

# HP LoadRunner

for the Windows and Linux operating systems

Software Version: Service Pack 11.51

## Installation Guide

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# 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.

**This chapter includes:**

- How This Guide Is Organized on page 8
- Who Should Read This Guide on page 8
- Documentation Library Guides on page 8
- Additional Online Resources on page 10
- Terminology on page 11

## 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 of LoadRunner on a Windows machine.

### Chapter 3 Installing the HP Load Generator on Linux

Describes how to install and configure the load generator on a Linux platform.

### Chapter 4 Viewing and Modifying a License

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

## 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.

## Documentation Library Guides

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

**Using this Documentation Library** explains how to use the Documentation Library and how it is organized.



## Accessing the Documentation

You can access the documentation as follows:

- After installing LoadRunner, click **Start > All Programs > HP Software > HP LoadRunner > Documentation** and select the relevant document.
- From the Controller **Help** menu, click **Documentation Library** to open the merged help.

## Getting Started Documentation

- **Readme.** Provides last-minute news and information about LoadRunner. You access the Readme from the **Start** menu.
- **HP LoadRunner Tutorial.** Self-paced printable guide, designed to lead you through the process of load testing and familiarize you with the LoadRunner testing environment. To access the tutorial, click **Start > All Programs > HP Software > HP LoadRunner > Documentation > Tutorial**.

## LoadRunner Guides

- **HP Virtual User Generator User Guide.** Describes how to create scripts using VuGen. When necessary, supplement this user guide with the online *HP LoadRunner Function Reference*.
- **HP LoadRunner Controller User Guide.** Describes how to create and run LoadRunner scenarios using the LoadRunner Controller in a Windows environment. Also describes how to set up the server monitor environment and configure LoadRunner monitors for monitoring data generated during a scenario run.
- **HP LoadRunner Analysis User Guide.** Describes how to use the LoadRunner Analysis graphs and reports to analyze system performance after running a scenario.
- **HP LoadRunner Installation Guide.** Explains how to install LoadRunner and additional LoadRunner components.

## LoadRunner References

- ▶ **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.
- ▶ **Analysis API Reference.** This Analysis API set can be used for unattended creating of an Analysis session or for custom extraction of data from the results of a test run under the Controller. You can access this reference from the Analysis Help menu.
- ▶ **Troubleshooting.** The Output dialog box (**Controller > View > Show Output**) displays details of any errors encountered during a scenario run. Click the icon in the Help column to open the Troubleshooting guide. This guide provides clear explanations and troubleshooting tips for many Controller connectivity and Web protocol errors. It also provides general troubleshooting tips for Winsock, SAPGUI, and Citrix protocols.

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Most of the support areas require that you register as an HP Passport user and sign in. Many also require a support contract.

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To register for an HP Passport user ID, go to:

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

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## Terminology

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

## Documentation Updates

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Welcome to This Guide

# 1

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## 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.

**This chapter includes:**

- Introducing the LoadRunner Windows Installation on page 13
- Introducing the LoadRunner Linux Installation on page 14
- Windows System Requirements on page 14
- Prerequisite Software on page 17
- Pre-installation Configuration on page 18

## Introducing the LoadRunner Windows Installation

Your LoadRunner installation disk 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.

The LoadRunner installation installs a full LoadRunner configuration, including virtual user and server side components.

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

## Introducing the LoadRunner Linux Installation

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

For more information, see Chapter 3, "Installing the HP Load Generator on Linux."

## Windows System Requirements

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

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

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## Controller, VuGen, and Analysis System Requirements

The following table describes the system requirements for installing the Controller, VuGen, or Analysis.

<b>Processor</b>	<p><b>CPU Type:</b> Intel Core, Pentium, Xeon, AMD or compatible</p> <p><b>Speed:</b> 1 GHz minimum. 2 GHz or higher recommended</p>
<b>Operating System</b>	<ul style="list-style-type: none"> <li>▶ Windows XP Professional SP3 32-bit</li> <li>▶ Windows Server 2003 Standard Edition/Enterprise Edition SP2 32-bit</li> <li>▶ Windows Server 2008 Standard Edition/Enterprise Edition SP2 32-bit and 64-bit</li> <li>▶ Windows 7 SP1 32-bit and 64-bit</li> <li>▶ Windows 2008 R2 SP1</li> </ul>
<b>Memory (RAM)</b>	<p><b>Minimum:</b> 2 GB</p> <p><b>Recommended:</b> 4 GB or higher</p>
<b>Screen Resolution</b>	<b>Minimum:</b> 1024 x 768
<b>Browser</b>	<ul style="list-style-type: none"> <li>▶ Microsoft Internet Explorer 6.0 SP1 or SP2</li> <li>▶ Microsoft Internet Explorer 7.0</li> <li>▶ Microsoft Internet Explorer 8.0</li> <li>▶ Microsoft Internet Explorer 9.0</li> </ul>
<b>Available Hard Disk Space</b>	<b>Minimum:</b> 4 GB

## Load Generator for Windows System Requirements

The following table describes the system requirements for installing the Load Generator on a Windows machine.

<b>Processor</b>	<p><b>CPU Type:</b> Intel Core, Pentium, Xeon, AMD or compatible</p> <p><b>Speed:</b> 1 GHz minimum. 2 GHz or higher recommended</p>
<b>Operating System</b>	<p>The following Windows operating systems are supported:</p> <ul style="list-style-type: none"> <li>▶ Windows XP Professional SP3 32-Bit</li> <li>▶ Windows Server 2003 Standard Edition/Enterprise Edition SP2 32-Bit</li> <li>▶ Windows Server 2008 Standard Edition/Enterprise Edition SP2 32-Bit and 64-bit</li> <li>▶ Windows 7 SP1 32-bit and 64-bit</li> <li>▶ Windows 2008 R2 SP1</li> </ul>
<b>Memory (RAM)</b>	<p><b>Minimum:</b> 1 GB</p> <p><b>Note:</b> Memory depends on protocol type and system under test and can vary greatly.</p>
<b>Browser</b>	<ul style="list-style-type: none"> <li>▶ Microsoft Internet Explorer 6.0 SP1 or SP2</li> <li>▶ Microsoft Internet Explorer 7.0</li> <li>▶ Microsoft Internet Explorer 8.0</li> <li>▶ Microsoft Internet Explorer 9.0</li> </ul>
<b>Available Hard Disk Space</b>	<p><b>Minimum:</b> 2 GB</p>

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**Note:** For information about system requirements for installing the Load Generator on Linux machines, see "Linux System Requirements" on page 47.

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## Prerequisite Software

Specific software needs to be installed before you can install LoadRunner. 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.

The following prerequisite software needs to be installed:

- ▶ Microsoft Windows Installer 3.1
- ▶ Windows Imaging Component. This is a prerequisite for .NET Framework 4.0.
- ▶ .NET Framework 3.5 SP1 (See the note below for installation instructions.)
- ▶ .NET Framework 4.0
- ▶ Web Services Enhancements (WSE) 2.0 SP3 for Microsoft .NET Redistributable Runtime MSI
- ▶ Web Services Enhancements (WSE) 3.0 for Microsoft .NET Redistributable Runtime MSI
- ▶ Microsoft Core XML Services (MSXML) 6.0
- ▶ Microsoft Visual C++ 2005 SP1 Redistributable Package MFC Security Update (x86)
- ▶ Microsoft Visual C++ 2005 SP1 Redistributable Package MFC Security Update (x64)
- ▶ Microsoft Visual C++ 2008 SP1 Redistributable Package MFC Security Update (x86)
- ▶ Microsoft Visual C++ 2008 SP1 Redistributable Package MFC Security Update (x64)
- ▶ Microsoft Visual C++ 2010 SP1 Redistributable Package MFC Security Update (x86)
- ▶ Microsoft Data Access Components (MDAC) 2.8 SP1 (or later)

**Note:**

- ▶ **Windows 7:** .NET 3.5.1 is installed by default.
  - ▶ **Windows 2008 R2:** To install .NET 3.5.1, click **Administrative Tools > Service Manager > Features**. Click **Add Features**, select the **.NET Framework 3.5.1** check box, and then click **Install**.
  - ▶ **All other supported version of Windows:** Install .NET 3.5.1 using the .NET 3.5.1 installer.
- 

## Pre-installation Configuration

Before you begin the installation, review the following configuration information:

- ▶ To run the LoadRunner installation, you must have full local administrative rights on the designated machine.
- ▶ If any version of LoadRunner is installed on your machine, uninstall the current version before you begin the new installation.
- ▶ You cannot use the UNC (Universal Naming Convention) path to run the installation. Therefore, if the LoadRunner installation folder is located on a network drive, the network drive needs to be mapped before you can run the installation.
- ▶ LoadRunner does not support installation via terminal service. Installation must be performed at the destination machine.
- ▶ You cannot install LoadRunner on a machine that contains an existing installation of HP Performance Center or a standalone installation of either Analysis, VuGen, or Service Test.
- ▶ If you are working with a non-English version of Windows, and your machine does not have an internet connection, .NET Framework 3.5 SP1 must be installed before you run the LoadRunner installation.

# 2

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## Installing LoadRunner on Windows

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

**This chapter includes:**

- Performing the Installation on page 20
- Installing Additional Components on page 32
- Configuring User Login Settings on page 40
- Silent Installation of LoadRunner on page 42
- HP LoadRunner User Interface Pack Installation on page 43
- Upgrading LoadRunner on page 44

## Performing the Installation

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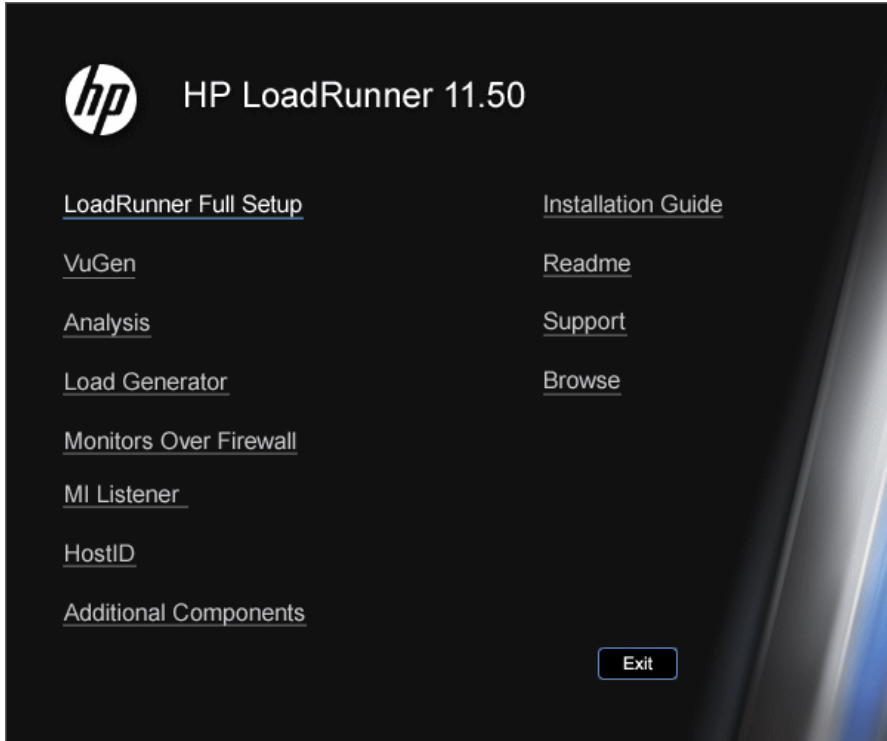
**Caution:** Before you install LoadRunner, review the pre-installation information, including the system requirements, described in Chapter 1, "Before You Install."

---

To install LoadRunner or an additional component:

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

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



**2 Select the required installation option.**

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

- ▶ **LoadRunner Full Setup.** Installs the main LoadRunner components, including the Controller, the Virtual User Generator (VuGen), Analysis, and the Load Generator. Use this option for the machine that runs the load testing scenarios.

For details on the components that are included in the installation, see "LoadRunner Installation Components" on page 30.

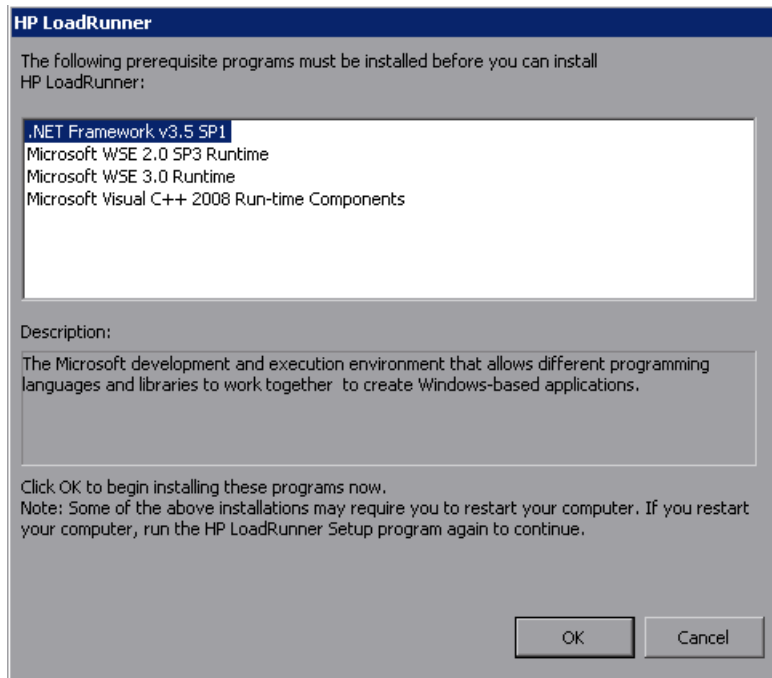
- ▶ **VuGen.** Installs a standalone version of the LoadRunner Virtual User Generator, VuGen.
- ▶ **Analysis.** Installs a standalone version of LoadRunner Analysis.
- ▶ **Load Generator.** Installs the components needed for running virtual users to generate load. Use this option for machines that are used to generate load only, 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 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 Guide*.
- ▶ **Host ID.** Opens the Host ID Generator that displays the computer's Host ID.
- ▶ **Additional Components.** Opens the **Additional Components** folder located in the root folder of the LoadRunner installation disk. From this folder, you can install the following components:
  - ▶ Agent for Citrix Server
  - ▶ Agent for Microsoft Terminal Server
  - ▶ Assembly Crawler for Analysis API
  - ▶ HostID Generator
  - ▶ HP Diagnostics Mediator
  - ▶ HP Performance Validation SDK
  - ▶ IDE Add-Ins
  - ▶ LRTCPDump

- Monitor Probe for Microsoft COM+ Server Components
- MQTester
- SAP Tools: SAPGUI Spy, SAPGUI Verify Scripting, Verify RFC User
- Standalone Applications: Analysis, Load Generator, MI Listener, Monitors over Firewall, VTS (Virtual Table Server), and VuGen
- WinPcap

For a description of each of these components, see "Installing Additional Components" on page 32.

**3 If necessary, install prerequisite software.**

Specific software, for example, .NET Framework 3.5 SP1, needs to be installed before you can install LoadRunner. If the prerequisite software is not already installed on your computer, a dialog box opens displaying the list of prerequisite programs that are required.



Click **OK** to install the listed software before continuing with the LoadRunner installation. If you click **Cancel**, the LoadRunner installer exits because LoadRunner cannot be installed without the prerequisite software.

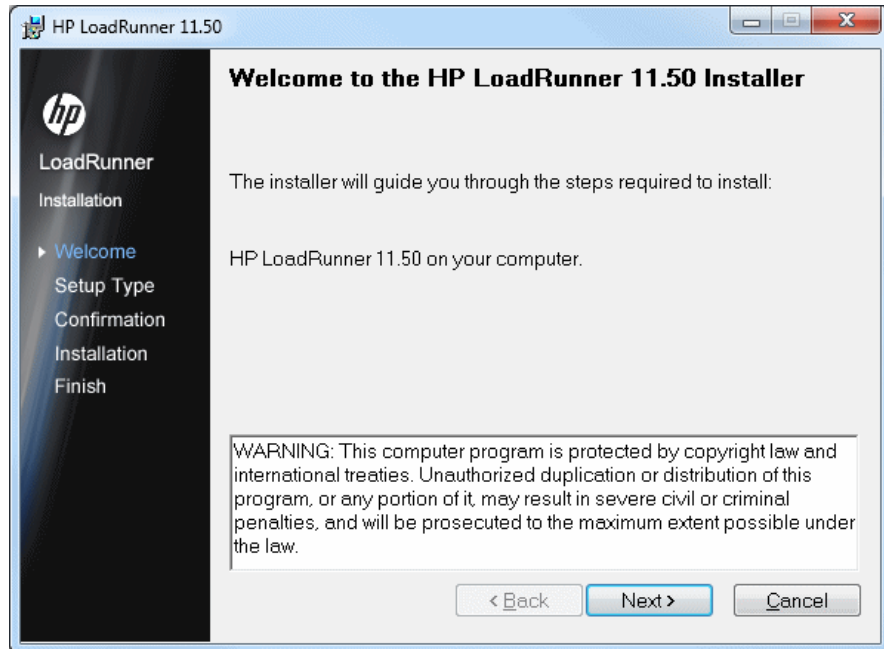
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**Note:** For the full list of prerequisite software, see "Prerequisite Software" on page 17.

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#### 4 Start the LoadRunner installation.

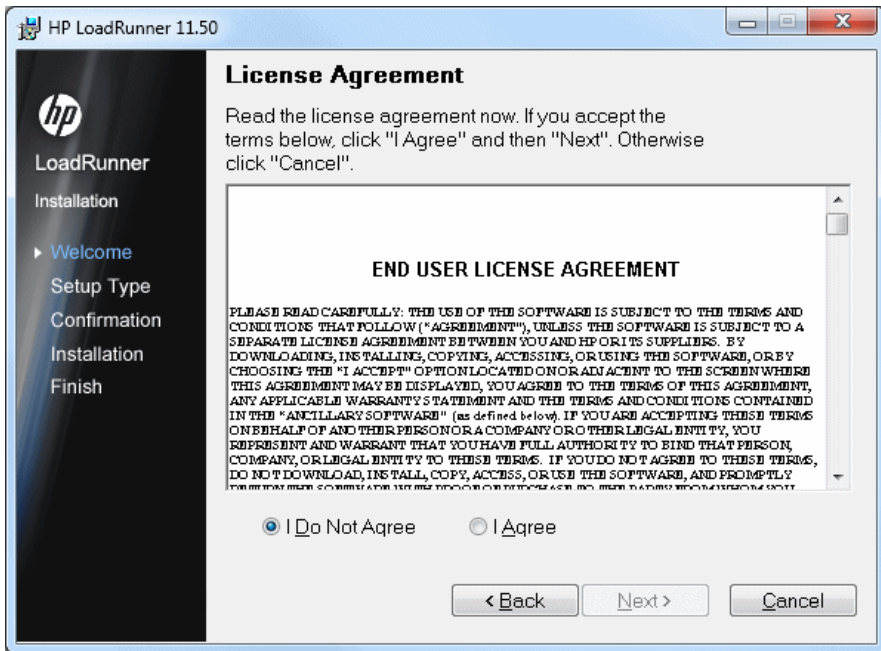
The LoadRunner Setup Wizard opens, displaying the welcome page.



Click **Next** to proceed.

## 5 Review the License agreement.

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

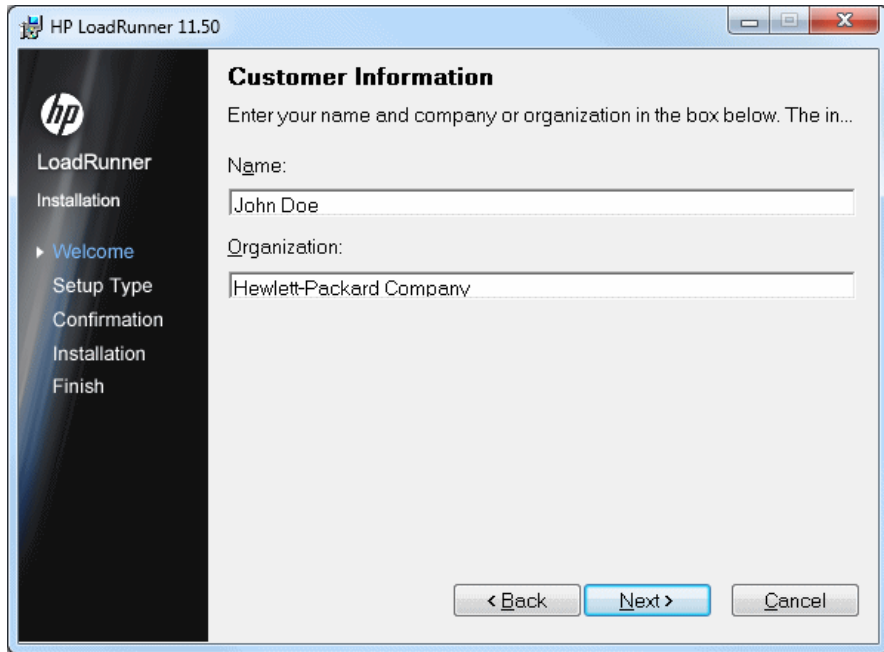


Click **Next** to proceed.



**6 Register the LoadRunner Installation on your computer.**

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

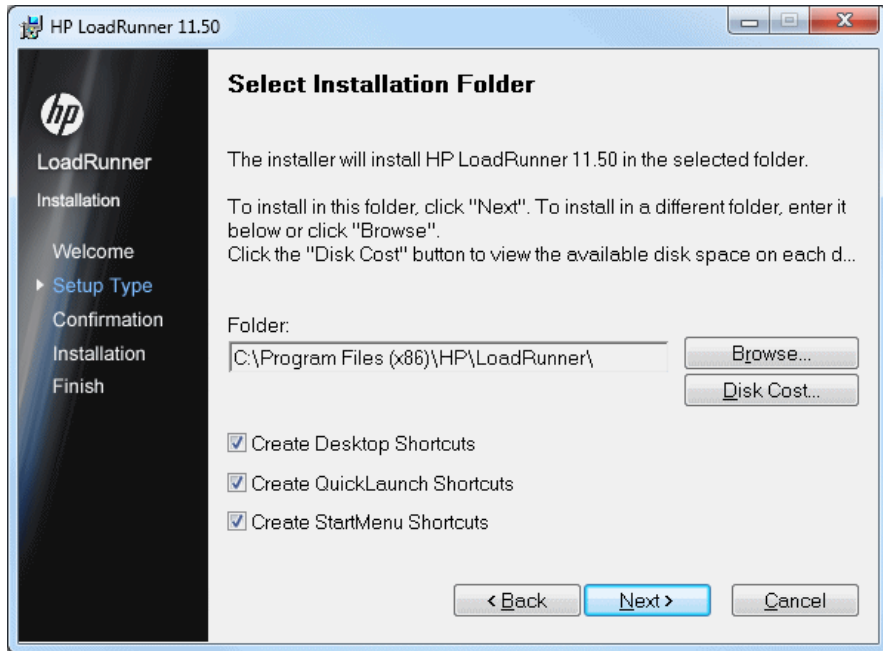


The screenshot shows the 'Customer Information' dialog box in the HP LoadRunner 11.50 installation wizard. The window title is 'HP LoadRunner 11.50'. On the left, there is a navigation pane with the HP logo and the following steps: 'LoadRunner Installation', 'Welcome' (highlighted with a blue arrow), 'Setup Type', 'Confirmation', 'Installation', and 'Finish'. The main area is titled 'Customer Information' and contains the instruction: 'Enter your name and company or organization in the box below. The in...'. There are two text input fields: 'Name:' with the text 'John Doe' and 'Organization:' with the text 'Hewlett-Packard Company'. At the bottom right, there are three buttons: '< Back', 'Next >' (highlighted in blue), and 'Cancel'.

Click **Next** to proceed.

## 7 Select an Installation folder.

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



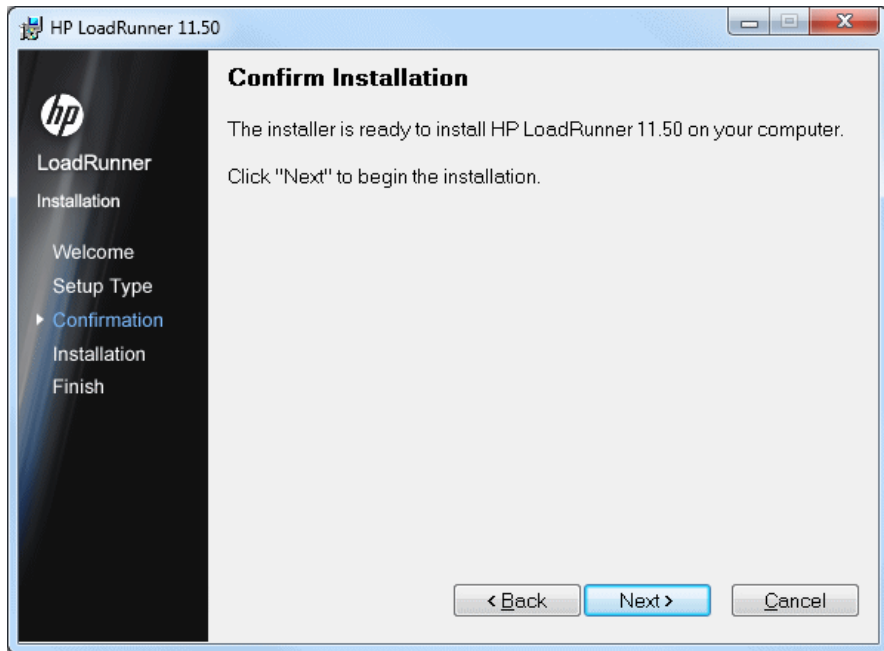
Click **Disk Cost** to check the disk space for each drive. The dialog box displays the size, available space, and required space for each disk.

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

Click **Next** to proceed.

**8 Start the installation process.**

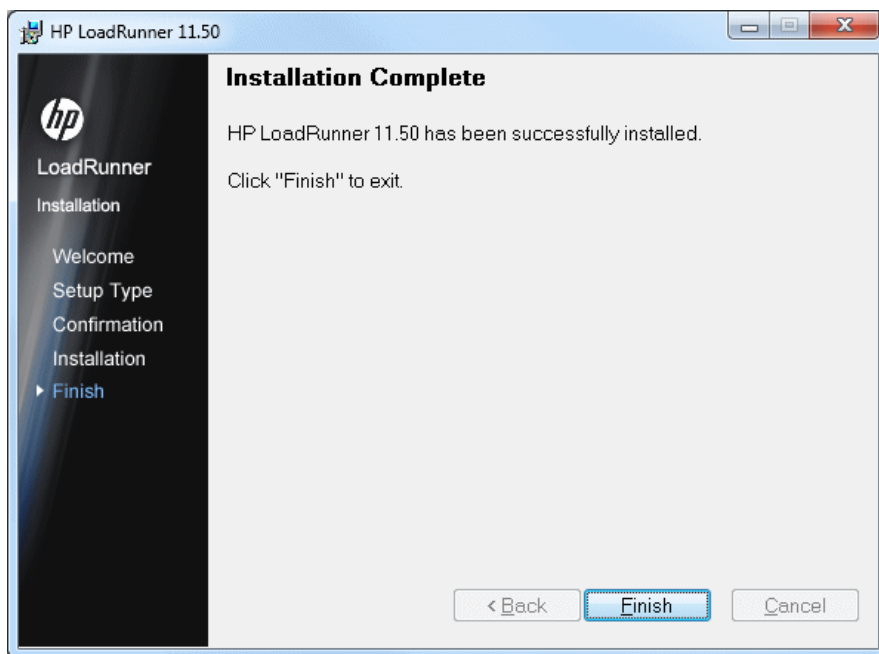
The wizard prompts you to confirm the installation.



Click **Next** to start the installation. The Installing HP LoadRunner screen opens indicating the progress of the installation.

**9 Complete the installation process.**

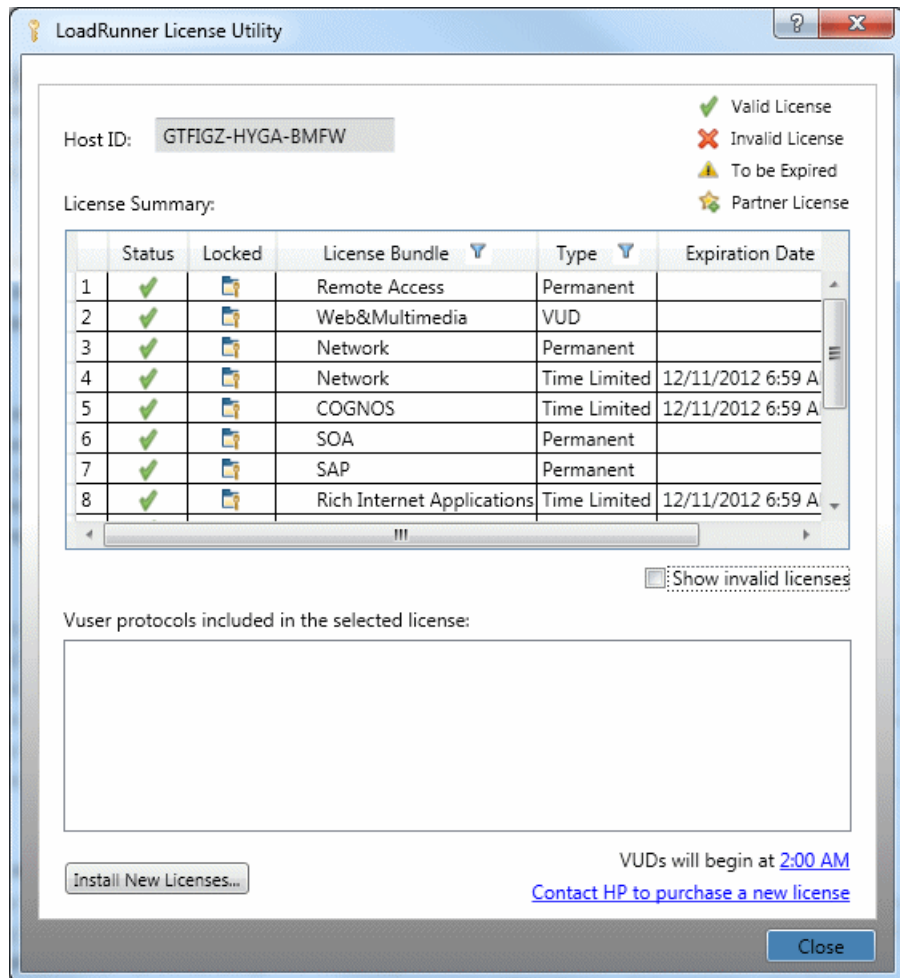
When the installation is complete, a wizard page opens, confirming successful installation.



Click **Finish** to close the LoadRunner installation program.

**10 Check your license information.**

The LoadRunner installation is now complete. The LoadRunner License Utility opens, displaying your LoadRunner license information.



During the LoadRunner installation, if LoadRunner does not detect a valid license on your computer, you are automatically granted a temporary 10-day license for 25 Users. 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 63.

Click **Close** to close the LoadRunner License Utility.

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**Notes:**

- To uninstall LoadRunner, use the Windows **Add/Remove Programs** utility. Alternatively, you can run the **setup.exe** file located in the root directory of the LoadRunner installation disk, select **LoadRunner Full Setup**, and then select the **Remove** option in the Setup Wizard.
  - To repair LoadRunner, run the **setup.exe** file located in the root directory of the LoadRunner installation disk, select **LoadRunner Full Setup**, and then select the **Repair** option in the Setup Wizard.
  - 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 on 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 40.
- 

## **LoadRunner Installation Components**

The LoadRunner full setup installation includes the following components:

- **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 Guide*.

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**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"

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- ▶ **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 HP'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 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 Guide*.
- ▶ **Online Documentation.** All LoadRunner user guides in PDF 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.
- ▶ **Vuser Generator [VuGen].** 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 LoadRunner installation disk. The following components are available:

- ▶ **Agent for Citrix Server.** Installs an optional utility on the server machine which enhances VuGen's capabilities in identifying Citrix client objects. For installation instructions, see "Installing the Citrix Server Agent" on page 35.
- ▶ **Agent for Microsoft Terminal Server.** Installs an optional utility on the RDP server. It provides enhancements to the normal RDP functionality in VuGen. For installation instructions, see "Installing the Microsoft Terminal Server Agent" on page 36.
- ▶ **Assembly Crawler for Analysis API.** Installs a command-line utility to build a .NET configuration file for a LoadRunner Analysis API application. For more information, refer to the *Analysis API Reference*.
- ▶ **HostID Generator.** Opens the Host ID Generator that displays the computer's Host ID. For details, see "Determining the Host ID" on page 34.
- ▶ **HP Diagnostics Mediator.** Installs the HP Diagnostics Mediator, the component that gathers and correlates 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 Guide*.
- ▶ **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.
- ▶ **LRTCPDump.** Gives you access to VuGen's command line utilities for creating trace files containing logs of TCP traffic over the network. For more information, refer to the *HP Virtual User Generator User Guide*.
- ▶ **License Server for Service Test.** Installs the Sentinel License Manager for use with HP Service Test. For more information, see the section about installing a Service Test license server in the *Service Test Installation Guide*, **hpst\_install.pdf**, located in the product's **help** folder.
- ▶ **Microsoft COM+ Server Monitor Probe.** Configures the server machine for COM+ monitoring. For more information on configuring the server, refer to the Application Component section in the *LoadRunner Monitor Reference*.
- ▶ **MQTester.** Installs MetaStorm's MQTester for HP LoadRunner. It allows you to test IBM's WebSphere MQ-based systems in a LoadRunner environment.
- ▶ **SAP Tools**
  - ▶ **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\SapGuiSpy** 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\VerifySAPGUI** 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 **SAP\_Tools\VerifyRFCUser** 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 **SAP\_Tools\VerifyRFCUser** directory, load the **AddMTSDestinationsFolder.reg** by double-clicking the file and then run the **VerifyRFCUser.exe** file.
- ▶ **Service Test Add-in.** Enables you to run VuGen with all of the HP Service Test capabilities. This integration requires an HP Service Test license. For more information, see the section about installing HP Service Test in the *Service Test Installation Guide*, **hpst\_install.pdf**, located in the product's **help** folder.
- ▶ **Standalone Applications.** Enables you to run standalone installations of the following applications: Analysis, Load Generator, MI Listener, Monitors Over Firewall, VTS (Virtual Table Server), and Virtual User Generator (VuGen). Run the relevant application's setup program from the **Additional Components\Standalone Applications** folder, and follow the wizard's instructions to completion.
  - ▶ For additional information about the VTS installation, see "Configuring the VTS Administration Server" on page 37.
- ▶ **Third Parties.** Includes the source code for open source packages that are incorporated into LoadRunner, and which have licences with source distribution clauses.
- ▶ **WinPcap.** Installs the WinPcap utility. WinPcap allows the user to capture network traffic into a file and analyze it afterwards. WinPcap is used in the Server Side Recording feature in the VuGen Web Services protocol. For more information about WinPcap, see <http://www.winpcap.org/>

## Determining the Host ID

LoadRunner licences may be either locked or unlocked.

- ▶ **Locked.** A locked license can be installed only on the specific computer for which the license was issued. You will need to provide the Host ID when purchasing a locked LoadRunner license.
- ▶ **Unlocked.** Indicates that the license can be installed on any computer. You will not need to provide the Host ID when purchasing an unlocked LoadRunner license.

To determine a Host ID, perform either of the following procedures on the computer for which you require the Host ID:

- 1 Click **Start > All Programs > HP Software > HP LoadRunner > License > LoadRunner License Utility**. The HP LoadRunner License Utility opens and displays the computer's Host ID.

Or

- 1 Run the setup.exe file in the root folder of the LoadRunner installation disk.
- 2 In the LoadRunner Setup window, click **Host ID**. The Host ID Generator opens.
- 3 Click **Generate New**. The Host ID is displayed.

## Installing the Citrix Server Agent

The installation file for the Agent for Citrix Server is located on the LoadRunner installation disk, under the **Additional Components\Agent for Citrix Server** folder.

Note that the agent should only be installed on your Citrix server machine—not Load Generator machines.

If you are upgrading the agent, make sure to uninstall the previous version before installing the next one (see uninstallation instructions below).

### To install the Agent for Citrix Server:

- 1 If your server requires administrator permissions to install software, log in as an administrator to the server.

- 2 If you are using a Remote Desktop connection (RDP) to install the agent onto a machine running Windows 2003, run the following command on the target machine before starting the installation:

```
Change user /install
```

- 3 Locate the installation file, **Setup.exe**, on the product installation disk in the **Additional Components\Agent for Citrix Server\Win32** or **...\Win64** folder.
- 4 Follow the installation wizard to completion.

---

**Note:** After installation the agent will only be active for LoadRunner invoked Citrix sessions—it will not be active for users who start a Citrix session without LoadRunner.

---

To disable the agent, you must uninstall it.

#### To uninstall the Agent for Citrix Server:

- 1 If your server requires administrator privileges to remove software, log in as an administrator to the server.
- 2 Open **Add/Remove Programs** in the server machine's Control Panel. Select **HP Software Agent for Citrix Server 32** or **64** and click **Change/Remove**.

### Installing the Microsoft Terminal Server Agent

The installation file for the Agent for Microsoft Terminal Server is located on the product installation disk, under the **Additional Components\Agent for Microsoft Terminal Server** folder.

Note that the agent should only be installed on your RDP server machine, not Load Generator machines.

If you are upgrading the agent, make sure to uninstall the previous version before installing the next one (see uninstallation instructions below).

### To install the Agent for Microsoft Terminal Server:

- 1 If your server requires administrator permissions to install software, log in as an administrator to the server.
- 2 If you are using a Remote Desktop connection (RDP) to install the agent onto a machine running Windows 2003, run the following command on the target machine before starting the installation:

```
Change user /install
```

- 3 Locate the installation file, **Setup.exe**, on the LoadRunner DVD in the **Additional Components\Agent for Microsoft Terminal Server** folder.
- 4 Follow the installation wizard to completion.

---

**Note:** To use the agent, you must set the recording options before recording a Vuser script. In the Start Recording dialog box, click Options. In the Advanced Code Generation node, check **Use RDP Agent**.

---

### To uninstall the Agent for Microsoft Terminal Server:

- 1 If your server requires administrator privileges to remove software, log in as an administrator to the server.
- 2 Open **Add/Remove Programs** in the server machine's Control Panel. Select **HP Software Agent for Microsoft Terminal Server** and click **Change/Remove**.

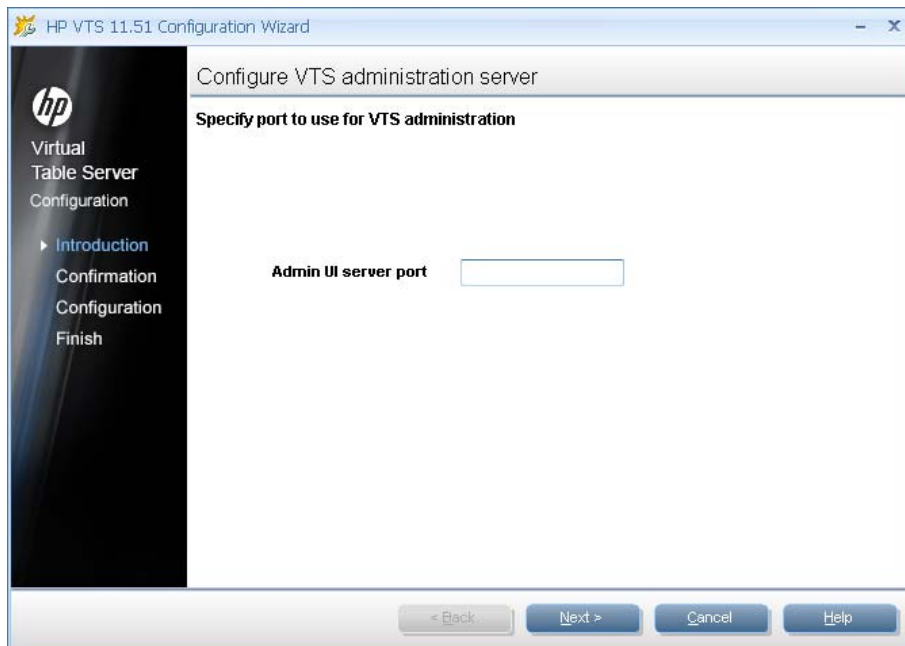
## Configuring the VTS Administration Server

During the VTS installation process, you need to specify the port that is used to access the VTS server for administrative purposes.

### To configure the VTS Administration server:

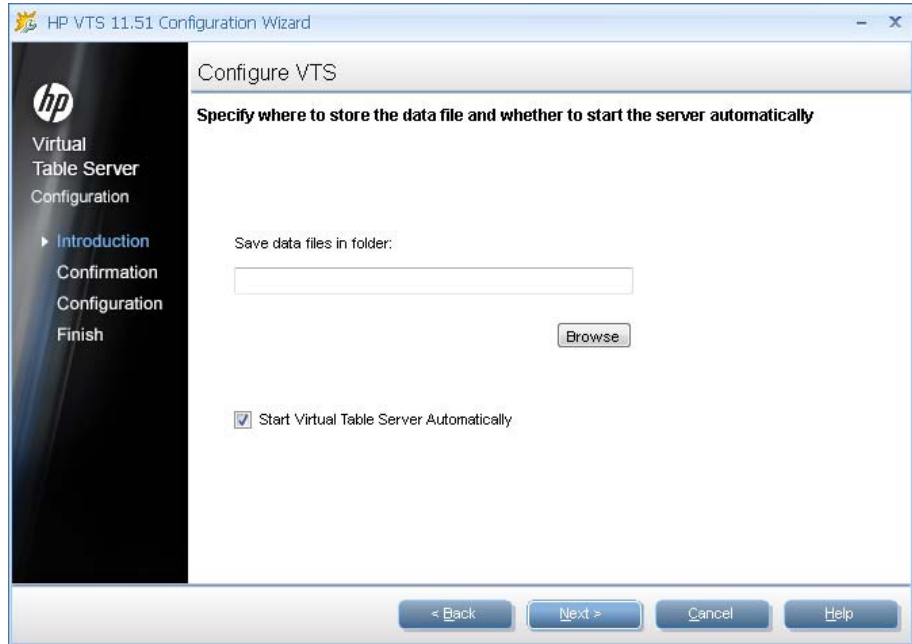
- 1 Begin the VTS installation process as described in "Installing Additional Components" on page 32.

During the VTS installation process, the Configure VTS administration server screen appears.



**2** In the **Admin UI server port** box, enter **4000**.

- 3 Click **Next** to continue with the installation. The Configure VTS screen appears.



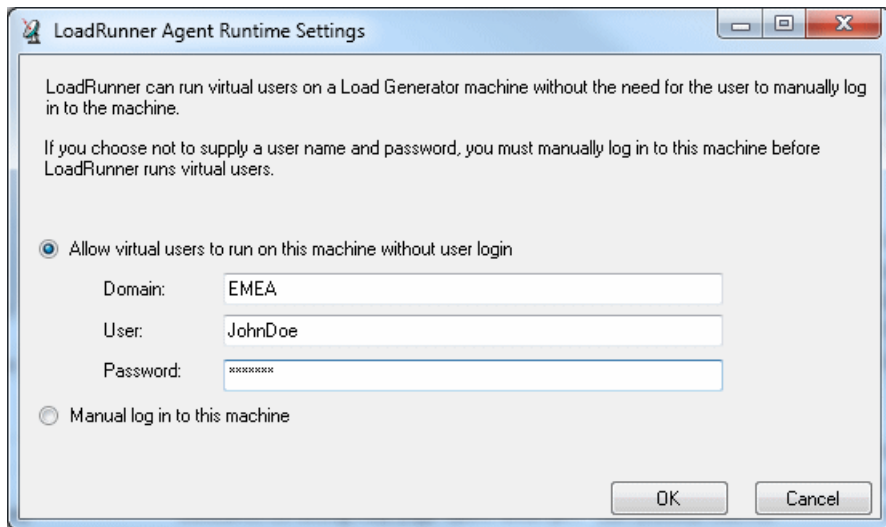
- 4 Specify where to save the VTS data file.
- 5 Make sure that the **Start Virtual Table Server Automatically** check box is selected.
- 6 Click **Next**, and then follow the wizard's instruction to complete the VTS installation procedure.

## Configuring User Login Settings

By default, you need to manually log on to a computer before LoadRunner can run Vusers on that computer. However, you can configure LoadRunner to run Vusers on a load generator machine without the need for the Vuser to manually log in to the machine.

To configure user login settings:

- 1 Select **Start > All Programs > HP Software > HP LoadRunner > Tools > 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 Vusers 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.

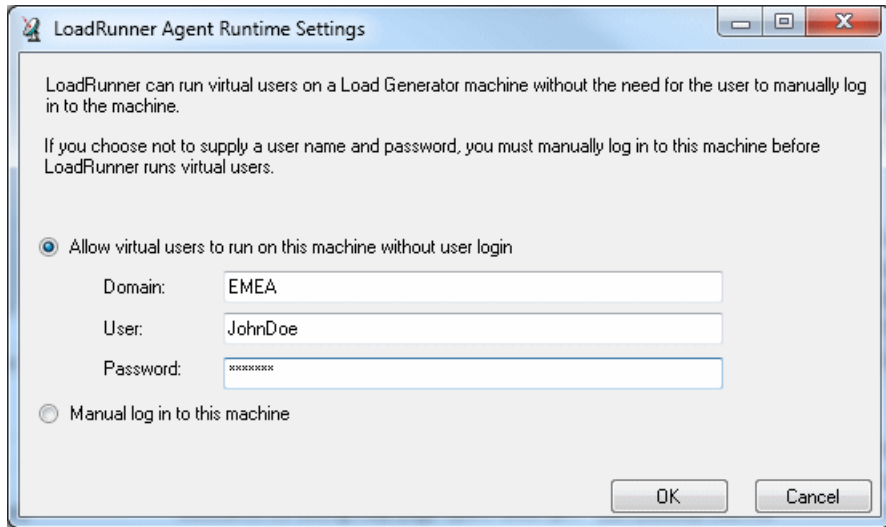
**3 Click OK.**

---

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

---

- 4 Select **Start > All Programs > HP Software > HP LoadRunner > Tools > Agent Runtime Settings Configuration**. The LoadRunner Agent Runtime Settings dialog box opens.



## 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 17. You can begin the silent installation only after all the prerequisite software is installed.
- 2 To install all of the LoadRunner components, run one of the following commands from the command line:

```
msiexec.exe /qn /i "<Installation_disk>\runner\MSI\LoadRunner_x64.msi"
```

```
msiexec.exe /qn /i "<Installation_disk>\runner\MSI\LoadRunner_x86.msi"
```

**Notes:**

- ▶ Each machine on which you are installing LoadRunner requires administration privileges.
  - ▶ LoadRunner MSI supports both 32 bit and 64 bit operating systems. Ensure that you run the appropriate MSI version for your operating system.
  - ▶ Use Standard MSI command line options to define installation properties. For example, use TARGETDIR to specify an alternate installation folder.
- 

## HP LoadRunner User Interface Pack Installation

The HP LoadRunner User Interface Pack enables you to view the LoadRunner, VuGen Standalone, and Analysis Standalone user interface in your local language. You install the User Interface Pack from the <Language> User Interface Pack CD-ROM.

- 1** Make sure that HP LoadRunner is already installed. For details, see "Performing the Installation" at the beginning of this chapter.
- 2** Insert the <Language> User Interface Pack CD into the CD-ROM drive. The **HP LoadRunner <Language> User Interface Pack Setup** window opens.

---

**Note:** If the CD-ROM drive is on a network computer, map the network drive, navigate to the root folder of the mapped network path, and double-click **setup.exe**.

---

- 3 Click the desired link (**LoadRunner**, **Vugen Standalone**, or **Analysis Standalone User Interface Pack Setup**) and follow the on-screen instructions.

The <Language> **User Interface Pack** is automatically installed in the location that was specified during the installation of the HP LoadRunner.

## Upgrading LoadRunner

Various options exist for upgrading your LoadRunner installation. The options vary depending on your installed version of LoadRunner, and the version to which you want to upgrade.

### Upgrading to LoadRunner 11.50

- If your installed version of LoadRunner is prior to version 11.00, uninstall LoadRunner and then install LoadRunner 11.50. For details, see "Performing the Installation" on page 20.
- If you have LoadRunner 11.00 installed, install LoadRunner 11.50 as described in "Performing the Installation" on page 20.

### Upgrading to LoadRunner Service Pack 11.51

You must have LoadRunner 11.50 installed before you can install LoadRunner Service Pack 11.51. To install LoadRunner Service Pack 11.51, run the LoadRunner Service Pack 11.51 installation wizard, and then follow the online instructions.

# 3

---

## Installing the HP Load Generator on Linux

You can install the HP Load Generator component on a Linux platform to run Vusers. The Linux Vusers interact with the Controller, installed on a Windows machine.

This chapter describes how to install the load generator on a Linux machine.

**This chapter includes:**

- ▶ Understanding the Installation Process on page 46
- ▶ Linux System Requirements on page 47
- ▶ Installing Using the Setup Wizard on page 48
- ▶ Using Native Package Commands on page 51
- ▶ Silent Installation on page 52
- ▶ After Installing the HP Load Generator on Linux on page 53
- ▶ Uninstalling the HP Load Generator on page 59
- ▶ Recommended Configuration on page 60

## Understanding the Installation Process

The HP Load Generator Linux installation involves the following steps:

### 1 Review system requirements

Before you install the HP Load Generator on Linux, review the system requirements as described in "Linux System Requirements" on page 47.

### 2 Install the HP Load Generator

You install HP Load Generator using the **HP Load Generator Setup wizard**. For more information, see "Installing Using the Setup Wizard" on page 48.

Advanced users can install the The HP Load Generator native package directly using **Native package commands**. For example, if you are using a remote deployment tool to install the HP Load Generator on multiple machines, you may need to use native package commands. For more information, see "Using Native Package Commands" on page 51.

### 3 Configure your environment

Before you can begin working with the load generator you need to configure your environment. This involves setting the appropriate environment variables, checking access to the load generator, and verifying the installation. See "After Installing the HP Load Generator on Linux" on page 53.

## Notes and Limitations

- The HP Load Generator installation is based on native packages per operating system. This requires you to be logged in as **root user** to run the installation.

## Linux System Requirements

This section describes the system requirements necessary for installing the HP Load Generator on a Linux machine.

<b>Memory (RAM)</b>	256 MB minimum <b>Note:</b> Memory depends on protocol type and system under test and can vary greatly.
<b>Available Hard Disk Space</b>	500 MB minimum

The following table describes the supported operating systems on which you can install a Linux Load Generator.

OS Type	OS Version	Platform
Red Hat Linux	<ul style="list-style-type: none"> <li>▶ Enterprise Linux 5.0</li> <li>▶ Enterprise Linux 6.0</li> </ul>	<ul style="list-style-type: none"> <li>▶ <b>CPU Type:</b> Intel Core, Pentium, AMD or compatible</li> <li>▶ <b>Speed:</b> 1 GHz minimum. 2 GHz or higher recommended</li> </ul>

---

**Note:** The HP Load Generator supports all X Servers.

---

## Installing Using the Setup Wizard

This section describes how to install the HP Load Generator on Linux using the setup wizard.

- 1 Ensure that you are logged in as **root user**.
- 2 **Launch the setup wizard.**

Run the following command to launch the setup wizard:

```
<LoadGenerator Linux installation disk>/Linux/installer.sh
```

The setup wizard welcome screen opens.

```
-----  
Welcome to the HP Load Generator 11.50 Setup Wizard  
-----  
This wizard will guide you through the steps required to install HP Load Generator 11.50 on the computer.  
  
WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in several civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.  
  
> To continue, select "Next"  
> To abort the setup wizard, select "Cancel"  
  
Select [ Next[n], Cancel[c] ] :
```

Select **Next** to continue.



**3 Review the License agreement.**

```

-----
LICENSE AGREEMENT
-----

Please take a moment to read the License Agreement, located in:
/media/sf_products/LT/LT-LR/linux32_release/LR_Apollo/SetupBuilder/Output
/UNIX/LG_UnixCD/Linux/sequencer/resources/EULA/EULA .

>To review the full License Agreement, select "View Agreement"
>To accept the agreement terms, select "Agree"
>To go back to the previous step, select "Back"
>To abort the setup wizard, select "Cancel"

Select: [ View Agreement[v], Agree[a], Back[b], Cancel[c] ] :

```

To view the entire license agreement, select **View Agreement**.

If the terms of the license agreement are acceptable to you, select **Agree** to continue.

**4 Select the installation directory.**

```

-----
SELECT INSTALLATION DIRECTORY
-----

The installer will install HP Load Generator 11.50 in the following directory:
/opt/HP/HP_LoadGenerator.

> To install in this directory, select "Next"
> To install in a different directory, select "Select different directory"
> To go back to the previous step, select "Back"
> To abort the setup wizard, select "Cancel"

Select [ Next[n], Select different directory[s], Back[b], Cancel[c] ] :

```

Select **Different Directory** to install the load generator in a different directory, or select **Next** to install the load generator in the **/opt/HP/HP\_LoadGenerator** directory.

## 5 Start the installation process.

The wizard prompts you to confirm the installation.

```
-----  
CONFIRMATION  
-----  
  
The HP Load Generator 11.50 features you selected for installation are:  
  
+LoadGenerator  
-LoadGenerator-11.50.000-Linux2.6.rpm  
  
Size:  
283909 KB  
  
HP Load Generator 11.50 will be installed in the following directory:  
/opt/HP/HP_LoadGenerator.  
  
> To start the HP Load Generator 11.50 installation, select "Install"  
> To go back to the previous step, select "Back"  
> To abort the setup wizard, select "Cancel"  
  
Select [ Install[i], Back[b], Cancel[c] ]:
```

Select **Install** to start the installation process.

The Installation screen opens, displaying the progress of the installation.

```
-----  
INSTALLATION  
-----  
  
LOG FILE: Native OS Install output log directory:  
"/var/log/27.02.12_10-56-05_HP_LoadGenerator_11.50.000_iHP_log.txt".  
  
Tail log to track detailed progress.  
Installing Package: LoadGenerator-11.50.000-Linux2.6.rpm started.  
....
```

## 6 Complete the installation.

When the installation is complete, the Finish screen opens.

```

-----
FINISH
-----

HP Load Generator 11.50 has been successfully installed in the /opt/HP/HP_LoadGen
erator directory

LOG FILE: Install log directory:
/var/log/27.02.12_10-56-05_HP_LoadGenerator_11.50.000_iHP_log.txt

> To complete the setup wizard, select "Finish"
> To view the output log, select "View Log"

Select [ Finish[f], View Log[v] ]:

```

- Select **View Log** to view a log of the installation process.
- Select **Finish** to complete the installation.

## 7 Configure your environment

After you install the load generator, configure your environment as described in "After Installing the HP Load Generator on Linux" on page 53.

## Using Native Package Commands

You can run the HP Load Generator installation using native package commands. The native package name for the HP Load Generator is **LoadGenerator**.

There is a separate native package for each OS platform located at: **<HP Load Generator Linux installation disk>/Linux/packages/packages\_Linux/LoadGenerator-11.50.000-Linux2.6.rpm**.

---

**Note:** This section contains general reference information about native package commands. For detailed information about the native package commands, refer to your relevant operating system documentation.

---

- 1 Run the relevant installation command described in "Native Package Commands Table" on page 52.
- 2 Run the `run_after_install.sh` script located in the `/opt/HP/HP_LoadGenerator` directory.

### Native Package Commands Table

The following table describes the relevant installation commands for Linux:

Install Command	Get Package Information Command	Uninstall Command
<code>rpm --nodeps -i --nomd5 &lt;path to rpm file&gt;</code> <b>For example:</b> <code>rpm --nodeps -i --nomd5 /dev/cdrom/Linux/packages/packages_Linux/LoadGenerator-11.50.000-Linux2.6.rpm</code>	<code>rpm -q LoadGenerator</code>	<code>rpm -e LoadGenerator</code>

### Silent Installation

To perform a silent installation of the HP Load Generator, perform the following procedure:

- 1 Run the relevant installation command as described below:

Silent Installation Command	Example
<code>rpm --nodeps -i --nomd5 &lt;path to rpm file&gt;</code>	<code>rpm --nodeps -i --nomd5 /dev/cdrom/Linux/packages/packages_Linux/LoadGenerator-11.50.000-Linux2.6.rpm</code>

- 2 Run the `run_after_install.sh` script located in the `/opt/HP/HP_LoadGenerator` directory.

## Creating Symbolic Links

This section describes how to create a symbolic link.

Assume for example that the installation directory is `/opt/HP/HP_LoadGenerator` and that you want to store the load generator content in `/usr/HP/HP_LoadGenerator`.

- 1 Create the new directory. For example:

```
mkdir -p /usr/HP/HP_LoadGenerator
```

- 2 Make sure that the directory `/opt/HP` exists. If it does not exist, create the directory as follows:

```
mkdir -p /opt/HP
```

- 3 Create a symbolic link from `/opt/HP/HP_LoadGenerator` to the other directory. For example:

```
ln -s /usr/HP/HP_LoadGenerator  
/opt/HP/HP_LoadGenerator
```

In the above example, the symbolic link called `HP_LoadGenerator` in the directory `/opt/HP` points to the directory `/usr/HP/HP_LoadGenerator`.

## After Installing the HP Load Generator on Linux

This section describes the configuration steps you need to complete before you can begin working with the HP Load Generator on Linux.

To complete the setup process after installing the load generator, you must:

- 1 **Set the appropriate environment variables.**

See "Setting Environment Variables" on page 54.

- 2 **Verify your Linux installation.**

See "Verifying the Linux Installation" on page 55.

- 3 **Check that the Controller can access the load generator.**

See "Checking Controller Connection" on page 57.

## Setting Environment Variables

To work with the load generator, your Linux startup configuration file needs to include specific environment variables. At the end of the load generator installation, the installer creates the **env.csh** script. **For C Shell users**, this script is used to set the appropriate environment variables. (See "Setting Environment Variables For C Shell Users" below).

**Bourne and Korn shell** users need to set the variables manually. (See "Setting Environment Variables For Bourne and Korn Shell Users" on page 55.)

The following environment variables need to be included:

- ▶ **M\_LROOT**. The location of the Linux Load Generator installation directory
- ▶ **PATH**. The location of the Linux Load Generator *bin* directory.
- ▶ **LD\_LIBRARY\_PATH**. The location of Linux Load Generator's dynamic libraries.

If you are running Vusers for a protocol that requires a client installation (for example, Oracle), make sure that the path for the client libraries is included in the dynamic library path environment variable (**LD\_LIBRARY\_PATH** or **SHLIB\_PATH**).

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

```
ldd application_name
```

## Setting Environment Variables For C Shell Users

At the end of the load generator installation, the installer creates the **env.csh** script. This script is used to set the appropriate environment variables.

To set the environment variables, users need to add the **env.csh** script to their **.cshrc** startup configuration file.

Add the following line in the **.cshrc** startup configuration file:

```
source <load generator installation directory>/env.csh
```

For example:

```
source /opt/HP/HP_LoadGenerator/env.csh
```

## Setting Environment Variables For Bourne and Korn Shell Users

**Bourne and Korn shell** users need to set the environment variables manually in the **.profile** startup configuration file. Use the following example to set up your environment variables:

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

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

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

# End LoadRunner setting #
```

## Verifying the Linux Installation

The installation includes a setup verification utility, **verify\_generator**, that checks the load generator setup on your Linux machine. It checks environment variables and your **.cshrc** or **.profile** file to verify that they are set up correctly.

It is strongly recommended that you run **verify\_generator** after an HP Load Generator installation, before attempting to invoke the application.

The **verify\_generator** utility checks the following items:

- There are at least 128 file descriptors
- The **.rhost** permissions have been defined properly: **-rw-r--r--**
- The host can be contacted by using **rsh** to the host. If not, it checks for the host name in **.rhosts**
- **M\_LROOT** is defined
- **.cshrc** or **.profile** defines the correct **M\_LROOT**

- ▶ `.cshrc` or `.profile` exists in the home directory
- ▶ The current user is the owner of the `.cshrc` or `.profile`
- ▶ A Linux Load Generator 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

### Running `verify_generator`

Before you run the `verify_generator` utility, make sure that you have set the `DISPLAY` environment variable on your machine.

- 1 From the `<load generator installation directory>/bin`, run the following command:

```
verify_generator
```

for example:

```
/opt/HP/HP_LoadGenerator/bin/verify_generator
```

If you want to receive detailed information about the checks you can use the `-v` option, as follows:

```
verify_generator -v
```

- 2 View the results.
  - ▶ If the settings are correct, `verify_generator` returns **OK**.
  - ▶ If they are incorrect, `verify_generator` returns **Failed** and a suggestion on how to correct the setup.



## Checking Controller Connection

By default, the Controller connects remotely to the load generator using **rsh** (remote shell). You need to make sure that the load generator can be remotely accessed by the Controller.

- 1 On the load generator machine, go to the **.rhosts** file, located in the user home directory.
- 2 In the **.rhosts** file, verify that the Controller is included in the list of machines. If it is not listed, add it to the list.

If the Controller still cannot connect to the load generator, contact your system administrator.

---

**Note:** You can configure the Controller to connect to the load generator not using **rsh**. In this case, you need to activate the agent daemon on the load generator. For more information, see the "Connecting to a Linux Load Generator Without Using RSH" below.

---

## Connecting to a Linux Load Generator Without Using RSH

This section describes how to connect to a Linux load generator without using RSH.

- 1 On the Linux load generator, run the agent daemon by running the following command from **<load generator installation directory>/bin**:

```
m_daemon_setup -install
```

This runs a daemon called **m\_agent\_daemon**, and if successful you will receive a message: **m\_agent\_daemon <process ID>**.

The agent will now keep running, even if the user is logged off. It will only stop running using the command explained in step 9 below, or by rebooting the machine.



- 6 Click **More**.
- 7 Click the **UNIX Environment** tab, and select the **Don't use RSH** option.
- 8 Connect as usual.
- 9 To stop the agent daemon, run the following command from the <LR\_root>/bin directory:

```
m_daemon_setup -remove
```

This stops the m\_agent\_daemon, and if successful, you will receive a message: m\_agent\_daemon is down.

## Uninstalling the HP Load Generator

You can use the Maintenance wizard to uninstall the HP Load Generator.

---

**Note:** You can also uninstall the HP Load Generator using the commands as described in "Using Native Package Commands" on page 51.

---

- 1 Make sure that you are logged in as **root user**.
- 2 Make sure that the load generator is not connected to any Controller machine.
- 3 Make sure that the m\_agent\_daemon process is not running on your machine.
- 4 Launch the maintenance wizard by running the following command:

```
/var/opt/HP/iHP/HP_LoadGenerator/11.50.000/installer.sh
```

- 5 Follow the remaining instructions in the wizard to uninstall the HP Load Generator.

## Recommended Configuration

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

---

**Note:** Most operating systems using the Linux Load Generator have sufficient default file descriptors, process entries, and swap space, and rarely require reconfiguration.

---

This section includes recommendations for improving load generator performance. This section includes:

- ▶ "Increasing Process Entries" on page 60
- ▶ "Increasing File Descriptors" on page 60
- ▶ "Increasing Swap Space" on page 62

### 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.

#### Linux

This section describes how 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

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

- ▶ 14 file descriptors for the launch service

- 20 file descriptors for the agent
- 30 file descriptors for each Vuser driver. By default, there is a driver for every 50 Vusers.
- File descriptors for the running Vusers. Each Vuser requires 2 descriptors.

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

Descriptors	Purpose of the descriptors
14	for the launcher
20	for the 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.

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
```

## 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.

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

```
hard nfile 8192
```

- 2 Add the following line to the `/etc/sysctl.conf` 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.

# 4

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## Viewing and Modifying a License

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

To run Vusers from the LoadRunner Controller, you need the appropriate LoadRunner licenses. These licenses must be installed on the computer on which the LoadRunner Controller is installed. You use the LoadRunner License Utility to manage your LoadRunner licenses. The LoadRunner License Utility enables you to:

- ▶ View the details of licenses that are currently installed.
- ▶ Install additional licenses.

This chapter describes how to use the HP LoadRunner License Utility to view, enter, and modify license information.

**This chapter includes:**

- ▶ Installing a New License on page 64
- ▶ Viewing License Information on page 66
- ▶ Troubleshooting Licenses on page 70

## Installing a New License

After you receive your license information from your HP representative, you can use the HP LoadRunner License Utility to enter the license information.

Using the LoadRunner License Utility, you can install a new license by using either a license file or a license key.

- ▶ **License file.** When you purchase a new license, HP may send you an email with an attached license file. The license file contains the license keys for one or more licenses. When you use the license file to install the new licenses, the LoadRunner License Utility reads the license file and extracts all the license keys that are included in the license file. You can then select which of the available licenses to install. You may choose to use a license file to install LoadRunner licenses because the license file enables you to install multiple licenses simultaneously.
- ▶ **License key.** Unlike a license file, a license key enables you to install just a single license at a time. You may receive the license key directly from HP, or the license key may be included in a license file that you receive from HP.

**To install a new LoadRunner license:**

- 1** click **Start > All Programs > HP Software > HP LoadRunner > License > LoadRunner License Utility**. The HP LoadRunner License Utility opens.
- 2** In the LoadRunner License Utility, click **Install New Licenses**. The LoadRunner License Utility - New License dialog box opens.

**To install using a license file**

- 3** Click the **Browse** button to the right of **License file**, and locate the license file that was sent to you by HP.
- 4** Click **View License File Content** to display details of the licenses that are included in the license file.
- 5** In the list of licenses included in the license file, select the licenses to install.

**To install using a license key**

- 6** Click **Install a license using a license key**.
- 7** Enter the license key that you received from HP.



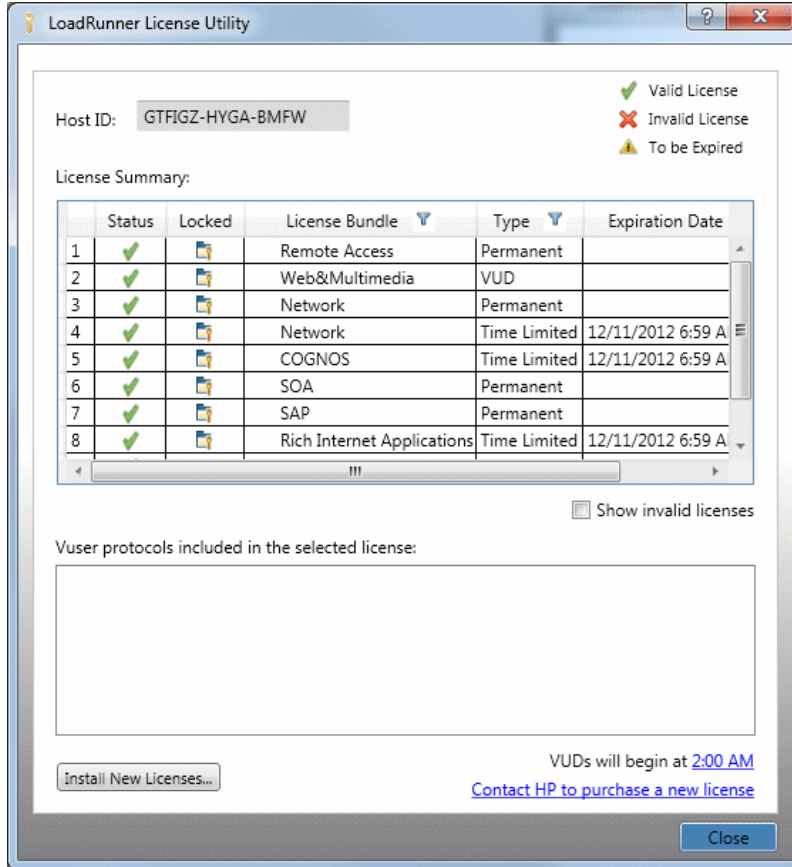
**To complete the installation**

- 8** Click **Install**. The selected licenses are installed.
- 9** Click **Close**. In the License Summary table, make sure that the new licenses appear in the list of installed licenses.

## Viewing License Information

You can view your license information from the HP LoadRunner License Utility.

To view your license information, click **Start > All Programs > HP Software > HP LoadRunner > License > LoadRunner License Utility**. The HP LoadRunner License Utility opens.



The HP LoadRunner License Utility displays the following information:

- **Host ID.** Identifies the computer on which the Controller is installed. You may need to provide the Host ID when purchasing new LoadRunner licenses. To obtain new LoadRunner licenses, click the Contact HP to purchase a new license link at the bottom of the LoadRunner License Utility.
- **License Summary.** Displays a list of the LoadRunner licenses that are installed on the Controller computer. Click on any license in the table to display additional details about the license. The Vuser protocols included in the selected license box displays a list of the Vuser protocols that are included in the selected license.
- **Status.** Indicates the status of the license.
  - **Valid.** Indicates that the license is current and functional.
  - **Invalid.** Indicates that the license is no longer valid. An **Evaluation** license or an **Instant on** license becomes invalid if a **Time limited**, **Permanent**, or **VUD** license is installed for the same Vuser bundle. A **VUD** license becomes invalid when the remaining capacity is zero. By default, the **License Summary** table does not show invalid licenses. Select the **Include invalid licenses** check box to show invalid licenses. Note that a license may become temporarily invalid if the LoadRunner License Utility detects that the system clock has been tampered with. To restore the affected licenses, reset the system clock to the current time.
  - **To be Expired.** Indicates that the license will expire within 30 days.
- **Locked.**
  - **Locked.** Indicates that the license can be installed only on the computer on which it is currently installed – not on any other computer.
  - **Unlocked.** Indicates that the license can be installed on any computer.

- ▶ **License Bundle.** Indicates the name of the Vuser protocol bundle to which the license applies. The license enables the Controller to run Vusers of any protocol that is included in the protocol bundle. To display a list of the Vuser protocols that are included in a bundle, click the license in the License Summary table. A list of the associated Vuser protocols is displayed at the bottom of the LoadRunner License Utility.

Note that a **Partner License** icon that appears to the left of a license bundle indicates that the license is for a LoadRunner partner, and not for standard LoadRunner Vuser protocols. Partner licenses enable third-party applications to be controlled by the LoadRunner Controller. Partner licenses operate the same as standard LoadRunner licenses.

- ▶ **Type.** Indicates the type of license:
  - ▶ **Instant On** licenses are installed when LoadRunner is first installed. Note that the expiration date of an **Instant On** license is calculated based on the date on which LoadRunner is first installed. You cannot extend the **Expiration Date** of an **Instant On** license by uninstalling and then reinstalling LoadRunner.
  - ▶ **Evaluation** licenses are supplied to enable potential customers to evaluate LoadRunner functionality.
  - ▶ **Time limited** licenses are valid for a limited period only. Time limited licenses are typically issued for 60 or 365 days.
  - ▶ **Permanent** licenses do not expire - there is no time limit to the validity of these licenses.
  - ▶ **VUD** licenses are issued with a limited capacity. The capacity is defined by the measurement Vuser-days or VUDs. For example, the capacity of a VUD license may be 1000 VUDs. Each day that the Controller is used to run Vusers, the maximum number of Vusers that ran simultaneously on that day is deducted from the remaining license capacity. If a maximum of 200 Vusers ran on day 1, then 800 VUDs will remain in the license.

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

- ▶ **Expiration Date.** Indicates the date and time when **Time limited**, **Instant on**, and **Evaluation** licenses expire.
- ▶ **Capacity.** Indicates the capacity of the selected license:
  - ▶ For **Instant on**, **Evaluation**, **Time Limited**, and **Permanent** licenses, **Capacity** indicates the maximum number of Vusers [of the type specified by the license bundle] that can be run simultaneously from the LoadRunner Controller.
  - ▶ For **VUD** licenses, **Capacity** indicates the number of VUDs that remain in the license.
- ▶ **Show invalid licenses.** Select this check box to show invalid licenses in the list of LoadRunner licenses that are installed.
- ▶ **Vuser protocols included in the selected license.** Displays the Vuser protocols that are included in the selected license.
- ▶ **Install New Licenses.** Opens the New License dialog box which enables you to install new LoadRunner licenses.

## Generating a Host ID

LoadRunner requires the appropriate licenses to run Vusers from the Controller. The licenses may be either locked or unlocked.

- ▶ **Locked.** Indicates that the license can be installed only on the computer on which it is currently installed – not on any other computer.
- ▶ **Unlocked.** Indicates that the license can be installed on any computer.

For details on how to determine the Host ID for your computer, see Determining the Host ID on page 34.

## Troubleshooting Licenses

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

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. The license key must include the required spaces. The license key is case sensitive.
- ▶ 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** folder (the folder where Windows is installed), as described below.

### 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**.

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