
Version 1.0

Load generators over a firewall

LRE 2021 R1

Troubleshooting Guide for Micro Focus SaaS Customers



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Contents

1	Document Purpose and Target Audience	4
2	How to use this guide	4
3	Terminology/Glossary	5
4	Start Here: Answering Initial Questions	7
5	Troubleshooting New Setups (based on Q1)	9
5.1	Symptom: The load generator is not listed in the Hosts view in LRE (Q3).....	9
5.2	Symptom: The LG is listed as “Unavailable” or “Non-Operational” in LRE (Q4).....	11
5.3	Symptom: Tests fail to start even though all involved LGs are “Operational” (Q5).....	18
6	Troubleshooting Preexisting Setups (based on Q1)	19
6.1	Symptom: All LGs in one location have fallen into “Non-Operational” status (Q2, Q4).....	19
6.2	Symptom: Some LGs have fallen into “Non-Operational” status, while other LGs on the same location and MI Listener may still be operational (Q2, Q4).....	20
6.3	Symptom: Tests fail to start even though all involved LGs are listed as operational (Q5)...	21
6.4	Symptom: Tests start, though a sudden immediate drop in running VUser count occurs (Q6, rare)	24
7	Contacting Micro Focus SaaS	26
8	Appendix	27
8.1	Configuring the Agent as either Service or Process	27
8.2	Reinstalling the Load Generator Software	28
8.3	Applying the Latest Patch Upgrades.....	28

1 Document Purpose and Target Audience

The “Load generators over a firewall - LRE 2021 R1 Troubleshooting Guide” assists Micro Focus SaaS customers to assess and directly address typical issues in Windows-based load generator over a firewall setup located in their networks. These setups are often also referred to as “On-premises Load Generators” (OPLGs).

Investigated issues in this document include:

- Load generators not listed in the “Resources/Hosts” view.
- Load generators not listed in operational state.
- Load generators that prevent tests to start.
- Load generators crashing during tests.

Note that this guide does not attempt to include all potential root causes for the above symptoms. Instead, it simply isolates typical causes and assists in quickly addressing them.

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

2 How to use this guide

Please use this guide if you plan to troubleshoot an existing load generator over a firewall installation that is not (yet) functioning as expected. For information on how to conduct new installations from scratch, please use the document “Load generators over a firewall - LRE 2021 R1 Installation Guide” instead.

This troubleshooting guide consists of four main chapters:

“**5. Start Here: Answering Initial Questions**” asks a few basic questions about the setup and behavior, helping to triage the later troubleshooting path and to select the next chapter.

“**6. Troubleshooting New Setups**” and “**7. Troubleshooting Preexisting Setups**” each contain subchapters to troubleshoot typical symptoms. Guided by the answers of chapter 5, these chapters are to be read selectively. First select the observed symptoms based on your answers, then proceed to troubleshoot them cause by cause as listed until either the issue is addressed, or SaaS needs to be contacted.

“**8. Contacting Micro Focus SaaS**” describes briefly which information is minimally required by Micro Focus SaaS in case that your specific load generator issue cannot be solved by the measures proposed in this guide. Including sufficient information when filing your case will help speeding up resolution times by allowing us to start the initial investigation of your case more quickly.

3 Terminology/Glossary

LoadRunner Enterprise (LRE)

The new name for Performance Center (PC).

OneLG

The load generator installation package for all LoadRunner family products.

Load Generator Over The Firewall

A load generator that is located inside the customer's network and connected to a Micro Focus SaaS LRE 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 Micro Focus SaaS personnel.

On-premises Load Generator

Another term used for a standalone load generator in the customer environment.

Private Load Generator

Another term used for a standalone load generator in the customer environment.

Host

A machine that acts as a standalone load generator.

Agent Configuration

An application installed on the host that is used to configure the specific load generator. It is typically accessible through "Start/All Programs/Micro Focus/Load Runner/Advanced Settings/Agent Configuration".

Agent Service (Agent)

A Windows service ("LoadRunner Agent Service") that runs on the host to connect it to Micro Focus SaaS LRE. 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 Micro Focus SaaS network that acts as a proxy to connect the customer's load generators with LRE in the Micro Focus SaaS datacenters. 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).

Standalone Load Generator

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

4 Start Here: Answering Initial Questions

Please start with answering the following questions before proceeding to the next chapter.

Q1. Did the load generators (affected by the issue) work successfully in previous load tests (pre-existing setup), or is the issue present since installation (new setup)?

Whereas chapter 6 deals with symptoms and causes typically found in new setups, chapter 7 is dedicated mainly to symptoms in preexisting setups.

Q2. Does the issue occur in all load generators deployed in the same customer network location, or only on some or one of them?

Q3. Are the load generators in question visible in the “Resources/Hosts” list?

To answer this question, log into LRE and if you have sufficient privileges, display the “Resources/Hosts” view without any filters. This view lists each load generator registered for your pool/project, identified in the “Name” and “Location” columns. Check if the load generators having the issue are listed here.

If they are not listed, especially for new setups, they may not have been registered yet in LRE yet, or under a different name. In this case, proceed to chapter 6.1 immediately.

Q4. What value does the “Status” column for the load generators show: “Operational”, “Non-Operational”, or “Unavailable”?

Please note: “Unavailable” load generators are not available for load testing by definition, unless they get made available by either Micro Focus SaaS personnel or applying “Reconfigure Host” successfully, leading LRE to move them into “Operational” or “Non-Operational” state. Newly registered load generators start out as “Unavailable” until marked differently by Micro Focus SaaS when the SaaS portion of the setup is determined complete. To move a host from “Unavailable” state, please contact Micro Focus SaaS to determine the cause for this state and to request to make them operational when possible.

“Non-Operational” load generators typically are or recently have been involved in connectivity issues, as further diagnosed in this document. In this state, they cannot be used in load tests. Load generators also can be non-operational by design after a new, previously “Unavailable” load generator has been put into “non-operational” by using “Reconfigure Host”.

“Operational” load generators are listed as available for load tests. However, they may still become non-operational in some cases when attempting to start a test unsuccessfully. Such cases include e.g. insufficient patch level on the load generators, and recently failed test starts due to other failing load generators involved in the test. Such cases are discussed later in this document.

NOTE: Controllers also can list as non-operational. However, in most cases this happens shortly after a test run fails to start because of a load generator being or turning non-operational. If so, the non-operational status of the controller must be ignored as it is only indicative of faulty load generator and not the controller itself. This is the case because LRE automatically puts the controller of the test into non-operational status in case a load generator is faulty during test start, then putting the controller back into operational state by itself a few minutes later. However, should you observe a

controller to be in “non-operational” status for prolonged time *without* any load generators being non-operational then please report an incident to Micro Focus SaaS about the controller issue.

Q5. If “Status” shows “Operational”, can a load test be started successfully that includes the load generator(s) in question?

Note that if a test cannot be started due to load generator issues, typically three things happen during the start checklist screen of the load test. First, the step “Connecting to load generators...” fails with an error message specifically listing the load generator(s) at fault. Second, these load generators get marked as non-operational. Third, the controller gets marked Non-Operational as well for a few minutes, until a regular background task in LRE puts it back into “Operational”.

Q6. If the test starts, do you see sudden large drops in VUser count during the test, indicating that the load generator(s) in question fail during the load test?

One symptom is an unexpected sudden (immediate, at the same exact time) drop of larger amounts of VUsers during the test as seen on the “Running VUsers” graph. Note that this symptom is different from a fast decreasing, though not immediate drop of the number of running VUsers that is typically caused by script or test environment issues.

5 Troubleshooting New Setups (based on Q1)

Multiple components must be configured correctly first before load generators can operate properly. This section helps you to eliminate and address common causes of incomplete or incorrect configurations that typically occur in new setups. If the issue cannot be addressed this way, progress to chapter 7 and 8 below.

5.1 Symptom: The load generator is not listed in the Hosts view in LRE (Q3)

Please walk through the list of potential causes below.

5.1.1 Cause: Naming mismatch or host not yet registered in LRE

Each load generator must have a name and resides in a specific location. Both the load generator name and location name must be unique across LRE. Location names are typically picked by SaaS or by the customer and given by location for a customer. Typically locations are e.g. named after the customer, and if multiple locations exist for a customer, their names need to be specified further to distinguish them among each other, e.g. by geography or data center name.

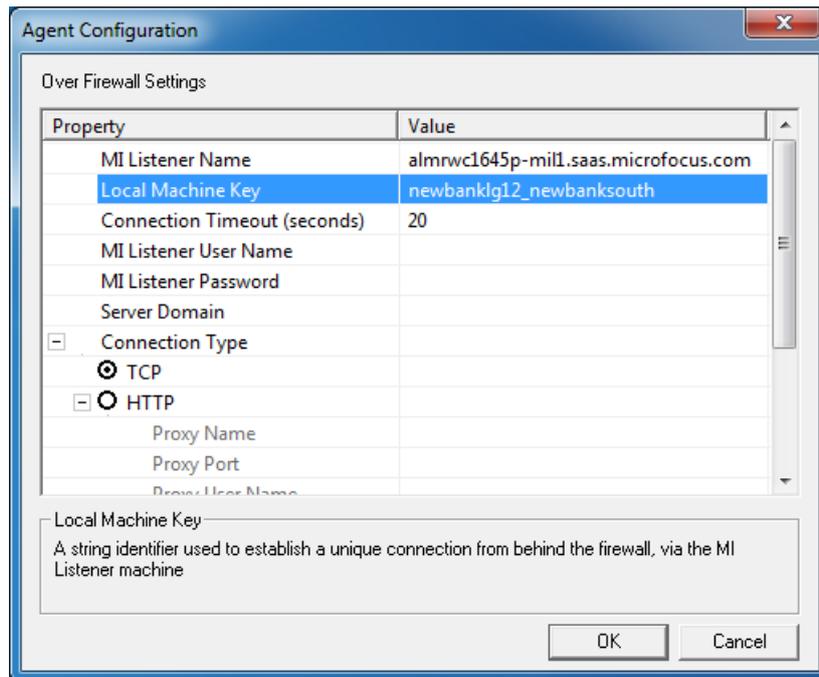
All load generators in the same location (e.g. data center) have to use the same location name. The only characters allowed in load generator names and location names are letters, numbers, dashes, and the underscore character.

Examples of valid load generator names (if not already used) are: *newbanklg01* to *newbanklg15*

Examples of valid location names are: *newbank* and *newbanksouth*

Troubleshooting:

- On the load generator, start the “Agent Configuration” application, typically located at “Start/All Programs/Micro Focus/Load Runner/Advanced Settings/Agent Configuration”. Make sure that the “Enable Firewall Agent” checkbox is enabled, then click on “Settings”.
- Now verify that the “Local Machine Key” field contains the exact spelling of the unique load generator name and the location name, separated by an underscore character:
<injectorname>_<locationname>
E.g. for load generator “newbanklg12” in location “newbanksouth”, the Local Machine Key has to be *newbanklg12_newbanksouth*



- At this point, verify if this load generator is registered under the load generator name in the named location inside of LRE and if it is visible to your project. To do this, log into LRE, and select the “Resources/Hosts” view that lists all load generators (both injectors over the firewall as well as SaaS load generators, if purchased) that are available for your project. Make sure to remove any potentially pre-existing filters from the view. Check the “Name” and “Location” columns and see if you can find a line item that has both the load generator name and the load generator location name listed.
- Only if there is a load generator listed whose name and location are exactly spelled as configured in the Local Machine key, the load generator is registered correctly (in our case it would be a host named “newbanklg12” and a location named “newbanksouth”).
- Otherwise, the issue can be resolved as follows.
 - If you find the host listed, though with spelling differences from the Local Machine Key: Either change the spelling of the load generator name in the Local Machine Key in the agent configuration to match as listed in LRE (and let the agent restart afterwards), or you can request from SaaS to correct the load generator name and/or location name in LRE as needed.
 - Instead, if you cannot find the host listed at all: Request from Micro Focus SaaS to add the host to your project, using the given load generator name and location name. Be sure to provide the name of the project, and the correct case-sensitive spelling for location and load generator names, for example by copy-pasting the value of the Local Machine Key from your installation. Micro Focus SaaS will then perform the necessary steps, either registering the host for you, and/or registering the location if not yet present, or, if the host is already registered, simply adding it to the pool assigned to your project.
- If after these steps the load generator still does not show up in the hosts list (in any state), please continue to work with Micro Focus SaaS on this issue directly.

5.2 Symptom: The LG is listed as “Unavailable” or “Non-Operational” in LRE (Q4)

The symptom is that under Resources/Hosts in LRE, the load generator shows up but is listed in “Unavailable” or “Non-Operational” status instead of the “Operational” status required for the load generator to be ready for a load test.

Note that a “Non-operational” status typically indicates that at some previous point in time the host was indeed operational, though it is currently not. In contrast, an “Unavailable” status of a host indicates typically that the load generator setup in question is not yet complete and it never has connected to LRE successfully before, or in rare cases that Micro Focus SaaS later chose to make the host unavailable temporarily for maintenance.

This symptom can have a variety of causes. Let us eliminate the most common ones.

5.2.1 Cause: Name mismatch

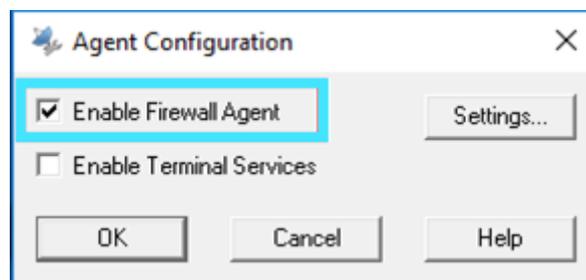
Troubleshooting:

- Similar to cause 6.1.1, a misspelled local machine key in the Agent Configuration will prevent a load generator to show up in LRE as operational. Please follow step 6.1.1 above to assume that both load generator name and host name are properly present in the load generator’s Agent Configuration and in the LRE “Resources/Hosts” table.
In case you perform a change in the Agent Configuration, make sure to allow restarting the agent as requested by a popup after saving your edits, and in LRE’s “Resources/Hosts” list, a few moments later select the host and click “Check Host”. If it does not turn to operational this way, wait for at least 10 minutes for the load generator’s “Operational” state to appear in LRE’s “Resources/Hosts” graph, and if still not operational, continue troubleshooting as below.

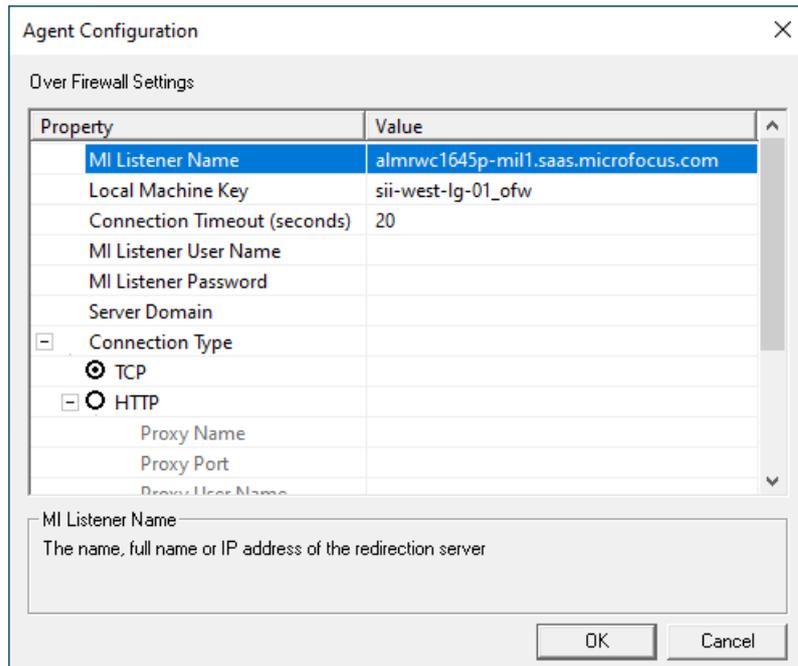
5.2.2 Cause: Other common agent configuration issues

Troubleshooting:

- On the load generator, when starting the “Agent Configuration” application, check that the Firewall Agent checkbox is enabled. If not, the load generator will not attempt to connect to LRE.



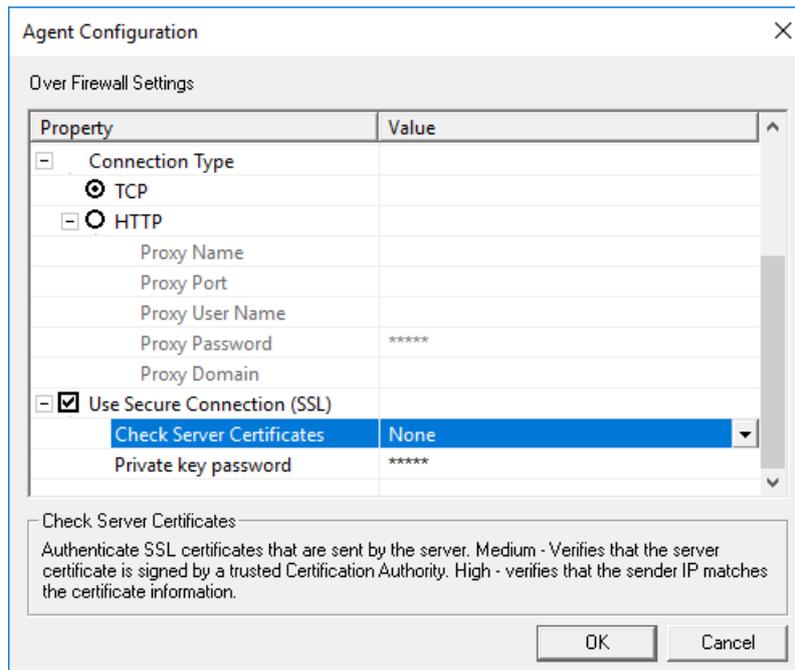
- Click on “Settings” and check the “MI Listener Name” field:



This field is supposed to contain the public DNS name, or, alternatively, IP address, of the MI Listener host **as provided to you by Micro Focus SaaS**. Note that the DNS name on the screenshot is just an example and may not be the correct address for your load generators. If in doubt, contact Micro Focus SaaS to obtain the correct DNS name or IP address for your MI Listener host.

Note that in specific cases, multiple MI Listeners may have been made available for your account, typically to balance the load from larger amounts of load generators.

- Check the “Connection Timeout (seconds)” field. Values should be between 5 and 20 seconds. For larger setups of 20 and more load generators, we recommend using 20 seconds.
- Scroll down and check that that “Use Secure Connection (SSL)” is enabled and that the “Check Server Certificates” is set to “None”.



- If you made any changes, allow the Agent to restart as prompted and wait for 10 minutes before checking if LRE now lists the load generator as operational.

5.2.3 Cause: Firewall not open (for typical non-proxy configurations)

In order for a load generator to connect to LRE, the firewall around your network that hosts your load generator must have port 443 open for outbound communication (an exception is the less common use of proxy configurations, which require tunneling the load generator's communication to LRE through a proxy in your network to pass through the firewall this way).

In many cases, outbound communication on port 443 is permitted already before load generator installation, though in cases of higher security, even outgoing communication may be blocked by default.

Troubleshooting:

- On the load generator, open a Windows command shell (e.g. by Start/Run, typing "cmd").
- Enter "telnet <MI_Listener_DNS_name> 443" and check the response. The MI Listener DNS name is provided by Micro Focus SaaS and needs also to be entered identically in the Agent Configuration's "MI Listener" field (see cause 6.2.2). E.g. for the MI Listener used in our earlier example, the command is:

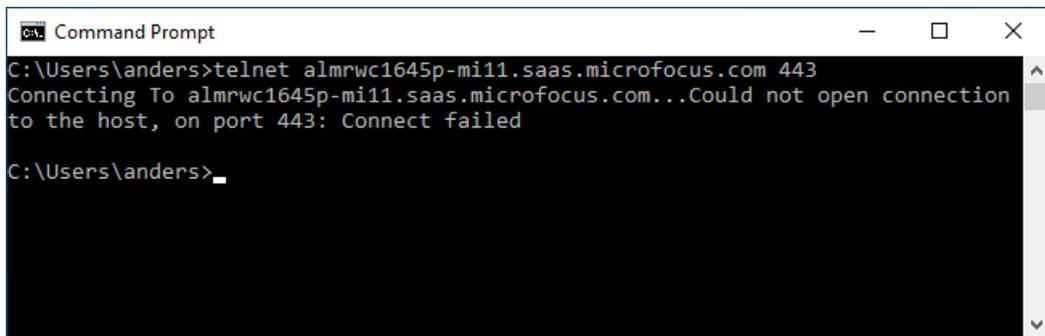
```
telnet almrwc1645p-mil1.saas.microfocus.com 443
```

- 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. You can click the "X" close icon to close the window and proceed to the next cause.

- If the response looks like this: ("could not open connection ...")



... then the firewall is not open and is in need to be opened by your IT Security team, unless you used proxy configuration instead. Please contact your IT Security Team to open the firewall from the list of IP addresses of load generators you use to the MI Listener DNS name (alternatively, IP address) outgoing on port 443. Note that the firewall rule does not have to be bidirectional, as incoming connections can still be blocked safely without functional impact to LRE. Only outbound connections on port 443 need to be allowed.

- If the response instead indicates that telnet is not enabled on this computer, then you can try to enable the telnet feature on the load generator through Windows, as long as not forbidden by your IT organization or prevented by Windows security policy. Enabling telnet works slightly differently in different versions of Windows, though it is typically done through "Start/Control Panel/Programs and Features" or similar. E.g. on Windows 7, select "Start/Control Panel/Programs/Programs and Features/Turn Windows Features on or off" and make sure that the "telnet" checkbox is checked. After installation, repeat the test above.
If the telnet test cannot/should not be performed, we alternatively recommend to ask your IT Security team to check if the firewall is open outgoing from the load generator's IP address(es) to the MI Listener DNS, or, if so configured in the MIL Agent, the IP address, on port 443.

5.2.4 *Cause: Proxy-related issues*

For the less common case that the load generator communication is configured to be tunneled through a proxy in your network (e.g. because the firewall could not be opened):

Troubleshooting:

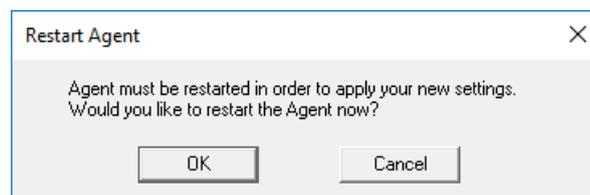
- Please check that the proxy parameters entered in the Agent configuration match the proxy configuration in your network, as given by your IT department.
- Especially, verify that the user account listed in the Agent Configuration is correct and currently active. This can be verified easily by checking if these credentials work with any browser. Simply try accessing an external website requiring proxy authentication. You can then provide the user account being used by the load generator.
- If the above checks do not identify the issue, we recommend you to verify with your IT department that the proxy is working correctly and that any traffic from the agent can be seen on the proxy's diagnostics if available.

5.2.5 *Cause: Agent restart or host restart required*

A simple agent restart may be required to re-synchronize the agent with LRE for the load generator to be recognized.

Troubleshooting:

- Start the Agent Configuration dialog, though without getting into the "Settings" dialog.
- Instead, simply click "OK" and confirm the "Restart Agent" dialog with another click on "OK".



- Now wait 5-10 minutes to determine if the load generator status turns "operational" in LRE.
- Alternatively, try the "reconfigure host" button after selecting the load generator in the view and after completing, check the status.
- If the issue does not get resolved this way, you may also attempt to restart the host instead of restarting just the agent service.

5.2.6 *Cause: Agent installed as service: Service is not running, and does not start when starting host*

During installation of the load generator software, the user has the choice to install the agent as either service or process. For most Micro Focus SaaS setups, especially those permanent, we recommend that the Agent is installed as a service, as only in this case the load generator be available automatically as soon as the host is started, in contrast to being available only after a user logged in to the load generator starts it.

If installed correctly, the "Load Runner Agent" starts automatically after reboot, connecting to LRE.

However, in some cases, the installed service may not start automatically.

Troubleshooting:

- On the load generator, go to the “Services” view (e.g. on Windows 7, right-click on “Computer”, select “Computer Management”, “Services and Applications/Services”).
- Verify that the “LoadRunner Agent Service” is in “started” status (you may have to refresh the view to get the latest reading).
- If it is not started, check that the startup type is “Automatic”. If not, change the startup type.
- Start the service (in “Automatic”). Refresh the view after 30s to check that the service is still running.
- If it is not running, a permission issue may be the cause as the software may not have been installed properly using administrative privileges.
 - First verify that your user account has administrative privileges in Windows.
 - Now, you can change the credentials of the Agent service following the steps in Appendix 9.1.3.
 - Alternatively, you can opt to reinstall the load generator, making sure you have administrative privileges following the steps as outlined in Appendix 9.1.
 - (Optional, extensive step): If that does not work, you could try to reconfigure the Agent to run as a process temporarily, following Appendix 9.1.2. If that works, likely a permission issue with the agent running as a service is the cause, as process-based execution does not need administrative privileges but service-based execution does. Don’t forget to revert to reconfigure the agent to run as a service when done, following Appendix 9.1.1.
- If the service still does not start after reinstallation and reboot, continue with cause 6.2.7 and cause 6.2.8.

5.2.7 Cause: Agent installed as a process: Process is not running

During installation of the load generator, the user has the choice to install the agent as either service or process. For most Micro Focus SaaS setups, especially those permanent, we recommend that the Agent is installed as a service, as only in this case the load generator be available automatically as soon as the host is started, in contrast to being available only after a user logged in to the load generator starts it.

However, if installed as a process, one common reason why a load generator may not be operational is a very simple one: The agent process (magentproc.exe) may not be running.

Troubleshooting (for as-a-process installations only):

- Login to the load generator.
- Start the task manager, for example through the right-click menu on the Windows start bar.
- Select the “Processes” tab and make sure that “Show processes from all users” is selected.
- Sort by name, and check if “magentproc.exe” is running.
- If the process not running, we recommend to first verify that it is not installed/started as a service instead:
 - On the load generator, go to the “Services” view (e.g. on Windows 7, right-click on “Computer”, select “Computer Management”, “Services and Applications/Services”).
 - Verify the “LoadRunner Agent Service” is not present and running. If that service is unexpectedly running, then proceed to cause 6.2.8.
- Now start the agent as a process (using administrative privileges). This can be done through multiple means.

- E.g. on Windows Explorer, run magentproc.exe from <LG>\launch_service\bin as administrator (right-click for this option).
- Alternatively, use the “LoadRunner Agent Process” shortcut from the Start -> Program Files -> Startup group
- If desired to start the process automatically after login, add a shortcut to the magentproc.exe into the Start -> Program Files -> Startup group.
- Validate in the task manager that magentproc.exe is now running and check once again a few minutes later to make sure it keeps running as expected.

5.2.8 *Cause: Agent running as both process and service simultaneously*

The load generator can run the agent as either service or process, though not both at the same time. Below are steps how to verify if both are running simultaneously erroneously.

Troubleshooting:

- On the load generator, go to the “Services” view (e.g. on Windows 7, right-click on “Computer”, select “Computer Management”, “Services and Applications/Services”).
- Verify if the “LoadRunner Agent Service” is present and running.
- Start the task manager, for example through the right-click menu on the Windows start bar.
- Select the “Processes” tab and make sure that “Show processes from all users” is selected.
- Sort by name, and check if “magentproc.exe” is running.
- If indeed both service and process are active, first stop both of them.
- Now follow instructions in Appendix 9.1 (we recommend choosing the service option in most cases). This will assure that only one of the two options will start the next time the host will be booted or a user logs in.

5.2.9 *Cause: Load Generator installation does not have the latest patches applied*

Patch mismatch with our servers may lead to intermittent or no connectivity with LRE, and to issues when starting, operating and stopping tests.

Dependent on the SaaS-certified patches applied to the load generator since its first installation, you may or may not find that the latest SaaS-certified patch was applied. Note that Micro Focus SaaS certifies patches only after conducting additional testing against SaaS infrastructure, hence latest SaaS-certified patch may not be the latest patch available on Micro Focus Software Support Online or recommended by Micro Focus Software Support. It is important to for SaaS customers to use SaaS-certified patches only.

Version: At the time of writing, there are one patch available for LRE 2021 R1.

The required patch is listed in the Standalone Downloads section of your LRE instance. Find further information on patches in Appendix 9.2. Please feel free contact Micro Focus SaaS to validate the latest patch version that matches your LRE environment.

Troubleshooting:

- To validate the installed patch level, use the “Programs” (or “Programs and Settings”) view in Windows, set to show installed updates. The location of this view depends on the version of Windows used.
 - E.g. in Windows 7, the functionality can be found located in “Start/Control Panel/Uninstall Programs” (or alternatively, “Programs and Features”), then clicking on “View installed updates”.

- E.g. in Windows Server 2008R2, use “Start/ Control Panel/Programs and Features” and click the link “View installed updates”.
- Now verify that you can find the latest update for “Micro Focus Load Runner – Load Generator”.
- If the latest certified patch level has not been installed obtain and install the latest patch as described in Appendix 9.3, or through Micro Focus SaaS.
- If patches are required, make sure that they are installed using administrative privileges.
- Allow the host to restart if prompted, otherwise initiate a restart manually.
- After the reboot make sure that the LoadRunner Agent service is in place and started, using the “services” view in Windows.
- Wait approximately 5 to 10 minutes before checking if the load generator is listed as operational in LRE.

5.2.10 Cause: *The Load Generator may have been installed on a not supported Operating System version.*

Troubleshooting:

- You can verify the list of supported operating systems for the Standalone Load Generator installation at the following URL: <https://admhelp.microfocus.com/lre/>
- Then navigate to *Get Started -> Support Matrix -> Support Matrix documentation*

5.3 Symptom: Tests fail to start even though all involved LGs are “Operational” (Q5)

If this symptom occurs in a new setup, please proceed to chapter 7.3.

6 Troubleshooting Preexisting Setups (based on Q1)

Even after a load generator has been configured correctly and used in load tests successfully, multiple components must stay in tune for load generators to continue to operate properly. This section helps you eliminate and address common causes that may affect service over time. If this section cannot address the issue, forward to section 8, “Contacting Micro Focus SaaS”.

6.1 Symptom: All LGs in one location have fallen into “Non-Operational” status (Q2, Q4)

In this case, previously most or all load generators have worked successfully and have now suddenly fallen from “Operational” status into “Non-operational” status.

Please walk through the list of potential causes below.

6.1.1 Cause: Customer network issues

Troubleshooting:

- First, see if the network path is open from the load generators in your network, to the MI Listener in Micro Focus SaaS.
- To perform that check in standard non-proxy setups, log into one of the now non-operational load generators and perform the telnet test outlined in 6.2.3.
 - If the telnet test fails, you need to assure that the firewall is open/opened again and that no other issues exist in your network connecting to the public DNS name/IP address of the MIL. E.g. running the tracert command in the command shell can help analyzing broken paths in your network.
 - If a telnet test cannot be performed, in some cases (that is, if port 443 is supposed to be open to all outgoing communication), a simple test to access an https URL in the internet through a browser without proxy can confirm positively that the communication path to the internet is open on port 443. Remember though in case of failing access that your firewall/network simply may be restricted by intent in such a way that only the load generators have access through port 443 to the MI Listener DNS name/IP address only, making this test fail even though the firewall is open for your load generators.
- Alternatively, if a proxy setup is used to connect outside the network:
 - Verify that the user account listed in the Agent Configuration is still correct and currently active. This can be verified easily by checking if these credentials work with any browser. Simply try accessing an external website requiring proxy authentication. You can then provide the user account being used by the load generators.
 - Check with your IT department that the proxy in your network is still operating, reachable, and has not been re-configured recently.

6.1.2 Cause: SaaS-internal issues

In rare cases, the specific MI Listener inside Micro Focus SaaS LRE that the load generators in your network point to may require an agent restart. We recommend that you contact Micro Focus SaaS after your previous troubleshooting confirms that the network path to the internet is open from your load generators, e.g. on outgoing port 443 or through your proxy, and after you still see issues with all load generators being now in non-operational state.

6.2 **Symptom: Some LGs have fallen into “Non-Operational” status, while other LGs on the same location and MI Listener may still be operational (Q2, Q4)**

Since in this case there are still load generators in your network connecting to the MI Listener correctly, we can rule out MI Listener failure and general network issues that affect all load generators in your network. Typical remaining causes are listed below. Please walk through the list in sequence.

6.2.1 **Cause: The load generator Agent needs to reconnect or to be reconfigured**

- First, log into the LRE application and display the “Hosts” view without filters, and make sure that the line item for the non-operational load generators in question is visible and select that line item.
- Based on your permissions, you may have a “Check Host” button available in the view. Click it. A popup will appear to inform you of the communication status with the load generator.
- Based on your permissions, you may have a “Reconfigure Host” button available in the view. Click it, and confirm the dialog asking you if you want to reconfigure the host. Since at this point the host is non-operational, it is not involved in any load tests now, so this option can safely be used. Aside of other functions, this operation assures that a reconnect is attempted that will put the load generator into operational state if successful.

You may now have to refresh the “Hosts” view to reflect the status change to “Operational”. We recommended to attempt to run a test that includes the successfully reconfigured load generator, and to observe the load generator status for a short while in order not to overlook any reoccurring issues that may have deeper root causes.

If an error message appears instead, please continue as described below.

6.2.2 **Cause: The load generator needs to reboot**

- The load generator may need a reboot. To perform a reboot, please log in to the load generator through Windows, either directly or through Remote Desktop Client/RDP, and perform the reboot directly. After the reboot is completed, wait for 5 minutes before validating if the status goes to “Operational” in the “Hosts” view. If it does not become operational, also check out cause 6.2.7.

Note that even if the status does change to operational, we recommend to run a load test that makes use of the load generator, and to observe the status for a short while in order not to overlook any reoccurring issues that may have deeper root causes.

Note that while your permissions may allow you to use a “Reboot Host” button available in the “Hosts” view, this option typically only works with load generators within the same network as LRE (in our case, in Micro Focus SaaS), hence it is not the recommended procedure with load generators.

6.2.3 **Cause: The load generator is down**

Troubleshooting:

- Try to log into the load generator via Windows Remote Desktop. If you cannot get a login prompt, it is possible that the host is down and needs to be started.
- Even if 10 minutes after the start of the host the load generator shows operational successfully, in order to avoid ignoring a deeper lying issue we still recommend investigating the cause for the previous host shutdown.
- If the load generator does not go into “Operational” after a start, also check out cause 6.2.7.

6.2.4 **Cause: Patch level mismatch**

Troubleshooting:

- A recent required patch upgrade may not have been performed on all load generators, or a patch not certified by Micro Focus SaaS may have been applied. Please check that the load generator installation on the non-operational load generators are on the same patch level as the operational ones. To verify this, please follow instructions provided in cause 6.2.9.

6.3 **Symptom: Tests fail to start even though all involved LGs are listed as operational (Q5)**

While there are multiple causes why tests may fail to start, we are focusing only on those that report that load generators in your network fail to connect during the test start process.

- First, assure that all of the load generators involved in the test are indeed in operational state before test start, as such is required to start the test successfully. This may require to first troubleshoot the load generators in question by means described earlier in chapter 7. If you can repeatedly see though that while all load generators are operational before the test some fall into non-operational state when starting a test, continue here.
- If you need to determine if a particular previous test has failed to start due to load generator issues, you can bring up the test run’s log in LRE by selecting “Test Management/Runs”, picking your run ID, then clicking on “Test Log” and scanning for errors related to the specific hosts in question.

Now please walk through the list of potential causes below.

6.3.1 **Cause: Little or no disk space available**

Disk space issues on load generators can happen due to a variety of reasons. Most commonly, previously not collated results from tests may pile up on the system drive over time.

Best practices:

- Always collate your test runs after execution, even if the results are without relevance to you. This ensures that no un-collated results start to pile up on the load generator’s drives.
- Keep at least 5 GB of storage available on each load generator’s system drive if possible.
- Always turn off logging (even on error) for load tests that hold more than 10 VUsers. Error and message information is still available in LRE during the test and in the output.mdb file after the test.
- Always run with think times enabled in the run time settings and present between each transaction in the code of the script.
- Avoid multi-megabyte data files in your load test scripts, as such large files slow down test starts and can cause out-of-disk space conditions.

Troubleshooting:

- Log into the load generator in question and check the available disk space on the drive that holds the temporary directory for the IUSR_METRO user (Windows “%TEMP%” variable). This is typically the system drive (C:), unless changed explicitly by the user earlier.
- If the available disk space is very low, e.g. below 2 GB, disk space issues may have caused the test not to start. Otherwise you can proceed to the next troubleshooting cause.

- **IMPORTANT:** Before proceeding, we recommend collating results from previous tests through LRE as this may not be possible after the next step.
- **PROCEED WITH CAUTION: MANUAL REMOVAL OF OUTDATED TEST RESULTS.** You may also opt to clean up not collated test results manually, though be aware that deletion of a run’s not yet collated test results on even one load generator prevents the test’s future collation by LRE. Hence, we recommend to always collate any relevant test run results in LRE before manually cleaning up old data on your load generators. Note that in some cases, partial re-collation of business-critical tests with accidentally partially deleted test results may still be possible if performed by Micro Focus SaaS manually upon request.
- (!) **REMEMBER:** Deleting the files of an load generator’s TEMP directory manually will render the results of all not yet collated tests that used the load generator **PERMANENTLY NOT COLLATABLE**. The test results are held in subfolders of the TEMP directory of IUSR_METRO, which is typically pointing to C:\temp. To determine the location precisely, log in as IUSR_METRO (password can be obtained from Micro Focus SaaS) and check the TEMP system variable which holds the location.

If in doubt how to resolve the disk-space condition, contact Micro Focus SaaS.

6.3.2 ***Cause: Proxy credentials allowed for only one or limited connections at a time (for proxy setups only)***

On some proxy setups, credentials are required for the load generator to pass its communication through the proxy server in your environment, and on some proxy setups, the amount of simultaneous connections through one user account is limited to one or a small number. If the amount of allowed simultaneous proxy connections on the user account used by the load generators is smaller than the amount of load generators in your test, some or all load generators will fail to connect at test start as expected.

Troubleshooting:

- Note down username and password and proxy name used in the Agent Configuration.
- Please verify with your IT department that for the listed proxy the amount of simultaneous connections on this account is unlimited, or at least higher than the maximum amount of load generators in your network.

6.3.3 ***Cause: Patch level mismatch***

Troubleshooting:

- A recent required patch upgrade may not have been performed on all load generators, or a patch not certified by Micro Focus SaaS may have been applied. Please check that the Standalone Load Generator installations on the non-operational load generators are on the same patch level as the operational ones. To verify this, please follow instructions provided in cause 6.2.9.

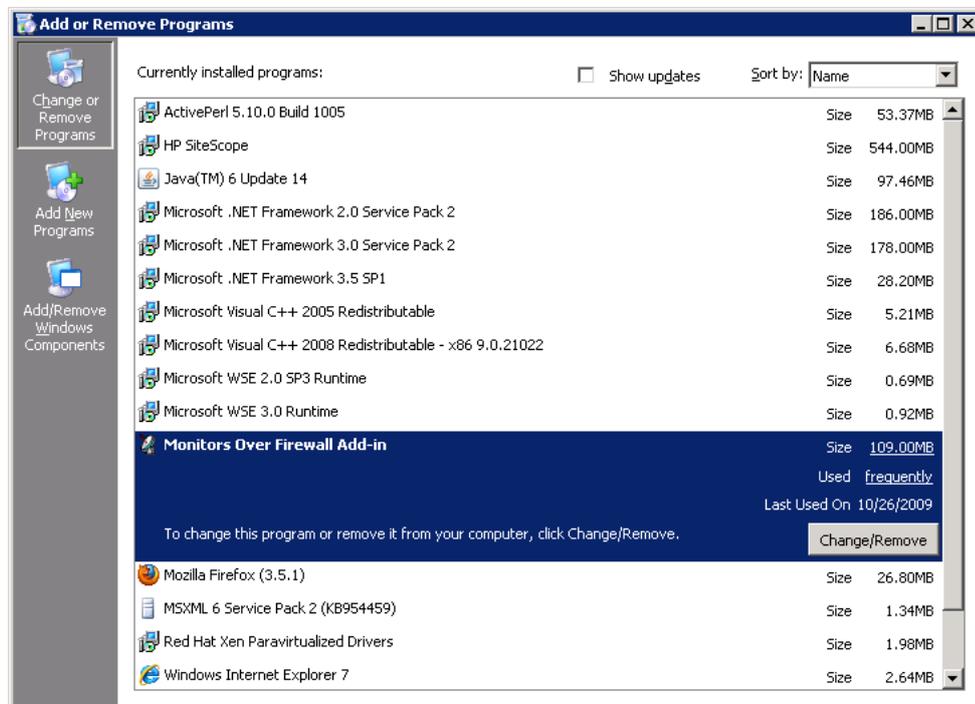
6.3.4 Cause: Analysis or Virtual User Generator product was recently installed on top of one or more of the LGs

In the past it was possible to install Analysis and/or Virtual User Generator on top of the Standalone Load Generator. This is no longer supported. Only the load generator software can be installed on the machine.

6.3.5 Cause: Monitor over the Firewall product was recently installed on top of one or more of the LGs

The Monitor Over the Firewall (MOFW) and the load generator products are not supported to run on the same host. We recommend not running SiteScope on load generator hosts either.

- In order to find out if the MOFW add-in is present on a host, check in the Windows Control Panel, under “Add or Remove Programs”, if the entry “Monitor Over Firewall Add-in” is present. If yes, then the MOFW component is installed, like in the example below:



- In order to get either the load generator or the MOFW working, you must uninstall both products first and then reinstall one of the two products. Note that uninstalling the MOFW will remove its configured data, hence we recommend that you create a separate MOFW installation on a different host first and manually port its configuration on that host first before uninstalling. Alternatively, you can simply try to remove the load generator installation and install the load generator on a different host.
For a load generator (re-)installation on a host that has now neither load generator nor MOFW components present, please follow the steps outlined in the separate document “Load generators over a firewall - LRE 2021 R1 Installation Guide” which can be obtained from Micro Focus SaaS.

6.4 Symptom: Tests start, though a sudden immediate drop in running VUser count occurs (Q6, rare)

Analyzing this issue is a bit more involved. If you choose to analyze it yourself before contacting Micro Focus SaaS, below you can find steps to do so.

In some cases, mdrv processes running on load generators in load tests may crash, dropping all VUsers running one or more mdrv processes for the remainder of that test. The amount of VUsers served by one mdrv process depends on configuration and load test protocol. For web tests, the default is to run up to 50 VUsers per process. If the rare issue of mdrv failure occurs, it can happen on single processes as well as all of them.

Before walking through the list of potential causes below, perform the following:

- First, rule out other (normal) causes for VUsers stopping in tests early, such as scheduling, script error conditions, or a gradual (even though fast) decline of VUsers during load conditions due to System Under Test-related issues.

In contrast, mdrv failure shows at least one of the following indicators:

- Mdrv failure typically causes an immediate drop of multiple running VUsers on the same load generator at the same moment, rather than over a short time period or across load generators. E.g. 50 or more VUsers may stop suddenly on one load generator. If the test is still running, such event typically shows as a sharp immediate vertical step down on the “Running VUsers” graph.
- Typically, an “mdrv failure” error message gets reported as well. Such message can be found in the error messages during the test. Should the test have collated and analyzed successfully, it will also be available in Analysis.
- Note that in some cases of mdrv failure, results may fail to collate. Try to re-collate at least twice, in order to work-around occasional temporary timeout issues. Contact Micro Focus SaaS if repeated collation attempts on the same test do not succeed.
- If the test collated and you want to drill deeper, you can opt to analyze the test results with Standalone Analysis, and then group the “Running VUsers” graph by host. If you see that sudden drops of multiple VUsers happen on the same load generator (host) at a time, mdrv failure on that load generator is likely.
- After identifying mdrv failure, we recommend searching for the following causes before contacting Micro Focus SaaS.

6.4.1 Cause: Load generator shutdown or reboot

Troubleshooting:

- Attempt to log into the load generators of the test and see if any of them are not running.
- If you can log in, you may check for signs that a reboot that may have happened during the test. E.g. The Windows event log that can be viewed with the “Event Viewer” in Windows holds this information.
- If a reboot indeed occurred, the event viewer may provide clues if the reboot was triggered externally (e.g. by a scheduled re-boot, or by an administrator).

6.4.2 Cause: Little or no disk space available

Disk space may have run out on a load generator during a test, e.g. due to an accumulation of temporary load test data. Follow cause 7.3.1 to identify this issue.

6.4.3 **Cause: Patch level mismatch**

An incorrect patch level on the load generator may cause this issue. Follow cause 6.2.9 for diagnosis.

7 Contacting Micro Focus SaaS

If the load generator issue you observed did not get addressed by the steps listed, we recommend contacting the Micro Focus SaaS support.

Please provide at least the following information, so that our team has enough data on hand right away to start working on your case in a timely manner:

- The full LRE instance URL
- The Domain and Project
- The type of issue (e.g. LG stays non-operational permanently), e.g. as classified in chapter 5
- Based on question 1, let us know if the issue occurred on a new setup, or a preexisting setup that was previously running load tests with the load generator successfully)
- If you observed the issue for the first time, or if it is a repeat issue
- Verbal description of the issue
- Please provide specific information if available:
- Local machine keys and location names of the load generators showing the issue
- If a test start/run issue, the Run ID(s) of the failed test(s)
- The answers to Q1. to Q6. in chapter 5 if available
- Any observations you find helpful that you may have made while troubleshooting the issue yourself

Note that during the troubleshooting process, the Micro Focus SaaS engineer may find it necessary to conduct in your presence a live remote diagnosis session on the load generators.

8 Appendix

This appendix describes certain common configuration tasks to remedy conditions identified in the troubleshooting sections of the document.

8.1 Configuring the Agent as either Service or Process

The load generator agent can be run either as service or as a process. Micro Focus SaaS recommends running the agent as a service for most (permanent) 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 'LoadRunner 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 -> 'LoadRunner Agent Service' to verify or change which user account is running the service, since this might have an effect on 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 in order 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 load generator Agent, the user can switch the Agent to run as either service or process by performing the following steps.

8.1.1 To run the Agent as a service (recommended for permanent setups)

1. Remove the "LoadRunner Agent Process" shortcut from the Start -> Program Files -> Startup group if present, 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>"
 - a. Note: If you want to set a different account:
 - b. 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".
 - a. If you wish to modify the login details after installation of Agent Service, do the following
 - b. Go to Start -> Control Panel -> Administrative Tools -> Services and look for the LoadRunner Agent Service.
 - c. Right-click and select Properties->Log On and change the information from there.

8.1.2 To run the Agent as a process (for specific reasons)

1. Launch the command prompt using Run as Administrator and go to <LG>\launch_service\bin

2. Uninstall LoadRunner Agent Service by typing in:
`magentservice.exe -remove<enter>`
3. Verify that the service 'LoadRunner Agent Service' is no longer running.
4. Start the load generator 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.

8.1.3 To run the Agent service under a different account

If an installed 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 LoadRunner 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".

8.2 Reinstalling the Load Generator Software

In some cases, it may be required to redo the load generator software installation completely, e.g. if the installation got corrupted. Please see steps for reinstallation below, then proceed to the patch upgrade in 8.3, if available.

Uninstalling and reinstalling the Standalone Load Generator:

- Make a note of the agent configuration parameters.
- Obtain the Standalone Load Generator software by downloading it through the LRE application ("Standalone Load Generator"), using the "Download applications" button.
- Make sure your Windows account on the load generator has administrative privileges.
- Now uninstall the existing Standalone Load Generator software.
- Reinstall the latest Standalone Load Generator software using *administrative* privileges (e.g. by right-clicking on the installer and selecting "run as administrator"), and during the setup choose the "LoadRunner Enterprise" and "as a service" (in contrast to as a process) options.
- Run the latest patch installers obtained from the LRE instance's downloads section, if available.
- In the Agent Configuration application, enter the configuration parameters as previously, and restart the agent as requested. This typically includes at least the MI Listener Name and the Local Machine Key.
- Verify through the Windows "services" view that the service is now present in Windows.
- Allow the host to restart.
- Make sure that the service is running.
- After 10 minutes, check in LRE if the load generator is connected.

8.3 Applying the Latest Patch Upgrades

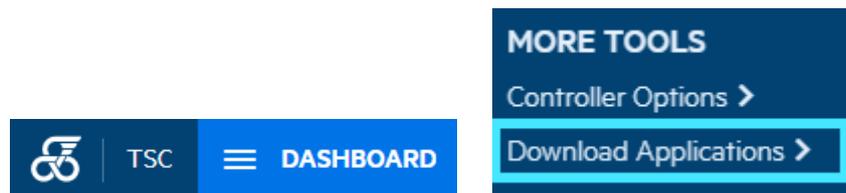
Any patches for your Standalone Load Generator installations that are required to match your LRE instance are available for download from that instance, certified for use by Micro Focus SaaS.

See below for instructions how to download the installers from LRE. Therefore, make sure to use

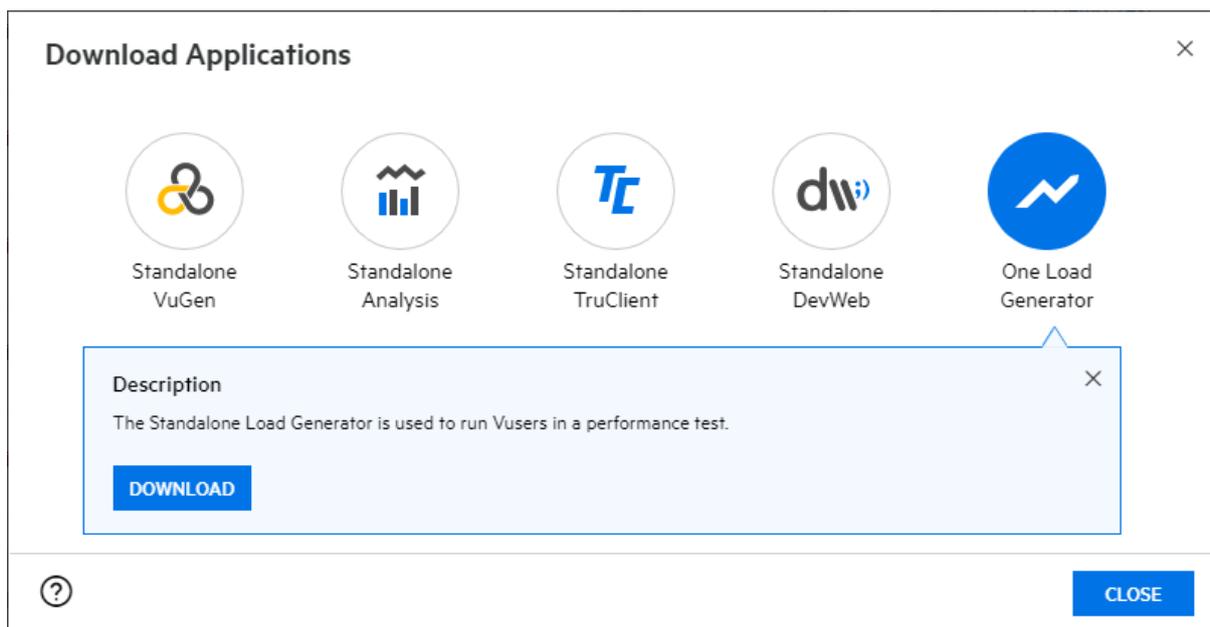
the installers provided in that location, rather than from alternate sources.

- Regarding the installation order of patches, please follow any instructions provided in the download section itself.
- Alternatively, feel free to contact Micro Focus SaaS to inquire about the latest proper patch levels and installers.
- At the time of writing, there are one patch available for LRE 2021 R1. Any required patches will be listed in the Standalone Downloads section of your LRE instance.

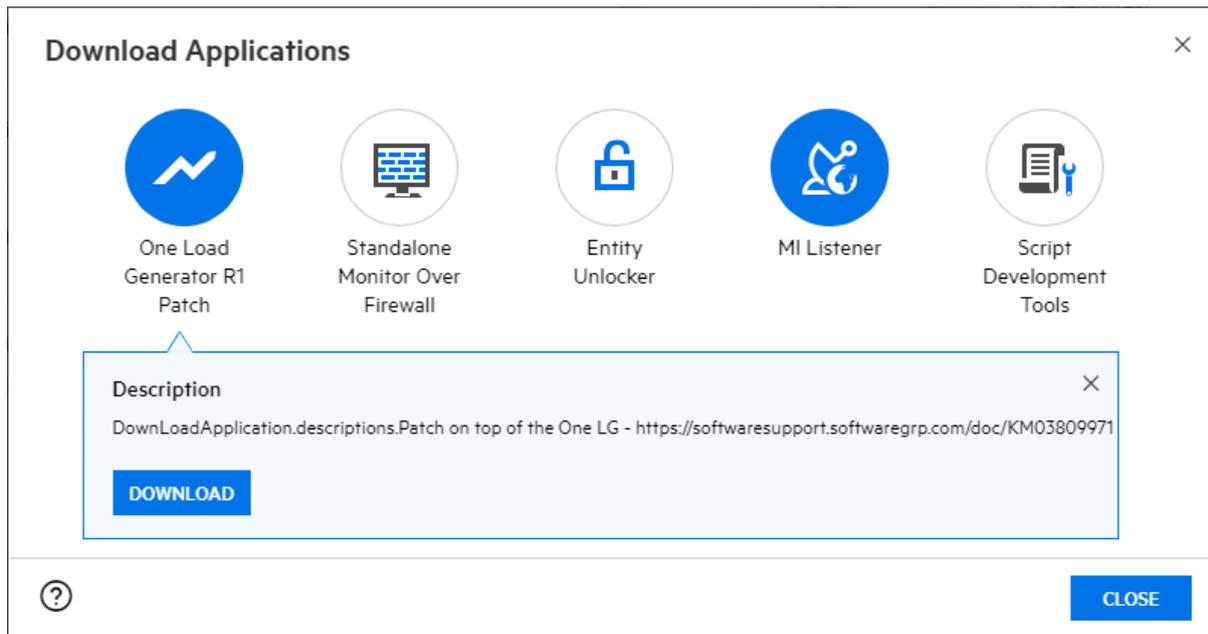
Accessing Micro Focus SaaS Standalone Load Generator installers and patches in LRE:



Example: The One Load Generator software for LRE 2021 R1:

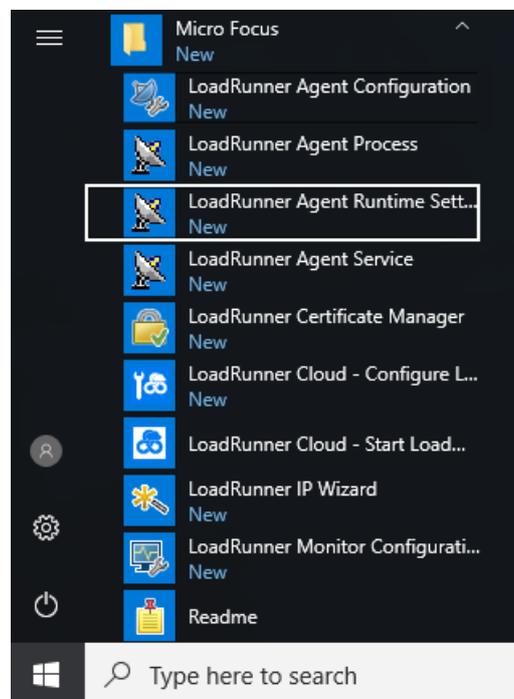


Example: The One Load Generator patch for LRE 2021 R1:

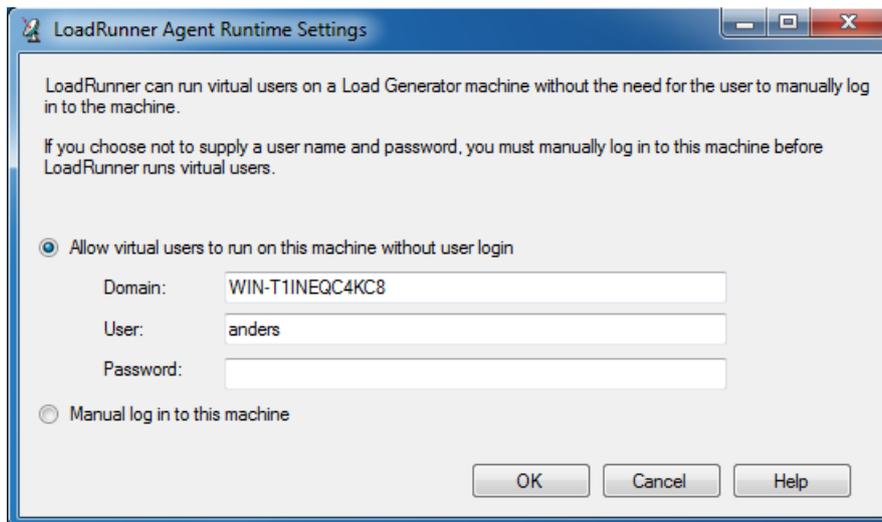


IMPORTANT: If a patch is installed, the installation normally removes the “LoadRunner Agent Service”. Hence, if you use the load generator as a service (which is the recommended configuration), a patch might require that after its installation you reinstall the LoadRunner Agent Service using the “Agent Runtime Settings Configuration”:

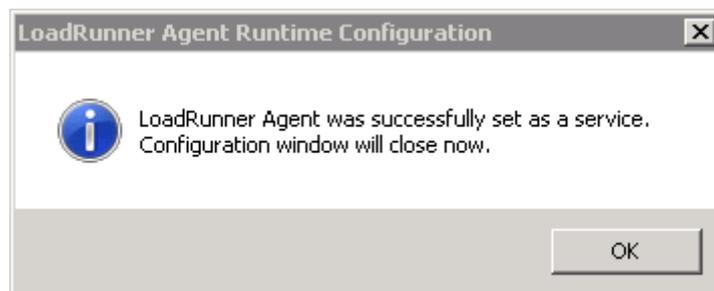
First, start the Agent Runtime Settings configuration, which can be located using the Windows Start menu, in “All Programs/Micro Focus”.



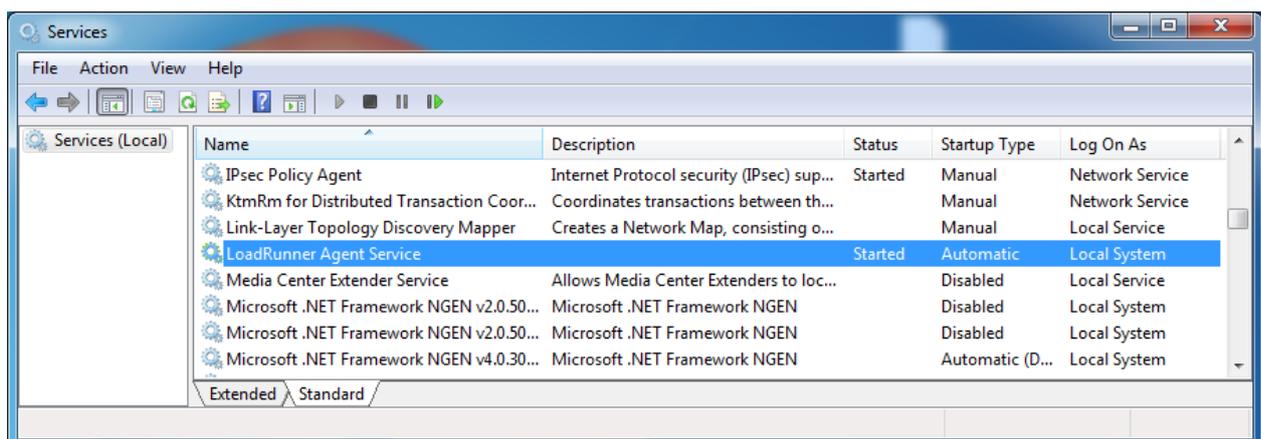
Now enter the credentials for the service user. These are typically the domain or host level Windows credentials of the administrative user you used to install the load generator and its patch.



Acknowledge the confirmation popup:



Run “services” from the Windows start menu and verify that the “LoadRunner Agent Service” is installed and running:



Finally, we also recommend reconfiguring the host to refresh the connection and make it operational, for example using “Reconfigure Host” in the Hosts view in your project in LRE:



SaaST...

HOSTS

+ Add Host



Check Host

Reconfigure Host

Maintenance

ID	Location	Name	Status	Privacy ...	Runtime State	Purpose	Installation	Priority
1106	Default	LREFRA002P-C7	Operational	Public	Idle	Windows Host	Windows Host	5
1146	ofw	UniLCTest	Operational	Private	Idle	Windows Host	Windows Host	5
1157	ofw	UniLCTest02	Non-Operational	Private	Idle	Windows Host	Windows Host	5
1179	Default	LREFRA002P-H6	Operational	Public	Idle	Windows Host	Windows Host	5
<input checked="" type="checkbox"/>	1180	ofw	sii-west-lg-01	Unavailable	Private	Idle	OneLG	5