



LoadRunner Professional

Software Version: 2020

Installation Guide

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Welcome to LoadRunner Professional

Welcome to the LoadRunner Professional Installation Guide.

LoadRunner, a tool for performance testing, stresses your application to isolate and identify potential client, network, and server bottlenecks.

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

LoadRunner Help Center

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

You can access the LoadRunner Professional Help Center on the web (<https://admhelp.microfocus.com/lr/>), or download and install a local version. 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.

Useful links

The following online resources provide more information for LoadRunner users:

Resource	URL
Help Center	LoadRunner Professional Help Center (select the relevant version)
Business Support	https://software.microfocus.com/en-us/software/customer-technical-support-services
Knowledge Base and Manuals Library	https://softwaresupport.softwaregrp.com/group/softwaresupport/
Community & blogs	https://community.microfocus.com/t5/Performance-Engineering/ct-p/sws-LoadRunner

Resource	URL
AppDelivery Marketplace	https://marketplace.microfocus.com/appdelivery
Resources	https://www.microfocus.com/resources/
Twitter	https://twitter.com/hashtag/Loadrunner
LinkedIn	https://www.linkedin.com/groups/1879289
Facebook	https://www.facebook.com/groups/MFLoadRunner/

LoadRunner components

The LoadRunner Professional **Full Setup** installation includes the following components:

- **Virtual User 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.** Component for running Vusers (including Windows-based GUI Vusers) to generate load. The load generator can be installed on Windows or Linux platforms, using the installer or via Docker.
- **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 Professional Help Center](#) (select the relevant version).
- **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 Professional Help Center](#) (select the relevant version).
- **TruClient.** Component for recording and developing test scripts for web-based applications. For more information, see the [TruClient Help Center](#) (select the relevant version).

All of the standalone installations (for example, for VuGen or the load generator) can be found in the LoadRunner installation package's **Standalone Applications** folder.

All of the additional components (such as the Citrix Agent and so on) can be found in the installation package's **Additional Components** folder.



Tip: You can also download VuGen, TruClient, DevWeb, VTS, and more, for free from [ADM Marketplace](#).

Help improve LoadRunner Professional

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

LoadRunner Professional 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 Professional or VuGen Setup window, displayed at the beginning of installation.

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

System requirements and prerequisites

This chapter includes:

- [System requirements](#) 8
- [Prerequisite software for installation on Windows](#) 8
- [Installation notes and limitations](#) 9

System requirements

The system requirements necessary for running LoadRunner Professional on a Windows system, or for running a load generator on a Windows or Linux system, are listed in the [System Requirements](#).

System requirements for other related components:

- **Diagnostics:** For system requirements, check the latest Diagnostics documentation in the [Knowledge Base](#).
- **Network Virtualization:** For system requirements and installation instructions, see the [Network Virtualization for LoadRunner Help](#) (select the relevant version). You can install Network Virtualization during the LoadRunner installation, or at a later time.

Prerequisite software for installation on Windows

Before installing LoadRunner Professional, make sure the prerequisite software is installed on the LoadRunner Professional machine. Some of the prerequisite software is automatically detected and installed by the installer; other prerequisite software must be installed manually.

- ["Automatically detected and installed by the installer" below](#)
- ["Manual installation for Windows updates" on the next page](#)

Automatically detected and installed by the installer

When you run the installation wizard, the wizard detects which prerequisite software is already installed on the machine and which software is missing. When you continue with the installation, all missing prerequisite software is installed.

The following prerequisite software must be installed:

- .NET Framework 4.8
- Microsoft Visual C++ 2015 Redistributable Package - x86 and x64

Note:

- Installation of .NET Framework 4.8 prompts an automatic restart. You then need to rerun the LoadRunner Professional installation.

- If Visual C++ 2017 Redistributable is already installed Visual C++ 2015 Redistributable will not be installed. Visual C++ 2017 Redistributable should be compatible in most cases. For more details, see the [Microsoft documentation](#).
- If installation of Visual C++ 2015 Redistributable Update 3 fails, install [KB2999226](#) manually.

Manual installation for Windows updates

Before installing any of the LoadRunner Professional components, make sure that the full set of Windows updates has been installed. If this was not done automatically, you must install them manually.

Note: Before installing any of the Windows updates, disable UAC (User Account Control) and restart the computer. For details on how to disable UAC, see the [Microsoft Windows documentation](#).

You can find the list of Windows updates in the [System Requirements](#).

Installation notes and limitations

Note: See [Known issues](#) in the [LoadRunner Professional Help Center](#) (select the relevant version) for additional notes and limitations.

Security review	We strongly recommend that you install LoadRunner components on dedicated machines that do not contain, or provide access to, sensitive information; and that you do a thorough security review of the network topology and access levels in your testing environment.
Permission requirements	<p>The Installation process for all LoadRunner components, requires a full administrator account (root account for Linux systems) for all operating systems.</p> <p>After installation, all of the LoadRunner applications and components can run under a standard user account (an administrator account is not required), with UAC and DEP enabled.</p>

Running Web Services Vusers on Windows	<p>When running Web Services Vusers on a standalone load generator, some configurations require activation of .NET 3.5 (see MSDN), and installation of WSE 2.0 SP3 and WSE 3.0.</p> <ul style="list-style-type: none">• Option 1: To avoid use of these components, you can recreate the scripts and import the WSDL using the default WCF toolkit.• Option 2: Install the WSE components from the LoadRunner Professional installation package's folders—lrunner\Common\wse20sp3 and lrunner\Common\wse30—or download these components from the Internet: WSE 2.0 SP3: https://www.microsoft.com/en-us/download/details.aspx?id=23689 WSE 3.0: https://www.microsoft.com/en-us/download/details.aspx?id=14089 <p>For more details, see Troubleshooting and Limitations for Web Services.</p>
LoadRunner and UFT coexistence	<p>If you install LoadRunner and UFT on the same machine, and then uninstall one of them, the remaining software program may not function correctly.</p> <p>Resolution: Run a Repair of the software program you want to use on the machine.</p>
License	<p>When upgrading to version 2020, you need to replace your current license to work with the upgraded LoadRunner Professional installation. If you are using the Community license, it is automatically replaced during LoadRunner Professional installation. For any other license, contact licensing support to obtain a valid, compatible license.</p> <p>For more information, see About LoadRunner Licenses in the LoadRunner Help Center.</p>
Custom certificates	<p>When upgrading from version 12.55 or earlier, 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.</p>
Network Virtualization	<p>If you choose to install NV automatically (as part of LoadRunner Professional installation), you must disable Windows SmartScreen before proceeding with the NV installation:</p> <p>Open HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer in the Registry Editor, and change the Value data for SmartScreenEnabled to Off.</p> <div><p>Note: You do not need to disable SmartScreen when installing NV manually.</p></div>

TruClient version conflict	<p>After upgrading your TruClient installation, if you encounter any version conflict, check that the legacy TruClient registry key TcWebIELauncher.exe, has been removed.</p> <ul style="list-style-type: none">• In the Registry Editor, open HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Internet Explorer\MAIN\FeatureControl\FEATURE_BROWSER_EMULATION and delete the key.• Or, run the command: <pre>"REG DELETE "HKEY_LOCAL_ MACHINE\SOFTWARE\Microsoft\Internet Explorer\MAIN\FeatureControl\FEATURE_BROWSER_EMULATION" /v "TcWebIELauncher.exe" /f"</pre>
Virtual environments	<p>The architectures provided by virtualization vendors are rapidly evolving. LoadRunner Professional 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 Professional-approved hardware requirements. If you follow the system requirements and support matrix to create the virtual machine, LoadRunner Professional will work correctly.</p> <p>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 machine's measurements and lead to false results.</p>

Installing LoadRunner Professional on Windows

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

Note: You can install the Windows load generator using the installer (UI based or silent), as described in this section, or through a Docker container—for more information, see ["Deploy Dockerized load generators on Linux" on page 33](#).

This chapter includes:

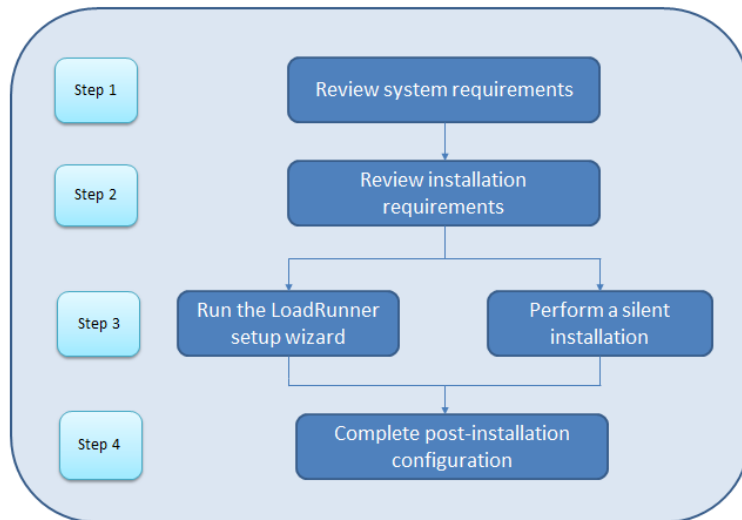
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Installation workflow

Your LoadRunner Professional installation package includes the Setup wizard that guides you through the process of installing the LoadRunner components.

The final stage of the installation includes the optional installation of Network Virtualization. Installing Network Virtualization enables you to generate the NV Insights report (replaces the NV Analytics report) from LoadRunner. The NV Insights report provides an in-depth analysis of how your application performs with different loads over various types of networks (virtual locations) and includes suggestions for optimizing your application's performance.

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



1. Review system requirements and notes

- Make sure that your system meets the hardware and software requirements. For details, see ["System requirements" on page 8](#).

Prerequisite software: When you run the LoadRunner Professional installation wizard, the wizard detects which prerequisite software is already installed on the machine and which software is missing. When you continue with the installation, all missing prerequisite software is installed. For details, see ["Prerequisite software for installation on Windows" on page 8](#).

- Review the ["Installation notes and limitations" 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 Professional 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 [System Requirements](#).

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

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 Professional 2020" on the next page](#).
- b. Run the Setup wizard to install the full version of LoadRunner Professional, LoadRunner

Professional standalone components, or additional components on a Windows system. For details, see ["Install LoadRunner Professional on Windows" below](#).

Then run any patch installations if necessary.

- c. After you complete the LoadRunner Professional 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 27](#).

Note:

- To perform a silent installation, see ["Install LoadRunner Professional silently" on page 18](#).
- VuGen and load generator installation on Windows includes OpenJDK 11, 32-bit.

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 26](#).
- To run Vusers with Controller there must be a valid license installed on the Controller machine. LoadRunner automatically installs the Community license bundle (free of charge) during LoadRunner Professional setup, providing 50 Vusers.

For details on managing LoadRunner Professional licenses and extending your Vuser capacity, see [LoadRunner Professional licensing](#).

Upgrade to LoadRunner Professional 2020

To upgrade your Windows installation to LoadRunner Professional 2020, follow the installation process as described in ["Install LoadRunner Professional on Windows" below](#). The installation process detects the older version, and gives you the option to upgrade.

Note: For silent upgrade, see ["Install LoadRunner Professional silently" on page 18](#).

Install LoadRunner Professional on Windows

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

For details on how to perform a silent installation, see ["Install LoadRunner Professional silently" on page 18](#).

Installation wizard information

Review the following information to help you successfully install your LoadRunner component.

- Load Generator standalone can be installed on a local machine, or provisioned in a cloud account. See the [LoadRunner Professional Help Center](#) (select the relevant version) for information on managing load generators on the cloud.
- 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 [LoadRunner Professional Help Center](#).
- During the installation of **Load Generator** standalone, **MI Listener**, or **Monitors over Firewall** components, the Setup wizard prompts you to select whether you want the installed agent to run in LoadRunner mode (for LoadRunner Professional) or LoadRunner Enterprise mode. The differences are as follows:

LoadRunner mode	LoadRunner Enterprise mode
The agent runs as a regular process.	The agent runs as a service under a special account named IUSR_METRO . This is a local Windows account, created during the installation process in LoadRunner Enterprise mode. (Some additional LoadRunner Enterprise configuration is also added on the load generator standalone machine.)
You must log in to the computer before the process can start.	As a service, the agent is launched automatically when the operating system starts.

- 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.
- In LoadRunner/BPM mode you can delete the IUSR_METRO account using the Windows **Local Users and Groups** console. Deleting IUSR_METRO in LoadRunner/BPM mode will not affect functionality.
- In LoadRunner Enterprise mode, you can delete the IUSR_METRO account only if the LoadRunner Enterprise system user was configured to a different Windows account; otherwise the host will not function correctly.
- During installation of **LoadRunner Full Setup**, **Load Generator**, **Monitor over Firewall**, and **MI Listener**, you can optionally install CA and TLS (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.
 - CA certificate: You can enter the path to an existing certificate, or leave it blank to skip the step. If you want to install the CA certificate, it should be generated in advance.
For details about generating a CA certificate, see the section about configuring secure communication in the [LoadRunner Professional Help Center](#).
 - TLS 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 more information about working with certificates in LoadRunner, see the section about Secure Communication in the [LoadRunner Professional Help Center](#).

Running the installation

The following procedure guides you through the Windows installation process.

To install LoadRunner Professional or an additional component:

1. Before installing:
 - Review the pre-installation information, including the system requirements and prerequisite software, described in ["System requirements and prerequisites" on page 8](#).
 - If you plan to install Network Virtualization, make sure that your system meets the requirements, as described in the [Network Virtualization for LoadRunner Help](#) (select the relevant version), or in the NV installation guide which can be downloaded from the **\Additional Components\Network Virtualization** folder of your LoadRunner installation package. (You can install Network Virtualization during the LoadRunner installation, or at a later time.)

Note: If you install Network Virtualization as part of the LoadRunner Windows installation, you may need to restart the machine after setup.

- Make sure you have full, local administrative rights on the designated machine.
 - Make sure the Windows Update process is not running.
2. Disable UAC (User Account Control) on the installation machine. For details, refer to your Microsoft Windows documentation.
Then reboot the machine. (Installation may fail if this is not done.)
 3. 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.
 4. Run the **setup.exe** file in the root folder of the installation package.
The LoadRunner installation program begins and displays the installation options.
 5. Select the required installation option.

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

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

Note: The LoadRunner Professional Setup wizard can install either LoadRunner Professional or LoadRunner Enterprise. Make sure to select **LoadRunner Professional**.

For details on the components that are included in the full installation, see ["LoadRunner components" on page 6](#).

- **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” section in the [LoadRunner Professional Help Center](#).
- **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” section in the [LoadRunner Professional Help Center](#).
- **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.** This option is available only when installing on native non-English operating systems. Enables you to install a patch for localized LoadRunner user interface, on top of the English version. For details, see ["Install a LoadRunner language pack" on page 27](#).
 - **Additional Components.** Opens the Additional Components folder located in the root folder of the installation package. For details of the additional components that you can install, see the **Advanced > Additional Components** section in the [LoadRunner Professional Help Center](#).
6. Specific software, for example, Microsoft Visual C++, needs to be installed before you can install LoadRunner Professional (see ["Prerequisite software for installation on Windows" on page 8](#)). 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 Professional installation. If you click **Cancel**, the LoadRunner Professional setup wizard exits because LoadRunner Professional cannot be installed without the prerequisite software.

Note: After installing prerequisite software, LoadRunner may restart the machine. If that occurs, rerun **setup.exe**.

7. Perform the installation.

The LoadRunner Professional Setup Wizard opens, displaying the Welcome page.

Follow the instructions in the wizard to complete the installation. Refer to the information in ["Installation wizard information" on page 14](#) to ensure a successful installation.

Note:

- The installation path for LoadRunner or LoadRunner components cannot contain non-English characters.
- The default installation path is: **C:\Program Files (x86)\Micro Focus\LoadRunner**

8. After the installation is complete, you can choose to install Network Virtualization (NV).

In the setup wizard, select:

- **Typical mode** for an automatic installation.
- **Custom mode** to change the installation folder, data folder, and the port.

For more details, see the installation section of the [Network Virtualization for LoadRunner Help](#) (select the relevant version).

9. If there is a patch available for the installed version:
- a. Run the patch installation file provided with the installation package.
 - b. Follow the onscreen installation and deployment instructions.

Note:

- To repair the installation, run the **setup.exe** file located in the root directory of the LoadRunner installation package, select **LoadRunner Professional 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 26](#).
- For a list of the components that were registered during setup, such as **DLL** and **OCX** files, see the **RegisteredComponents_Micro Focus LoadRunner.txt** file in the **build_info** folder of the installation.

Install LoadRunner Professional silently

A *silent installation* is an installation that is performed 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 20](#).

Note:

- Before you install LoadRunner Professional, review the pre-installation information, including the system requirements and prerequisite software, described in ["System requirements and prerequisites" on page 8](#).
- All machines on which you install LoadRunner Professional require administrator privileges.

- 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 Controller. For more details on the LoadRunner Agent, see the [LoadRunner Professional Help Center](#) (select the relevant version).

To perform a silent installation of LoadRunner Professional

1. 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.msi"
```

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

```
REBOOT_IF_NEED=1
```

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

```
NVINSTALL=N
```

- To install a LoadRunner standalone application:

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

- To install additional components:

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

2. If you are installing an [upgrade](#), run the following command:

```
msiexec.exe /update <full path to msp file> [/qn] [/l*vx <full path to log file>]
```

The msp files are located in the installation package.

Installation command line options

You can use the Windows command line to install the full LoadRunner Professional package, standalone applications, and Additional Components using the Wrapper file (Setup.exe) and "Package for the web" files (<PFTW>.exe).

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

Installing the full LoadRunner Professional package from the wrapper file

You can install the full LoadRunner package from the installation wrapper file, **Setup.exe**, located in \runner\<your_language> folder of your LoadRunner installation package. 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	<p>Installs only the prerequisites – does not install any LoadRunner components.</p> <p>By default, the setup program checks that your machine has the required prerequisites, and installs them if necessary, before installing the LoadRunner components.</p>

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=" <i>your_path</i> "	Specifies the location where the application will be installed.

Property name	Description
REBOOT_IF_NEED	1: Reboots the machine after installation, if required. This is recommended if you include the installation of NV (Network Virtualization). 0: Does not reboot the machine after installation. Default: 0
NVINSTALL	Empty string: Excludes the installation of the NV component. Y: Includes the installation of the NV component. Default: Y
INSTALL_NV_MODE	1: Sets the NV installation mode to Typical . 2: Sets the NV installation mode to Custom . Default: Typical
INSTALL_DIR="your_path"	Specifies a path for the installation.
START_LGA	Empty string: Instructs the machine not to start the load generator after installation. 1: Instructs the machine to start the load generator after installation. Default: 1
IS_RUNAS_SERVICE	0: Runs the load generator's agent as a process. 1: Runs the load generator's agent as a service. Default: 1
IMPROVEMENTPROGRAM	0: Disables the VuGen Improvement Program. 1: Enables the VuGen Improvement Program. 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_NEED="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 under 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.
/f	Specifies the path of a temporary folder for file extraction. For example: /f "c:\my_temp_folder" 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. 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 starts the load generator agent after the installation:

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

Deploy Dockerized load generator on Windows

This section describes how to run a Dockerized load generator on a Windows platform.

Docker is a platform that allows you to develop, ship, and run applications via a container. For details regarding Docker, see <https://docs.docker.com>.

Note:

- The load generator for Docker on Windows feature is provided as a tech preview version.
- Supported protocols: Web - HTTP/HTML, Web Services, DevWeb, and Java protocols
- FTP is not fully supported with load generator for Docker on Windows. Passive mode FTP is supported, but Active mode FTP is not.

Prerequisites

- Install Docker on the target machine, along with its dependencies, and set up the target machine environment as required. Currently, only the 64-bit version is supported. For installation details, see <https://docs.docker.com/install/>.
- Pull the Windows load generator Docker image (tech preview version) from the Docker hub,

[Windows Dockerized Load Generator](https://hub.docker.com/r/performance-testing/load_generator_windows/) (https://hub.docker.com/r/performance-testing/load_generator_windows/), using the following command and appropriate **<tag version number>**, for example, 20.00:

```
docker pull performance-testing/load_generator_windows:<tag version number>
```

Run a Dockerized load generator using the predefined image

Use the ready-to-use image to run a load generator on Docker for Windows.

Note: If you need customization for your container, for example, for Java or to run under a specific user, see ["Run a Dockerized load generator using a custom image" below](#).

To run a Dockerized load generator:

Run the load generator container using the following command:

```
docker run -id -p <host_port>:54345 performance-testing/load_generator_windows:<tag version number>
```

Note: Check that the **<host_port>** on the machine is available and allows incoming requests. You will specify this port on the Controller side when connecting to this load generator.

Run a Dockerized load generator using a custom image

If your environment requires customized settings for running the container, you can create a Dockerfile to build a custom image for Docker on Windows.

Examples for custom images:

- To use a specific user account for the processes under which the Vusers are running, to provide support for accessing network resources like script parameter files. After running, the container should be able to verify the user.
- To run Java protocols on Windows load generator containers.
- To define environment variables for proxy server host and port.

To run a custom Dockerized load generator:

1. Create a new folder, and within it create a file named **dockerfile**. Paste the following **FROM** line into the file, using the appropriate LoadRunner Professional version for the **<tag version number>**, and

add the relevant customization lines:

```
FROM performancetesting/load_generator_windows:<tag version number>  
<Customization lines>
```

For customization examples, see ["Examples of customized content for Dockerfiles" below](#)



Tip: For information on commands that can be used in Docker files, see <https://docs.docker.com/engine/reference/builder/>.

2. Save the Dockerfile.
3. Open a command line at the **dockerfile** folder path and run the following command, using the name you want for your custom image:

```
docker build -t <custom image name> .
```

4. Create a container for each load generator you want to use, by running the following command (or use any Docker orchestrator tool for running containers):

```
docker run -id -p <host_port>:54345 <custom image name>
```

If the custom image in step 3 was built with a tag then include it in the command:

```
docker run -id -p <host_port>:54345 <custom image name>:<tag version number>
```



Note: Check that the <host_port> on the machine is available and allows incoming requests. You will specify this port on the Controller side when connecting to this load generator.

Examples of customized content for Dockerfiles

Example for Vusers under a specified user account

The following gives an example of dockerfile content for running the Vusers under a specified user account with network access to shared locations. Replace the values between <> with credentials for a valid user account in your environment, with network access to the shared resources.



Example:

```
#escape=`  
FROM performancetesting/load_generator_windows:<tag version number>  
RUN c:\LG\launch_service\bin\magentservice.exe -remove  
RUN c:\LG\launch_service\bin\magentservice -install <domain>\<user name>
```




<password>

Example for running Java protocols

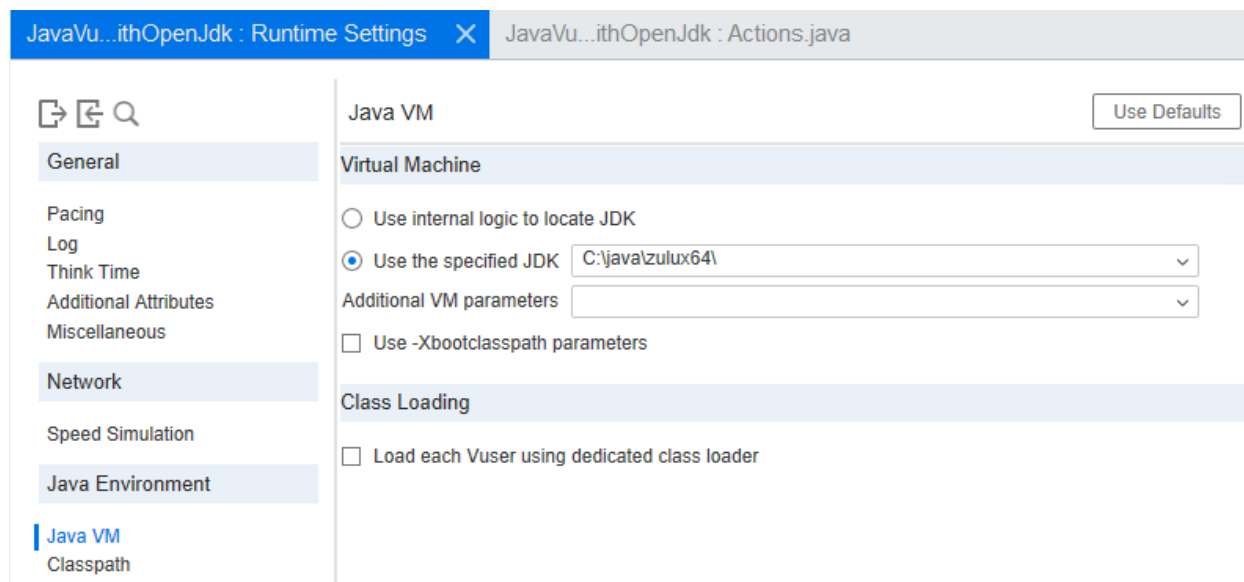
The following gives an example of dockerfile content to run Java protocols:



Example:

```
#escape=`  
FROM performancetesting/load_generator_windows:<tag version number>  
COPY .\<folder contains JDK> <target path in the container>
```

The path to the target JDK directory defined in the **COPY** line for the **<target path in the container>** must also be added to the **Java VM** runtime settings page:



Note: For Java 64-bit protocol testing, include the following command line in the dockerfile, in order to add the path to the **bin** folder for the JDK 64-bit to the machine PATH environment variable:

```
RUN powershell [Environment]::SetEnvironmentVariable(\"Path\", $env:Path +  
\";\<target JDK path in the container>\bin\", [EnvironmentVariableTarget]::Machine)
```

After running the load generator containers

Add the load generators containers to scenarios. For details, see [Configure Dockerized Load Generators](#) in the LoadRunner Professional Help Center.

Tips and guidelines

- Dockerized load generators, run from the predefined image, are not supported when running over a firewall.
- Use `docker ps` to list the containers that are running.
- To stop the load generator service:
 - Use `docker stop <load generator container name or ID>` if you want to reuse the same load generator.
 - Use `docker rm -f <load generator container name or ID>` in order to remove the load generator container.
- To access the host network directly, use `--net=host` in place of `-p <host_port>:54345`. We recommend you use this flag if the AUT generates a lot of network activity.

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:
 - From the Windows Start menu, go to, **Micro Focus > LoadRunner > Tools > Agent Runtime Settings Configuration**.
 - 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 language packs enable you to view the LoadRunner user interface in your local language. You install the language pack for the relevant LoadRunner component: LoadRunner full, VuGen standalone, or Analysis standalone from the LoadRunner installation package.

For a list of supported languages, see the [System Requirements](#).

The language packs are supported for native non-English operating systems only.

Important: The native language of the operating system must be the same as the language pack you are installing. For example, the Spanish language pack must be installed on a machine with a native Spanish operating system.

To install a language pack:

1. Make sure that LoadRunner English is already installed.
2. In the root folder of the LoadRunner installation package, run **setup.exe**. The LoadRunner installation program begins and displays the installation options.
3. Click **Language Packs**. The Language Packs folder in the installation package opens.
4. Navigate to the folder for the language and component you want to install and run the installation file. For example, to install the French language pack on a VuGen standalone machine, the path is **..\Language Packs\French\VugenSA\Vugen_FRA.msp**. Follow the online instructions.

Installing the load generator on Linux

LoadRunner Professional uses load generators to run Vusers. There are two versions of the LoadRunner Professional 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 Professional on Windows" on page 12](#).

Note:

- You can install the Linux load generator using the installer (UI based or silent), as described in this section, or through a Docker container—for more information, see ["Deploy Dockerized load generators on Linux" on page 33](#).
- For troubleshooting information, see ["Troubleshoot the load generator Linux installation" on page 43](#).

This chapter includes:

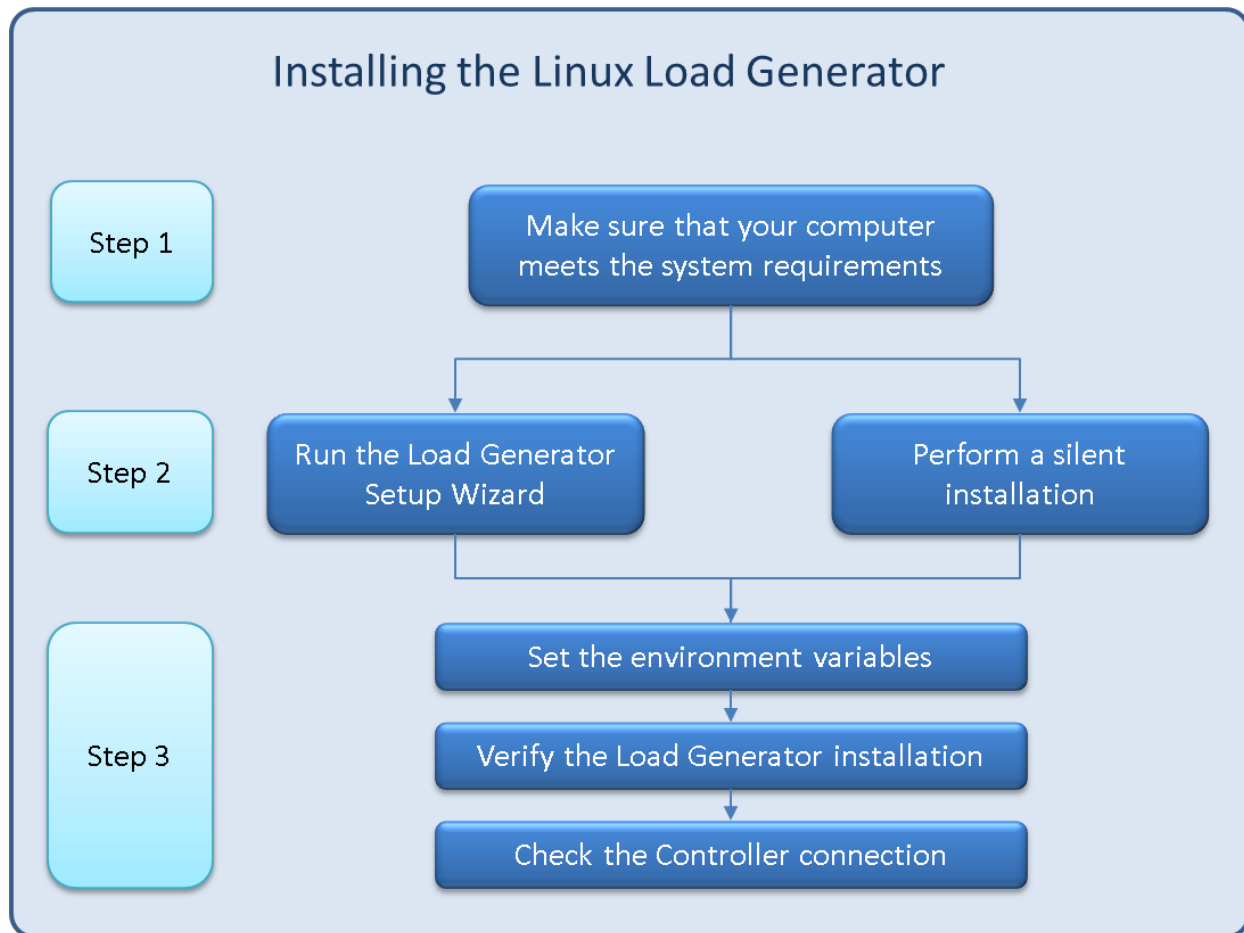
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• Improve load generator performance	40
• Uninstall the load generator from a Linux machine	41
• Troubleshoot the load generator Linux installation	43

Installation workflow

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

The load generator can be installed on a local Linux machine, or provisioned in a cloud account. See [Load generators on the cloud](#) in the LoadRunner Professional Help Center for information on managing load generators on the cloud.

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 and prerequisites" on page 8](#).

If you plan to install Network Virtualization, make sure that your system meets the requirements, as described in the [Network Virtualization for LoadRunner Help](#) (select the relevant version), or the NV installation guide in the **\Additional Components\Network Virtualization** folder of your LoadRunner installation package.

Note: To replay ODBC Protocol scripts on Linux machines, unixODBC v.2.3.1 or higher is required.

2. Run the setup

Note:

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

- If load generator version 12.55 or earlier is installed, you must first uninstall it. For details, see ["Uninstall load generator 12.55 or earlier" on page 42](#).

- **Wizard installation:** Start the setup using the Load Generator Setup Wizard. For more information, see ["Install a load generator on Linux with the Setup wizard" below](#).
- **Silent installation:** To perform a silent installation, see ["Silent Load Generator Installations on Linux" on page 32](#).

Note: The load generator installation on Linux includes OpenJDK 8, 32-bit .

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 36](#).

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 Setup wizard..

Note:

To perform the installation through a Docker container, see ["Deploy Dockerized load generators on Linux" on page 33](#).

To perform a silent installation, see ["Silent Load Generator Installations on Linux" on page 32](#).

This section includes:

- ["Before you start" below](#)
- ["Run the installation wizard" on the next page](#)

Before you start

- 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 the section about creating and installing digital certificates in the [LoadRunner Professional Help Center](#) (select the relevant version).

For more information on working with certificates in LoadRunner Professional, see the section about configuring client-server authentication in the [LoadRunner Professional Help Center](#).

Run the installation wizard

To install the load generator:

1. Switch to super user.
2. If Load Generator version 12.55 or earlier is installed on the machine, you must uninstall it manually. For details, see ["Uninstall load generator 12.55 or earlier" on page 42](#).

If you do not uninstall the load generator, you will get an error during the installation.

Tip: If Load Generator 12.56 or later is installed, the setup wizard uninstalls it during the installation process, then reinstalls it.

3. Change directory to `/<path_to_installer_dvd>/load_generator_linux_x64/`.
4. Launch the setup wizard:

For:	Type:
[sh and bash shells]	source ./installer.sh
[csh and tcsh shells]	source ./installer.csh
If the source command is not supported by the current shell, use the "dot" command.	For example: . ./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 36](#).

The Load Generator Setup Wizard checks that the required prerequisite software is installed on the computer. If any prerequisite software is missing, a message is displayed, and the setup wizard aborts. Install the required package. Then rerun the setup wizard.

5. Follow the online instructions to install the load generator. For more help during installation, see

["Troubleshoot the load generator Linux installation" on page 43.](#)

Note: The default installation path is: `/opt/MF/MF_LoadGenerator/_MF_LoadGenerator_Installation`

6. Exit super user or switch to another user.
7. Configure your environment as described in ["Configure the Linux environment" on page 36.](#)

Silent Load Generator Installations on Linux

This section describes how to perform a silent installation of the load generator on a Linux machine.

Note: You must have super user privileges.

To perform a silent installation of the load generator:

1. If a load generator is installed on the machine, you must first uninstall it—otherwise the silent installation will fail. To uninstall the load generator, see ["Uninstall the load generator from a Linux machine" on page 41.](#)
2. Change directory to `/<path_to_installer_dvd>/load_generator_linux_x64/`.
3. Run the following command to silently 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 page 36.](#)

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 43.](#)

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
```


Deploy Dockerized load generators on Linux

This section describes how to run a Dockerized load generator on a Linux distribution.

Docker is a platform that allows you to develop, ship, and run applications via a container. For details regarding Docker, see <https://docs.docker.com>.

Note: Supported protocols: Web - HTTP/HTML and DevWeb

Prerequisites

- Install Docker on the target machine, along with its dependencies, and set up the target machine environment as required. Currently, only the 64-bit version is supported. For installation details, see <https://docs.docker.com/install/>.
- Obtain the predefined load generator Docker image. Pull from the Docker hub, [Linux Dockerized Load Generator](https://hub.docker.com/r/performance-testing/load_generator_linux/) (https://hub.docker.com/r/performance-testing/load_generator_linux/), using the following command and appropriate **<tag version number>**, for example, 20.00:

```
docker pull performance-testing/load_generator_linux:<tag version number>
```

Run a Dockerized load generator using the predefined image

Use the ready-to-use image to run a load generator on Docker for Linux.

Note: If you need customization for your container, for example, for proxy servers, see ["Run a Dockerized load generator using a custom image" on the next page](#).

To run a Dockerized load generator:

Run the load generator container using the following command:

```
docker run -id -p <host_port>:54345 performance-testing/load_generator_
linux:<tag version number>
```

Note: Check that the **<host_port>** on the Linux machine is available and allows incoming requests. You will specify this port on the Controller side when connecting to this load generator.

Example using SSH

The following gives a simple C# code example for running multiple load generator containers using SSH. There are container orchestrator tools which do the same, for example, Kubernetes, OpenShift, Docker Swarm, and more.

```
using (var client = new SshClient(dockerHost, dockerHostUserName, dockerHostPasswd))
{
    client.Connect();
    for (int i = 0; i < numOfContainers; i++)
    {
        string command = "docker run -id -p " + lgInitialPort + i + ":54345
performancetesting/load_generator_linux:<tag version number>";
        var terminal = client.RunCommand(command);
        if (terminal.ExitStatus != 0)
        {
            throw new Exception("Failed to create new Docker container");
        }
        Console.WriteLine("Docker LG with external port" + lgInitialPort + i + "created.");
    }
    client.Disconnect();
}
```

Run a Dockerized load generator using a custom image

If your environment requires customized settings for running the container, for example for proxy servers, you can create a Dockerfile to build a custom image.

Note: Another alternative for customized settings: Start the container; once it is running, set up the load generator environment variables, then start the load generator manually inside the container.

To run a custom Dockerized load generator:

1. Create a new folder, and within it create a file named **dockerfile**. Paste the **FROM** line, plus the required customization lines, into the file, using the appropriate LoadRunner Professional version for the **<tag version number>**:

Note: This customization example is for proxy: It defines an environment variable for the proxy server host and port in the target image.

```
FROM performancetesting/load_generator_linux:<tag version number>
ENV http_proxy http://my_proxy_name:port
```

Note: The above customization example is for a proxy. It defines an environment variable for the proxy server host and port in the target image.

2. Save the Dockerfile.
3. Open a command line at the **dockerfile** folder path and run the following command, using the name you want for your custom image:

```
docker build -t <custom image name> .
```

4. Create a container for each load generator you want to use, by running the following command:

```
docker run -id -p <host_port>:54345 <custom image name>
```

If the custom image in step 3 was built with a tag then include it in the command:

```
docker run -id -p <host_port>:54345 <custom image name>:<tag version number>
```

Note: Check that the <host_port> on the Linux machine is available and allows incoming requests. You will specify this port on the Controller side when connecting to this load generator.

After running the load generator containers

Add the load generators containers to scenarios. For details, see [Configure Dockerized Load Generators](#) in the LoadRunner Professional Help Center.

Tips and guidelines

- Dockerized load generators, run from the predefined image, are not supported when running over a firewall. (Workaround for advanced users: You can develop your own Docker image with MI Listener support.)
- Use `docker ps` to list the containers that are running.
- To stop the load generator service:
 - Use `docker stop <load generator container name or ID>` if you want to reuse the same load generator.
 - Use `docker rm -f <load generator container name or ID>` in order to remove the load generator container.
- 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 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 the background. To access the container again, use the `docker attach container_id` command.
- To access the host network directly, use `--net=host` in place of `-p <host_port>:54345`. We recommend you use this flag if the AUT generates a lot of network activity.

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" below](#).

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 the next page](#).

3. Start the load generator.

```
.cd /opt/MF/MF_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 Controller connection" on page 39](#).

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 root folder.
- **PATH.** The location of the Linux load generator **bin** directory.

- **PRODUCT_DIR.** The location of the Linux load generator root folder.

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 43](#) 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 root folder is returned, then the environment variables are correctly set for current shell. If the name of the load generator root 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 root>/env.sh
```

- C Shell users:

```
source <Load Generator root>/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" on the next page](#).

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**

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" on the previous page](#).



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 root>/bin** folder, run the following command:

```
./verify_generator
```

For example:

```
/opt/MF/MF_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 Controller connection

If LoadRunner Professional 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 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 Controller is included in the list of machines. If it is not listed, add it to the list.

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

Connecting to a Linux load generator without using rsh

You can configure 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 root>/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 **<LoadRunner 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**.

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](#) 40
- [Increase process entries](#) 41
- [Increase swap space](#) 41

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

This section describes how to uninstall the load generator from a Linux machine.

This section includes:

- ["Uninstall load generator 12.55 or earlier" below](#)
- ["Uninstall load generator 12.56 or later" below](#)

Uninstall load generator 12.55 or earlier

You can uninstall load generator 12.55 or earlier versions using a manual command or silently.

To uninstall load generator version 12.55 or earlier:

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.
5. Uninstall the load generator:

- **Manual uninstall:** run the following command:

```
sh ./Change_HP_LoadGenerator_Installation
```

- **Silent uninstall:** Run the following command:

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

Uninstall load generator 12.56 or later

You can uninstall load generator 12.56 or later using the Setup wizard or a manual command, or silently.

To uninstall load generator version 12.56 or later:

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/MF/MF_LoadGenerator/bin;./m_daemon_setup -kill;su -;
```

3. Change the current directory to the installation directory:

```
cd <path_to_installation_folder>/_MF_LoadGenerator_Installation
```

4. Switch to super user.
5. Uninstall the load generator:
 - **Manual uninstall:** Run the following command:

```
sh ./Change_MF_LoadGenerator_Installation
```

- **Silent uninstall:** Run the following command:

```
sh ./Change_MF_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" below](#)
- ["Error when installing the load generator on a Linux platform" on page 46](#)
- ["Error when running load generator on RedHat Enterprise Linux 5.x with SELinux enabled" on page 46](#)
- ["Environment variables are not unset after uninstalling the load generator" on page 47](#)
- ["Unable to run Vusers on the load generator" on page 47](#)

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/MF/MF_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 MF_LoadGenerator on Wed Jan 30 16:20:10 IST 2019
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/MF/MF_LoadGenerator"
# End comments by InstallAnywhere on Wed Jan 30 16:20:10 IST 2019 2.
# New environment setting added by MF_LoadGenerator on Wed Jan 30 16:20:10 IST 2019
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/MF/MF_LoadGenerator"
# End comments by InstallAnywhere on Wed Jan 30 16:20:10 IST 2019 5.
# New environment setting added by MF_LoadGenerator on Wed Jan 30 16:20:10 IST 2019
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/MF/MF_LoadGenerator/bin:${PATH}"  
  
# End comments by InstallAnywhere on Wed Jan 30 16:20:10 IST 2019 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/MF/MF_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 MF_LoadGenerator on Fri Jan 16 11:14:24 IST 2019  
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/MF/MF_LoadGenerator  
  
export PRODUCT_DIR  
  
# End comments by InstallAnywhere on Fri Jan 16 11:14:24 IST 2019 1.  
  
# New environment setting added by MF_LoadGenerator on Fri Jan 16 11:14:24 IST 2019  
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/MF/MF_LoadGenerator  
  
export M_LROOT  
  
# End comments by InstallAnywhere on Fri Jan 16 11:14:24 IST 2019 4.  
  
# New environment setting added by MF_LoadGenerator on Fri Jan 16 11:14:24 IST 2019  
7.  
  
# The unmodified version of this file is saved in /etc/profile1806316421.  
  
# Do NOT modify these lines; they are used to uninstall.
```

```
PATH="/opt/MF/MF_LoadGenerator/bin:${PATH}"  
  
export PATH  
  
# End comments by InstallAnywhere on Fri Jan 16 11:14:24 IST 2019 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 load generator version 2020 on a Linux machine on which load generator version 2020 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"="MF_LoadGenerator"**.
For example:

```
<product name="MF_LoadGenerator" id="77f695c1-1f0c-11b2-883d-c486a85f6555"  
version="20.00.0.0" copyright="2019" info_url="http://www.microfocus.com" support_  
url="http://www.microfocus.com" location="/opt/MF/MF_LoadGenerator" last_modified="2019-11-  
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/MF/MF_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 38](#).

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).

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