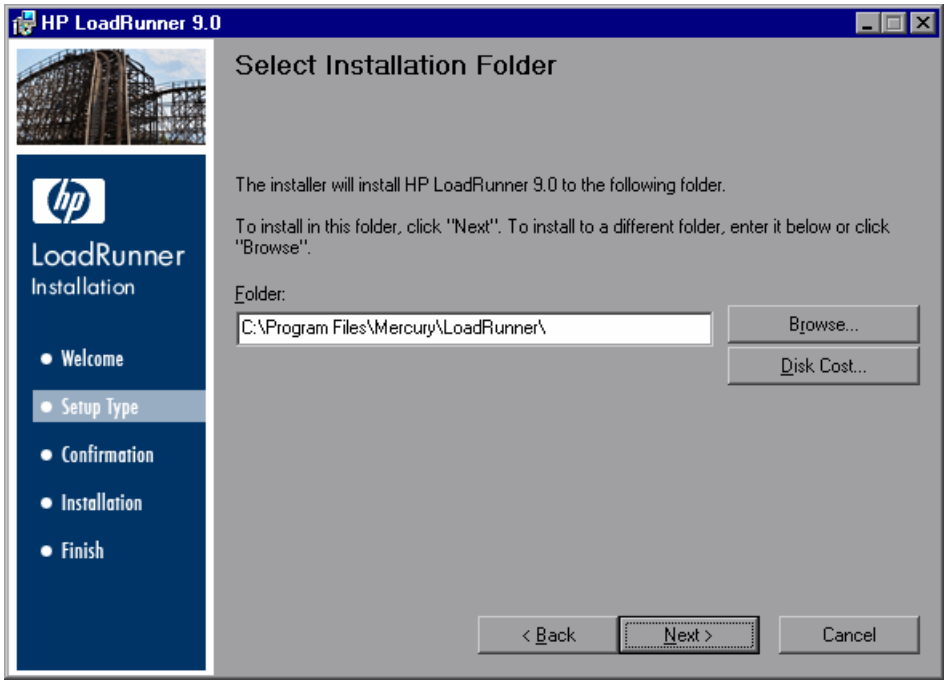
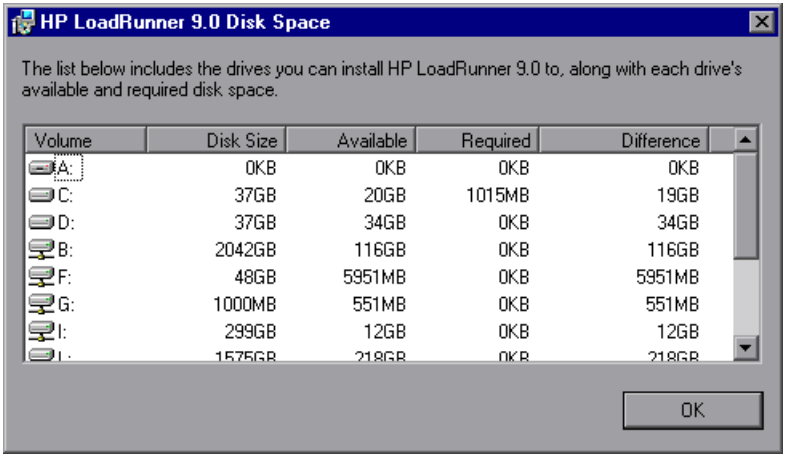
9 Select an Installation Folder.

Accept the proposed folder for the installation or browse to an alternate folder.



You can check required and available disk space for each drive, by clicking **Disk Cost**.

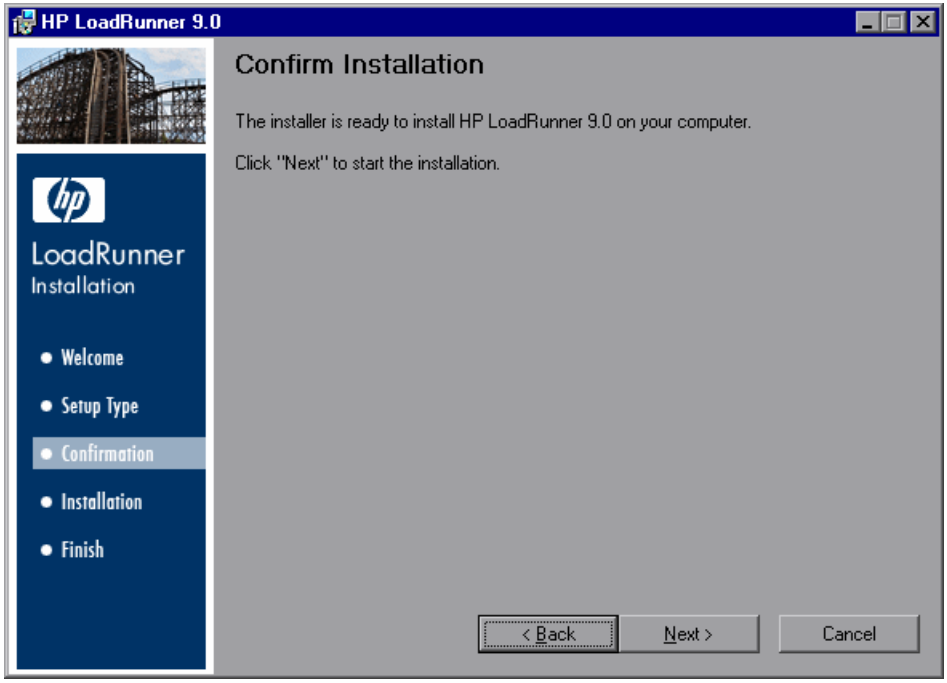


Click **OK** to close the Disk Space dialog box.

Click **Next** to proceed.

10 Start the installation process.

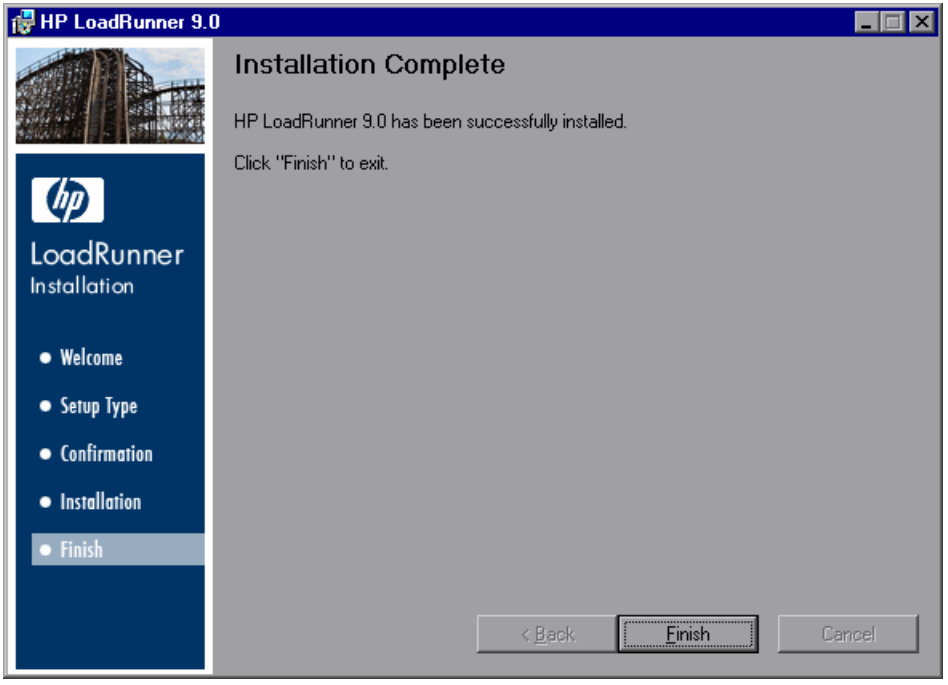
The wizard prompts you to confirm the installation.



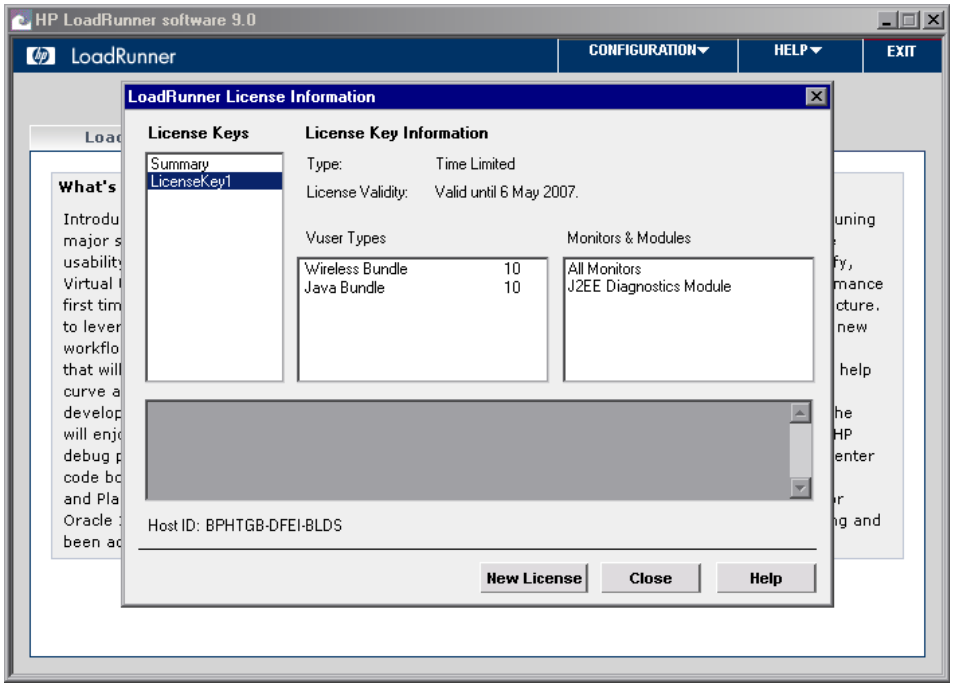
Click **Next** to start the installation.

11 Complete the installation process.

When the installation is complete, a wizard page opens, confirming successful installation.



When you click **Finish**, The LoadRunner Launcher opens displaying the LoadRunner License Information Dialog Box.



Important: During the LoadRunner installation, if LoadRunner does not detect an existing valid license on your computer, you are automatically granted a temporary 10-day license for 25 Vusers. To use LoadRunner beyond the 10-day period, you must request and enter license information for your copy of LoadRunner. For more information, see “Viewing and Modifying a License” on page 43.

The LoadRunner installation is now complete. To start LoadRunner, select **Start** > **Programs** > **LoadRunner** > **LoadRunner**. Select the application that you want to run from the LoadRunner launcher window.

Notes:

- To uninstall LoadRunner, use the Windows **Add/Remove Programs** utility.
- To repair LoadRunner, run the **setup.exe** file located in the root directory of the LoadRunner installation disk.
- If you want to install additional LoadRunner features after you have completed the installation, you need to uninstall LoadRunner, and re-install it with the features that you want.
- If your version of LoadRunner is supplied with a plug and you have not already installed the plug, do so now by inserting it in the parallel port.
- You can configure LoadRunner to run Vusers in a Load Generator machine without the need for the user to manually log in to the machine. For more information, see "Configuring User Login Settings" on page 38.

Custom Installation Options

As part of a custom installation of LoadRunner, you can install the following features.

- **Controller.** Controls the execution of scenarios and Vusers. Includes the online monitors which monitor and display information about the test execution. Install the Controller only on the machine that will control the Vusers.
- **Analysis.** Graphs and reports for analyzing the load test.

- **ERP and CRM Mediator.** The component needed to gather and correlate offline transaction data for the ERP/CRM diagnostics modules. For more information, refer to the ERP/CRM Diagnostics section in the *HP LoadRunner Controller User's Guide*.

Note: The Mediator must be installed on a machine that resides in the same LAN as the monitored ERP/CRM server, preferably on a dedicated machine. It is not recommended to install the Mediator on a Siebel or Oracle server that is involved in the load test.

By default, the Mediator agent is installed to run as a process. It is recommended to configure the Mediator agent to run as a service. To configure the agent to run as a service, see Appendix , "Configuring User Login Settings"

- **Launcher:** The LoadRunner launcher window used to open the installed components.
- **Load Generator.** The components for running virtual users (including Windows-based GUI Vusers) to generate load. Note that to run GUI Vusers you must have one of Mercury's functional testing products - QuickTest Professional or WinRunner - installed.
- **MI Listener Component.** Components for the MI Listener machine used in running Vusers and monitoring over the firewall. For more information, refer to the Using Firewalls chapter of the *HP LoadRunner Controller User's Guide*.
- **Monitors over FireWall.** Components on the agent machine for monitoring over the firewall. For more information, refer to the Using Firewalls chapter of the *HP LoadRunner Controller User's Guide*.
- **Online Documentation.** All user guides in Acrobat format.
- **Protocol SDK.** Enables LoadRunner to work with the HP Performance Validation SDK. To install this feature, you also need to install either the Vuser Generator or Load Generator.
- You install the HP Performance Validation SDK from the **Additional Components** folder located in the root folder of the installation disk.

- **Samples.** The LoadRunner sample flight application and Web server (Xitami).
- **Vuser Generator.** LoadRunner's tool for creating virtual user (Vuser) scripts, through recording. Vuser scripts emulate users without a graphical user interface by using direct function calls.

Installing Additional Components

You can install additional components that provide advanced features for working with LoadRunner. You install these components from the **Additional Components** folder, located in the root folder of the installation disk. The following components are available:

- **Citrix Replay Agent.** Installs an optional component on the server machine which enhances VuGen's capabilities in identifying Citrix client objects. To install the Citrix agent component, run the **CitrixAgent.exe** file.
- **Microsoft COM+ Server Monitor Probe.** Configures the server machine for COM+ monitoring. To install the COM+ Probe component, run the **Com_Plus_Probe.exe** file. For more information on configuring the server, refer to the Application Component section in the *LoadRunner Monitor Reference*.
- **HP Performance Validation SDK.** Provides you with the tools to create a custom protocol to run load tests on a previously unsupported application. For more information, refer to the *HP Performance Validation SDK Developer's Guide*.
- **IDE Add-ins.** Installs a component that enables you to create and run scripts, written in your standard development environment, in the application's native language. Select an add-in from the **IDE Add-ins** directory, and run the add-in's executable file.
- **MQ Tester.**
- **MSDE.** Installs the MSDE Database which is used for storing Analysis result data. To install MSDE, run the **Setup.exe** file.

- **SAPGUI Spy.** Helps examine the hierarchy of GUI Scripting objects, on open windows of **SAPGUI Client for Windows**. To install the SAPGUI Spy component, copy the three files **mscomctl.ocx**, **Msflxgrd.ocx** and **msvbvm60.dll** from the **SAP_Tools\SapGuiSpy\System32VBdlls** directory to your **C:\WINNT\system32** directory and then register the files. To register each file, select **Run** from the Windows Start menu and type: regsvr32 <File name>. Run the **SapSpy.exe** file from the **SAP_Tools** directory.
- **SAPGUI Verify Scripting.** Helps you verify that the SAPGUI Scripting API is enabled. To install the Verify Scripting component, run the **VerifyScripting.exe** file from the **SAP_Tools** directory.
- **Verify RFC User.** Determines whether the SAP user you have specified to connect to the SAP system, has permissions to invoke the required RFC functions necessary for working with SAP Diagnostics. To install the Verify RFC User component, copy the file **RFCFunctionsCollection.dll** from the **Verify RFC User** directory to your hard drive and then register the file by selecting **Run** from the Windows Start menu and typing: regsvr32 RFCFunctionsCollection.dll. In the **Verify RFC User** directory, load the **AddMTSDestinationsFolder.reg** by double-clicking the file and then run the **VerifyRFCUser.exe** file.
- **SiteScope.** Installs the SiteScope server used for the Siebel Web Server, SAP CCMS, SAP Portal, and Server Resource monitors.

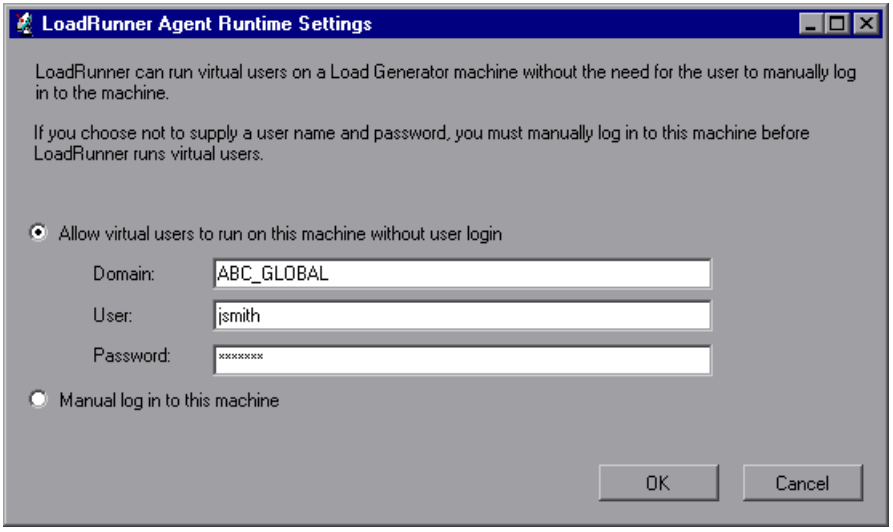
Note: SiteScope should not be installed in a directory whose path contains spaces, and the installation path must end with a directory called SiteScope.

Configuring User Login Settings

By default, you need to manually log on to a computer before LoadRunner can runs virtual users on that computer. However, you can configure LoadRunner to run Vusers in a Load Generator machine without the need for the user to manually log in to the machine.

To configure user login settings:

1 Select **Start** > **Programs** > **LoadRunner** > **Tools** > **LoadRunner Agent Runtime Settings Configuration**. The LoadRunner Agent Runtime Settings dialog box opens.



2 Select one of the following options:

➤ **Allow virtual users to run on this machine without user login.** LoadRunner will automatically log on to the network from the load generator machine, so the virtual users can run without any manual intervention. Enter the network domain where the user machine resides, a user name, and password.

Note: The user specified in the automatic login must have administrator privileges on the load generator machine.

➤ **Manual log in to this machine.** The user must manually log on to the network from the load generator machine for each session of running Vusers.

3 Click **OK**.

Note: You must boot and log in to the system at least once after the LoadRunner installation before the automatic login can work.

Silent Installation of LoadRunner

A *silent installation* is an installation that is performed automatically, without the need for user interaction.

To perform a silent installation of LoadRunner:

1 Install the prerequisite software. For the full list of prerequisite software, see "Prerequisite Software" on page 16. You can begin the silent installation only after all the prerequisite software is installed.

2 To install all of the LoadRunner components, run the following command from the command line:

```
msiexec.exe /qn /i "<Installation_DVD>\lrunner\LoadRunner.msi"
```

If you want to install only specific LoadRunner features, use the ADDLOCAL command line option to specify the features that you want to install. Features should be separated by commas. You always need to include the **UpdateService** feature.

For example, if you want to install only VuGen, run the following command:

```
msiexec.exe /qn /i "<Installation_DVD>\lrunner\LoadRunner.msi"
ADDLOCAL=UpdateService,Vuser_Generator
```

The following table describes which parameter to enter for each LoadRunner feature: (For a description of each of these features, see "Custom Installation Options" on page 34.)

Feature	Parameter
Analysis	Analysis
Controller	Controller
ERP and CRM Mediator	ERP_and_CRM_Mediator
Launcher	Launcher
Load Generator	Load_Generator,GUI_Vuser,Load_Generator_Core_Files **Note:** The Load Generator feature includes the following two sub-features: ➤ GUI_Vuser ➤ Load_Generator_Core_Files. You need to include at least one of them.
MI Listener Component	MI_Listener_Component
Monitors over FireWall	Monitors_over_FireWall
Online Documentation	Online_Documentation
Protocol SDK	Protocol_SDK
Samples	Samples
Vuser Generator	Vuser_Generator

Notes:

- For each machine on which you are installing LoadRunner, you need to have administration privileges.
- Use Standard MSI command line options to define installation properties. For example, use TARGETDIR to specify an alternate installation folder.

3

Viewing and Modifying a License

During the LoadRunner installation, if LoadRunner does not detect an existing valid license on your computer, you are automatically granted a temporary 10-day license for 25 Vusers. To use LoadRunner beyond the 10-day period, you must request and enter license information for your copy of LoadRunner.

This chapter describes how to enter, modify, or view license information in the HP LoadRunner Launcher window.

Entering or Modifying a License

After you receive your license information from your HP representative, you can enter or modify license information in the HP LoadRunner Launcher window.

To enter or modify license information:

1 Select **Start** > **Programs** > **LoadRunner** > **LoadRunner** to open the HP LoadRunner launcher window.

2 In the HP LoadRunner launcher window, select **Configuration** > **LoadRunner License** to open the LoadRunner License Information dialog box.

3 Click **New License**. The New LoadRunner License dialog box opens.

4 Enter the new license number exactly as it was given to you. Click **OK**.

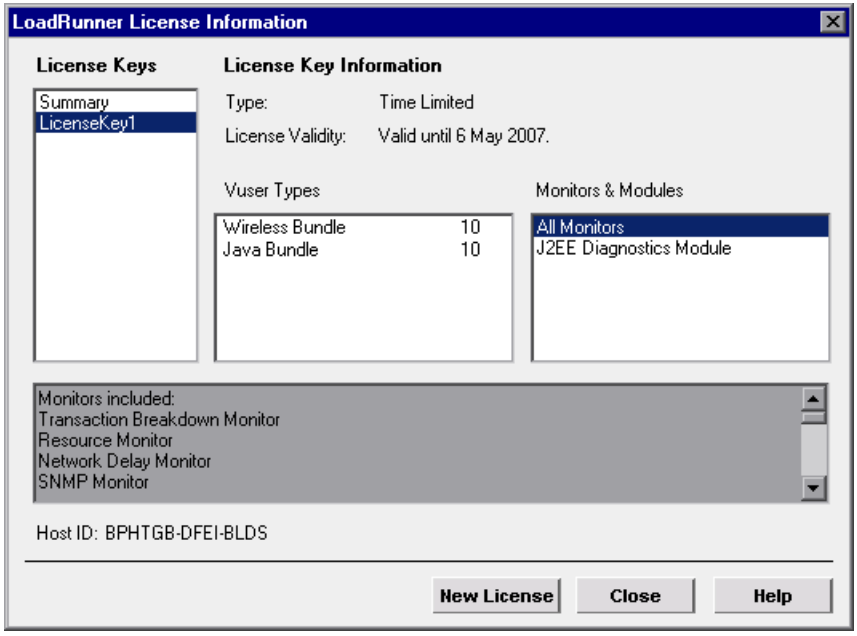
If your license is limited for a specific amount of time, you can view the time limitation in the LoadRunner License Information dialog box. When you select the relevant license, the **License Validity** field displays the time limitation.

5 Click **OK** to close the New LoadRunner License dialog box.

Viewing License Information

You can view your license information from the HP LoadRunner launcher window.

To view your license key information, click **Start** > **Programs** > **LoadRunner** > **LoadRunner**. The HP LoadRunner launcher window opens. From the **Configuration** menu, select **LoadRunner License** to open the LoadRunner License Information dialog box.



The LoadRunner License Information dialog box displays the following information:

License Keys. Displays the available license keys, as well as a summary of all the available license keys.

License Key Information

Type. Displays the type of license available for the license key you selected. The following types of licenses are available:

➤ **Permanent.** The license never expires.

- **Time Limited.** The license is limited by a start date and an expiration date.
- **Temporary.** The license is granted for a pre-defined number of days after product installation.
- **VUD-based.** With Virtual User Days or VUD based licenses you purchase a number of VUD type Vusers. Within a 24 hour period a portion of those Vusers can be used repeatedly to run an unlimited number of tests. At the end of the 24 hour period those Vusers are deducted from your total amount of available Vusers.

  For example, if you purchase 100 VUD type Vusers, you can run 3 different scenarios within the same 24 hour period, with 20 Vusers in each scenario. At the end of that period, only 20 Vusers (and not 60) are deducted from your total number of available Vusers, leaving you with 80 remaining Vusers which can be used at any time in the future.

Note: By default, LoadRunner begins the 24 hour cycle at midnight, however you can request a different cycle that best suits your test schedule

---

- **Plugged.** The license requires a dongle.

License Validity. Displays the time limitation of the selected license key.

Vuser Types. Displays a list of Vuser protocols available for the selected license key, or a list of protocol bundles for the new licensing implementation.

- **Group** < *n* >**.** A group of protocols that are often used together. This Vuser type is relevant only for versions of LoadRunner earlier than 9.0.
- **<bundle type> Bundle.** Each bundle contains a collection of protocols. When you select a protocol bundle, the dialog displays a list of included protocols.
- **Global.** The global license lets you run all Vuser types, provided you stay within the global, or total limit. The number following Global indicates the total number of Vusers purchased.

Monitors and Modules. Displays the online monitors available for the selected license key, and the modules included in the license, for example J2EE Diagnostics. If **All Monitors** is displayed in the list, it means that your license enables you to work with all the Controller online monitors. When you select **All Monitors,** the dialog displays a list of included monitors.

Host ID. Displays an ID for a specific machine. To receive a license key for a specific machine contact Customer Support.

New License. Opens the New LoadRunner License dialog box which enables you to enter a new license number. Enter the new license number exactly as it was given to you and click **OK**.

Troubleshooting

If you have a temporary license key, contact Customer Support to obtain a permanent license key.

If LoadRunner does not accept your license key, perform the following checks:

- Make sure you typed in the license key exactly as it was given to you. Your license key is case sensitive.
- If your LoadRunner license requires that you use a plug when running LoadRunner, and a message is issued stating that a plug is not installed, perform the following:

  Login as Administrator.

  Run **<loadrun_directory>/bin/hinstall.exe/i.**

  Reboot the machine.
- If you receive a **permission denied** error message during Controller start-up, you must grant **Full Control** permission for the Registry's **HKEY_LOCAL_MACHINE** key and in the **WINNT** directory (directory where Windows is installed).

To add Registry permissions:

1. Run **regedt32** to modify the registry.
2. Select the **HKEY_LOCAL_MACHINE** key.
3. Select **Security** > **Permissions**.
4. Add **Full Control** permission to the user that is running the Controller.
5. Turn on the **Replace Permission on the Existing Subkeys** flag.
6. Click **OK**.

To add permissions on an NTFS file system:

1. Select the **<System Drive>:\WinNT** folder.
2. Invoke **Properties**.
3. Select the **Security** tab.
4. Click **Permissions**.
5. Add **Full Control** permission for the user.
6. Turn on the **Replace Permissions on Subdirectories** flag.
7. Click **OK**.

4

Introducing the UNIX Installation

You can install the LoadRunner Load Generator component on a UNIX platform to run virtual users. The UNIX virtual users interact with the LoadRunner Controller, installed on a Windows machine.

For information about installing the LoadRunner Controller, see "Installing LoadRunner on Windows" on page 19.

This chapter discusses the installation steps and system requirements for installing the load generator on a UNIX platform.

UNIX Installation Steps

This guide describes the installation of the LoadRunner Load Generator component on all of the supported UNIX platforms. When a section applies only to a specific platform, it is explicitly stated.

The main steps of the installation process are:

- Installing the program files
- Setting the environment

Once you complete the installation, refer to the additional documentation for details on working with LoadRunner.

Setting the Environment

Since LoadRunner virtual users emulate an actual user of your system, the environment on the virtual user machine must be configured for the user to run correctly. The environment variables are defined in the **.cshrc** file for cshell users, and the **.profile** file for Bourne and kshell users.

- The installation process determines the platform upon which the Vuser is running, and prepares a script to modify the **.cshrc** file for cshell users. Bourne and kshell users should manually modify the **.profile** file. Refer to "Verifying Your UNIX Installation" on page 73 for sample **.cshrc** and **.profile** files.
- The LoadRunner installation process helps you set the environment variable to indicate the location of the LoadRunner bin directory and any DLLs used by the underlying protocol. This environment variable is called LIBPATH on AIX, SHLIB_PATH on HP/UX, and LD_LIBRARY_PATH on Solaris and Linux.

UNIX System Requirements

Your actual memory requirements may vary, depending on your configuration. Note that the installation procedure uses additional memory which becomes free after the installation. To ensure a smooth installation of the UNIX components, it is recommended that you make sure there is sufficient storage space, process entries, and swap space in the disk partition where you intend to install LoadRunner.

The following table describes the system requirements for each platform supported by HP for LoadRunner UNIX Vusers.

Platform	Version
Solaris	Solaris 9 (2.9) and 10 (2.10)
HP	HP-UX 11.i V2
IBM	AIX 5.2 and 5.3
Linux	RedHat Linux Advanced Server 3.0

Note that LoadRunner supports all X Servers.

Note: For Linux platforms, you should install the updated glibc packages which provide security and bug fixes. For more information, refer to https://rhn.redhat.com/errata/RHSA-2003-325.html#Red%20Hat%20Linux%208.0

System Resources

The following describes the system resources required for each platform or operating system. The actual resources may vary depending on the number of Vuser licenses purchased.

The resources for Vusers listed below apply to each virtual user. If you are installing multiple virtual users, you must multiply the figure by the number of virtual users.

Disk Space required for program installation	22 MB (34 for Linux)
Memory Space each Vuser if run as thread	300 KB (at least). This amount may vary, depending on the operating system and platform, and does not include the memory used by the process.
Memory Space each Vuser if run as process	1.5 MB (2.5 MB for Solaris)
Swap Space	approximately 1:7 memory/swap ration
Free Process Entries each Vuser if run as process	1
File Descriptors each Vuser if run as thread	2 (see below)

The **Memory Space** above describes a general C-Vuser type. Other types may take up more memory space. For example, each Web Vuser uses at least 500 KB.

A load generator additionally uses the following **File Descriptor** resources:

- 14 file descriptors for the LoadRunner launch service
- 20 file descriptors for the LoadRunner agent
- 30 file descriptors for each Vuser driver. By default, there is a driver for every 50 Vusers.

For example, to compute the number of file descriptors used in running 100 threaded Vusers the load generator requires:

14 for LR launcher

20 for LR agent

60 for 2 drivers (30 x 2, each one drives 50 Vusers)

200 for 100 Vusers (each Vuser requires 2)

Total: 294 File Descriptors

If Vusers are run as processes instead of threads, one driver is run per Vuser. Therefore, each Vuser requires 30 file descriptors.

You can increase the number of file descriptors, process entries, and amount of swap space by configuring the kernel, as described in this chapter.

Important: Most operating systems using LoadRunner version 7.0 or later have sufficient default file descriptors, process entries, and swap space, and rarely require reconfiguration.

Increasing Process Entries

Each Vuser requires several free process entries. To increase the number of process entries on your system, you must reconfigure the kernel.

Solaris 2.6

This section describes how to reconfigure the kernel for Solaris operating systems.

To reconfigure the kernel for Solaris operating systems:

1. Locate the **/etc/system** file.
2. Set the maximum number of processes in the system file. Type:

```
set max_nprocs=number (e.g.712)
```

3. Execute the touch/reconfigure command. Type:

```
touch /reconfigure
```

4. Reboot the machine.

HP-UX

This section describes how to reconfigure the kernel for HP platforms.

To reconfigure the kernel for HP platforms:

1. Login as root.
2. Invoke the *sam* tool to reconfigure the kernel. Type:

```
sam &
```

3. Select **Kernel Configuration** > **Configurable Parameters**.

4 Set the following parameters to the desired values:

nproc: The number of simultaneous processes—(# of Vusers * 2) + 200
maxuser: The number of maximum users—DB + RTE Vusers + 20
maxuprc: The number of processes per user—# of Vusers * 2

5 Reboot the machine.

IBM

This section describes how to reconfigure the kernel for IBM platforms using the AIX operating system.

To reconfigure the kernel for IBM platforms using the AIX operating system:

1 Display the current settings. Type:

```
lsattr -EHl sys0
```

2 Increase the maximum number of process entries per user. Type:

```
chdev -l sys0 -a maxuprocs = number (e.g.500)
```

3 Set the *nproc, maxusers* parameters to the desired values.

Linux

This section describes how to reconfigure the kernel for Linux platform.

To reconfigure the kernel for Linux platforms:

1 Locate the **/etc/security/limits.conf** file.

2 Set the maximum number of processes in the limits file. Type:

```
hard nproc 8192
```

3 Reboot the machine.

Increasing File Descriptors

Each Vuser requires from 6 (non-GUI Vusers) to 27 (GUI Vusers) file descriptor entries. The procedure to increase the number of file descriptors differs between platforms and shells.

All Platforms

In these examples, the number of descriptors is increased to the maximum of 1024.

➤ For sh and ksh users, type:

```
ulimit -n 1024
```

➤ For csh users type:

```
limit descriptors 1024
```

Solaris

The following section describes some alternate procedures to increase file descriptors on Solaris operating systems. In these examples, the number of descriptors is increased to the maximum of 1024.

1 Use the *adb* command to increase file descriptors (all shells). Note that 400 HEX is the equivalent to decimal 1024. In the following example, **kernel** is the name of the kernel file, e.g., **kernel/unix**.

```
adb -w -k /kernel/dev/mem
rlimits+28?W 400
rlimits+28/W 400
```

2 You can also increase the maximum number of file processes by reconfiguring the kernel.

Login as root and set the *rlim_fd_max* parameter inside the **/etc/system** file by typing:

```
set rlim_fd_max=1024
```

3 Save the file and reconfigure the system by typing:

```
touch /reconfigure
```

4 After reconfiguring the system, reboot the machine.

HP-UX

This section describes how to increase file descriptors for HP platforms.

To increase file descriptors for HP platforms:

1 Login as root.

2 Invoke the *sam* tool to reconfigure the kernel. Type:

```
sam &
```

3 Select **Kernel Configuration** > **Configurable Parameters**.

4 Set the *maxfiles* parameters to the desired values. This is the equivalent to file descriptors on Sun platforms.

maxfiles: The number of files open at a given time, typically set to 60. Change it to 500 -1024.

5 Reboot the machine.

Linux

This section describes some alternate procedures to increase file descriptors on Linux operating systems. In these examples, the number of descriptors is increased to the maximum of 8192.

To increase file descriptors on Linux operating systems:

1 Add the following line to the **/etc/security/limits.conf** file:

```
hard nfile 8192
```

2 Add the following line to the **/etc/sysctl.comf** file:

```
fs.file-max = 8192
```

3 Reboot the machine.

Increasing Swap Space

Each Vuser requires swap space ranging from 200 KB to 4 MB. Before adding space to your system configuration, you should determine your paging requirements. For environments running programs with very large memory requirements, it is recommended to have paging space of four times the physical memory. If you do not have enough paging space, certain processes may be killed, and others will be unable to start.

Solaris

This section describes how to increase swap space for machines running Solaris.

To increase swap space for machines running Solaris:

1. List the available paging areas. Type:

```
swap -l
```

2. Display the available swap space. Type:

```
swap -s
```

3. Create a new paging file. Type:

```
mkfile  size  path (e.g. mkfile 50m /extra/page_1)
```

4. Add the page file to the existing configuration. Type:

```
/usr/etc/swapon -a /extra/page_1 0 102400
```

5. Enable all swap areas listed in the filesystem configuration. Type:

```
/usr/etc/swapon -a
```

IBM

This section describes how to increase swap space for machines running the AIX Operating System.

To increase swap space for machines running the AIX Operating System:

1. List the available paging areas. Type:

```
lsps -a
```

2. Display the available swap space. Type:

```
swap -s
```

3. Create a new paging file, using a value one quarter the size of the actual file size. For example, to create 200 MB of paging space in the chemvg volume group, type:

```
mkps -a -n -s 50 chemvg
```

4. To increase the size of an existing paging file, type:

```
chps -s number paging_file
```

(e.g chps -s 10 page_01 adds 40 MB to page_01).

5. Add the page file to the existing configuration. Type:

```
swapon paging_area (e.g. swapon /dev/paging_01)
```

6. Enable all swap areas listed in the file system configuration file **/etc/swapspaces**. Type:

```
swapon -a
```

Diagnostics Hardware Requirements

For information on installation requirements for HP Diagnostics (J2EE and .NET), refer to the *HP Diagnostics Installation and Configuration Guide*.

5

Installing LoadRunner on UNIX

LoadRunner is installed using the installation media provided with the LoadRunner distribution package. The installation uses a Java Runtime Environment (JRE).

The following sections describe installing the LoadRunner UNIX components from a UNIX CD-ROM device. If a UNIX machine with a CD-ROM device is not available, you can copy the UNIX components from the CD into a directory on your PC, and transfer them to a UNIX directory via ftp or an NFS mounting at a later stage.

Checking Your Environment

- Verify that a CD-ROM device is attached to your local or remote machine.
- Find out which device driver is available for use with this drive. The device driver is usually located in the **/dev** directory of the machine to which the drive is attached. Consult your system administrator for the name of your device.

Installing LoadRunner on Multiple Platforms

In order to run LoadRunner on multiple UNIX platforms, you need to install a separate version of LoadRunner, in a separate directory, for each platform. The installation directories must be accessible to all the platforms. At the end of installation, follow the instructions at the end of this chapter for modifying the environment variables to indicate the LoadRunner installation directories.

For example, in order to install LoadRunner on a site that has both Solaris and IBM machines, you could use the following directories:

- For LoadRunner Solaris: **/tools/mercury/sol/lrunner**
- For LoadRunner IBM: **/tools/mercury/ibm/lrunner**

If you intend to run multi-platform scenarios, both directories should be NFS mounted. The Solaris machine should access the IBM installation directory and vice versa.

Running the Installation Program

Before you begin the installation program, make sure you can access the install script, **install.sh** from the CD. Note that most operating systems require you to mount the CD-ROM drive to a local directory. For information for mounting a CD-ROM on IBM, see "Preparing to Install from a CD-ROM (IBM only)" on page 67.

There are two installation modes: UI (or AWT) mode and console mode.

- To run the installation in UI mode, make sure that the DISPLAY environment variable is properly configured.
- To run the installation in console mode, add the -console parameter to the command line. For example:

```
install.sh -console
```

To run the LoadRunner installation program:

Note: The instructions below are for the UI mode.

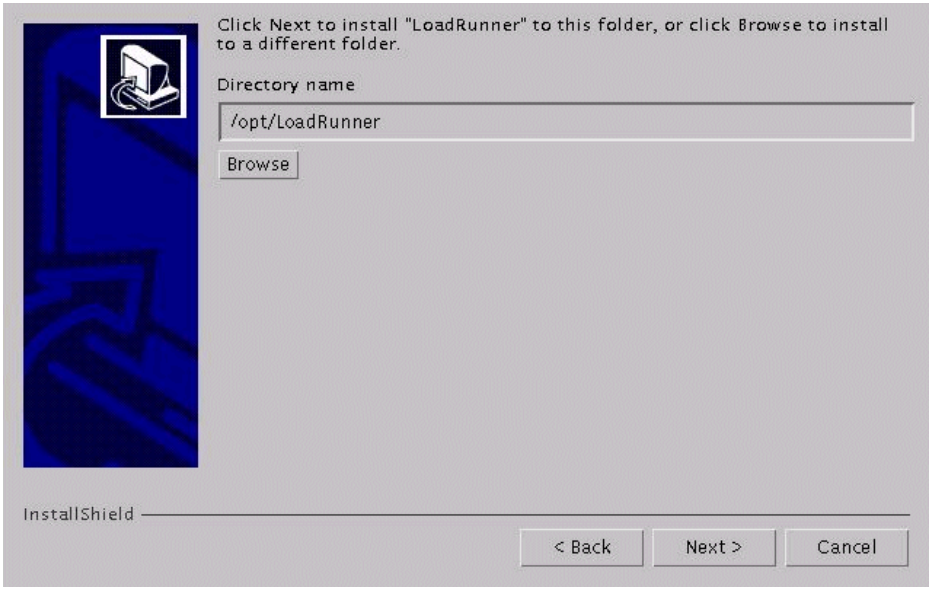
---

1 Type the following:

```
install.sh
```

The installation program begins and displays the license agreement.

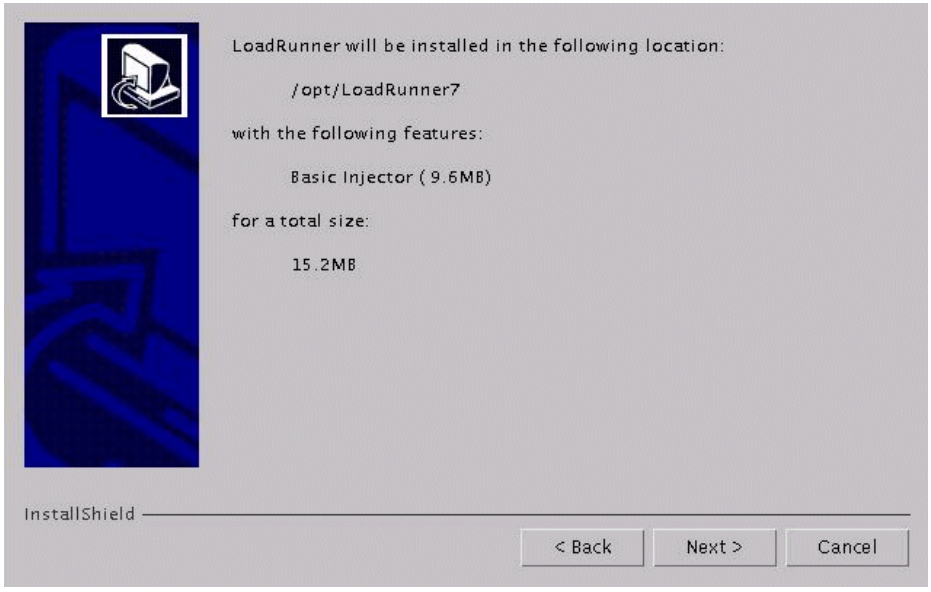
2 Read the agreement and select the option to accept it. The LoadRunner installation program begins and displays the installation location dialog box.



Choose the location where you want to install LoadRunner. To select a different location, click **Browse**, choose a directory, and click **OK**.

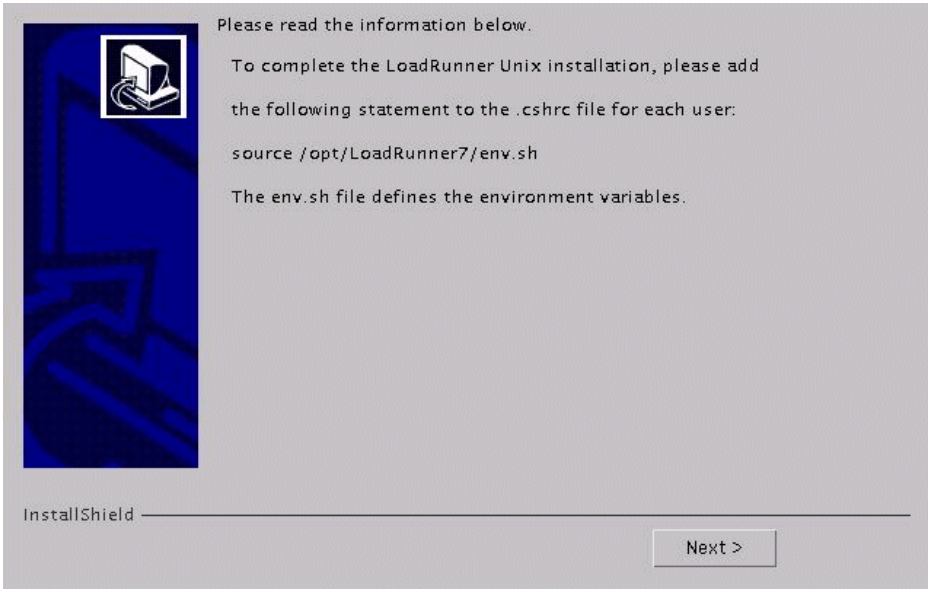
Click **Next**.

3 A read-only dialog box with your installation settings appears.



To select different installation settings, click **Back**. To begin installation, click **Next**. The installation process begins.

4 At the end of the installation, a message appears about setting the LoadRunner environment variables. The next step outlines this procedure. First complete the automatic installation by clicking **Next**.



5 The installation process prepared a file called **env.sh** that contains environment variable definitions for your cshell environment. Open the **.cshrc** file for each LoadRunner user and add the following statement:

source **/opt/LoadRunner7/env.sh**

where **/opt/LoadRunner7** is the LoadRunner installation directory.

Bourne shell and kshell users should refer to "Post UNIX Installation" on page 68 for instructions on modifying the **.profile** file.

6 Bring up a new terminal to run the **.cshrc** file. For more information about **.cshrc** files, see "Post UNIX Installation" on page 68.

7 Be sure to run *verify_generator* to verify your Vuser installation. This is a confirmation step, to ensure that the specified directory and device name are correct, and that you have sufficient disk space. For information about the tests performed by verify_generator, see "Verifying Your UNIX Installation" on page 73.

Preparing to Install from a CD-ROM (IBM only)

When installing LoadRunner on an IBM platform, you must mount the CD-ROM drive to access the installation program.

To mount the CD-ROM drive:

1. Insert the CD-ROM into the drive and log in or *su* as root.
2. Create the LoadRunner installation directory by typing:

```
mkdir -p /usr/cdrom/lrun
```

3. To add a CD-ROM file system, you need to use SMIT. To enter the program, type:

```
smit storage
```

4. From within SMIT, select **File Systems**.
5. Select **Add/Change/Show/Delete File Systems**.
6. Select **CD ROM File Systems**.
7. Select **Add a CDROM File System**.
8. Choose a DEVICE name. Note that device names for CD-ROM file systems must be unique.
9. Type in the following MOUNT POINT:

```
/usr/cdrom/lrun
```

10. Select the **Do** command, or click enter if you are using the ASCII interface.
11. Quit the SMIT program.
12. Type the following command in order to mount the CD-ROM file system:

```
smit mountfs
```

13. For the FILE SYSTEM Name, select either **/dev/cd0** or **/dev/cd1**.

14 Select the mount directory:

```
/usr/cdrom/lrun
```

15 Select **cdrfs** to set the TYPE of file system.

16 Select **Yes** to mount as a READ-ONLY system.

17 Select **Do** or **Enter** if you are using the ASCII interface.

18 Close your connection as the root user.

Post UNIX Installation

After installing LoadRunner, prior to starting work, you should check that your environment is configured properly.

This section describes:

- Setting Environment Variables
- Checking Authorizations
- Sample .cshrc and .profile Files

After you complete the post-installation configurations, run the LoadRunner verification utility to check your installation. For more information, see "Verifying Your UNIX Installation" on page 73.

Setting Environment Variables

The LoadRunner installation procedure created a file, **env.sh** which sets the environment variables. Rather than manually updating your **.cshrc** file with the variable definitions, you include a statement to access **env.sh** at the end of the **.cshrc** file. This section describes the environment variables in your **env.sh** file. Note that if you are working with kshell or Bourne shell, you should manually set these variables in your **.profile** file. The syntax in the examples below are for cshell users. For kshell and Bourne shell users, see "LoadRunner Settings in the .profile File" on page 72.

- M_LROOT

- PATH
- LD_LIBRARY_PATH (Solaris, Linux), LIBPATH (AIX), SHLIB_PATH (HP-UX)

M_LROOT: Set M_LROOT to the LoadRunner installation directory. For example:

```
setenv M_LROOT /tools/lrunner
```

PATH: The location of LoadRunner's executable programs, the *bin* directory, must be added to the PATH variable.

```
set path = ($path $M_LROOT/bin)
```

LD_LIBRARY_PATH: The path should include the location of LoadRunner's dynamic libraries ($M_LROOT/bin). To set the path, type:

```
setenv LD_LIBRARY_PATH ${LD_LIBRARY_PATH}:$M_LROOT/bin     /*Solaris and
Linux*/
setenv SHLIB_PATH ${SHLIB_PATH}:$M_LROOT/bin/*HP Platforms */
setenv LIBPATH "${LIBPATH}:$M_LROOT/bin"              /*IBM Platforms */
```

Check the dynamic libraries used by your application, and make sure that their path is also included in the appropriate dynamic library path environment variable (LD_LIBRARY_PATH, SHLIB_PATH or LIBPATH).

To check the dynamic libraries used by your application, type:

```
ldd my_application          /* Sun and Linux platforms */
chatr my_application        /* HP platforms */
dump -H my_application      /* IBM platforms */
```

Note: Remember that in order to use Oracle73, you need to add the path Oracle73 libraries to the dynamic libraries path environment variable.

Checking Authorizations

In order to execute Vusers on remote hosts, you must be authorized to execute a **remote shell**. To check your permissions on a host, type:

➤ For Solaris, Linux and IBM platforms:

```
rsh hostname ls
```

➤ For HP platform:

```
remsh hostname ls
```

If you do not have permission, consult the *.rhosts* file (man *rsh* or *remsh*).

Sample .cshrc and .profile Files

This section includes examples of LoadRunner settings within a user's **.cshrc** file and **.profile** file.

LoadRunner Settings in the .cshrc File

The following is an example of LoadRunner settings within a user's .cshrc file:

```
# LoadRunner settings #
#Chooses a path based on the location of the machine dependent LoadRunner
installation

switch ("`uname`")
 case SunOS:
       setenv M_LROOT {replace with LoadRunner Solaris installation path}
       setenv LD_LIBRARY_PATH ${LD_LIBRARY_PATH}:${M_LROOT}/bin
 breaksw

   case HP-UX:
       setenv M_LROOT {replace with LoadRunner HP-UX installation path}
       setenv SHLIB_PATH ${M_LROOT}/bin ${SHLIB_PATH}
 breaksw

 case Linux:
       setenv M_LROOT {replace with LoadRunner SunOs installation path}
       setenv LD_LIBRARY_PATH ${LD_LIBRARY_PATH}:${M_LROOT}/bin
 breaksw

 case AIX:
      setenv M_LROOT {replace with LoadRunner AIX installation path}
       setenv LIBPATH ${M_LROOT}/bin:${LIBPATH}
      breaksw
endsw

set path = ($M_LROOT/bin $path)

# End LoadRunner setting #
```

LoadRunner Settings in the .profile File

The following is an example of LoadRunner settings within a user's **.profile** file for kshell and Bourne shell environments:

```
# LoadRunner settings #
#Chooses a path based on the location of the machine dependent LoadRunner
installation

case "`uname`" in
 SunOS)
  M_LROOT={replace w/ LR Solaris installation path} ; export M_LROOT
    LD_LIBRARY_PATH=${M_LROOT}/bin ; export LD_LIBRARY_PATH
 ;;

 HP-UX)
    M_LROOT={replace w/ LR HP-UX installation path} ; export M_LROOT
    SHLIB_PATH={${M_LROOT}/bin ; export SHLIB_PATH
 ;;

 AIX)
    M_LROOT={replace w/ LR AIX installation path} ; export M_LROOT
    LIBPATH=${M_LROOT}/bin ; export LIBPATH
 ;;

 Linux)
    M_LROOT={replace w/ LR Linux installation path} ; export M_LROOT
    LD_LIBRARY_PATH=${M_LROOT}/bin; export LD_LIBRARY_PATH
esac


PATH=${M_LROOT}/bin:${PATH}; export PATH

# End LoadRunner setting #
```

Verifying Your UNIX Installation

LoadRunner has a setup verification utility *verify_generator*, that checks the LoadRunner setup. It checks environment variables and your *.cshrc* file to verify that they are set up correctly. The *verify_generator* utility checks the remote Vuser hosts.

It is strongly recommended that you run *verify_generator* after a Vuser installation, before attempting to invoke LoadRunner.

The verify_generator Test

The utility checks the following items in the Vuser environment:

- at least 128 file descriptors
- proper .rhost permissions: -rw-r--r--
- the host can be contacted using rsh to the host. If not, checks for the host name in .rhosts
- M_LROOT is defined
- .cshrc defines the correct M_LROOT
- .cshrc exists in the home directory
- the current user is the owner of the .cshrc
- a LoadRunner installation exists in $M_LROOT
- the executables have executable permissions
- PATH contains $M_LROOT/bin, and /usr/bin
- the rstatd daemon exists and is running

verify_generator Option

The verify utility checks the local host for its communication parameters and its compatibility with all types of Vusers. If you intend to run all of the Vusers on one host, type:

```
verify_generator
```

verify_generator either returns 'OK' when the setting is correct, or 'Failed' and a suggestion on how to correct the setup.

The syntax of *verify_generator* is as follows:

```
verify_generator [-v]
```

where -v provides detailed information about the checks.

Running the Uninstall Program

The uninstall program, like the installation program, uses a Java Runtime Environment (JRE). You can also run the uninstall program in UI mode, or in console mode. To run the program in console mode, add the console parameter to the end of the command line.

To run the LoadRunner uninstall program:

1. To access the program, type the following:

```
cd <installation directory>/_uninst
```

2. Type the following:

```
uninstall [-console]
```

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