# HP LoadRunner

Software Version: 12.53

## Installation Guide

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# Contents

# Welcome to LoadRunner

Welcome to the HP LoadRunner Installation Guide. 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 LoadRunner.

# LoadRunner Help Center

For context sensitive help within the LoadRunner product, click F1 within a dialog box or use the Help menu.

You can access the Help Center on the Web (http://lrhelp.saas.hpe.com/en/12.53/help/), or use the locally installed Help Center.To switch between online and local modes, select **Help > Help Center Options > Open Online** or **Open Locally**.

> **Note:**
>
> - To view the Help Center in Internet Explorer or within VuGen, you need to enable Javascript (Active scripting) in your browser settings (**Tools > Options > Security > Internet > Custom Level**).
> - If the online Help Center is unavailable at the start of a LoadRunner application session, the **Open Online** option may be disabled during the whole session with that application.

# Accessing PDF Files

To access LoadRunner Help in PDF format:

- In Windows operating systems prior to Windows 8: After installing LoadRunner, click **Start > All Programs > HP Software > HP LoadRunner > Documentation** and select the relevant document.
- In icon-based desktops such as Windows 8, search for **Guide** and select the appropriate user guide.

# Useful Links

The following online resources provide more information for LoadRunner users:

| Resource | URL |
|---|---|
| **HPE Software Web site** | http://www.hpe.com/go/software |
| **HPE Software Support** | https://softwaresupport.hpe.com |
| **Knowledge Base and Manuals Library** | https://softwaresupport.hpe.com/group/softwaresupport/ |

| Resource | URL |
|---|---|
| **LoadRunner Community Forums** | http://www.hpe.com/forum/lrpc |
| **LoadRunner Blog** | http://www.hpe.com/blog/loadrunner |
| **HPE Live Network (HPLN)** | https://hpln.hpe.com/group/performance-center-and-loadrunner |
| **LoadRunner Integrations and Solutions** | https://softwaresupport.hpe.com/group/softwaresupport/search-result/-/facetsearch/document/KM01702710 |
| **LoadRunner on Twitter** | https://twitter.com/hploadrunner |
| **LoadRunner on LinkedIn** | https://www.linkedin.com/groups/1879289 |
| **LoadRunner on Facebook** | https://www.facebook.com/groups/HPLoadRunner/ |

# LoadRunner Components

The LoadRunner full installation includes the following components:

- **Vuser Generator [VuGen].** LoadRunner's tool for creating virtual user (Vuser) scripts, primarily through recording. Vuser scripts emulate users without a graphical user interface by using direct function calls.
- **Controller.** Controls the execution of scenarios and Vusers. Includes the online monitors which monitor and display information about the test execution. The Controller must be installed on the computer used to control the Vusers.
- **Analysis.** Graphs and reports for analyzing the load test.
- **Load Generator.** Ccomponent for running Vusers (including Windows-based GUI Vusers) to generate load.
- **MI Listener Component.** Component for the MI Listener machine used in running Vusers and monitoring over the firewall. For more information, refer to the "Working with Firewalls in LoadRunner" in the LoadRunner help.
- **Monitors over Firewall.** Component on the agent machine for monitoring over the firewall. For more information, refer to "Working with Firewalls in LoadRunner" in the LoadRunner help.
- **TruClient.** Component for recording and developing test scripts for Web-based applications. For more information, see the TruClient Help Center (select the relevant version).
- **Samples.** The LoadRunner sample flight application and Web server.

# Help Improve VuGen

You can now help us improve the quality, reliability, and performance of VuGen, by participating in the VuGen improvement program. When you join the program, VuGen collects anonymous information about your software and hardware configuration, and about how you use VuGen.

VuGen does not collect any personally identifiable information, or any information about your company environment or the code of your scripts.

You can join the program by selecting the **Participate in VuGen improvement program** check box included in the initial LoadRunner or VuGen Setup window, displayed at the beginning of installation.

You can also join or exit the improvement program from within VuGen. Select **Tools > Options > General > Usage Data Collector**.

# Chapter 1: System Requirements

This chapter includes:



# LoadRunner System Requirements

For the list of system requirements necessary for running LoadRunner on a Windows system, or for running the Load Generator on a Windows or Linux system, refer to:

- the Readme, available from the LoadRunner installation menu page, or from the LoadRunner Help Center (http://lrhelp.saas.hpe.com/en/12.53/)
- the system requirements on HPLN (HP Live Network): https://hpln.hpe.com/group/performance-center-and-loadrunner.

**Note:**

- **HP Diagnostics:** For system requirements, refer to the HP Diagnostics System Requirements at https://softwaresupport.hpe.com/km/KM01715961.
- **Virtual Environments:** The architectures provided by virtualization vendors are rapidly evolving. LoadRunner is expected to function as designed in these changing environments, as long as the third-party vendor guarantees full compatibility of the virtualized environment with the LoadRunner-approved hardware requirements. If you follow LoadRunner system requirements and support matrix to create the virtual machine, LoadRunner will work correctly.
  Working on top of a virtual machine may require access to the virtualization server hardware/monitoring environment, to ensure the virtualization server is not saturated; otherwise, this might obscure the virtual machines measurements and lead to false results.

# Prerequisite Software for Installation on Windows

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. If you continue with the installation, all missing prerequisites will be installed.

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 4.5.1
- Microsoft Core XML Services (MSXML) 6.0

- Microsoft Visual C++ 2010 Redistributable Package - x86 only
- Microsoft Visual C++ 2012 Redistributable Package - x86 and x64
- Microsoft Visual C++ 2013 Redistributable Package - x86 and x64
- Microsoft Visual C++ 2015 Redistributable Package - x86 and x64
- Microsoft Data Access Components (MDAC) 2.8 SP1 (or later)

In addition, before you install any of the LoadRunner components, either make sure that the full set of Windows updates has been installed, or manually install the Windows updates listed in the table below:

**Note:** Before you install any of the Windows updates, disable UAC (User Account Control) and restart the computer. For details on how to disable UAC, refer to your Microsoft Windows documentation.

| Windows Version | Required Updates |
|---|---|
| • Windows 7<br>• Windows 2008 R2 | • SP1<br>• Update for Universal C Runtime in Windows<br>(Also known as UCRT, also known as KB2999226.<br>See https://support.microsoft.com/en-us/kb/2999226) |
| • Windows 8.1<br>• Windows 2012 R2 | • March 2014 servicing stack update for Windows 8.1 and Windows Server 2012 R2<br>(See: https://support.microsoft.com/en-us/kb/2919442.<br>Includes the KB2919442 update.)<br>• Windows 8.1, and Windows Server 2012 R2 update: April 2014<br>(See https://support.microsoft.com/en-us/kb/2919355.<br>Includes the following updates: KB2932046, KB2937592, KB2938439, KB2934018, KB2959977, KB2919355)<br>• Update for Universal C Runtime in Windows<br>(Also known as UCRT, also known as KB2999226.<br>See https://support.microsoft.com/en-us/kb/2999226) |
| • Windows 10 | • No updates required |

> **Limitation:** If you are installing a standalone load generator on a Windows 8.1 or Windows 2012 (R2) machine, and you intend to run Web Services Vusers, you need to have the .NET 3.5 turned on and WSE 2.0 SP3 and WSE 3.0 installed. Perform one of the following actions (these may require administrator privileges):
>
> • **Before Installation:** Turn on the .NET 3.5 Windows feature before installing LoadRunner. (See MSDN for details.) The WSE components will be installed automatically during the installation.

- **During Installation:** Accept the setup program's suggestion to install .NET 3.5. The WSE components will be installed automatically during the installation.
- **After Installation:** First, turn on the .NET 3.5 Windows feature. (See MSDN for details.) Next, install the WSE components from the LoadRunner DVD folders, **lrunner\Common\wse20sp3** and **lrunner\Common\wse30**) or download them from the Internet.

# Chapter 2: Installing LoadRunner on Windows

This chapter describes how to install either the full version of LoadRunner or a LoadRunner component, on a Windows platform.

This chapter includes:



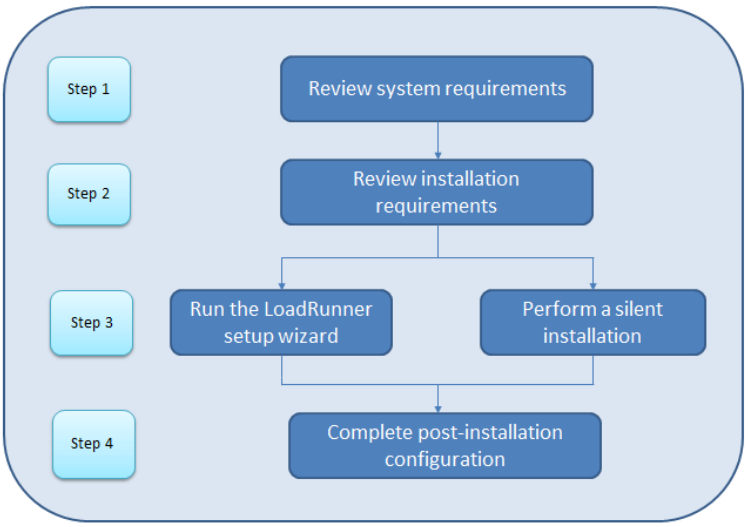
# Installation Workflow

Your LoadRunner installation DVD includes a setup program that guides you through the process of installing LoadRunner's components.

The LoadRunner installation installs a full LoadRunner configuration, which includes the Controller, the Virtual User Generator (VuGen), Analysis, and the Load Generator. For details on the LoadRunner components, see "LoadRunner Components" on page 7.

The final stage of the installation includes the optional installation of HPE Network Virtualization. Installing Network Virtualization enables you to include virtual locations as part of your load testing, and to use the NV Analytics Report.

Installing LoadRunner on a Windows system involves the steps shown below:



1. **Review system requirements**

   Before you install LoadRunner, make sure that your system meets the hardware and software requirements. For details, see "LoadRunner System Requirements" on page 9.

   > **Note:**
   >
   > Prerequisite software: 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 installs it. For details, see "Prerequisite Software for Installation on Windows" on page 9.

2. **Review installation requirements**

   Before you begin the installation, make sure you meet the following installation requirements:

   - You must have full local administrative rights on the designated machine.
   - Installation must be performed at the destination machine. LoadRunner does not support installation via terminal service.
   - For the full list of components that can be installed on the same physical machine at the same time, see the Product Availability Matrix, available from the Software Support site.

   > **Note:** It is recommended that you close all anti-virus applications, such as McAfee or Aladdin's eSafe, before installing LoadRunner.

3. **Perform the installation**

   a. If you were working with a previous version of LoadRunner, review the upgrade instructions. For details, see "Upgrade to LoadRunner 12.53" below.

   b. Run the setup wizard to install the full version of LoadRunner, LoadRunner standalone components, or additional components on a Windows system. For details, see "Install LoadRunner on Windows" on the next page.

      To perform a silent installation, see "Install LoadRunner Silently" on page 17.

   c. After you complete the LoadRunner installation, you can install a localized version to view the LoadRunner, VuGen Standalone, and Analysis Standalone user interface in your local language. For details, see "Install a LoadRunner Language Pack" on page 22.

4. **Complete post-installation configuration**

   - Configure LoadRunner to run Vusers on a load generator machine, without the need to log on manually. For details, see "Configure User Login Settings" on page 21.
   - Manage LoadRunner licenses. For details, see "Manage Licenses" on page 41.

# Upgrade to LoadRunner 12.53

The upgrade process varies depending on your installed version of LoadRunner.

### Upgrading from LoadRunner 11.00 or later

Install LoadRunner 12.53 as described in "Install LoadRunner on Windows" below. The installation process detects the older version, and gives you the option to upgrade or exit the installation.

> **Note:** If you used custom certificates in your previous installation of LoadRunner, install them again when prompted for certificates during setup. Otherwise, the setup program will overwrite them using the defaults.

### Upgrading from a LoadRunner version earlier than 11.00

1. Uninstall LoadRunner.

   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 DVD, select **LoadRunner Full Setup**, and then select the **Remove** option in the setup wizard.
2. Install LoadRunner 12.53.

   For details, see "Install LoadRunner on Windows" below.

# Install LoadRunner on Windows

This section describes how to install LoadRunner on Windows using the setup wizard.

For details on how to perform a silent installation, see "Install LoadRunner Silently" on page 17.

> **Caution:** Before you install LoadRunner:
>
> - Review the pre-installation information, including the system requirements and prerequisite software, described in "System Requirements" on page 9.
> - Make sure you have full, local administrative rights on the designated machine.
> - Make sure the Window Update process is not running.

**To install LoadRunner or an additional component:**

1. Perform the following on the installation machine:
   - Uninstall any previous Shunra or Network Virtualization version.
   - Disable UAC (User Account Control) - for details, refer to your Microsoft Windows documentation.

   Then reboot the machine. (Installation may fail if this is not done.)
2. To prevent DEP (Data Execution Prevention) from interfering with the installation, enable it for essential Windows programs and services only.

   For details on how to change DEP settings, refer to your Microsoft Windows documentation.
3. Run the **setup.exe** file in the root folder of the LoadRunner installation DVD.

   The LoadRunner installation program begins and displays the installation options.

4. Select the required installation option.

> **Note:** If LoadRunner 11.00 or later is installed on your machine, the installation process detects the older version, and gives you the option to upgrade or exit the installation.
>
> If a version earlier than LoadRunner 11.00 is installed on your machine, you must first uninstall. For details, see "Upgrade to LoadRunner 12.53" on page 13.

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

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

  For details on the components that are included in the full installation, see "LoadRunner Components" on page 7.
- **VuGen.** Installs a standalone version of VuGen (includes TruClient).
- **Analysis.** Installs a standalone version of LoadRunner Analysis.
- **Load Generator.** Installs the components needed for running Vusers 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 “Working with Firewalls in LoadRunner” chapter in the *HP LoadRunner 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 “Working with Firewalls in LoadRunner” chapter in the *HP LoadRunner User Guide*.
- **TruClient.** Installs the standalone TruClient application for recording and developing test scripts for Web-based applications.

> **Note:** If you install the TruClient standalone on a machine, you cannot install any of the other LoadRunner components, except for the standalone Analysis.
>
> To use TruClient on a LoadRunner machine, install the LoadRunner full setup, which includes the TruClient component.

- **Language Packs.** Enables you to install localized versions of LoadRunner. For details, see "Install a LoadRunner Language Pack" on page 22.

> **Note:** This option is available on non-English operating systems only.

- **Additional Components.** Opens the Additional Components folder located in the root folder of the LoadRunner installation DVD. For details of the additional components that you can install, see the **Advanced Topics > Additional Components** section in the *LoadRunner* or *Virtual User*

*Generator* user guides.

> **Note:** During the installation of Load Generator standalone, MI Listener, or Monitors over Firewall components, the setup prompts you to select whether you want the installed agent to run in LoadRunner mode or Performance Center mode.

| Performance Center mode | LoadRunner mode |
|---|---|
| The agent runs as a service under a special account named **IUSR_METRO**. | The agent runs as a regular process. |
| As a service, the agent is launched automatically when the operating system starts. | You must login to the computer before the process can start. |

> **Tip:** If you are installing Load Generator standalone for use with Business Process Monitoring (BPM), select LoadRunner mode unless you have a specific requirement to run the agent as a service.

5. If necessary, install prerequisite software.

   Specific software, for example, Microsoft Visual C++, 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.

   > **Note:** For the full list of prerequisite software, see "Prerequisite Software for Installation on Windows" on page 9.

6. Perform the LoadRunner installation.

   The LoadRunner Setup Wizard opens, displaying the welcome page.

   Follow the instructions in the wizard to complete the installation. While installing, consider the following:

   - The installation path for LoadRunner or LoadRunner components cannot contain non-English characters.
   - During installation, you can select the **Start LoadRunner Agent after installation** option, which starts the LoadRunner Agent on the load generator immediately after installation. The Agent enables communication between the load generator and the Controller. For more details on the LoadRunner Agent, see the *HP LoadRunner User Guide*.
   - During installation of LoadRunner Full Setup, Load Generator, Monitor over Firewall, and MI Listener, you can optionally install CA and SSL certificates for LoadRunner by selecting the

**Specify a certificate that will be used by the LoadRunner Agent** option. These certificates are used for authentication and secure communication respectively. Both certificates should be in *.cer (X.509) format.

- For a CA certificate: You can enter the path to an existing certificate, or leave blank to skip the step. If you want to install the CA certificate, it should be generated in advance.
- For an SSL certificate: You can select it from an existing certificate file. Alternatively, it can be generated automatically if you provide the CA certificate containing the private key.

For details on generating a CA certificate, see “How to Create and Use Digital Certificates” in the *HP LoadRunner User Guide*.

For more information on working with certificates in LoadRunner, see the "Authentication Settings" documentation in the *HP LoadRunner User Guide*.

7. After the LoadRunner installation is complete, you can choose to install HP Network Virtualization (NV). Select Typical mode for an automatic installation and Custom mode to select which HP NV components to install. Typical mode includes automatic installation of the NV Analytics Report component.

**Note:**

- To repair LoadRunner, run the setup.exe file located in the root directory of the LoadRunner installation DVD, select **LoadRunner Full Setup**, and then select the **Repair** option in the setup wizard.
- 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 "Configure User Login Settings" on page 21.
- For a list of the components that were registered during setup, such as **DLL** and **OCX** files, refer to the **RegisteredComponents_HP LoadRunner.txt** file in the build_info folder of the installation.

# Install LoadRunner Silently

A *silent installation* is an installation that is performed without the user interface, and without the need for user interaction. You use the command line to run the setup files. For details, see "Installation Command line Options" on page 19.

**Caution:** Before you install LoadRunner, review the pre-installation information, including the system requirements and prerequisite software, described in "System Requirements" on page 9.

**To perform a silent installation of LoadRunner:**

Run one of the following commands from the command line:

- To install all of the LoadRunner components including the prerequisite software in a single command:

```
<Installation_disk>\lrunner\<your_language_folder>\setup.exe /s
```

- To first install all of the prerequisites, and then LoadRunner, run the following commands:

```
<Installation_disk>\lrunner\<language_folder>\setup.exe /InstallOnlyPrerequisite
/s
```

```
msiexec.exe /qn /i "<Installation_disk>\lrunner\MSI\LoadRunner_<x64_or_x86>.msi"
```

- By default, HP Network Virtualization (NV) is installed during the LoadRunner installation. To facilitate this installation add the following to the installation command:

```
REBOOT_IF_NEEDED=1
```

- To prevent the installation program from installing NV, add the following to the installation command:

```
INSTALL_NV=0
```

- To install a LoadRunner standalone application:

```
<Installation_disk>\Standalone Applications\Setup<component_name>.exe /s /a /s
```

- To install a LoadRunner additional component:

```
<Installation_disk>\Additional Components\<setup_file_path> /s /a /s
```

**Note:**

- For the full list of prerequisite software, see "Prerequisite Software for Installation on Windows" on page 9.
- All machines upon which you are installing LoadRunner, requires administration privileges.
- LoadRunner MSI supports both 32 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 INSTALLDIR to specify an alternate installation folder.
- To prevent the LoadRunner Agent on the load generator from starting immediately after installation, add the following to the command line command: `START_LGA=0`. The Agent enables communication between the load generator and the Controller. For more details on the LoadRunner Agent, see the LoadRunner Help.

# Installation Command line Options

You can use the Windows command line to install the full LoadRunner package, standalone applications, and additional components. LoadRunner uses Wrapper files (Setup.exe) and "Package for the Web" files (<PFTW>.exe) for command line installations.

- The full LoadRunner installation can be launched via a Setup.exe file.
- The installations of standalone applications and additional components can be launched via PFTW files.

## Installing the full LoadRunner package from the Setup.exe file

You can install the full LoadRunner package from the installation wrapper file, **Setup.exe**, located in the <Installation_disk>\lrunner\<your_language> folder. The following command line options are available:

| Option | Description |
|---|---|
| /s | Runs the installation in the background (silently), with no user interaction. |
| /qb | Runs the installation in unattended mode, with limited user interaction. |
| /InstallOnlyPrerequisite | Installs only the prerequisites – does not install any LoadRunner components.<br>By default, the setup program checks that your machine has the required prerequisites, and installs them if necessary, before installing the LoadRunner components. |

You can set public properties for the command line installation, using the following syntax:

```
setup.exe PROPERTY_NAME="value"
```

The following properties are available:

| Property name | Description |
|---|---|
| INSTALLDIR="*your_path*" | Specifies the location where the application will be installed. |
| REBOOT_IF_NEEDED | 1: Reboots the machine after installation, if required. This is recommended if you include the installation of NV (Network Virtualization).<br>0: Does not reboot the machine after installation.<br>Default: 0 |

| Property name | Description |
|---|---|
| INSTALL_NV | Empty string: Excludes the installation of the NV (Network Virtualization) component.<br>1: Includes the installation of the NV (Network Virtualization) component.<br>Default: 1 |
| INSTALL_NV_MODE | 1: Sets the NV installation mode to **Typical**.<br>2: Sets the NV installation mode to **Custom**. |
| START_LGA | Empty string: Instructs the machine not to start the Load Generator after installation.<br>1: Instructs the machine to start the Load Generator after installation.<br>Default: 1 |
| IS_RUNAS_SERVICE | 0: Runs the Load Generator's agent as a process.<br>1: Runs the Load Generator's agent as a service.<br>Default: 1 |

**Example:** The following command performs the installation silently and then reboots the machine if necessary:

```
DVD\lrunner\en\setup.exe /s REBOOT_IF_NEEDED="1"
```

## Installing a Standalone Application or an Additional Component from a PFTW file

You can install a LoadRunner standalone application or one of the additional components, via the PFTW (Package for the Web) files that are included with the LoadRunner installation media. The installation files are located in the **Standalone Applications** or **Additional Components** folders on the installation media. You can double-click on the packaged file or run it from the command line, using the following options:

| Option | Description |
|---|---|
| /s | Runs the installation in the background (silently), with no user interaction. |
| /e | Only extracts the installation files; does not run them. |

| Option | Description |
|---|---|
| /f | Specifies the path of a temporary folder for file extraction.<br>For example: `/f "c:\my_temp_folder"`<br>If you leave out this option, the default temporary folder is used. |
| /a | Allows you to pass parameters or properties to the autorun file, such as setup.exe.<br>Use the properties defined above for the Setup.exe file. |

**Example:** The following command silently runs a Load Generator setup, installs the application in a specified folder, and then starts the Load Generator agent after the installation:

```
SetupLoadGenerator.exe /s /a INSTALLDIR="c:\HP\LGSA" START_LGA="1"
```

# Configure 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 to manually log on to the machine.

**To configure user login settings:**

1. Do one of the following:
   - Select **Start > All Programs > HP Software > HP LoadRunner > Tools > Agent Runtime Settings Configuration**.

   Or
   - In icon-based desktops such as Windows 8, search for **Agent** and select the **Agent Runtime Settings Configuration** item.

   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 automatically logs 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:** When created, the LoadRunner Agent service starts with the **LocalSystem** account (not as a specified user). The specified credentials are used by the Agent service to start the *mdrv.exe* process when you run the script.

   - **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 reboot and log on to the system at least once after the LoadRunner installation before the automatic login can work.

# Install a LoadRunner Language Pack

The LoadRunner Language Packs enables you to view the Controller, VuGen, and Analysis user interfaces in your local language. You install the Language Packs from the LoadRunner installation DVD.

> **Note:** A Language pack must be installed on a Windows operating system with the same native language as the language pack you are installing. For example, on Windows 7 x64 - Spanish, you first install the LoadRunner English installation, and then the LoadRunner Spanish language pack.

**To install a language pack:**

1. Make sure that HP LoadRunner English is already installed.
2. In the root folder of the LoadRunner installation DVD, run **setup.exe**. The LoadRunner installation program begins and displays the installation options.
3. Click **Language Packs**. The Language Packs folder on the installation DVD opens.
4. Navigate to the folder for the language and component that you want to install. Run the installation file and follow the on-line instructions.

# Chapter 3: Installing the Load Generator on Linux

LoadRunner uses load generators to run Vusers. There are two versions of the LoadRunner Load Generator. One version runs Vusers on Windows platforms, and the other version runs Vusers on Linux platforms. You use a Windows-based Controller to control both the Windows-based and the Linux-based Vusers.

This chapter describes how to install the Load Generator on a Linux platform. For details on how to install the Load Generator on a Windows platform, see "Installing LoadRunner on Windows" on page 12.

> **Note:** For troubleshooting information, see "Troubleshoot the Load Generator Linux Installation" on page 36.

This chapter includes:

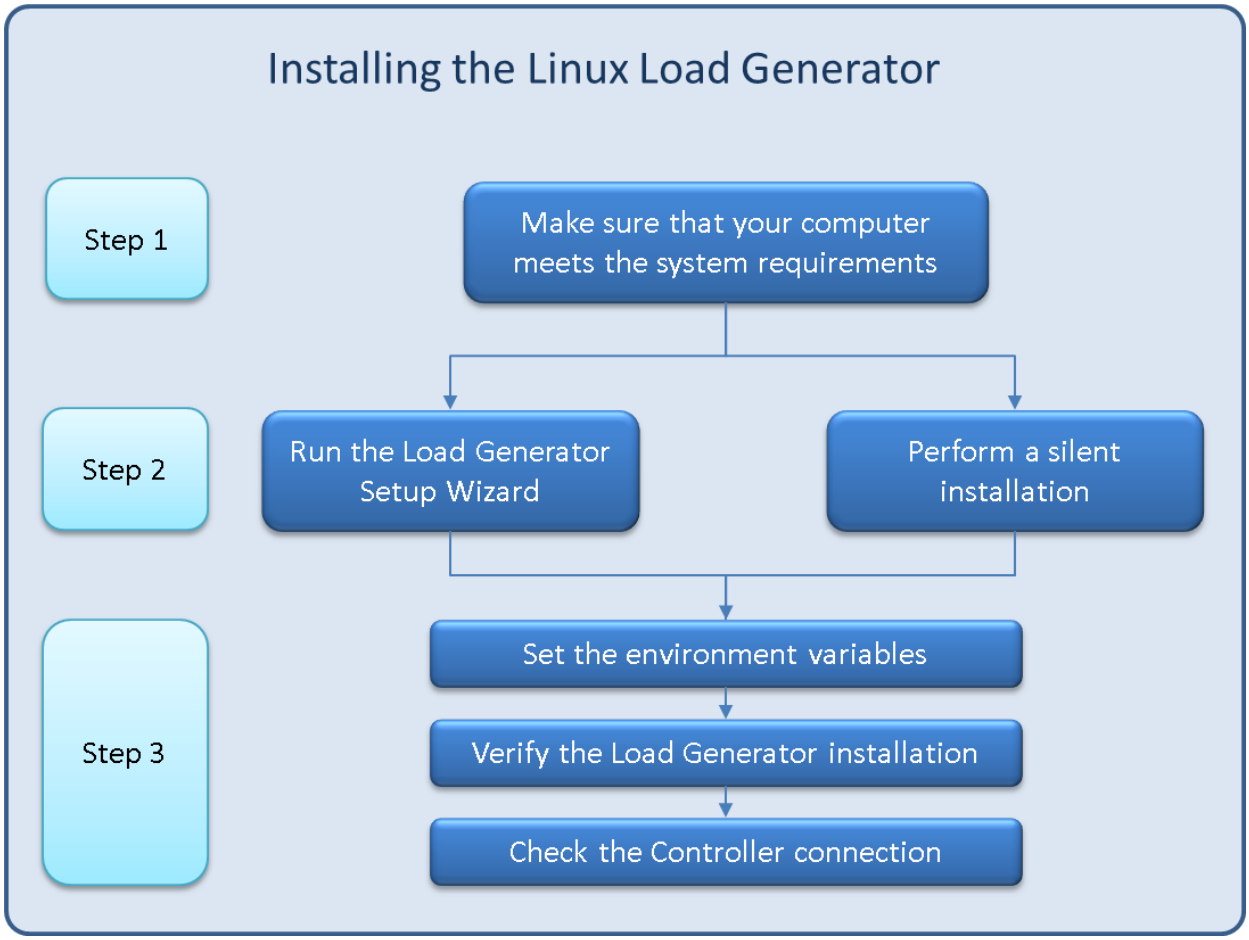


# Installation Workflow

You can install the LoadRunner load generator component on a Linux platform to run Vusers. The Linux-based Vusers interact with the LoadRunner Controller, installed on a Windows platform.

You can install the load generator on a Linux machine through the installation program (UI based or silent) or through a Docker container. For details see see "Install a Load Generator on Linux with the Setup Wizard" on page 25. or "Install a Load Generator Using Docker" on page 31.

The following diagram shows the primary steps in installing the load generator on a Linux platform using the standard installation program:




1. **Review the system requirements**

   Before you install the load generator on a Linux platform, make sure that your system meets the requirements, as described in "System Requirements" on page 9.

2. **Run the setup**

   a. Start the setup using the HP Load Generator Setup Wizard. For more information, see "Install a Load Generator on Linux with the Setup Wizard" on the next page.If you were working with a previous version of the load generator, the setup will first uninstall the old version and then install the new.

   b. To perform a silent installation, see "Silent Load Generator Installations on Linux" on page 26.

   > **Note:** It is recommended that you close all anti-virus applications, such as McAfee or Aladdin's eSafe, before installing LoadRunner.

3. **Configure your environment**

   After the installation, 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 "Configure the Linux Environment" on page 27.

# Install a Load Generator on Linux with the Setup Wizard

This section describes how to install the load generator on a Linux platform using the standard installation programs. For details on installing through a Docker container, see "Install a Load Generator Using Docker" on page 31.

The following section describes installing the load generator using the setup wizard. For information on how to perform a silent installation, see "Silent Load Generator Installations on Linux" on the next page.

**Note:** During installation, you can optionally install CA and SSL certificates for the load generator. These certificates are used for authentication and secure communication respectively. Both certificates should be in *.cer (X.509) format.

- For a CA certificate: You can enter the path to an existing certificate, or leave the path blank to skip the step. If you want to install the CA certificate, it should be generated in advance.
- For an SSL certificate: You can select it from an existing certificate file. Alternatively, it can be generated automatically if you provide the CA certificate containing the private key.

For details on generating a CA certificate, see “How to Create and Use Digital Certificates” in the *HP LoadRunner User Guide*.

For more information on working with certificates in LoadRunner, see the "Authentication Settings" documentation in the *HP LoadRunner User Guide*.

**To run the Load Generator Setup Wizard:**

1. Kill any LoadRunner agent process that may be running on the machine. Type:

   ```
   cd /opt/HP/HP_LoadGenerator/bin;./m_daemon_setup -kill;su -;
   ```

2. Change to super user.
3. If you have an earlier version of the load generator installed on the machine, you must first uninstall it. Type:

   ```
   cd /opt/HP/HP_LoadGenerator/;cd _HP_LoadGenerator_Installation/;sh ./Change_HP_
   LoadGenerator_Installation;
   ```

4. Change directory to `/<installation root directory>/InstData/Linux/VM`. The <installation root directory> is any path that contains the **Web_Installers** folder, for example **/tmp/Web_Installers**. Copy the installation folder to this location.

   **Note:** There are two versions of the Load Generator Setup Wizard, a 32-bit version and a 64-bit version.

- The 64-bit version checks that the required pre-requisite software is installed on the computer. If any pre-requisite software is missing, a message is displayed, and the setup wizard will abort. Install the required package and then re-run the setup wizard.
- The 32-bit version of the setup wizard does not check whether the pre-requisite software is installed.

Make sure that you select the correct <installation root directory> version for your Linux installation.

5. [sh and bash shells] Launch the setup wizard by typing: `source ./installer.sh`.
   [csh and tcsh shells] Launch the setup wizard by typing: `source ./installer.csh`.

   **Note:**

   It is recommended that you use the **source** command to run the setup wizard, as shown above. If you run the setup wizard without using this command, you must manually set the environment variables for the current shell session. For details, see "Set the Environment Variables" on page 28.

   If the source command is not supported by the current shell, use the "dot" command. For example, `. ./installer.csh`.

   Follow the online instructions to install the load generator.For more help during installation, see "Troubleshoot the Load Generator Linux Installation" on page 36.
6. Exit super user or switch to another user.
7. Configure your environment.
   After you install the load generator, configure your environment as described in "Configure the Linux Environment" on the next page.

# Silent Load Generator Installations on Linux

To perform a silent installation of the load generator, make sure you have super user privileges and follow the procedure below:

1. Change the current directory to the installer directory:

```
cd <path_to_installer_cd>/InstData/Linux/VM
```

2. Run the following command to silent-install the load generator:

```
source ./installer.sh -i silent
```

> **Note:** It is recommended that you use a **source** command to perform a silent installation, as shown above. If you perform the installation without using the **source** command, you will need to set up the environmental variables after installing the load generator. For details, see "Set the Environment Variables" on the next page.
>
> If the source command is not supported by the current shell, use the "dot" command. For example, `. ./installer.sh - i silent`.
>
> If you encounter an error during the installation, see "Troubleshoot the Load Generator Linux Installation" on page 36.

By default, the load generator will be launched at the end of the installation. If you do not want to automatically launch the load generator, add the following command-line option:

```
source ./installer.sh -i silent –DSTART_PRODUCT_AFTER_INSTALL=No
```

# Configure the Linux Environment

This section describes the configuration steps you need to complete after installing the load generator, before you can begin working with the load generator.

**To complete the setup process after installing the load generator:**

1. Set the appropriate environment variables.
   See "Set the Environment Variables" on the next page.

   > **Note:** If you used a **source** command to install the load generator, the setup wizard automatically sets the appropriate environment variables, and there is no need to perform this step.

2. Verify the load generator installation.
   See "Verify the Linux Installation" on page 29.
3. Start the load generator.

   ```
   .cd /opt/HP/HP_LoadGenerator/;source env.csh;cd bin;./m_daemon_setup -install
   ```

4. Check that the Controller is able to access the load generator.
   For details, see "Check the Controller Connection" on page 30.

# Set the Environment Variables

> **Note:** This topic is applicable only if you ran the Load Generator Setup Wizard without using a **source** (or "dot") command. If you used these commands, there is no need to perform any of the procedures described below.

To enable the load generator to run, the following environment variables must be defined:

- **M_LROOT.** The location of the Linux load generator installation directory.
- **PATH.** The location of the Linux load generator **bin** directory.
- **PRODUCT_DIR.** The location of the Linux load generator installation directory.

The Load Generator Setup Wizard performs the following tasks relating to the environment variables:

- Adds the environment variable definitions to the system-wide startup scripts.

  If the variable definitions were not correctly set during the setup, see "Troubleshoot the Load Generator Linux Installation" on page 36 for possible solutions.
- Sets environment variables for the current shell session if the **source** command was used to run the setup wizard.

  This topic describes how to set the environment variables for the current shell session if a **source** command was not used to run the setup wizard.

To determine if environment variables are set, run **verify_generator** (see "Run verify_generator" on the next page) or use the following command:

```
echo $M_LROOT
```

If the name of the load generator installation folder is returned, then the environment variables are correctly set for current shell. If the name of the load generator installation folder is not returned, then manually set the variables as described below.

To manually set the environment variables for the current shell session (if the **source** command was not used to run the setup wizard), execute one of the following commands:

- Bash users:

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

- C Shell users:

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

# Verify the Linux Installation

The load generator installation includes a setup verification utility, **verify_generator**, that checks the load generator setup on your Linux machine. The verification utility checks environment variables and your startup scripts (**/etc/csh.cshrc**, **${HOME}/.cshrc** or **/etc/profile**, **${HOME}/.profile**) to verify that they are set up correctly.

It is strongly recommended that you run **verify_generator** after installing the load generator, before attempting to invoke the load generator. For details on how to run the **verify_generator** utility, see "Run verify_generator" below.

The **verify_generator** utility checks the following:

- All the prerequisite software is installed. (This check is performed for 64-bit installations only.)
- There are at least 128 file descriptors
- The `.rhosts` 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**
- `/etc/csh.cshrc`, `${HOME}/.cshrc` or `/etc/profile`, `${HOME}/.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

## Run verify_generator

It is recommended that you run the **verify_generator** utility after installing the load generator, before attempting to invoke the load generator. For details on what is checked by the **verify_generator** utility, see "Verify the Linux Installation" above.

> **Note:** To run this command, you must be a "normal" user and not root user.

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

**To run verify_generator:**

1. From the **<Load Generator installation directory>/bin** folder, 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 any of the settings are incorrect, **verify_generator** returns **Failed**, and suggestions on how to correct the setup.

# Check the Controller Connection

If the LoadRunner Controller will connect 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, locate the **.rhosts** file which is 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.

### Connecting to a Linux Load Generator Without Using rsh

You can configure the Controller to connect to the load generator without using **rsh**. In this case, you need to activate the agent daemon on the load generator, as described below.

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 entering 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 receive a message: **m_agent_daemon <process ID>**.

   The agent now keeps running, even if the user is logged off. You can stop the agent by using the command explained in step 9 below, or by rebooting the machine.

   > **Note:** If you look at the **m_agent_daemon[xxx].log** log file in the temp directory, you may see communication errors, even if the installation succeeded.

2. In the Controller, select **Scenario > Load Generators**. The Load Generators dialog box opens.
3. Click **Add**. The Load Generators dialog box opens.
4. In the **Name** box, enter the name of the computer on which the load generator is running.

5. From the **Platform** list, select **Linux**.
6. Click **More**.
7. Click the **Linux Environment** tab, and make sure that the **Don't use RSH** check box is selected.
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** daemon, and if successful, you receive the message: **m_agent_daemon is down**.

# Install a Load Generator Using Docker

This section describes how to install the load generator on a Linux platform using Docker.

Docker is a platform that allows you to develop, ship, and run applications via a container. Docker uses a standard container format that lets developers prepare applications inside containers, while system administrators and other teams, such as Quality Assurance engineers, run the container in order to deploy the application. For details regarding Docker, see https://docs.docker.com.

**To set up an installation through Docker:**

### Install Docker

Install Docker on the target machine, along with its dependencies. Currently, only the 64-bit version is supported. For installation details, see https://docs.docker.com/installation.

### Set up the environment

Set up the target machine environment as required.

### Obtain the Dockerfile image

Locate the base load generator image. Use the image provided on the DVD (in the **InsData** folder of the ISO file) or obtain one from the HP Docker hub.

If you need to customize your settings, you can start a container and install the load generator manually. Alternatively, you can create your own Dockerfile. Use the sample Dockerfile contents provided below, and edit them to fit your specific needs.

### Build a custom Dockerfile image (optional)

Create a custom Dockerfile using the example below as a basis for your custom file. Once you have the file, follow these steps to build an image:

1. Place your Dockerfile and the load generator installation folder, **VM** (containing inst64.bin, unzip, and installer.sh), together in the same folder.
2. Switch to root user. Make sure you have Internet access and the ability to install dependencies.

3. In the directory which contains Dockerfile, type:

```
docker build -t load_generator ./
```

### Import the base image

Import the image from the tar archive using the following command:

```
docker load < load_generator.tar
```

### Set the proxy (optional)

If you need to set a proxy for a target image, set it in the Dockerfile using the following command:

```
ENV http_proxy http://my_proxy_name:port
```

### Start a container and launch the load generator

Check that port 54345 is available and not being used by another process. This is the default port used by the Controller. Use the following command to run the load generator in the background, in detached mode.

```
docker run -d -i -p 54345:54345 --net=host load_generator.
```

If you need to use a different port, type

```
docker run -id -p <host_port>:54345 load_generator
```

If you specify a non-default port, you also need to modify the port on the Controller side.

### Tips and Guidelines

- Use `docker ps` to list the containers that are running.
- Use `docker stop <container>` to stop the load generator service.
- The Dockerfile container has an ENTRYPOINT section. The container first runs the commands in ENTRYPOINT. It sets up the environment and then starts the load generator. The command uses a While loop to wait for input, in order to keep the container from exiting. This behavior prevents you from accessing the container while it is running. Make sure to add -i while starting the container; otherwise the While loop will consume a an excessive amount of CPU.
- If you need entry into the container, add an argument such as `--entrypoint=/bin/bash` when starting the container. After entering the container, set the load generator environments and start the load generator . You can then switch to the host using CTRL+p and CTRL+q while keeping the container running in background. To access the container again, use the `docker attach container_id` command.
- To access the host network directly, add **--net=host**. We recommend you add this flag if the AUT generates a lot of network activity.

### Sample Dockerfile Content

The following example shows how to build an image. It sets a proxy enabling the container to connect to the Internet and then installs the load generator prerequisites. It then copies the load generator installation files to the container and installs it silently. Lastly, it sets an ENTRYPOINT which tells the container what to execute when starting.

```
# sudo docker build -t load generator /
```

**# Set the base image**

```
FROM ubuntu:14.04
```

**# Set the proxy**

```
# ENV http_proxy http://my_proxy_name:port
```

**# Install prerequisites for Load Generator**

```
RUN dpkg --add-architecture i386
RUN apt-get update && apt-get install -y libc6-i386 lib32stdc++6 lib32ncurses5
libkeyutils1:i386 libglib2.0-0:i386
```

**# Copy the Load Generator installation files to a temporary folder**

```
RUN mkdir /opt/tmp_LG

ADD VM /opt/tmp_LG
```

**# Install the Load Generator**

```
RUN /bin/bash -c "cd /opt/tmp_lg; source ./installer.sh -i silent"
```

**# Remove the installation files**

```
RUN rm -R /opt/tmp_LG
```

**#Start the container. If you need entry to the container, add --entrypoint to overwrite the ENTRYPOINT. If you do not need entry to the container, use "-id" to start the container.**

```
ENTRYPOINT ["/bin/bash","-c","cd /opt/HP/HP_LoadGenerator/; source env.sh; cd bin/; ./m_
daemon_setup -install; while true; do cat; done"]
```

# Improve Load Generator Performance

This section includes recommendations for improving load generator performance. You can increase the number of file descriptors, process entries, and amount of swap space by configuring the kernel.

> **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:

# Increase 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 two 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 shells.

In the examples below, 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
```

Below is an alternate procedure to increase file descriptors. In this example, 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.

## Increase Process Entries

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

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.

## Increase Swap Space

Each Vuser requires swap space ranging in size 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.

# Uninstall the Load Generator from a Linux Machine

You can use the Load Generator Setup Wizard to uninstall the load generator, as described below. If you want to perform an upgrade for your load generator, you will need to uninstall the existing one.

Note that the last step in the procedure enables you to perform either a regular uninstall or a silent uninstall.

**To uninstall the load generator:**

1. Make sure that you are logged in as the same user who installed the load generator.
2. Make sure that the **m_agent_daemon** process is not running on the machine. If it is running, kill its process:

```
cd /opt/HP/HP_LoadGenerator/bin;./m_daemon_setup -kill;su -;
```

3. Change the current directory to the installation directory:

```
cd <path_to_installation_folder>/_HP_LoadGenerator_Installation
```

4. Switch to super user.

   To run the uninstall wizard, run the following command and follow the instructions in the wizard.

   ```
   sh ./Change_HP_LoadGenerator_Installation
   ```

   To perform a silent uninstall, run the following command:

   ```
   sh ./Change_HP_LoadGenerator_Installation -i silent
   ```

# Troubleshoot the Load Generator Linux Installation

This section describes troubleshooting tasks relating to the setup of the Linux load generator.

This section includes:



## Environment variables were not set correctly in the system-wide startup scripts

To enable the load generator to run, the system-wide startup scripts must be modified to set specific environment variables. The required modifications to the startup scripts are made by the Load Generator Setup Wizard. If the startup scripts were not correctly modified during the setup of the load generator, you can manually make the required changes to the startup scripts as described below. The required changes differ slightly between C shell users, and Bourne and Korn shell users.

- **Manually modifying the startup scripts for C shell users**

  During the load generator installation process, the setup wizard creates the **env.csh** script. This script includes the commands to set the required environment variables for C shell users. A sample **env.csh** script is shown below.

  ```
  setenv PRODUCT_DIR <Load Generator installation directory>
  setenv M_LROOT ${PRODUCT_DIR}
     if ( ! $?PATH ) then
        setenv PATH ""
  ```

```
   endif
setenv PATH ${M_LROOT}/bin:${PATH}"
```

Add the following line to the **/etc/csh.cshrc** or **~/.cshrc** startup script to execute the **env.csh** script during the shell startup:

```
source <Load Generator installation directory>/env.csh
```

For example:

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

The effect of making the above modification to the startup script is similar to the modifications that are made by the setup wizard. A sample of the modifications that the setup wizard makes to the **/etc/csh.cshrc** startup script is shown below:

```
# New environment setting added by HP_LoadGenerator on Wed Jan 30 16:20:10 IST
2013 2.
# The unmodified version of this file is saved in /etc/.login1557000131.
# Do NOT modify these lines; they are used to uninstall.
setenv PRODUCT_DIR "/opt/HP/HP_LoadGenerator"
# End comments by InstallAnywhere on Wed Jan 30 16:20:10 IST 2013 2.
# New environment setting added by HP_LoadGenerator on Wed Jan 30 16:20:10 IST
2013 5.
# The unmodified version of this file is saved in /etc/.login1557000131.
# Do NOT modify these lines; they are used to uninstall.
setenv M_LROOT "/opt/HP/HP_LoadGenerator"
# End comments by InstallAnywhere on Wed Jan 30 16:20:10 IST 2013 5.
# New environment setting added by HP_LoadGenerator on Wed Jan 30 16:20:10 IST
2013 8.
# The unmodified version of this file is saved in /etc/.login1557000131.
# Do NOT modify these lines; they are used to uninstall.
if ( ! $?PATH ) then
setenv PATH ""
endif
setenv PATH "/opt/HP/HP_LoadGenerator/bin:${PATH}"
# End comments by InstallAnywhere on Wed Jan 30 16:20:10 IST 2013 8.
```

- **Manually modifying the startup scripts for Bourne and Korn shell users**

  During the load generator installation, the setup wizard creates the **env.sh** script. This script includes commands to set the required environment variables for Bourne shell and Korn shell users.

  Add the following line to the **/etc/profile** or **~/.profile** startup script to execute the **env.sh** script during the shell startup:

  ```
  source <Load Generator installation directory>/env.sh
  ```

  For example:

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

  The effect of making the above modification to the startup script is similar to the modifications that are made by the setup wizard. A sample of the modifications that the setup wizard makes to the **/etc/profile** startup script is shown below:

  ```
  # New environment setting added by HP_LoadGenerator on Fri Jan 18 11:14:24 IST
  2013 1.

  # The unmodified version of this file is saved in /etc/profile1806316421.

  # Do NOT modify these lines; they are used to uninstall.

  PRODUCT_DIR=/opt/HP/HP_LoadGenerator

  export PRODUCT_DIR

  # End comments by InstallAnywhere on Fri Jan 18 11:14:24 IST 2013 1.

  # New environment setting added by HP_LoadGenerator on Fri Jan 18 11:14:24 IST
  2013 4.

  # The unmodified version of this file is saved in /etc/profile1806316421.

  # Do NOT modify these lines; they are used to uninstall.

  M_LROOT=/opt/HP/HP_LoadGenerator

  export M_LROOT

  # End comments by InstallAnywhere on Fri Jan 18 11:14:24 IST 2013 4.

  # New environment setting added by HP_LoadGenerator on Fri Jan 18 11:14:24 IST
  2013 7.

  # The unmodified version of this file is saved in /etc/profile1806316421.

  # Do NOT modify these lines; they are used to uninstall.

  PATH="/opt/HP/HP_LoadGenerator/bin:${PATH}"

  export PATH

  # End comments by InstallAnywhere on Fri Jan 18 11:14:24 IST 2013 7. LoadRunner
  settings #PATH=${M_LROOT}/bin:$PATH; export PATH
  ```

# Error when installing the Load Generator on a Linux platform

When you use the **source installer.sh** command to install the load generator version 12.53 on a Linux machine on which the load generator version 12.53 was previously installed, you may receive the following error message:

"An error occurred while trying to manage the selected instance."

**Solution:**

1. Open the registry file **/var/.com.zerog.registry.xml** and locate the element "**product**" with attribute "**name**"="**HP_LoadGenerator**".

   For example: <product name="HP_LoadGenerator" id="77f695c1-1f0c-11b2-883d-c486a85f6555" version="11.52.0.0" copyright="2012" info_url="http://www.hpe.com" support_url="http://www.hpe.com" **location="/opt/HP/HP_LoadGenerator"** last_modified="2013-01-21 13:12:14">
2. Record the value of the "**location**" attribute.
3. Remove the entire directory that is referred to by the "**location**" attribute.
4. Delete the registry file **/var/.com.zerog.registry.xml**.
5. Rerun the **source installer.sh** command.

# Error when running Load Generator on RedHat Enterprise Linux 5.x with SELinux enabled

During use of the load generator on RHEL 5.x, you might receive the following error:

"m_agent_daemon: error while loading shared libraries: /opt/HP/HP_LoadGenerator/bin/liblwc_cryptolib.so: cannot restore segment prot after reloc: Permission denied."

This problem occurs because SELinux is installed and enabled on the machine. SELinux is preventing the specified shared library from loading.

**Solution:**

There are two possible workarounds:

1. Before using the load generator, disable SELinux using the command "setenforce 0".
2. If you want to keep SELinux enabled, you can change the security context of all problematic libraries (for example, <Path_to_LoadGenerator>/bin/*.so" to "textrel_shlib_t").
   To do this, execute the command: "chcon -t textrel_shlib_t <Path_to_LoadGenerator>/bin/*.so"

# Environment variables are not unset after uninstalling the load generator

When you uninstalled the Linux load generator, the setup wizard might not have unset the load generator environment variables (M_LROOT, PRODUCT_DIR, and PATH) for the current shell. To unset the environment variables, close the current shell session and invoke a new one, or manually unset the variables as described below:

- To unset the M_LROOT and PRODUCT_DIR variables:
  - [bash shells] Use the **unset** command.
  - [csh shells] Use the **unsetenv** command.
- To update the PATH variable to exclude the load generator binary directory, type:
  - [bash shells] `PATH=<required list of paths>; export PATH`
  - [csh shells] `setenv PATH <required list of paths>`

# Unable to run Vusers on the load generator

If you are unable to run Vusers on the load generator, no specific error is reported, and the Vuser protocol requires a third-party application or client to be present on load generator side, check the dynamic libraries used by the application. This will enable you to establish if any shared objects cannot be found. A shared object that cannot be found may indicate either a missing prerequisite package or an environment variable issue.

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

```
ldd application_name
```

For example, type `ldd mdrv` to determine if all the dependencies of the **mdrv** executable can be found. If any dependencies are not found, run **verify_generator** as described in "Run verify_generator" on page 29.

> **Note:** 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).

# Chapter 4: Manage Licenses

LoadRunner is delivered with a Community Bundle license (this replaces the Instant-on license). The Community Bundle provides the following features:

- A permanent bundle with that lets you run 50 Vusers.
- All protocols are included except for GUI (UFT), COM/DCOM and protocols in the template bundle such as C and Java Vusers.

To run additional Vusers from the LoadRunner Controller, you need the appropriate LoadRunner licenses. These licenses must be available 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 includes:



# Install New Licenses

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

You install a new license using either the license key or the license file provided by HPE.

- **License key.** A license key enables you to install just a single license at a time. You may receive the license key directly from HPE, or the license key may be included in a license file that you receive from HPE.
- **License file.** A license file contains the license keys for one or more licenses. When you use a 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.

**To install a new LoadRunner license:**

1. **Open the LoadRunner License Utility.**
   a. In legacy Windows operating systems, click **Start > All Programs > HP Software > HP LoadRunner > License > LoadRunner License Utility**.

      or

In icon-based desktops such as Windows 8, search for **License** and select the **LoadRunner License Utility** item.
The HP LoadRunner License Utility opens.

b. In the LoadRunner License Utility, click **Install New Licenses**. The LoadRunner License Utility - New License dialog box opens.

2. **To install using a license file:**
   a. Click the **Browse** button to the right of **License file**, and locate the license file that was sent to you by HPE.
   b. Click **View License File Content** to display details of the licenses that are included in the license file.
   c. In the list of licenses included in the license file, select the licenses to install.
3. **To install using a license key:**
   a. Click **Install a license using a license key**.
   b. Enter the license key that you received from HPE.
4. **Complete the installation.**
   a. Click **Install**. The selected licenses are installed.
   b. Click **Close**. In the License Summary table, make sure that the new licenses appear in the list of installed licenses.

# View License Information

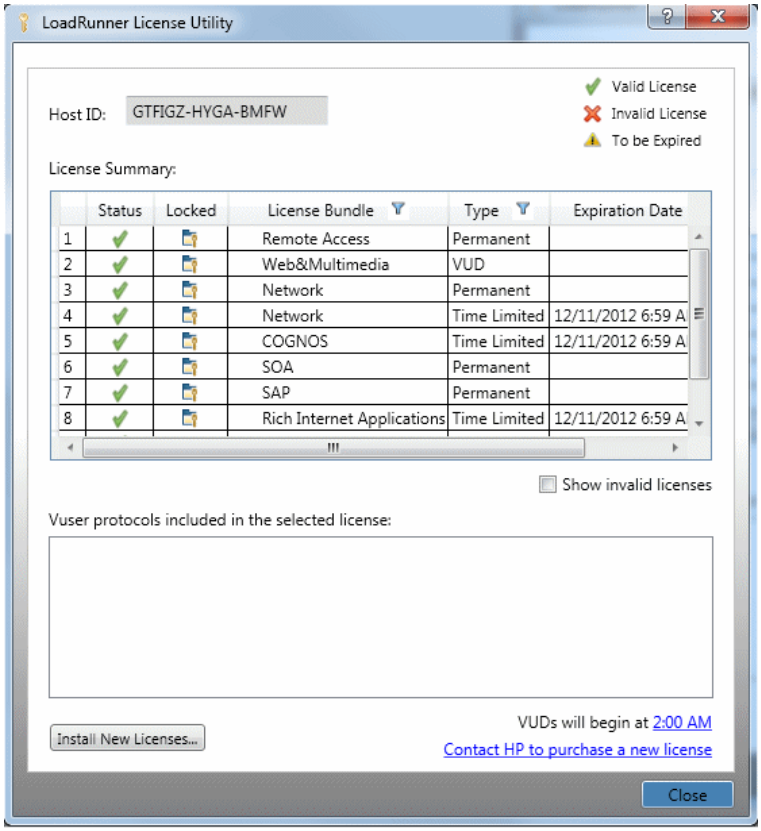
You can use the HP LoadRunner License Utility to view your license information.

The **Community** license provides 50 permanent Vusers at no cost. These Vusers are valid for all protocols except for GUI (UFT), COM/DCOM, and template protocols.

To view your license information:

In legacy Windows operating systems, click **Start > All Programs > HP Software > HP LoadRunner > License > LoadRunner License Utility**.

In icon-based desktops such as Windows 8, search for **License** and select the **LoadRunner License Utility** item. 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 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 Vuser protocols. Partner licenses enable third-party applications to be controller by the LoadRunner Controller. Partner licenses operate the same as standard LoadRunner licenses.
- **Type.** Indicates the type of license:
  - **Freemium** licenses are installed when LoadRunner is first installed.
  - **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 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**, and **Evaluation** licenses expire.
- **Capacity.** Indicates the capacity of the selected license:
  - For **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.

# Troubleshoot Licenses

If you have a temporary license, contact HPE 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 startup, you must grant Full Control permission for the Registry's HKEY_LOCAL_MACHINE key as described below.

**To add registry permissions:**

1. Run **regedit** 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. Click **OK**.

# Send Us Feedback

Let us know how we can improve your experience with the Installation Guide.

Send your email to: docteam@hpe.com