Version 1.0

Load generators over a firewall

All Versions

Installation Guide for OpenText™ Customers

opentext™

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1 Document Purpose and Target Audience

Welcome to the OpenText “Load generators over a firewall - Installation Guide”.

The purpose of this guide is to assist OpenText customers in performing new Windows-based load generators over a firewall setup located in their own networks. These setups are often also referred to as “On-premises Load Generators” (OPLGs).

Note that this guide does not attempt to include all potential setup situations. Instead, it focuses on the process and typical aspects of the OPLG installation.

The target audience of this document is technical personnel of OpenText customers who are involved with operating load tests within OpenText Enterprise Performance Engineering or later and/or installing and maintaining load generators in their own network that are connected to OpenText SaaS environments. The audience typically includes load test specialists, QA lab managers, and QA managers.

This guide now covers all versions, meaning that that version number visible in some screenshots may vary, but the instructions are still valid. Any differences between versions will be mentioned.

2 How to use this guide

The recommended installation procedure consists of five phases to be followed in sequence. This guide provides a chapter for each phase.

“4.1 Prerequisites” lists typical steps of preparation that are required before the actual load generator software can get installed. Performing these is crucial for a successful install later.

“4.2 Adding a load generator to OpenText Enterprise Performance Engineering” describes which pieces of information to give to and which to obtain from OpenText SaaS before the installation can commence.

“4.3 Installation” walks through the actual installation of the load generator, including the latest patches (if available).

“4.4 Configuration” guides though the parameters to be configured on the load generator after installation.

“4.5 Finalizing the Setup” shows the final steps to finish the setup. For any potential troubleshooting at the end of the process, please first refer also to our other document, “Load generators over a firewall - Troubleshooting Guide”.

3 Terminology/Glossary

OneLG

The common load generator installation package for all OpenText Performance Engineering family products.

Standalone Load Generator

This is the OneLG software package initially installed when deploying a load generator over a firewall. Application of the latest patches available for download on your instance might also be required, as described in detail later in this document.

Injector over the Firewall (IOFW) / Load Generator over the Firewall / On-premises Load Generator (OPLG) / Private Load Generator

These are all names for a load generator that is located inside the customer's network, or on a network controlled by the customer, and connected to an OpenText Enterprise Performance Engineering instance for the purpose of performance testing. Most load generators get installed on Windows through the "Standalone Load Generator" setup. They are maintained by customer personnel rather than OpenText personnel. These will be referred to as OPLGs (on-premises LGs) in this document.

Agent Configuration

An application installed on the load generator host that is used to configure the specific load generator. It is typically accessible through:

> "Start / OpenText Performance Engineering / Agent Configuration".

Agent Service (Agent)

A Windows service ("OpenText Performance Engineering Agent Service") that runs on the load generator host to connect it to your OpenText instance. In rare cases, the load generator is alternatively installed as a process instead that needs to be started by a logged in user.

Firewall

In the context of this document, we refer to the firewall(s) in the customer's network that typically separate(s) the load generator hosts from the internet.

MI Listener (MIL)

An MI Listener is a server located in the OpenText network that acts as a proxy to connect the customer's load generators with the OpenText servers. Each host must be configured in the Agent Configuration to point to that MIL (by entering the public DNS name of the MIL into the "MI Listener" field).

4 Start Here

4.1 Prerequisites

Before a successful installation and configuration of load generators over a firewall can take place, it is necessary to follow certain brief steps of preparation as outlined below.

4.1.1 *Determining the location of your load generators*

First, decide on the specific location of the load generator(s) you want to use, based on your testing objectives, network topology, and available hardware.

OpenText hosted Load generators vs. on-premises load generators (OPLGs)

- Both types of load generators can be used simultaneously within an instance, project, or even load test.
- *OpenText hosted Load generators* are hosted by OpenText on AWS and can effectively provide load from outside your network. This type of setup requires that the Application Under Test (AUT) is either directly accessible from the internet, or through the company firewall(s). For questions regarding this, please contact OpenText directly and these types of load generators are not discussed further in this document.
- *On-premises load generators* (OPLGs) reside within your company's network(s) or on networks controlled by your company, and therefore can access the Application Under Test more directly and if often used for intranet applications. The installation process is described in this document.

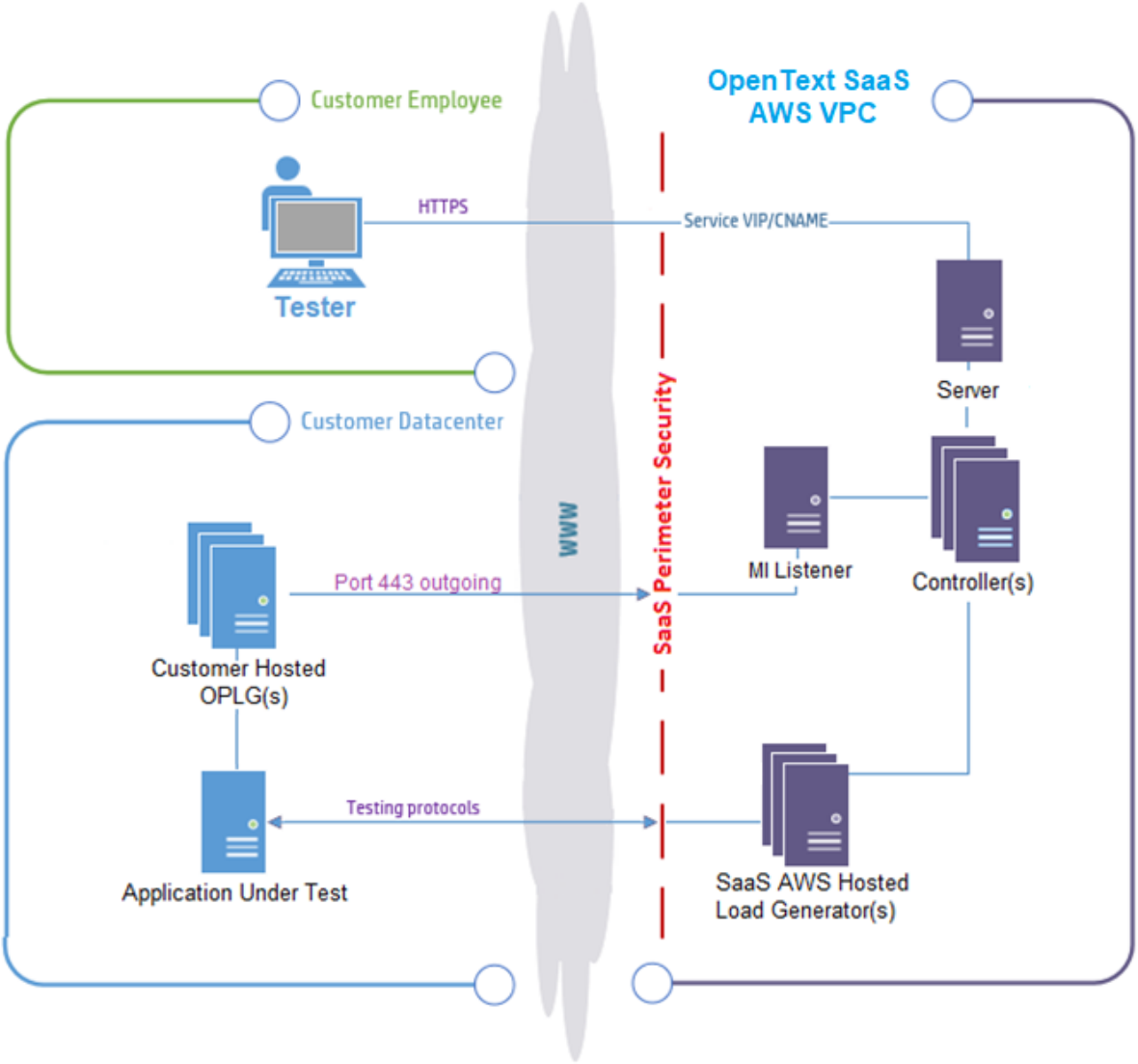
Network requirements between the OPLGs and the AUT

- The Application Under Test (AUT) must be accessible from the OPLGs, either directly in the same network or through firewall(s) inside your company network.

Network requirements between OPLGs and OpenText

- The OPLGs must have *outbound* access to the public OpenText MI Listener DNS name (alternatively, IP address).
- This access is outbound traffic (only) on port 443 through the company firewall **from** the OPLGs **to** the public OpenText MI Listener DNS name.
- **No *inbound* ports need to be opened in the company firewall** from the MI Listener to the load generators, as there will be no incoming traffic from the MI Listener.
- No ports on the OpenText side need to be opened nor configured.
- The public DNS name of the MI Listener can be obtained from OpenText.
- Configuring the necessary firewall rules for the MI Listener based on DNS name is preferred by OpenText over IP-address-based rules.
- While we recommend using direct communication through the firewall to the MI Listener, alternatively a proxy server may be used if required by your network.

- Which method of access is required for your OPLGs depends on the configuration of your network and firewall, to some extent determined by the security policies laid down by your IT organization.
- Hence, **we recommend that you contact your IT department or security team to determine if outbound traffic from the load generator's network/load generator hosts is allowed or can be allowed through the company's firewall on outbound port 443 towards a public DNS name in OpenText SaaS's network, or if proxy access must be used instead and is available**. Note that outbound traffic on port 443 towards specific DNS names/IP addresses is typically permissible in most cases, though sometimes the firewall must be opened first.



4.1.2 *Host hardware, software, and OS requirements*

Decide on the number of load generators and host hardware configuration you will provide, based on your available hardware and the load intensity during your largest planned tests.

The load intensity is influenced by the number of Virtual Users, the scripting protocols in use, and run-time settings, such as pacing and think time.

We recommend dedicating load generator hosts to that purpose only. During a load test, ample availability of system resources including CPU, disk, memory, GDI resources and network bandwidth is crucial. In case of resource shortages introduced by other software running on the load generator host, load bottlenecks may occur that may affect the load generated and the system under test's behavior.

- Do not install any web servers such as IIS or other on the same host.
- Do not install VuGen, Analysis or "Monitor over the Firewall" (MOFW) on the load generator hosts, as this is not supported.

We recommend placing the load generators in a safe zone of your environment so that virus scanning software does not need to run during tests. Such software may severely interfere with the timing and amount of the generated load and the resulting measured response times.

Please refer to the online help for the latest hardware and software system requirements:

https://admhelp.microfocus.com/lre/en/latest/online_help/Content/PDF_only/PDF_PC_Install_Guide.htm

4.1.3 *Downloading the OneLG installer*

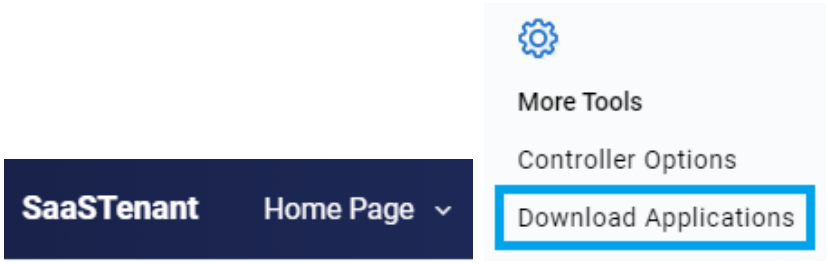
The OneLG installer is available in the download section of your instance. Feel free to contact OpenText at the time of installation to determine if any patches are required.

Important: Do **not** use installers obtained from other sources than your OpenText Enterprise Performance Engineering instance or the OpenText team.

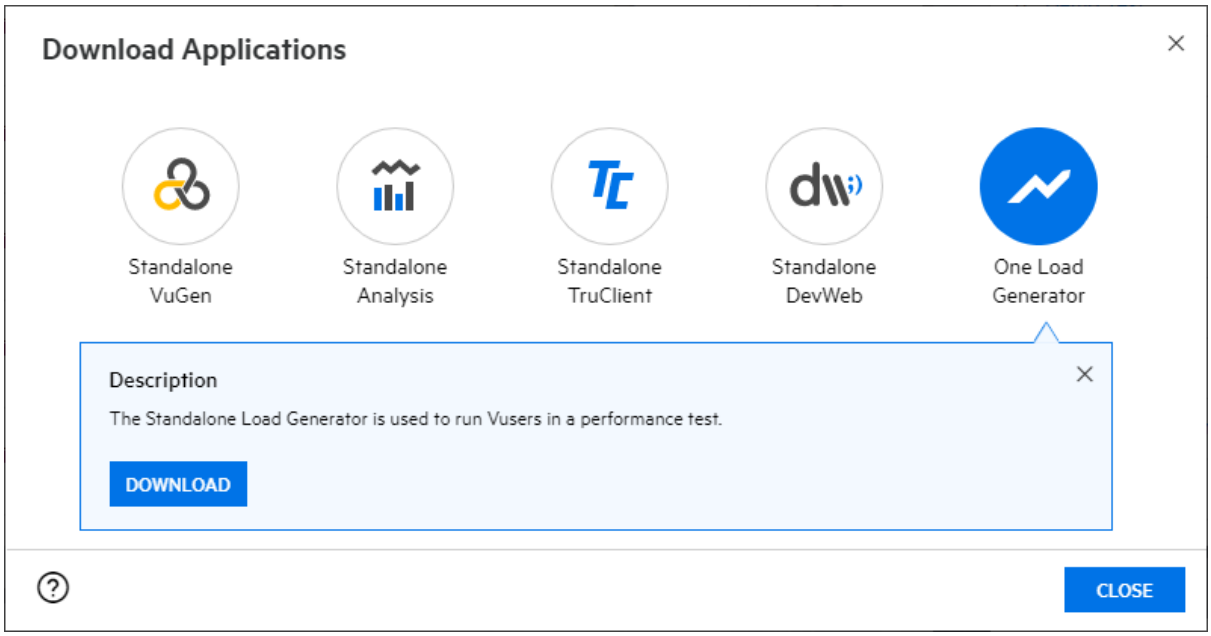
The OneLG installer

This installer can be downloaded directly from inside a project:

- Log into a project using your domain/project and user credential information.
- On the Homepage, select “Download Applications”.



- In the popup window, select “One Load Generator” and click “Download”:



Patch installers

Only install patches that can be found in the “Download Applications” section of your instance.

4.2 Adding a load generator to OpenText Enterprise Performance Engineering

The setup of a load generator over a firewall requires not only the installation and configuration of the load generator itself, as described in the next few chapters, but also to register the load generator within the OpenText Enterprise Performance Engineering instance.

You have two options to perform this step, either registering the load generator in your project yourself, or otherwise requesting registration assistance from OpenText.

Option 1. Registering load generators in a project

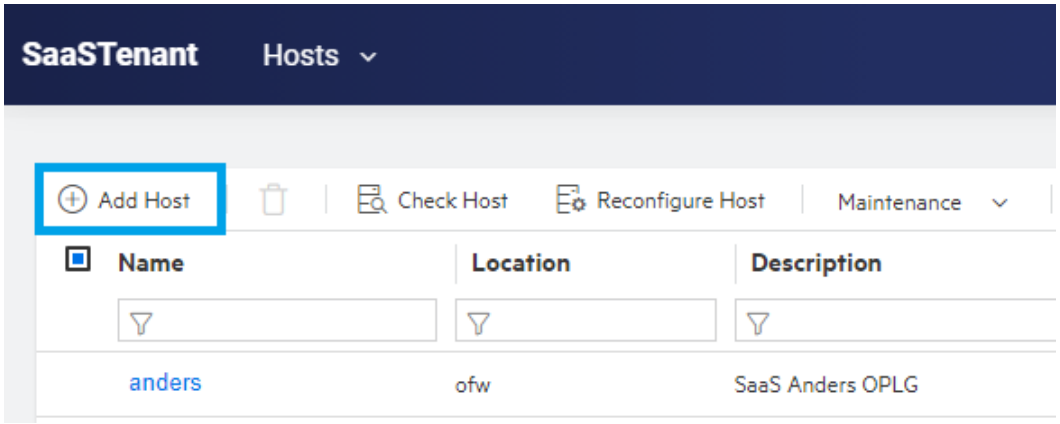
For this do-it-yourself method, the following requirements need to be met.

- You have access to your project as part of the "Performance Tester" group. To validate, check if the "Add Host" button is accessible from the "Hosts" view in the project where you would like to add the OPLG, as in the screenshot below. Otherwise, the button is greyed out.
- Your requirement is to add the load generator only to the pool associated with your project, not into multiple pools. If you have multiple projects that also point to different pools and want to make the load generator available in those pools as well, use option 2.
- The location that the load generator will be associated with is already registered in the Administration.

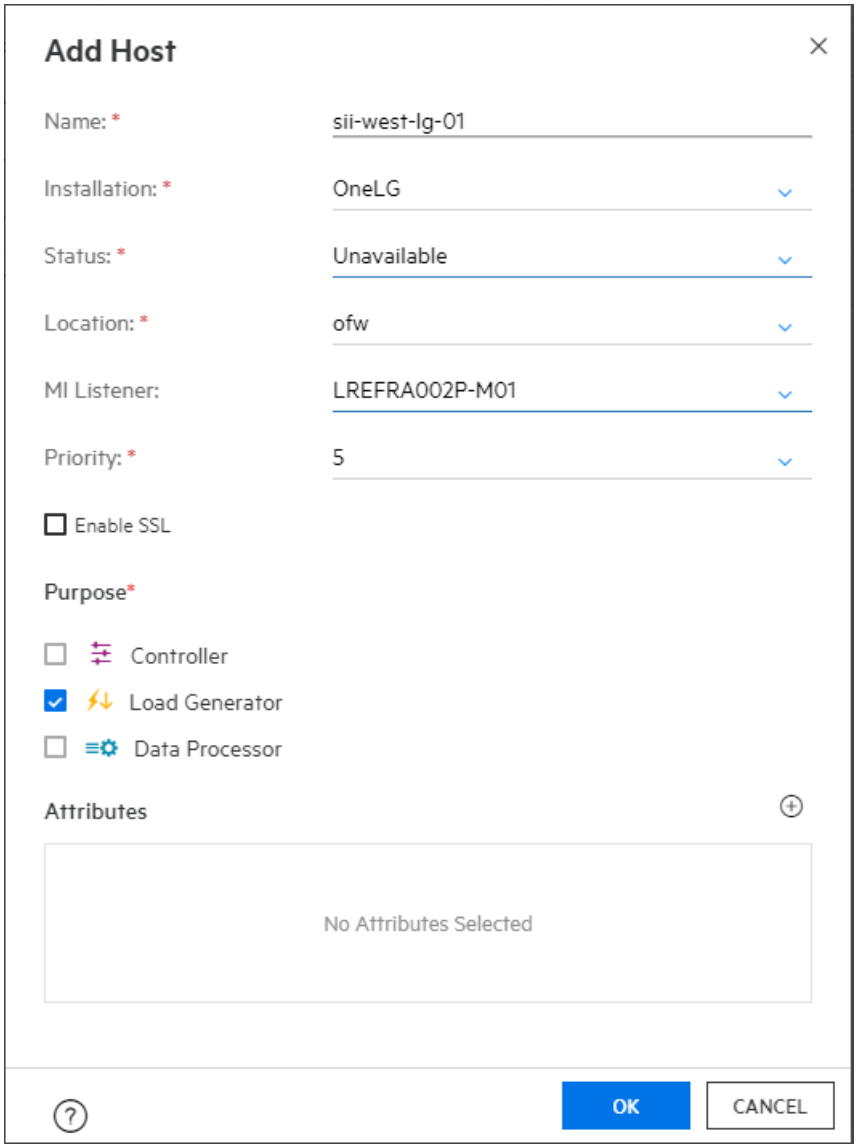
If any of the above conditions do not hold, we recommend opening a support request with OpenText (Option 2 below).

Let us assume that you want to register a load generator in your network named "**`sii-west-lg-01`**" in location "**`ofw`**". Hence, the load generator itself would later be configured with a local machine key of "**`sii-west-lg-01_ofw`**".

To register this load generator in the pool of your project, select "Resources/Hosts" in the menu, and click on "Add Host":



In the "Add Host" popup, as in the screenshot below.



Enter the name of the load generator (without the "`_<location>`" postfix) into the "Name" field, which in our example is "`sii-west-lg-01`".

It is important that the string entered here will exactly match the local machine key that will be entered into the OPLG's configuration upon installation, without the "`_<location>`" postfix.

Select "Installation" as "**OneLG**", and "Status" as "**Unavailable**". This is important, as it would otherwise not be possible to add this registration before the actual installation of the load generator has been successfully completed.

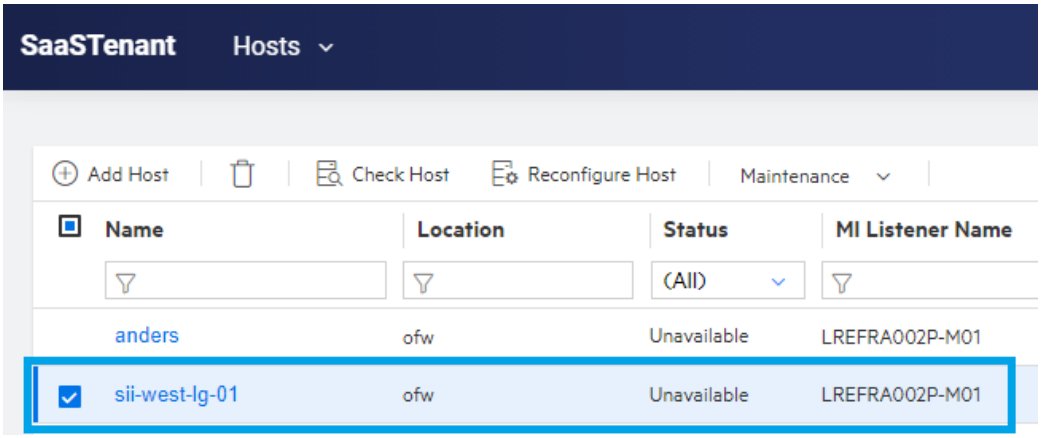
Select the "Location" from the drop-down options. If you cannot find your desired location, request it to be added by OpenText, or use option 2.

Leave the "Enable SSL" tick box unticked. SSL will still be used with this option unticked, but we do not have to install any additional certificates. If additional certificates are to be used, please contact the OpenText support.

Select the “MI Listener” that will be used in the load generator’s Agent Configuration. If there is only one choice, select that one. Note that in case multiple MI Listeners are available, you will have to select the correct one by name. This name is the short name of the MI Listener and may not match the DNS name configured in the Agent Configuration. In this case, contact your Administrator within your organization or your OpenText Customer Success Manager to obtain that piece of information.

Finally, hit “OK”.

The “Hosts” view should now reflect your added load generator in an “Unavailable” state.

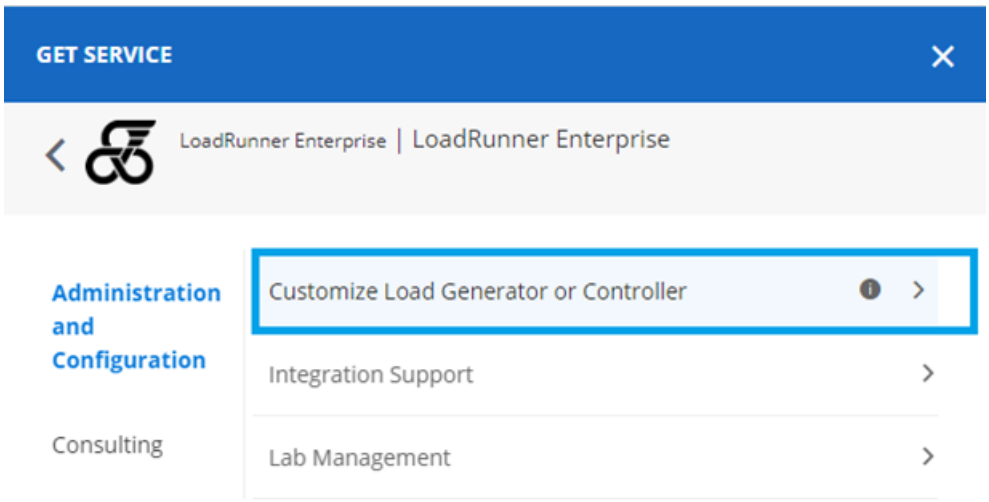


This indicates that the load generator has been registered and is ready for later re-configuration after you have completed its installation and local configuration.

Option 2. File a case with OpenText to register locations and load generators

Alternatively, open a ticket with the OpenText support to register the load generator and location (if needed). To start that process, you will need to exchange certain minimal information with OpenText SaaS. We recommend doing this before the actual installation commences.

Open a new support case through the OpenText portal:



In your request, please provide the following information so that we can process your information with minimal delay:

1. Mention that you request registering load generators over a firewall and how many.
2. The URL of the OpenText Enterprise Performance Engineering instance, the domain and the project (and alternatively the name of the pool in case you have it). With this option, you can specify to add the load generator even to multiple pools (for multiple projects linked to different pools).
3. For each load generator to be registered, the exact spelling of the *unique* name of the load generator, without its location. Please see below for the policy for selecting load generator names.
4. For each load generator to be registered, provide the exact spelling of the location name. Please see below for the policy for selecting location names.

If not sure which load generators in which locations already exist for your project, you can open the "Resources/Hosts" view to display them. The "Name" and "Location" columns refer to load generator name and location for each load generator available to your project.

Policy for selecting valid load generator names

In your request, a valid load generator name must meet the following criteria:

- Only alphabetical and numeric characters as well as dashes '-'.
- We encourage the use of numbers, although the name must start with a letter.
- Load generator names must be unique (across the instance). Hence, the name should be descriptive, contain organizational-specific information and should not be generic ("lg01" or "generator" are not valid examples).
- We recommend starting the name with an abbreviation of the company or project name.

Here some typical examples of valid load generator names for customer "Sample Industries, Inc.":

- "`sii-lg-01`", "`sii-west-lg-01`", "`siinyork-4`"

Policy for selecting valid location names

In your request, you can always opt for SaaS to pick location names for you. If choosing one on your own, a new valid location name must meet the following criteria:

- Only alphabetical characters, numbers, and dashes.
- The location cannot start with a number or a dash.
- The location must be unique hence the location should be descriptive and include organizational-specific information.
- We recommend starting the name with an abbreviation of the company or project name.

Here some typical valid examples of location names for customer "Sample Industries, Inc.":

- "`sii`", "`sampind`", "`siinyork`", "`sii-south`"

What happens after you have filed your request with OpenText SaaS

OpenText SaaS will first validate the information and ask for further detail if necessary. As soon as the information is complete and correct, we will process the request.

If required, we will define unique load generator names and a location name and we will register the location and load generators as necessary.

For each load generator added, we will provide/confirm the precise spelling of the following parameters that you will later need for the configuration step of the process:

- The **MI Listener Name** (see chapter “Configuration”)
- The **Local Machine Key** (see chapter “Configuration”).

Note that the Local Machine Key is composed of: `<lg-name>_<location-name>`

E.g., for four load generators requested in two different locations we may provide:

- `sii-lg-01_siinyork`
- `sii-lg-02_siinyork`
- `sii-lg-03_siisfo`
- `sii-lg-04_siisfo`

NOTE: Immediately after the request is opened, you can immediately proceed to the next step (installation). However, you will need the information above for the configuration later in the process before you can continue with to final phase.

4.3 Installation

The load generator installation on the host is simple, using the base installer obtained in the preparation phase earlier, with any required patches installed on top.

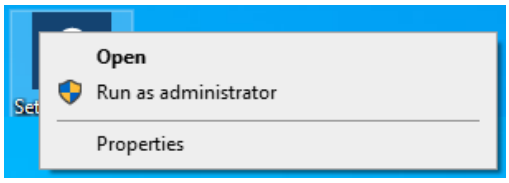
4.3.1 *Checking for pre-installed components*

The installation of the OneLG installer requires that no previous version of the Load Generator software be present, and that no other components such as VuGen, Analysis or MOFW are installed. **None of those components can co-exist on the machine where the Standalone Load Generator is installed.** Hence, as a first step, make sure that no old versions of LoadRunner or Standalone Load Generator are present, and uninstall them in case.

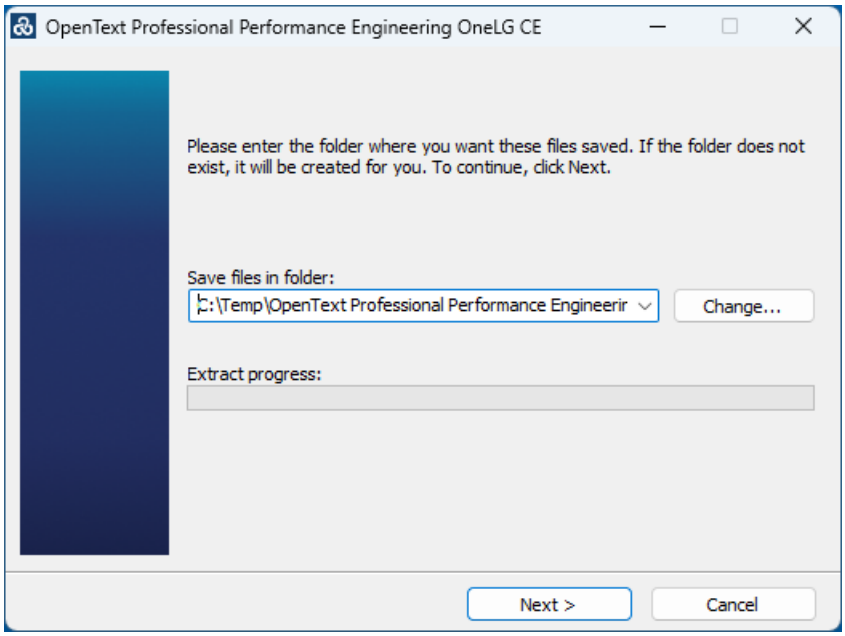
You can check for pre-installed components through the Windows Control Panel/Add or Remove Programs.

4.3.2 *Base installation*

After making sure that no previous load generator software is present, start the installation by running your "SetupOneLG.exe" installer ***using a local or domain administrator login*** *and* ***Run as administrator***:



Accept the default location or select a different one.

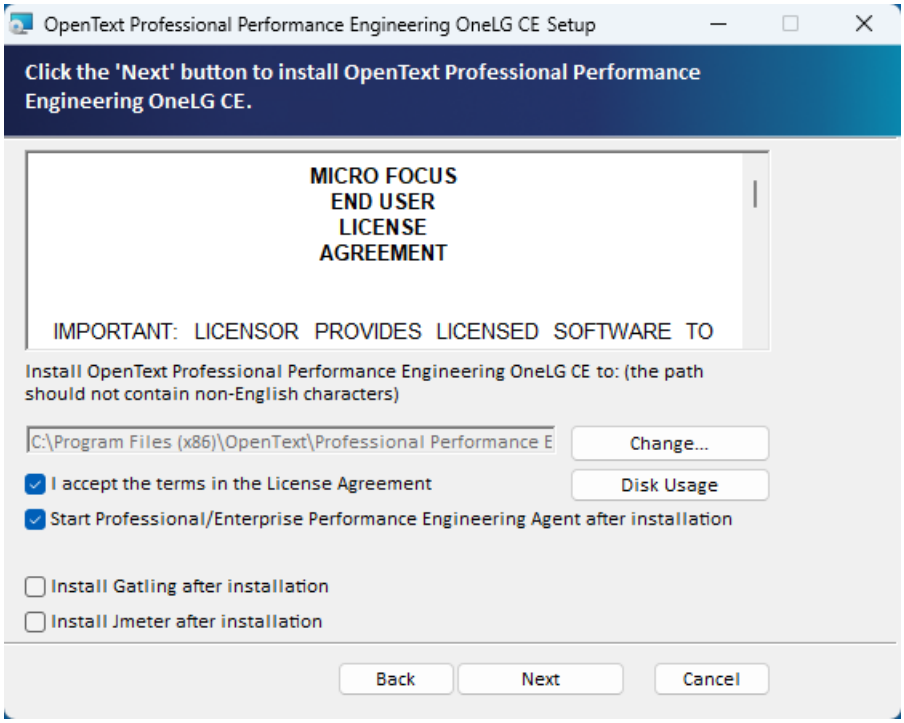


Accept any requests to install prerequisite programs that may have been determined to be missing.

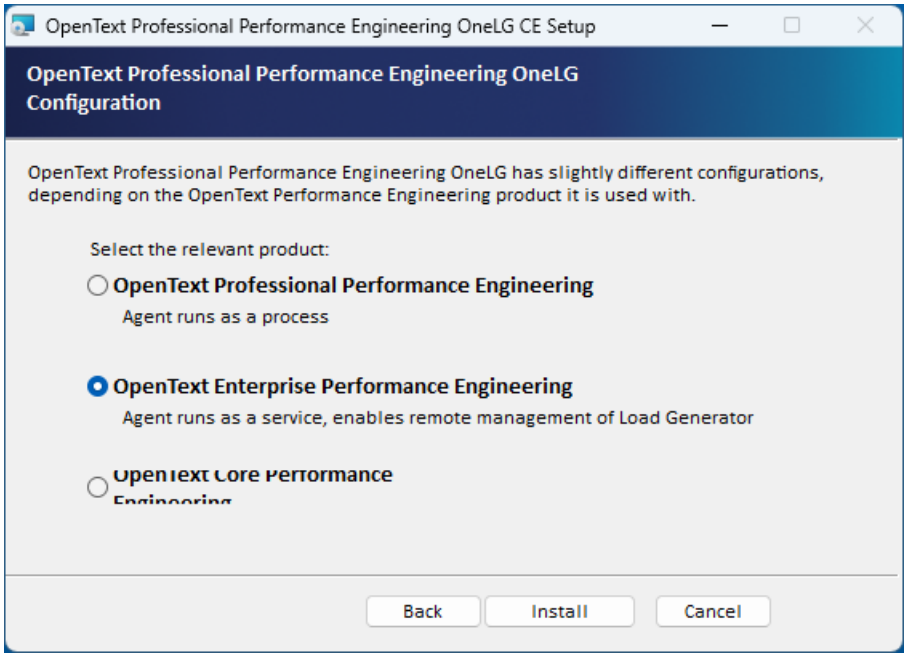
You may also be asked to install missing Windows updates. Such can be obtained either through the Windows Updater or manual download from Microsoft.

Once the prerequisite installation has been completed by the OneLG installer, follow the instructions on the screen and provide the requested information.

Select to accept the license agreement and to “Start Professional / Enterprise Performance Engineering Agent after installation”. Install also any of the other products/protocols if these are to be used with the OPLG.



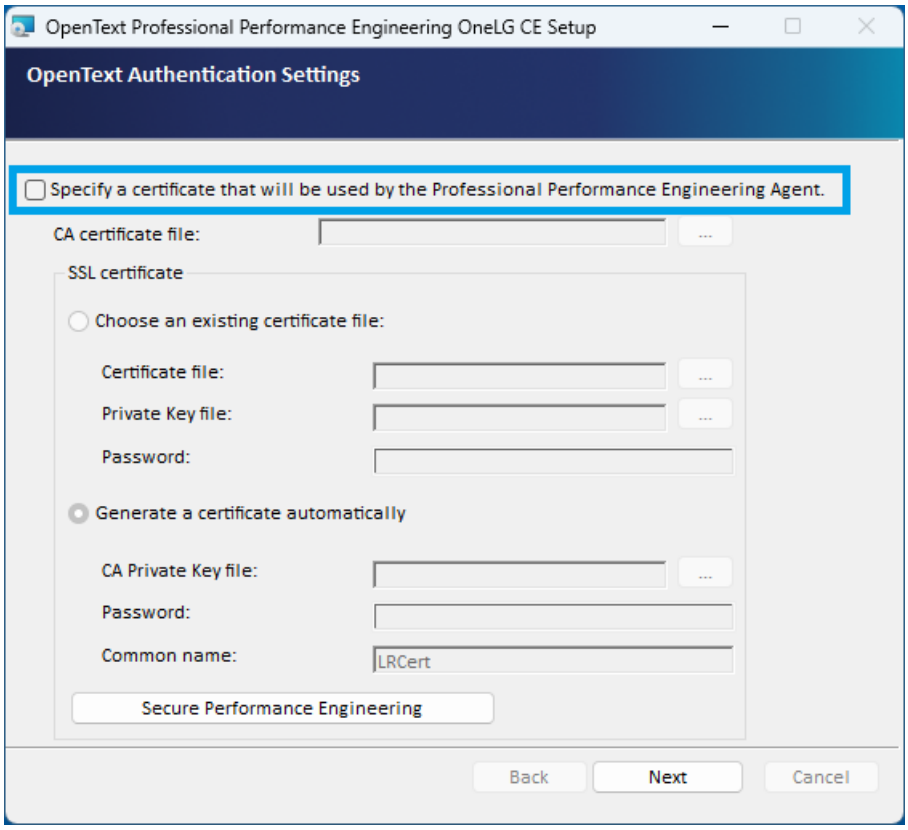
Select the “OpenText Enterprise Performance Engineering” product.



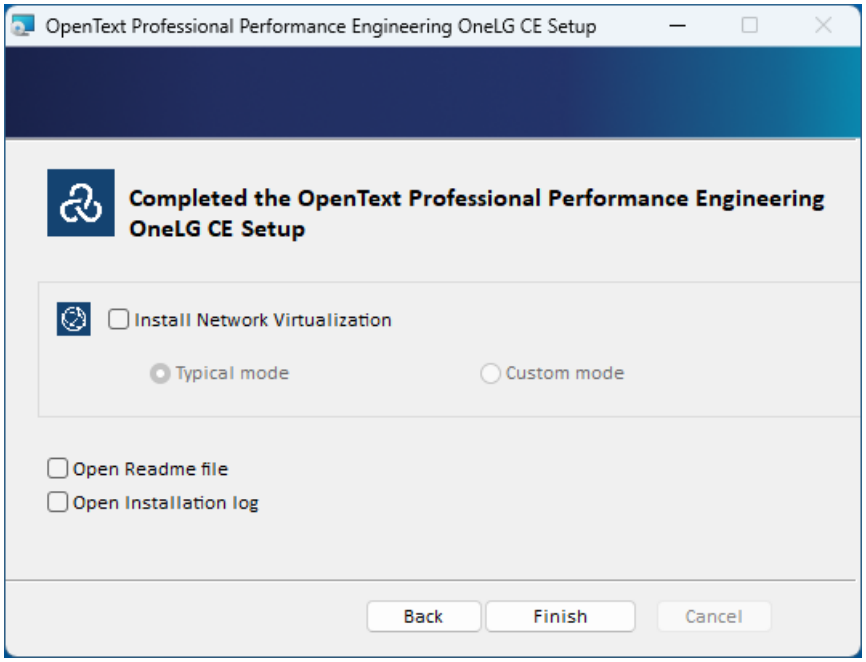
Click “Install” to continue with the installation.

After installation, make sure to **uncheck** the flag “*Specify a certificate that will be used by the Professional Performance Engineering Agent*”, unless you have exchanged certificates with OpenText, then follow the instructions from our operations team.

By unchecking this box, preinstalled default certificates will be used for the SSL communication.



The load generator installation itself is now complete, and a final dialog asks if you want to install the Network virtualization feature on this load generator. Uncheck the “*Install Network Virtualization*” checkbox, unless you want to install the NV feature, and press “Finish”.



You can install the NV feature on your load generator at any time. You can either choose to do so at end of the LG installation process or running the NV installer at a later point.

Note: The NV installer modifies network driver settings on the host it installs on. As a result, if you are logged into that host through RDP/Remote Desktop Client while you perform the NV installation (or a later uninstallation), you may experience a loss of RDP connection during the installation process on some Windows OS versions that will require a reboot of the host at a later point to recover.

4.3.3 *Installation of patches*

Patches are only to be installed if present in the Downloads section of your instance.

4.4 Configuration

4.4.1 *Prerequisite #1: Agent Configuration parameters obtained*

You will need the following information.

The **MI Listener Name**.

- This name is the public DNS name of the specific MI Listener in the OpenText SaaS network that the load generators will communicate with.
- An example: "`almrwc1645p-mil1.saas.microfocus.com`"
- When large amounts of load generators are to be configured, you may have been provided with multiple MI Listener names. During configuration, for each host, please use the MI Listener name we associated specifically with that host only.

- If you chose option 2 (registration through OpenText), the ticket response should contain the MI Listener name. If you chose option 1 (self-registration), you can contact your OpenText Enterprise Performance Engineering administrator or your OpenText Customer Success Manager to obtain the MI Listener name.

The **Local Machine Key**.

- The Local Machine Key is composed of `<lg-name>_<location-name>`
- Examples:
  - `acmelg01_office`
  - `acmelg02_office`
- In case you chose option 1 (self-registration), you would have defined the load generator name yourself. In case of option 2 (support case), we would have provided it to you in our ticket response.

4.4.2 *Prerequisite #2: Outbound Network Access from the LG to the MI Listener*

As mentioned in the prerequisites chapter under "Network requirements between Load Generators and OpenText", load generator hosts must have network access to reach the MI Listener from your network. Network access can be provided through one of two means:

Case A (typical, preferred): Direct communication on port 443

The firewall between load generators and the internet must be open for **outbound communication on port 443 to the MI Listener DNS name** (or, less preferable, IP address).

If the firewall is not open, you need to open a firewall request with your security team.

Note that the firewall rule should not be bidirectional, since there are no incoming connections from the MI Listener. Only outbound connections on port 443 should be allowed.

At this point, make sure to test if the firewall is open from your load generator hosts, using the simple telnet test described in Appendix.

Case B (alternate): Proxy Communication

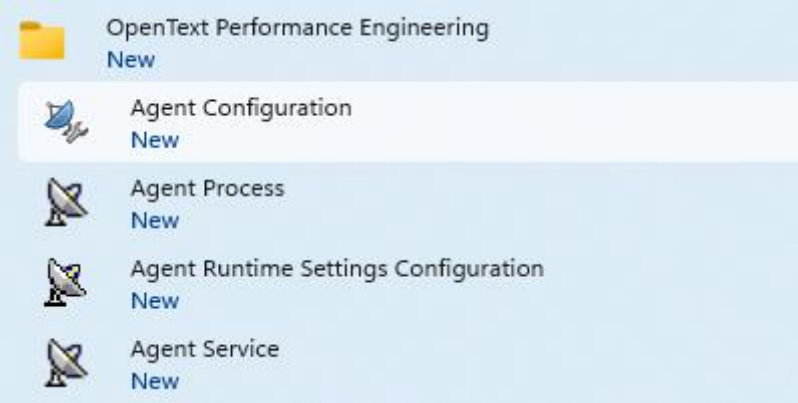
If a proxy server is needed to reach the internet or the MI Listener, please contact your IT or security team to provide proxy configuration details, including the proxy DNS name or IP address, and its port. Proxy credentials may be required as well. Please make sure to mention that this will be used for performance testing, meaning that there might be a lot of traffic passing through it.

Alternatively, you may also log on to the load generator, open a browser and check its settings if a proxy is active and which parameters are used. If a proxy is present in the browser and browsing to the internet works, in most cases you should be able to use the same proxy settings for the load generator configuration as well, but always check with your network team.

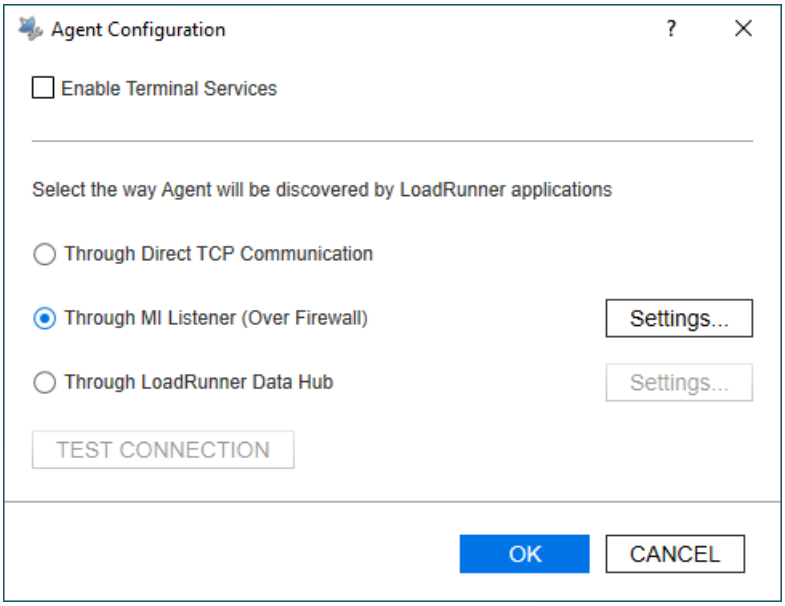
4.4.3 *Agent Configuration*

To configure the agent, start the agent through:

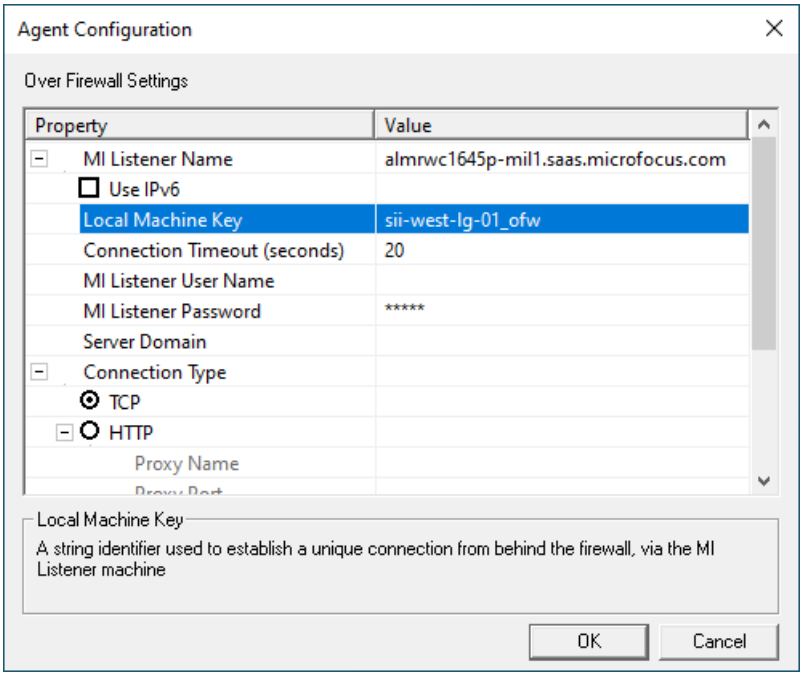
Start button / OpenText Performance Engineering / Agent Configuration



Select the “Through MI Listener (Over Firewall)” checkbox and click Settings:



Enter the MI Listener Name, as provided to you by OpenText, and the Local Machine Key.



In this **example**, the public DNS name of the MI Listener Name is:

```
almrwc1645p-mil1.saas.microfocus.com
```

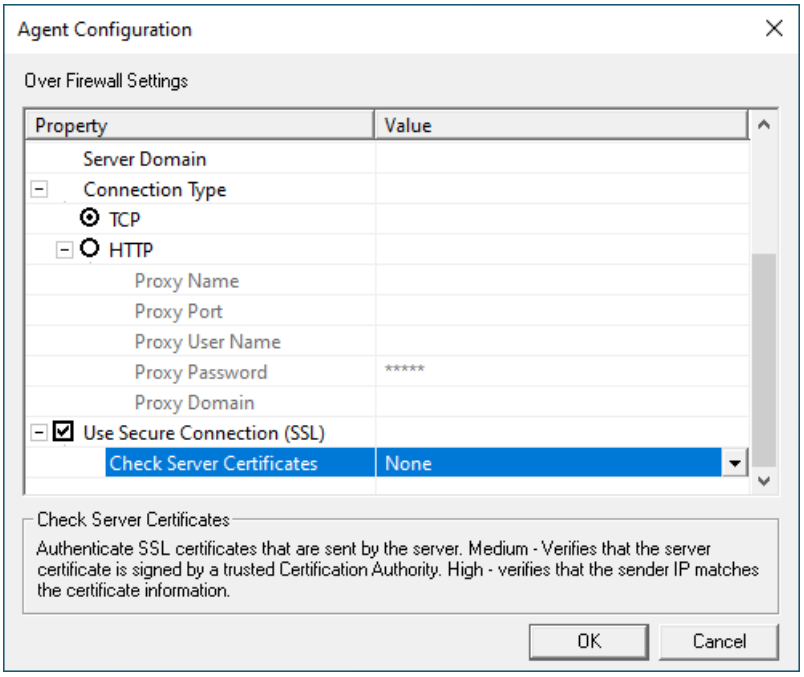
The Local Machine Key is:

```
sii-west-lg-01_ofw
```

Local Machine keys must be spelled in lower case characters exactly as provided, and have the format:

```
<lg-name>_<location-name>
```

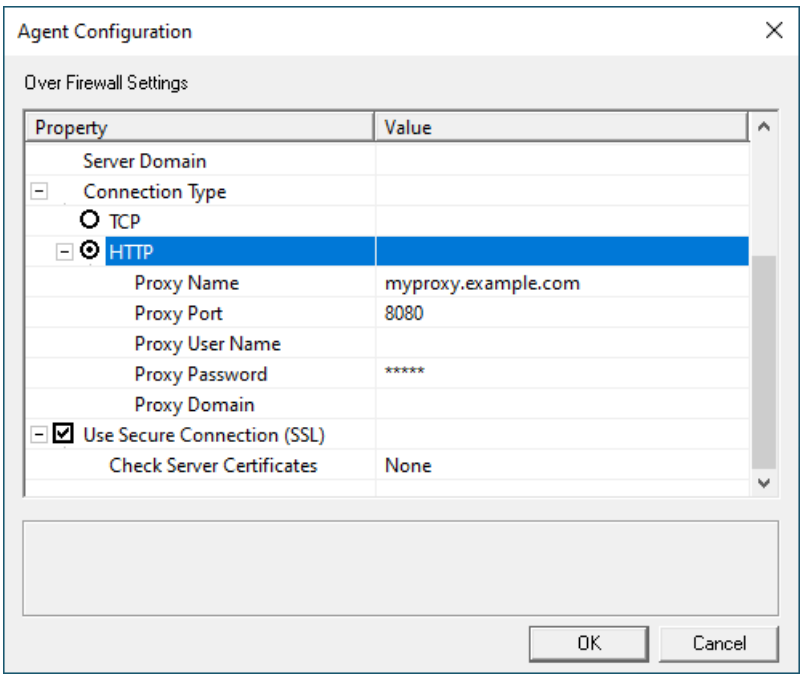
Finally check the "**Use Secure Connection (SSL)**" box to enable SSL between the load generator and the MI Listener but **set the "Check Server Certificates" to "None"**. The latter is due to the certificate is offloaded on the load balancer and not on the MI Listener. It is also possible to not use SSL, so if you run into issues, please try without SSL as well.



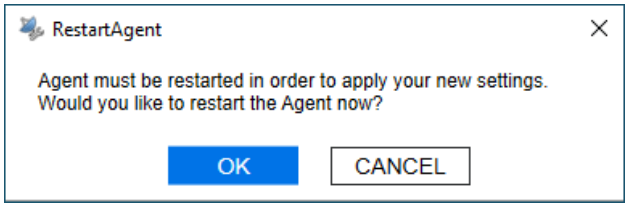
For proxy configurations only (case B above):

Enter the proxy parameters as provided by your IT or security team. This typically includes at least Proxy Name and Proxy Port, sometimes also credential information.

Check also the “Use Secure Connection (SSL)” box and set the “Check Server Certificates” to “None”.



Click “OK” twice and you will be asked to restart the agent:



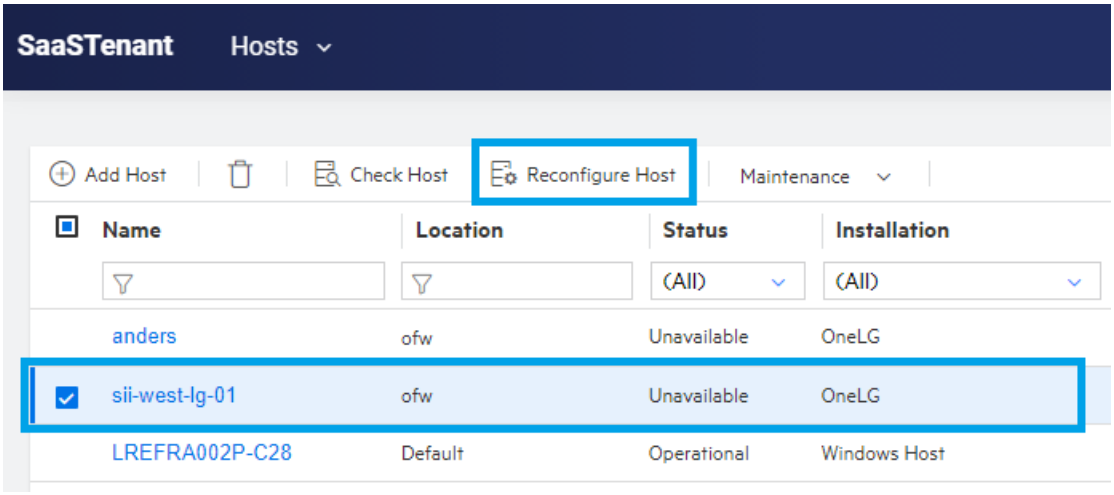
The Agent Configuration is now complete. Please proceed to the next chapter, “Notifying OpenText and Finalizing the Setup”.

4.5 Finalizing the setup

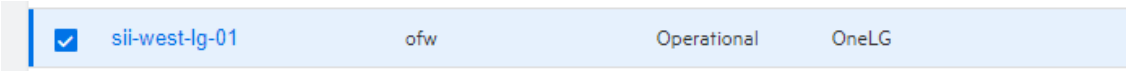
In case you chose option 1 (self-registration)

Go back into the “Hosts” view on your instance and select the line that contains the newly registered host, in our example “`sii-west-lg-01`”.

Click the “Reconfigure Host” button, as marked below, to perform the reconfiguration operation:



Soon after, a dialog should confirm that the load generator is now Operational, hence ready to use.



Should an error message appear, e.g. one indicating that the load generator cannot be reached, then re-attempt the reconfiguration again. If the issue persists, please continue with section “Troubleshooting” below.

In case you chose Option 2 (case with OpenText)

Simply update your support case briefly to notify OpenText that you have completed the load generator installation and configuration at your end and our team will continue to move the load generators into an operational state. We will be notifying you of the outcome through the support case, and in case that the load generators are now in operational state as expected, we will resolve the ticket, completing the process.

Troubleshooting

Please follow the basic troubleshooting instructions outlined in the support case and/or in chapters 1 and 2 of our other document, the “Load generators over a firewall - Troubleshooting Guide”. After the load generators has become operational, please make a note in the support case that that installation succeeded so that we can resolve the case.

Troubleshooting with OpenText

Should the recommended steps in the “Load generators over a firewall - Troubleshooting Guide” not suffice to resolve any technical issues, please inform us through the (still open) support case. Our team will reach out to you to help you resolve the matter directly.

Please add at least the following information to the existing case to ensure fastest possible resolution:

- A short description of the issue, including any observations you find helpful that you may have made while troubleshooting the issue yourself.
- If applicable, which steps from the guide have already been attempted?

Further details on troubleshooting can be found in the “Load generators over a firewall - Troubleshooting Guide”.

Note that during the troubleshooting process, the OpenText engineer may find it necessary to conduct a live remote diagnosis session on the load generators.

5 Appendix

5.1 Configuring the LG Agent as Service or Process

The LG Agent can be run either as service or as a process.

The load generator Agent can be run either as a service or as a process. OpenText recommends running the Agent as a service for most setups, as the Agent becomes ready immediately after the host is started, then idling with minimal system resources.

NOTE: It is crucial that the Agent only runs through one of these two means, not both, at the same time. Otherwise, operational errors will occur.

As a service, the 'OpenText Performance Engineering Agent Service' service runs automatically even if the user does not log in to the system. The user can login to the machine and go to Administrative Tools -> Services -> 'OpenText Performance Engineering Agent Service' to verify or change which user account is running the service, since this might affect the user's rights to pass through proxies. The service should run under administrative privileges, or user "IUSR_METRO".

While installing, make sure to have administrative privileges (domain or local).

As a process, the Agent runs through 'magentproc.exe' from the <LG>\launch_service\bin folder. This requires a user to login to the machine to start this Agent and stay logged in during the use of the load generator. The Agent will run with the same user rights as the logged in user.

After installing the LG Agent, the user can switch the Agent to run as either service or process by performing the following steps.

5.1.1 *To run the LG Agent as a service*

1. Remove the "OpenText Performance Engineering Agent Process" shortcut from the Start -> Program Files -> Startup group or similar, to avoid the process from starting when the computer is rebooted.
2. Launch the command prompt using **Run as Administrator** and go to <LG>\launch_service\bin. (If started erroneously as a non-administrative user, the installed service will not work properly later).
3. Type in "magentservice.exe -install<enter>"
   - Note: If you want to set a different account:
     Type in "magentservice.exe -install <user_domain>\<user_name> <password>"
4. Go to the Window's Services view and change its properties to start it as "Automatic".
5. If you wish to modify the login details after installation of Agent Service, do the following:
   - Go to Start -> Control Panel -> Administrative Tools -> Services and look for the OpenText Performance Engineering Agent Service.
   - Right-click and select Properties->Log On and change the information from there.

5.1.2 *To run the LG Agent as a process*

1. Launch the command prompt using **Run as Administrator** and go to <LG>\launch_service\bin
2. Uninstall OpenText Performance Engineering Agent Service by typing in:
   - magentservice.exe -remove<enter>
3. Verify that the service 'OpenText Performance Engineering Agent Service' is no longer running.
4. Start the LG Agent process by running magentproc.exe from <LG>\launch_service\bin
5. If desired to start the process automatically after login, add a shortcut to the magentproc.exe into the Start -> Program Files -> Startup group.

5.1.3 *To run the LG Agent service under a different account:*

If an installed load generator Agent service runs under incorrect credentials that do not have proper administrative permissions, you can correct this by uninstalling and reinstalling the service:

1. Launch the command prompt using **Run as Administrator** and go to <LG>\launch_service\bin
2. Uninstall OpenText Performance Engineering Agent Service by typing in:
   - magentservice.exe -remove<enter>
3. Type in “magentservice.exe -install <user_domain>\<user_name> <password>”
4. Go to the Window's Services view and change its properties to start it as "Automatic".

5.2 Reinstalling the LG Software

In some cases, it may be required to reinstall the Standalone Load Generator software installation completely, e.g. if the installation got corrupted.

Remember to make a note of or take screenshots of the agent configuration parameters.

Always uninstall the existing Standalone Load Generator software before reinstalling.

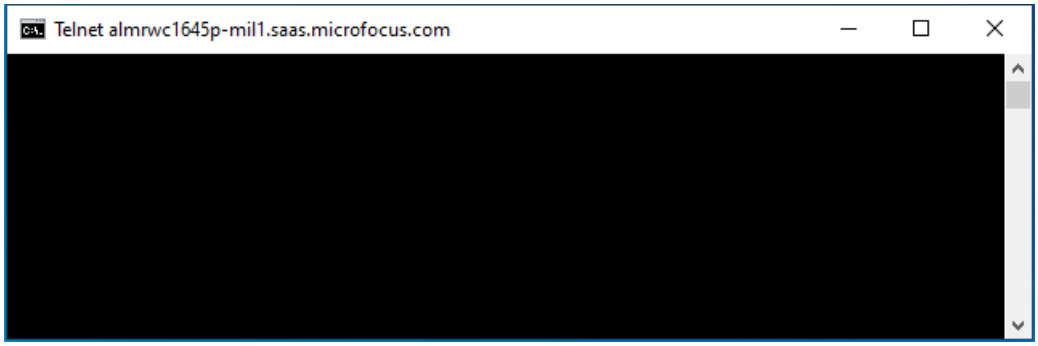
5.3 Test if firewall is open for LG to MIL Communication

Load generators can connect to the MI Listener in OpenText in one of two ways: Either directly through your company's firewall through outbound port 443 or through a proxy in your network.

In many cases, outbound communication on port 443 is permitted already before load generator installation, for example for browsing the internet from the host, though in cases of higher security, even outbound communication may be blocked by default.

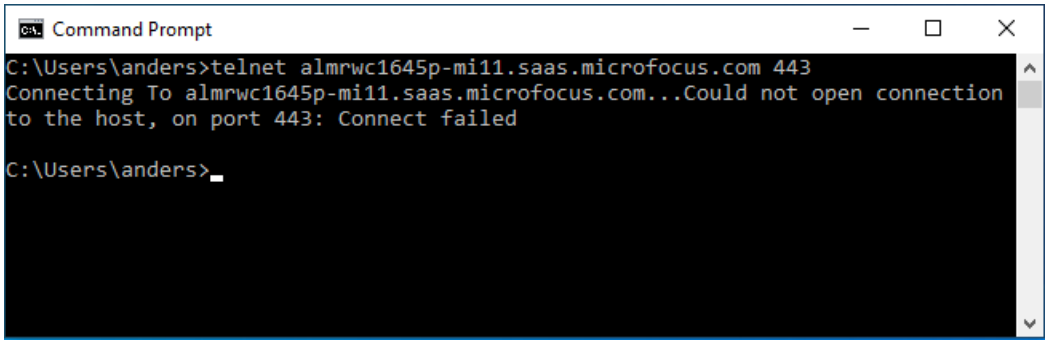
- On the LG host, open a Windows command shell.
- Enter "`telnet <MI Listener DNS name> 443`" and check the response.
  E.g. for MI Listener "almrwc1645p-mil1.saas.microfocus.com", the command is
  `telnet almrwc1645p-mil1.saas.microfocus.com 443`

Case 1: If the response looks like this (blinking cursor on empty window):



Then the firewall is open from the load generator to the MI Listener on port 443, as it needs to be for direct communication. You can click the "X" close icon to close the window and log off.

Case 2: If the response looks like this ("could not open connection …"):



Then the firewall is not open and might have to be opened by your IT Security team (port 443 outgoing to the MI Listener) unless you need to use a proxy configuration instead.

If the telnet test cannot be performed, or if proxy configuration is required:

We recommend asking your IT Security team to check if the firewall is open outgoing from the LG IP address(es) to the MI Listener DNS name (or if given alternatively, the MI Listener IP address) on port 443.

5.4 Load Generator Calibration Test (Advanced)

In case you have to plan a larger scale load generator setup or atypical test setup and need to get the best-possible sizing information for your load generator hardware ahead of time, you may conduct a load generator calibration test. The idea of this test is that you run one of your largest or most challenging load tests in some specific manner, though scaled down to only one model load generator, in order to determine how many Virtual Users per load generator can safely be operated in a stable manner without introducing bias to the load and measured transaction response times.

As a result, you will obtain a reliable account of required load generators for the planned full-scale load test. Feel free to contact OpenText in case you would perform such load generator calibration test and have questions.

Prerequisites

- Only **one** of the load generators need to be ready and set-up with the hardware configuration that you expect to use for all load generators.
- You need the actual load test setup, including the System under Test, scripts, target VUsers, think times/pacing, ramp-up speed, and potentially other runtime settings as planned.

This process determines if a specific amount of load generators of given hardware will be sufficient for the test while only **one** host is present.

Preparation

Our example: We assume that a 36,000 web VUser test with realistic think times needs to be ramped up to peak in 1 hour and held at peak load for 1 hour before stopping the load. We want to determine if ten two-year old quad-core hosts with 16 GB RAM each is up to the task.

- Create a copy of the full-scale load test, and work on that copy.
- Divide the total amount of VUsers in the test by the target number of load generators you want to use in the final test and make that the new total amount. (e.g. 36,000/10=3,600 VUsers)
- Reduce the number of load generators to 1 (selecting only the one you have already available)
- Divide the target ramp-up speed by the target number of load generators (e.g. a 100 VUsers/10 second ramp-up becomes a 10 VUsers/10 second ramp-up). Keep the total ramp-up time and step time the same (in our case, 1 hour of increments every 10 seconds)

Execution

- Open Task Manager in the “Performance” tab on the load generator, so that you can judge CPU utilization as well as memory available during the load test.
- Run the test from beginning to end and observe CPU utilization and physical memory utilization during the ramp-up and peak phase.
- If you see that CPU utilization stays close to 100% for a prolonged period of time, or if physical memory utilization gets higher than 80%, or if the test appears unstable, then your

test has already passed its scalability limit, and you need to stop the test after noting the amount of VUsers in the test when the issues started.

Observations during the run

The load generator setup with the target amount of load generators will only be large enough if:

- No significant number of errors occurs during the test that are unrelated to the Application Under Test
- CPU utilization stays safely below 80% for most of the time during ramp-up phase (short 100% spikes are acceptable but should resolve moments later).
- CPU utilization safely stays below 50% for most of the time during peak phase (short 80% spikes are fine but should resolve moments later).
- Memory utilization throughput peak load should not be higher than 80% of the available *physical* (not virtual) memory at any time.

Tweaking

- *If any of the above criteria is violated for more than 15 seconds at a time*, re-run the test with lower targets (requiring resizing the test parameters accordingly), until the criteria are met. This will result in an increase of the total amount of load generators required for the final setup.
- If CPU utilization almost always stays below 40% during ramp-up and below 25% during peak, and memory utilization is never higher than 40%, you may consider doubling the load per load generator and testing again, effectively shrinking the final amount of load generators needed.
- Keep in mind though that even while a setup close to 80% CPU or memory is possible, often lower utilization is desired, especially if you expect some significant parameters of the test to change later during your load testing process, such as think times, target VUsers, etc. Hence, it may be better to target somewhat lower CPU and memory utilization to allow some headroom for test flexibility.