

Administrator's
Guide

Keysight Licensing

Notices

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CAUTION

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Overview

This document is intended for use by system administrators and end users who perform advanced configuration tasks as an aid in managing Keysight Licensing, which utilizes the FlexNet licensing solution. For additional information on FlexNet, refer to the FlexNet Publisher's License Administration Guide, included in the [Keysight License Manager installer](#). This document focuses on recommendations and information specific to the Keysight Licensing scheme.

Licensing governs the usage of a Keysight product. Depending on the product, you may purchase one or more licenses to enable you to run a software application on a computer or instrument, or to unlock specific features of an application or instrument.

Keysight Licensing is based on FlexNet Publisher and supports most of the FlexNet licenses that have been issued by Keysight for its products over the years. Keysight Licensing provides tools and processes for floating, USB portable, node-locked, and transportable licenses.

In this section

[What Is Keysight Licensing?](#)

[License Types](#)

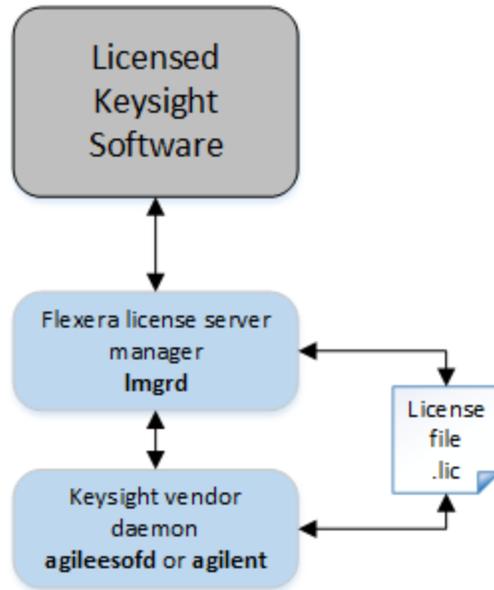
[Supported Platforms](#)

What Is Keysight Licensing?

Keysight Licensing includes three elements that work together to unlock applications and features of Keysight products:

- Your licensed Keysight product includes license client software to manage feature requests
- The FlexNet license server manager (*lmgrd*) to manage servers
- The Keysight vendor daemon(s) (*agileesofd* and/or *agilent*) to manage product licenses

Figure: Keysight Licensing



Licensed Keysight software:

- Requests the use of a license when you try to use a licensed application or feature
- Lets you know if it cannot acquire a license

License server manager *lmgrd*:

- Starts and maintains *agileesofd* and any other vendor daemons listed in the VENDOR lines of the license file used to start *lmgrd*
- Refers license checkouts (requests) to the appropriate vendor daemon

Keysight vendor daemons *agileesofd* and *agilent*:

- Manage Keysight product licenses, mapping feature requests to the appropriate license
- For historical reasons, Keysight licensing uses either or both of two vendor daemons, depending on the types of licenses in use.

License Types

Keysight Licensing provides four types of licenses:

- **node-locked**
- **USB portable**
- **transportable**
- **floating**

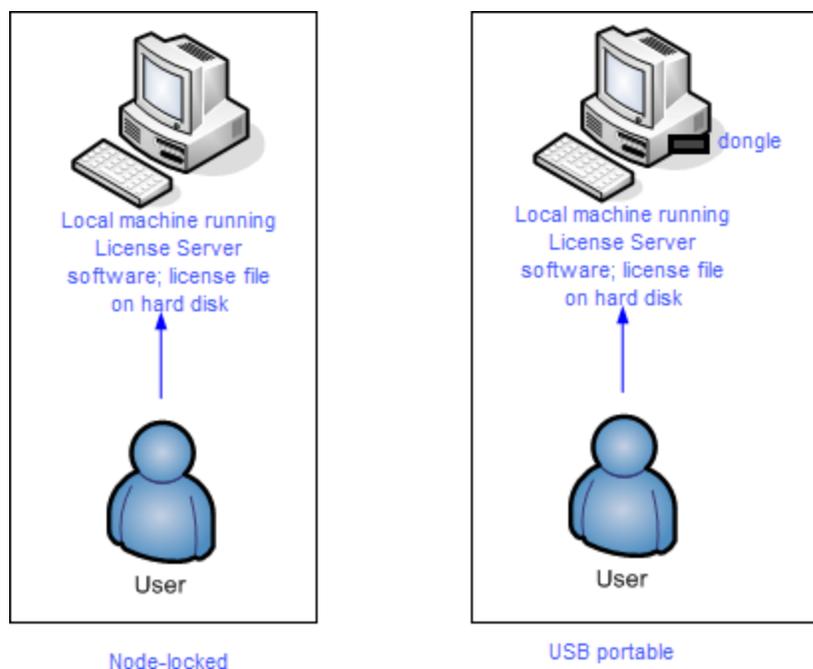
Each license is either **perpetual** (permanent) or **time-based** (good for a limited amount of time).

A **node-locked** license permits the licensed software to run on only one machine. Each node-locked license is locked to an instrument or computer: The license is resident on the hard disk of the system that it's locked to, and that system runs the licensed feature or product. **Trial licenses** are node-locked, time-based licenses. Trial licenses are issued for a particular instrument or computer and are provided free of charge for you to try out a Keysight product.

A **USB portable** license is locked to a USB dongle (also called a USB key). Systems that run the licensed feature or product must have the license file resident on their hard disks, and have the dongle attached when they run the licensed feature or product.

Node-locked and USB portable licenses may be **counted** or **uncounted**. Counted licenses enable a specified number of a given capability – for example, a given number of simulations in an EDA application. An uncounted license simply unlocks the licensed feature or application on the system where it is installed.

The Keysight Licensing implementation of **counted** node-locked and USB portable licenses requires the FlexNet Publisher license server manager (*lmgrd*) and Keysight vendor daemon (*agileesofd*) to run on the local machine where the licensed product resides (the machine for which the license is issued or, in the case of a USB portable license, the machine to which the dongle will be connected). See [Setting Up Licenses](#) for setup instructions.



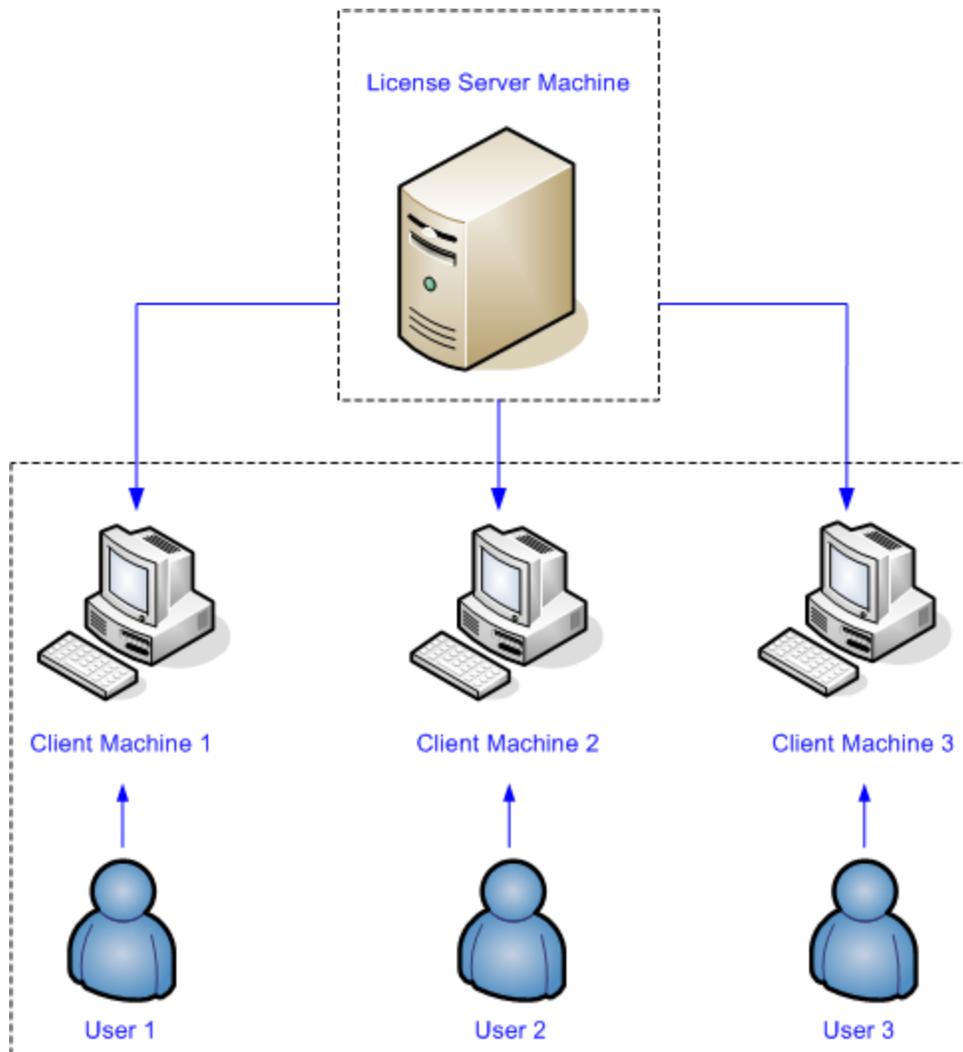
A **transportable** license is a type of node-locked license that can be unlocked from one client host and then locked to another client host, via a network-enabled process performed in conjunction with the Keysight Software Manager website.

Floating licenses (network licenses) reside on a license server (a separate computer) and are checked out for use by Keysight products (instruments or applications), then

returned (checked in) when no longer needed so that they can be used on another computer or instrument.

Floating licenses can also be **borrowed** for a specified number of days. Once you have borrowed a license, you can disconnect the licensed instrument or computer from the license server and continue to use the license offline for the duration of the borrow period. Some older floating licenses do not support borrowing.

As in any implementation of FlexNet Publisher floating licenses, both the license server manager *lmgrd* and the vendor daemon *agilesofd* run on the license server system. See [Setting Up Floating Licenses](#) for setup instructions.



See also

[Recognize Your License Type...](#)

Recognize Your License Type

You can determine whether a served license is node-locked or floating by looking at the `INCREMENT` lines in your license file.

The `INCREMENT` line embeds the host ID of the license server machine, or the FlexNet ID of the dongle, in the `HOSTID=` part of the statement.

Example 1: Served, counted node-locked license

```
SERVER this_host D8D385997F8A
VENDOR agilesofd

INCREMENT b_core agilesofd 3.0 14-sep-2013 1

VENDOR_STRING="D8D385997F8AP=#1,7,8,13,14,25,27,66,67,\
105,110,116,131,132,156D=#W2200BP,ADS_Core;e_core :

MUFNCUI WQDZPFX QTBM CYE SW2TFGC OWKGNHJ UIB" \
HOSTID=d8d385997f8a ISSUER=LICENSEID=1598592 \
START=19-Sep-2012 SIGN="033F C701 \
6926 5CB6 5505 F6EC D5EE E3FE F302 A765 9201 008B E71B \
FE5B 2308 EE8F D5C0 9374 AEOF 2F68 24CD"
```

In the example above, the presence of `HOSTID=d8d385997f8a` indicates that codeword `b_core` is tied to the host ID `d8d385997f8a`. The presence of a `SERVER` line indicates that this is a *served* license. To use this license, you'll need to run a license server process locally on the machine where you will use the license. (Keysight License Manager 6 will start that process for you when you use it to add your license.)

Example 2: Unserved, uncounted node-locked license

```
FEATURE EEFIXED agilesofd 2019.1231 permanent uncounted \
VENDOR_STRING=" : XJYDGO2 DIJCUMA MULOWMQ GF2DCKA GBXCQH2 D" \
HOSTID=ecb1d7563fcf START=16-May-2017 SIGN="0101 B84C 49F0 \
65BC 6D41 6824 BF56 798D 9393 1527 3E01 A678 26ED 9660 E4B6 \
3AA9 80BA 90F3 41E2 55A4 98E1"
```

In an unserved node-locked license, there is no `SERVER` line. This license is used locally without a license server process. The `uncounted` keyword indicates that this license is unlimited; it does not provide a number of counts of the feature. This license can be managed through Keysight License Manager 5, but not through Keysight License Manager 6.

Example 3: Served, counted USB portable license

```

SERVER this_host FLEXID=10-0BEB CD44
VENDOR agileesofd
INCREMENT b_core agileesofd 3.0 14-sep-2013 1

VENDOR_STRING="10-0BEB CD44P=#1,7,8,13,14,25,27,66,67, \
105,110,116,131,132,156D=#W2200BP,ADS_Core;e_core :

MUFNCUI WQDZPFX QTBM CYE SW2TFGC OWKGNHJ UIB" \
HOSTID=FLEXID=10-0BEB CD44 ISSUER=LICENSEID=1598593 \
START=19-Sep-2012

SIGN="002F CADB 63C8 0FCE DF16 BBA4 4AAB A335 B54F \
F121 3A02 79A9 D9A9 A701 F727 AAF8 791E 0615 BD0B D95F 87C5"

```

In the example above, the presence of `HOSTID=FLEXID=10-0BEB CD44` indicates that codeword `b_core` is tied to a dongle with the ID `10-0BEB CD44`. The presence of a `SERVER` line indicates that this is a *served* license.

Example 4: Unserved, uncounted USB portable license

```

FEATURE KS8400A agileesofd 2019.0212 permanent uncounted \
VENDOR_STRING="10-0bebf2d8: PNGSIWK YPSUIME J2HXICJ RAYURJC \
1FOMP" HOSTID=FLEXID=10-0bebf2d8 SUPERSEDE \
ISSUER=LICENSEID=3211204 ISSUED=22-Feb-2018 START=22-Feb-2018 \
TS_OK SIGN="0286 D3D9 A6C2 A61C 3843 6251 1BF6 E4C6 7D94 71E5 \
8601 26F1 4D9D 1087 6537 18D4 B5ED 8285 5519 D60A AA9D"

```

In an unserved USB portable license, there is no `SERVER` line. This license is used locally without a license server process. The `uncounted` keyword indicates that this license is unlimited; it does not provide a number of counts of the feature.

Example 5: Floating license

```

SERVER delly 001EC940F06A 27001
VENDOR agileesofd

```

```
INCREMENT KSF_SWIFT_EXAMPLE_1 agileesofd 2018.12 \
  6-feb-2019 2 VENDOR_STRING="OIU1KGD UIWQDCP FXFWUQC \
YVAPBUJ VZ2DQYL GFHLDTF JEKNBXJ 2EFZPBD RCU" \
  BORROW=8760 SIGN="01D8 1A61 62CD 3E38 E3B3 F8FF 67FF \
  B218 F5AD 89E4 B501 A16D 6F1F 5957 F794 FF13 B78B BCB8 F631 7BDA F50B"
```

As shown above, no `HOSTID` in the `INCREMENT` line indicates that this is a floating license. The `BORROW` keyword indicates that this license can be borrowed (taken offline to be used for a limited time). In this case, the license can be borrowed for up to 8760 hours (365 days).

See also

[Setting Up Licenses](#)

Supported Platforms

Keysight license server software (*lmgrd.exe* and *agileesofd.exe*) is supported on:

- Microsoft Windows 7 Enterprise SP1 (32-bit and 64-bit)
- Microsoft Windows 10 Creators Update (32-bit and 64-bit)
- 64-bit RedHat Linux v7.0

Keysight License Manager 6 is supported on

- 64-bit Microsoft Windows 7 Enterprise SP1
- Microsoft Windows 10 Creators Update 64-bit

NOTE

The license server software is supported on 32-bit and 64-bit Windows and 64-bit Linux systems, but **the Keysight License Manager 6 utility is supported on 64-bit Windows systems only**. To set up licensing on 32-bit Windows and on Linux systems, use the processes described in [Manual License Setup](#).

The license server does not need to use the same operating system as the clients (the licensed systems). You can run the license server on a Linux machine and have clients running Windows, or the reverse. You can also have one license server with clients running different operating systems – a Windows license server with clients on both Windows and Linux, for example.

Setting Up Licenses

This section describes how to set up Keysight Licensing, including licenses tied to an instrument or computer (via host ID) or to a USB dongle (USB key), floating licenses (tied to a networked license server). These setup instructions apply to both permanent and time-limited (including trial) licenses.

No matter what kind of licenses you have, you'll first need to obtain your license file(s) and install the appropriate tools. Specific tools and additional setup steps vary depending on the type of licenses you'll be using and on your operating system.

Use the links in the following table to find detailed instructions for your license type and operating system. See [Supported Platforms](#) for details of operating system support, such as supported versions and distributions.

	64-bit Win- dows	32-bit Windows	64-bit Linux
Node-locked license (may need Keysight License Manager 5; see note below)	Setting Up Node-Locked Licenses	Manual Setup: Node-Locked Licenses on Windows	Manual Setup: Node-Locked Licenses on Linux
USB portable license	Setting Up USB Portable Licenses	Manual Setup: USB Portable Licenses on Windows	Manual Setup: USB Portable Licenses on Linux
Floating license server	Setting Up Floating Licenses	Manual Setup: Floating Licenses on Windows	Manual Setup: Floating Licenses on Linux
Floating license client	Setting Up Floating Licenses	Manual Setup: Floating Licenses on Windows	Manual Setup: Floating Licenses on Linux

Setting up licenses manually

In certain cases, you cannot use Keysight License Manager 6:

- **If you need to set up licensing on a 32-bit Windows system or on Linux**, you must use the manual setup procedures. The Keysight License Manager 6 utility is supported on 64-bit Windows systems only.
- **If you are setting up unserved, uncounted node-locked or transportable licenses, you may need to use the older version of the tool**, Keysight License Manager 5, rather than the tools and processes described in this document. When you add a license in Keysight License Manager 6, you will see a message directing you to use the older version if that is necessary.
- **If you have already set up licenses on your system manually** – that is, using the FlexNet tools rather than the Keysight License Manager – you should continue

to set up subsequent licenses manually. This is because the manual process involves creating environment variables for license search paths, but the Keysight License Manager (on Microsoft Windows) uses registry entries for the same purpose. Environment variables override registry entries; therefore, if you use the Keysight License Manager after using the manual process, your changes will not take effect.

The manual setup processes are described in [Manual License Setup](#).

Setting Up Floating Licenses

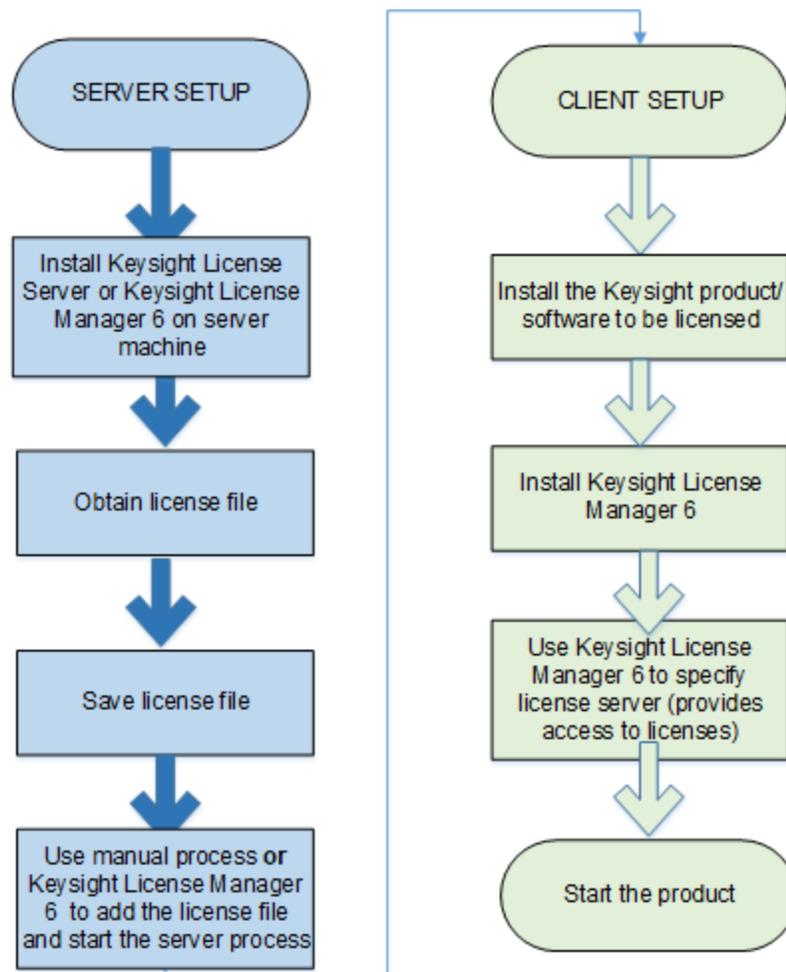
This section describes how to set up floating licenses (tied to a networked license server) using Keysight License Manager 6. These setup instructions apply to both permanent and time-limited licenses.

To set up floating licensing, you'll need to configure the license server and the client (the instrument or computer running the licensed Keysight product). In certain cases, you cannot use Keysight License Manager 6:

- **If either machine runs Linux or 32-bit Windows**, you must use the manual setup procedures on that machine. The Keysight License Manager 6 utility is supported on 64-bit Windows systems only. The license server does not need to use the same operating system as the clients; if the operating systems differ, you can use Keysight License Manager 6 where appropriate and use the manual process (FlexNet tools) on the other systems.
- **If you are setting up unserved, uncounted node-locked licenses, you may need to use the older version of the tool**, Keysight License Manager 5, rather than the tools and processes described in this document. When you add a license in Keysight License Manager 6, you will see a message directing you to use the older version if that is necessary.
- **If you have already set up licenses on your system manually** – that is, using the FlexNet tools rather than the Keysight License Manager – you should continue to set up subsequent licenses manually. This is because the manual process involves creating environment variables for license search paths, but Keysight License Manager 6 uses registry entries for the same purpose. Environment variables override registry entries; therefore, if you use the Keysight License Manager after using the manual process, your changes will not take effect.

The manual setup processes are described in [Manual License Setup](#).

Setting up floating licenses with the Keysight License Manager



License server setup

First, see the criteria above the diagram to determine whether you will use Keysight License Manager 6 to set up your server. If you need to set up your server manually, go to [Manual Setup: Floating Licenses on Windows](#).

Repeat the following steps on each license server. (For help on choosing a license server, see the FlexNet Publisher License Administration Guide, installed with Keysight License Manager 6 at *C:\Program Files\Common Files\Keysight\License Manager 6*.)

Step 1: Install Keysight License Manager 6 on the license server machine

Keysight License Manager 6 may have already been installed with your Keysight product. To check, click in the Windows search box and search for **Keysight License**

Manager 6. If you have an earlier version, you must still follow the steps below to get the latest version.

If you don't already have Keysight License Manager 6, follow these steps to download and install it.

1. Open your web browser and navigate to <http://www.keysight.com/find/LicensingSupport>.
2. Download the **Keysight License Manager 6** installer.
3. Double-click the installer file and follow the instructions to complete the installation.

Step 2: Obtain a license file

1. If you have ordered a licensed Keysight product, you'll receive (typically by email) a license certificate (.pdf file). Note the order number and certificate number.
2. Determine the license server's host ID in one of these ways:
 - On the server machine, execute `lmutil lmhostid` to get the FlexNet host ID directly.
 - On the server machine, execute `getmac /v /fo list`. Your host ID is listed as the Physical Address of the Network Adapter.
3. Go to <http://www.keysight.com/find/softwaremanager> to obtain your license (.lic) file. Follow the instructions on screen to enter your order number, certificate number, and host ID.

NOTE

If you haven't done this before, you may need to create an account and add the Software Manager capability.

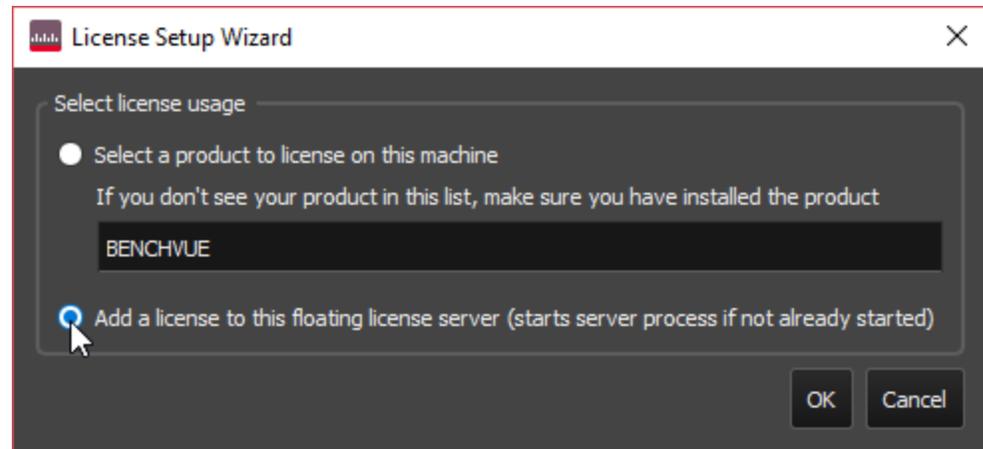
4. Follow additional instructions to request a license file, which will be emailed to you.

Step 3: Save the license file

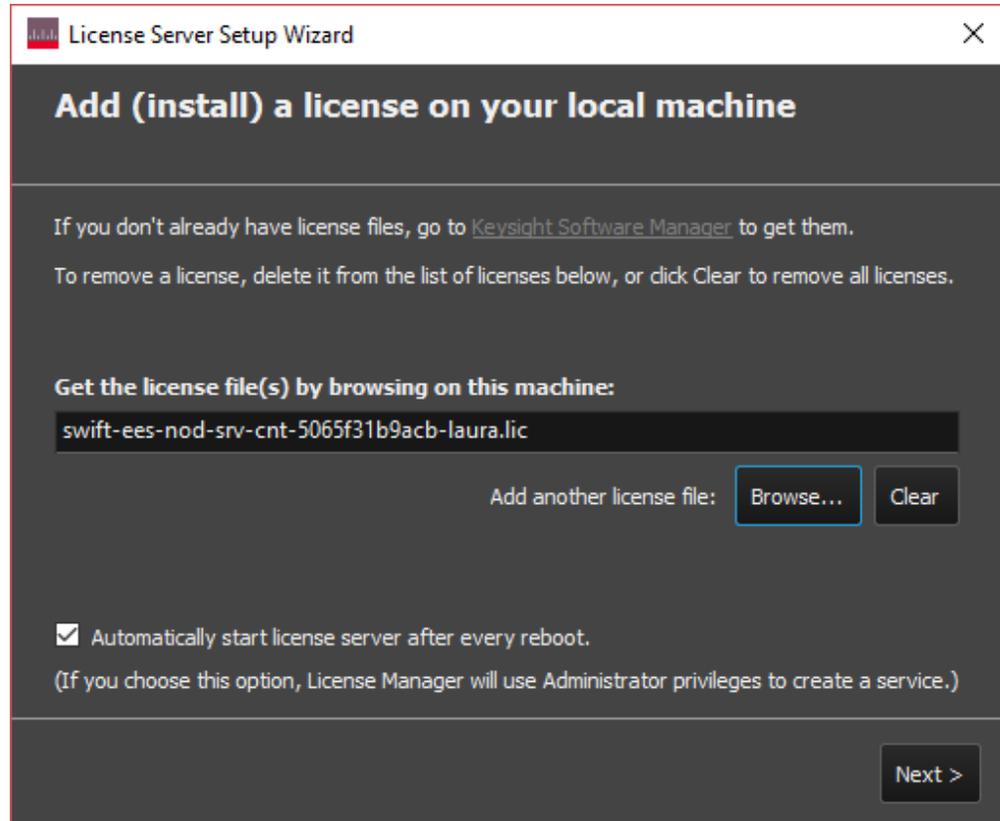
1. Make a copy of the license file on the license server machine, and note the location.
2. If you want the license to be served from multiple servers, or if you are using a [triple-redundant server configuration](#), put a copy of the license file on each server machine.

Step 4: Set up the license server and add your license(s)

1. On the license server machine, start Keysight License Manager 6 from your computer's Start screen or Start menu.
2. Click **Add a license to your local machine**.
3. Select **Add a license to this floating license server**.



4. In the **Add (install) a license** window, click **Browse** and browse to the location of your license file. You can repeat this as many times as needed to install all your licenses.
5. If you want the license server process to start automatically each time the server machine is restarted, make sure that **Automatically start license server after every reboot** is selected. If it is selected, Keysight License Manager will create a Windows service named *EEsof EDA License Server*, which (by default) will restart every time the machine is restarted.



6. Click **Next**. The license(s) will be added to your server configuration, and the license server manager (*lmgrd*) and Keysight vendor daemon (*agileesofd*) will be started if they are not already running.
7. You will not be able to add a license if it specifies a different port number from Keysight licenses already installed on this machine. You will need to edit your license file(s) to specify the same port number. See [Port Number Conflicts](#) for details.

License client setup

First, see the criteria above to determine whether you will use Keysight License Manager 6 to set up your client machine(s) (the machines that will run your licensed Keysight software). If you need to set up your clients manually, go to [Manual Setup: Floating Licenses on Windows](#). Note that you can set up some clients manually and others using Keysight License Manager 6: for example, you may need to do this if the clients are running different operating systems.

On each client machine (instrument or computer where you want to run Keysight products using floating licenses) where you will use Keysight License Manager 6, you'll need to do the following:

Step 1: Install the licensing software on the client machine

Keysight License Manager 6 may have already been installed with your Keysight product. To check, click in the Windows search box and search for **Keysight License Manager 6**. If you have an earlier version, you must still follow the steps below to get the latest version.

If you don't already have Keysight License Manager 6, follow these steps to download and install it.

1. Open your web browser and navigate to <http://www.keysight.com/find/LicensingSupport>.
2. Download the **Keysight License Manager 6** installer.
3. Double-click the installer file and follow the instructions to complete the installation.

Step 2: Specify the remote license server(s)

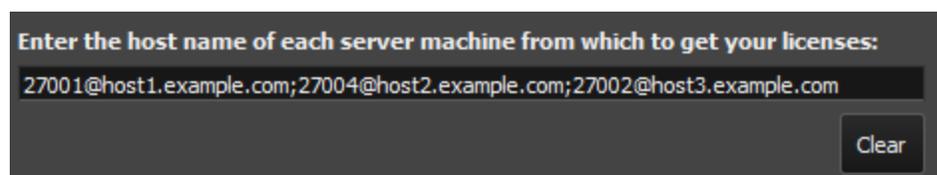
On each client machine, follow these steps to provide access to licenses on your floating license server(s).

1. Before you start, make sure you know the host name of each license server, and the port number to be used. Get this information from your system administrator if they set up the license server, or see [Keysight Licensing FAQs](#) for information on how to find it.
2. On the client machine, start Keysight License Manager 6 from your Keysight product's Help menu or from your computer's Start screen or Start menu.
3. Click **Specify a remote floating license server**.
4. You may see the **License Setup Wizard - Select a product** dialog box. Choose the product you wish to license, and click **OK**. (If you started Keysight License Manager 6 from a Keysight product's installer or menu, that product will be preselected and you will not see the dialog box.)

NOTE

If the product you want to license is not in the list, you may not have successfully installed the product. Close the License Setup Wizard window and install or reinstall your product software.

5. Type the **port_number@host_name** of each server. If you have more than one server, separate them with semicolons (;). For example:



6. Click **Next** to complete your setup.

Setting Up Node-Locked Licenses

This section describes how to set up node-locked licenses (tied to a specific computer or instrument) using the Keysight License Manager.

In certain cases, you cannot use Keysight License Manager 6:

- **If you need to set up licensing on a 32-bit Windows system or on Linux**, you must use the manual setup procedures. The Keysight License Manager 6 utility is supported on 64-bit Windows systems only.
- **If you are setting up unserved, uncounted node-locked or transportable licenses, you may need to use the older version of the tool**, Keysight License Manager 5, rather than the tools and processes described in this document. When you add a license in Keysight License Manager 6, you will see a message directing you to use the older version if that is necessary.
- **If you have already set up licenses on your system manually** – that is, using the FlexNet tools rather than the Keysight License Manager – you should continue to set up subsequent licenses manually. This is because the manual process involves creating environment variables for license search paths, but the Keysight License Manager (on Microsoft Windows) uses registry entries for the same purpose. Environment variables override registry entries; therefore, if you use the Keysight License Manager after using the manual process, your changes will not take effect.

The manual setup processes are described in [Manual License Setup](#).

Setting up node-locked licenses with the Keysight License Manager

Perform all the following steps on your local machine (the instrument or computer on which you'll run the licensed Keysight product).

Step 1: Install the licensing software

Keysight License Manager 6 may have already been installed with your Keysight product. To check, click in the Windows search box and search for **Keysight License Manager 6**. If you have an earlier version, you must still follow the steps below to get the latest version.

If you don't already have Keysight License Manager 6, follow these steps to download and install it.

1. Open your web browser and navigate to <http://www.keysight.com/find/LicensingSupport>.
2. Download the **Keysight License Manager 6** installer.
3. Double-click the installer file and follow the instructions to complete the installation.

Step 2: Obtain a license file

1. If you have ordered a licensed Keysight product, you'll receive (typically by email) a license certificate. Note the order number and certificate number.
2. Determine your local machine's host ID in one of these ways:
 - From `C:\Program Files\Common Files\Keysight\License Manager 6\bin`, execute `lmutil lmhostid` to get the FlexNet host ID directly.
 - Execute `getmac /v /fo list`. Your host ID is listed as the Physical Address of the Network Adapter.
1. Go to <http://www.keysight.com/find/softwaremanager> to obtain your license file. Follow the instructions on screen to enter your order number, certificate number, and host ID.

NOTE

If you haven't done this before, you may need to create an account and add the Software Manager capability.

2. Follow additional instructions to request a license file, which will be emailed to you.

Step 3: Save the license file

Make a copy of the license file on your local machine, and note the location.

Step 4: Add your license(s)

1. Start Keysight License Manager 6 from your Keysight product's Help menu or from your computer's Start screen or Start menu.
2. Click **Add a license to your local machine**.
3. In the **Add (install) license** window, click **Browse** and browse to the location of your license file. You can repeat this as many times as needed to install all your licenses.
4. If you want the license server process (needed for counted node-locked licenses) to start automatically any time the server machine is restarted, make sure that **Automatically start server after every reboot** is selected. If you do this, Keysight License Manager will create a Windows service named *EEsof EDA License Server*, which (by default) will restart every time the machine is restarted.
5. Click **Add (Install)**. The licenses will be added to your configuration, and the license server manager (*lmgrd*) and Keysight vendor daemon (*agileesofd*) will be started or restarted.
6. You will not be able to add a license if it specifies a different port number from Keysight licenses already installed on this machine. You will need to edit your license file(s) to specify the same port number. See [Port Number Conflicts](#) for details.

Setting Up USB Portable Licenses

In certain cases, you cannot use Keysight License Manager 6:

- **If you need to set up licensing on a 32-bit Windows system or on Linux**, you must use the manual setup procedures. The Keysight License Manager 6 utility is supported on 64-bit Windows systems only.
- **If you are setting up unserved, uncounted node-locked or transportable licenses, you may need to use the older version of the tool**, Keysight License Manager 5, rather than the tools and processes described in this document. When you add a license in Keysight License Manager 6, you will see a message directing you to use the older version if that is necessary.
- **If you have already set up licenses on your system manually** – that is, using the FlexNet tools rather than the Keysight License Manager – you should continue to set up subsequent licenses manually. This is because the manual process involves creating environment variables for license search paths, but the Keysight License Manager (on Microsoft Windows) uses registry entries for the same purpose. Environment variables override registry entries; therefore, if you use the Keysight License Manager after using the manual process, your changes will not take effect.

The manual setup processes are described in [Manual License Setup](#).

Setting up USB portable licenses with the Keysight License Manager

Step 1: Install the licensing software

Keysight License Manager 6 may have already been installed with your Keysight product. To check, click in the Windows search box and search for **Keysight License Manager 6**. If you have an earlier version, you must still follow the steps below to get the latest version.

If you don't already have Keysight License Manager 6, follow these steps to download and install it.

1. Open your web browser and navigate to <http://www.keysight.com/find/LicensingSupport>.
2. Download the **Keysight License Manager 6** installer.
3. Double-click the installer file and follow the instructions to complete the installation.

Step 2: Install dongle drivers

Repeat these steps on each machine on which you plan to use the USB portable license:

1. Download the FLEXID10 USB Dongle Driver package for your platform from <http://www.keysight.com/find/LicensingUsbDriver>.

2. The driver files are provided in .zip format. Extract the files to a convenient location on the machine.
3. Execute *Setup64.exe* (on 64-bit Windows) or *Setup32.exe* (on 32-bit Windows).
4. Follow the installer prompts, accepting the default values.

For more information and detailed instructions, see the *FlexNet Publisher Driver Installation Guide for FlexNet ID Dongles*, available from <https://flexeracommunity.force.com/customer/CCDocumentation> (login required).

Step 3: Connect the dongle

Connect the dongle to a USB port.

Step 4: Obtain a license file

1. If you have ordered a licensed Keysight product with a USB portable license, you'll receive a license certificate (paper or email) and you will have the option of ordering a USB hardware key (dongle). If you don't order a new dongle, you will use one you already have to perform the following steps. Note the order number and certificate number from the paper or emailed certificate.
2. To determine your dongle ID, either read the dongle ID directly from the key or, with the dongle connected to your computer, execute `lmutil lmhostid - flexid`.
3. Go to <http://www.keysight.com/find/softwaremanager> to obtain your license file. Follow the instructions on screen to enter your order number, certificate number, and host ID.

NOTE

If you haven't done this before, you may need to create an account and add the Software Manager capability.

4. Follow additional instructions to request a license file, which will be emailed to you.
5. Perform steps 5 and 6 on *each* machine on which you plan to run the licensed Keysight product using the USB portable license.

Step 5: Save the license file

Make a copy of the license file on each machine on which you plan to use the USB portable license, and note the location of the copy.

Step 6: Add your license(s)

1. Start Keysight License Manager 6 from your Keysight product's Help menu or from your computer's Start screen or Start menu.
2. Click **Add a license to your local machine**.

3. In the **Add (install) license** window, click **Browse** and browse to the location of your license file. You can repeat this as many times as needed to install all your licenses.
4. If you want the license server process (needed for counted USB portable licenses) to start automatically any time the server machine is restarted, make sure that **Automatically start server after every reboot** is selected. If it is selected, Keysight License Manager will create a Windows service named *EEsof EDA License Server*, which (by default) will restart every time the machine is restarted.
5. Click **Add (Install)**. The licenses will be added to your configuration, and the license server manager (*lmgrd*) and Keysight vendor daemon (*agileesofd*) will be started if they are not already running.
6. You will not be able to add a license if it specifies a different port number from Keysight licenses already installed on this machine. You will need to edit your license file(s) to specify the same port number. See [Port Number Conflicts](#) for details.

Manual License Setup

This section describes how to set up Keysight Licensing manually – that is, using the Flex tools and not Keysight License Manager 6. The easiest way to set up licensing is to use Keysight License Manager 6; see [Setting Up Licenses](#).

In certain cases, you cannot use Keysight License Manager 6:

- **If you need to set up licensing on a 32-bit Windows system or on Linux**, you must use the manual setup procedures. The Keysight License Manager 6 utility is supported on 64-bit Windows systems only.
- **If you are setting up unserved, uncounted node-locked or transportable licenses, you may need to use the older version of the tool**, Keysight License Manager 5, rather than the tools and processes described in this document. When you add a license in Keysight License Manager 6, you will see a message directing you to use the older version if that is necessary.
- **If you have already set up licenses on your system manually** – that is, using the FlexNet tools rather than the Keysight License Manager – you should continue to set up subsequent licenses manually. This is because the manual process involves creating environment variables for license search paths, but the Keysight License Manager (on Microsoft Windows) uses registry entries for the same purpose. Environment variables override registry entries; therefore, if you use the Keysight License Manager after using the manual process, your changes will not take effect.

NOTE

Counted node-locked, counted USB portable, and floating licenses require a license server to get installed

and started. For a counted node-locked or USB portable license, the license server and the client are the same machine (that is, your local machine). For floating licenses, these can be separate machines.

For manual setup instructions, see the section that fits your license type and operating system:

[Floating Licenses on Linux](#)

[Floating Licenses on Windows](#)

[Node-Locked Licenses on Linux](#)

[Node-Locked Licenses on Windows](#)

[USB Portable Licenses on Linux](#)

[USB Portable Licenses on Windows](#)

Manual Setup: Floating Licenses on Linux

To set up floating (network) licensing, you'll need to do license server setup and client setup.

License server setup

Repeat the following steps on each license server. (For help on choosing a license server, see the *FlexNet Publisher's License Administration Guide*, installed with Keysight License Server 6.)

Step 1: Determine your executable and license locations and stop any existing server process

1. First, run `ps -ef | grep agileesofd` to see whether there is already an *agileesofd* process running on your license server.
2. If you find such a process, determine the path to its executable by executing `readlink -f /proc/<pid>/exe`. Make note of this path.
3. Go to that location and run *lmtools.exe*.
4. In the LMTTOOLS window, go to the Config Services tab and take note of the **Path to the license file**. This is where you'll put your new licenses.
5. Close LMTTOOLS.
6. Kill the *agileesofd* process.

Step 2: Install Keysight License Server on the license server machine

1. On your license server machine, open your web browser and navigate to <http://www.keysight.com/find/licenseserver>.
2. Download the *agileesofd-<version>-<platform>.tar.gz* archive.
3. Untar the files, either:
 - to the executable location from Step 1 above, or
 - if you do not have an existing location, to `/opt/keysight/licensing/agileesofd`.

Step 3: Obtain a license file

1. If you have ordered a licensed Keysight product, you'll receive (typically by email) a license certificate. Note the order number and certificate number.
2. Determine the license server's host ID in one of these ways:
 - On the server machine, execute `lmutil lmhostid` to get the FlexNet host ID directly.

NOTE

If you see a `No such file or directory` error when you try to run `lmutil`, then you need to install the [Linux Standard Base library](#). Use `yum` to install `redhat-lsb`.

- On the server machine, execute `/sbin/ifconfig -a`. Examine the `ifconfig` results to find your Ethernet interface (often called `eth0`) and use its hardware address (`HWaddr`). For example, in the `ifconfig` output shown below, the host ID is `00:0c:29:c0:06:65`.

```
eth0 Link encap:Ethernet HWaddr 00:0c:29:c0:06:65
inet addr:156.140.113.178 Bcast:156.140.113.255
Mask:255.255.254.0
inet6 addr: fe80::20c:29ff:fec0:665/64 Scope:Link
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
RX packets:36522 errors:0 dropped:0 overruns:0
frame:0
TX packets:10160 errors:0 dropped:0 overruns:0
carrier:0
collisions:0 txqueuelen:1000
RX bytes:38094114 (38.0 MB) TX bytes:695114 (695.1
KB)
```

3. Go to <http://www.keysight.com/find/softwaremanager> to obtain your license file. Follow the instructions on screen to enter your order number, certificate number, and host ID.

NOTE

If you haven't done this before, you may need to create an account and add the Software Manager capability.

4. Follow additional instructions to request a license file, which will be emailed to you.

Step 4: Save the license file

To save the license file for use by Keysight Licensing:

1. Make a copy of the license file on your hard disk, either:
 - in the license file directory from Step 1 above, or
 - if you do not have an existing location, in `/var/opt/keysight/licensing/licenses/server`.

2. Open or cat the license files in the directory to ensure they all specify the same port value (between 27000 and 27009, inclusive) in their SERVER statements. If not, edit them to have the same port value. You will experience licensing failures if the licenses have conflicting port numbers. See [Port Number Conflicts](#) for more information.
3. Set the file permissions so that it can be read by *lmgrd*. For example:

```
chmod a+r <filename.lic>
```

 This example gives all users read access to the license.

Step 5: Start the license server manager

NOTE

You must install a license (Step 3 above) before you can start the license server.

Start the license server manager (*lmgrd*) and vendor daemon (*agileesofd*) on the machine to which the license is tied as follows:

1. Change directory to the location of your server files (for example, */opt/keysight/licensing/agileesofd*).
2. Run the following command to start *lmgrd*:

```
./lmgrd -c <license file path> -l <license log file path>
```

where:

- [<license file path>](#) specifies one or more full path names to license file(s) and/or folder(s) containing license files.
- [<license log file path>](#) is the full path name to the debug log file.

Automate FlexNet license server startup

To automate the license server manager's startup upon system reboot, add something similar to the following sample script in the system boot services directory or in */etc/rc.d/init.d*.

```
#!/bin/sh
#
# Sample FlexNet startup script for restarting Keysight License Server
#
### BEGIN INIT INFO
# Provides: license server
# Required-Start: $network
# Required-Stop:
# Default-Start: 3 4 5
# Default-Stop:
# Description: Start License Server
### END INIT INFO
```

```
sudo /opt/keysight/licensing/agileesofd/lmgrd -c /var/opt/keysight/licensing/licenses -l /var/log/keysight/licensing/log/license-server.log
```

```
echo "Starting Keysight FlexNet license daemon....."
sleep 5
```

Once you implement your version of the FlexNet startup script using the above sample, follow the steps below to complete the automation:

1. Change to the system boot services directory `/etc/rc.d/init.d`.
2. Create a startup script (for example, `keysight_lmgrd_restart`) in the system boot services directory.
3. Insert your FlexNet startup script (above) into the startup script.
4. Set the permissions for this script as follows:


```
chmod 755 keysight_lmgrd_restart
chown root keysight_lmgrd_restart
chgrp sys keysight_lmgrd_restart
```
5. If this machine is your license server, run this command: `/sbin/chkconfig --add keysight_lmgrd_restart`
6. Create a system service file (`keysight_lmgrd.service`), with the contents shown below, in the system boot services directory `/etc/systemd/system`.

```
[Unit]
Description=Keysight License Service
After= multi-user.target
```

```
[Service]
Type=simple
ExecStart=/etc/rc.d/init.d/keysight_lmgrd_restart.sh
TimeoutStartSec=0
```

```
[Install]
WantedBy= default.target
```

7. From the terminal, execute the command:


```
systemctl enable keysight_lmgrd.service
```

The license server will be automatically started as soon as the system is restarted.

NOTE

If you see one of these errors when you start `lmgrd`:

```
lmgrd: /lib64/ld-lsb-x86-64.so.3:
bad ELF interpreter: No such file or
directory
lmgrd: No such file or directory
```

then you need to install the [Linux Standard Base library](#) .
Use `yum` to install `redhat-lsb` .

If you need to stop the license server manually, execute the following (substituting your license location if it is

```
different):
lmutil lmdown -c
/var/opt/keysight/licensing/licenses
```

Client setup

Clients of a Linux license server can run Linux and/or Microsoft Windows. These instructions are for Linux client setup. See [Setting Up Floating Licenses](#) for Windows client setup.

Step 1: Provide access to licenses

Once you have successfully configured all the license servers, configure each client (the instruments and/or computers on which you will run Keysight products) to point to the appropriate license server. To do this, set the environment variable(s) `<PRODNAME>_LICENSE_FILE` to contain the list of license files and/or license servers to search when a license is requested for each product, where `<PRODNAME>` is the short name of the product, matching the prefix of the `<PRODNAME>.xml` file installed with each product at `/var/opt/keysight/licensing/config`. This environment variable can be set in the user login startup file, such as `.cshrc` (for C shell) or `.profile` (for Bourne shell) in the `$HOME` directory. Alternatively, you can set the variable on the command line, as shown below.

Be sure to specify the network license server name in the format `port@host.domain`, or, if no static TCP port is used on the license server, use the format `@host.domain`. To determine your server name, run `lmutil lmstat -lm`

Command line for csh, tcsh, cshrc

```
setenv <PRODNAME>_LICENSE_FILE port@host.domain
```

Command line for ksh, bash

```
export <PRODNAME>_LICENSE_FILE= port@host.domain
```

Test your setup

To test your configuration, run

```
lmutil lmdiag -c $ <PRODNAME>_LICENSE_FILE
```

If it doesn't find licenses, see [Floating License Problems](#) for troubleshooting assistance.

Manual Setup: Floating Licenses on Windows

To set up floating (network) licensing, you'll need to do license server setup and client setup.

License server setup

Repeat the following steps on each license server. (For help on choosing a license server, see the *FlexNet Publisher's License Administration Guide*, installed with Keysight License Manager 6.)

Step 1: Determine your executable and license locations and stop any existing server process

1. Run Task Manager to see whether there is already an *agileesofd* process running on your license server. It may be listed as **VendorDaemon agileesofd**.
2. If you find such a process, determine the path to its executable:
 1. Right-click the process in Task Manager.
 2. Select **Properties**.
 3. Make note of the full path, shown in the **Location** field.
3. Open a command prompt, go to the executable path, and run *lmtools.exe*.
4. In the LMTOOLS window, go to the Config Services tab and take note of the **Path to the license file**. This is where you'll put your new licenses.
5. Close LMTOOLS.
6. Right-click the *agileesofd* process in Task Manager and select **End task**.

Step 2: Install Keysight License Server on the license server machine

1. On your license server machine, open your web browser and navigate to <http://www.keysight.com/find/licenseserver>.
2. Download the *agileesofd-`<version>`-`<platform>`.zip* archive.
3. Extract the files, either:
 - to the executable location from Step 1 above, or
 - if you do not have an existing location, to *C:\Program Files\Common Files\Keysight\Licensing\Agileesofd*.

Step 3: Obtain a license file

1. If you have ordered a licensed Keysight product, you'll receive (typically by email) a license certificate. Note the order number and certificate number.
2. Determine the license server's host ID or the dongle ID in one of these ways:
 - On the server machine, execute `lmutil lmhostid` to get the FlexNet host ID directly.
 - On the server machine, execute `getmac /v /fo list`. Your host ID is listed as the Physical Address of the Network Adapter.
 - If you want the license tied to a dongle, read the dongle ID directly from the key or, with the dongle connected to your computer, execute `lmutil lmhostid -flexid`.
1. Go to <http://www.keysight.com/find/softwaremanager> to obtain your license file. Follow the instructions on screen to enter your order number, certificate

number, and host ID.

NOTE If you haven't done this before, you may need to create an account and add the Software Manager capability.

2. Follow additional instructions to request a license file, which will be emailed to you.

Step 4: Save the license file on the license server machine

1. Make a copy of the license file on your hard disk, either:
 - in the license file directory from Step 1 above, or
 - if you do not have an existing location, in `C:\ProgramData\Keysight\Licensing\Licenses\Server`.
2. Open or view the license files in the directory to ensure they all specify the same port value (between 27000 and 27009, inclusive) in their SERVER statements. If not, edit them to have the same port value. You will experience licensing failures if the licenses have conflicting port numbers. See [Port Number Conflicts](#) for more information.
3. If you want the license to be served from multiple servers, put a copy of the license file on each server machine.

Step 4: Start the license server manager

NOTE You must install a license (Step 3 above) before you can start the license server manager and the vendor daemon.

To start the FlexNet license server manager (*lmgrd*) and vendor daemon (*agileesofd*) and automate their restart upon PC reboot, configure a Windows service as follows:

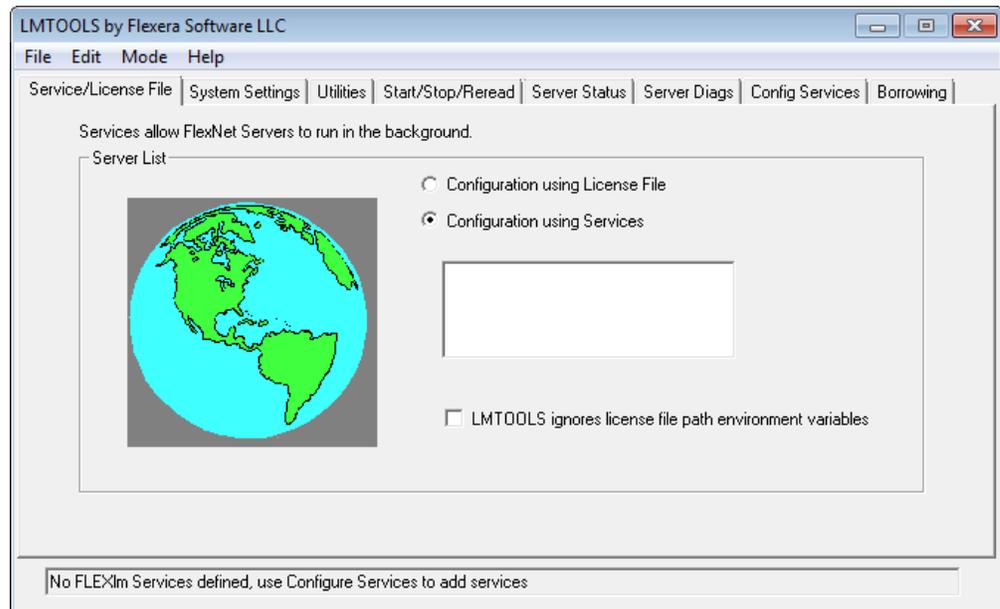
NOTE You must have administrator privileges to configure a Windows service. The service will run under the local system account as the special *Local Server* user, which does not have special system privileges. This means you should consider the following:

- The log file must be in a location that is writable by all users. If you specify a log file location that is not writable, the service will immediately exit, and will not indicate any errors (it returns an exit code of 0 even though it encountered an error). Since the log file was not writable, you will have no error message anywhere to indicate what went wrong, or even that there was a problem.
- The license files must be in a location that is readable by all users. If you specify a location that isn't readable, the log file will contain an error indic-

ating that the license file couldn't be found.

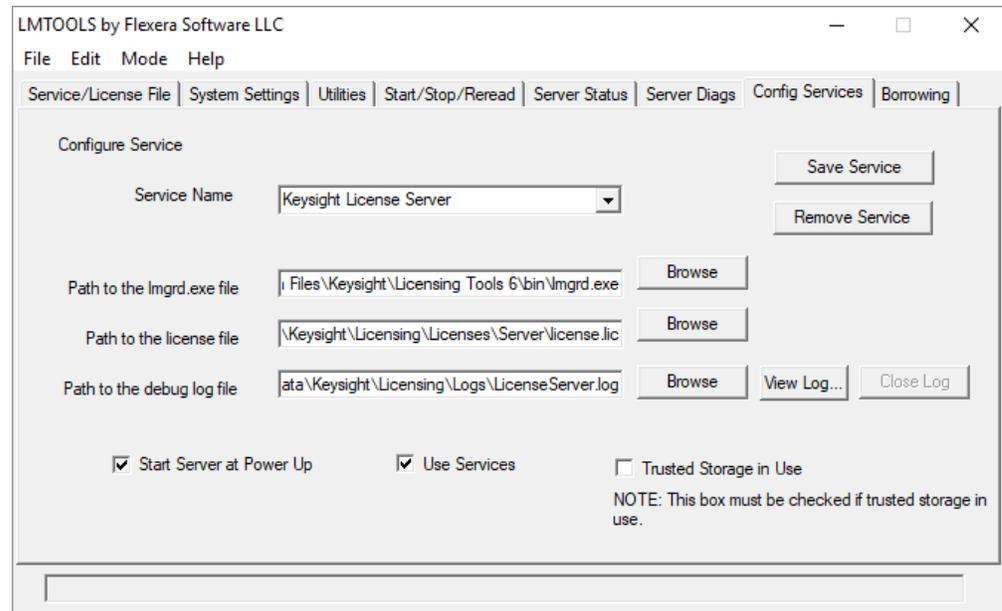
- Keysight recommends you put the log file and license files somewhere under *C:\ProgramData\Keysight*, which will allow them to inherit the appropriate permissions.

1. Run *lmtools.exe* from *C:\Program Files\Common Files\Keysight\Licensing\Agileesofd*. The **LMTOOLS** window is displayed.
2. In the **Service/License File** tab, select the **Configuration using Services** option.



3. Click the **Config Services** tab and enter the following details. See the NOTE above for additional information about paths.
 1. **Service Name:** For compatibility with Keysight EDA products, use the name **EEsof EDA License Server**.
 2. **Path to the lmgrd.exe file:** Click **Browse** and specify the path to the *lmgrd.exe* file on the license server (for example, *C:\Program Files\Common Files\Keysight\Licensing\Agileesofd\lmgrd.exe*).
 3. **Path to the license file:** Click **Browse** and specify the path to the license file on the license server (for example, *C:\ProgramData\Keysight\Licensing\Licenses\Server\license.lic*). If you have multiple license files for multiple Keysight products, include them all.
Path to the debug log file: Click **Browse** and specify the path to the debug log file on the license server (for example, *C:\ProgramData\Keysight\Licensing\Log\LicenseServer.log*).

4. Select the **Use Services** option.
5. Select the **Start Server at Power Up** option.
6. Click **Save Service**. The following figure shows the configured services in the **LMTTOOLS** window.



7. Click the **Start/Stop/Reread** tab and observe that your service shows up in the **FlexNet license services installed on this computer** list.
8. To start the service, on the **Start/Stop/Reread** tab, select your service and click **Start Server**.

NOTE To verify that the license server manager and the vendor daemon are running, click the **Config Services** tab again and click **View Log**. A log window appears that indicates whether *lmgrd* and *agileesofd* are up and running.

If you need to stop the license server, execute the following (substituting your license location if it is different):

```
lmutil lmdown -c
C:\ProgramData\Keysight\Licensing\Licenses
```

Client setup

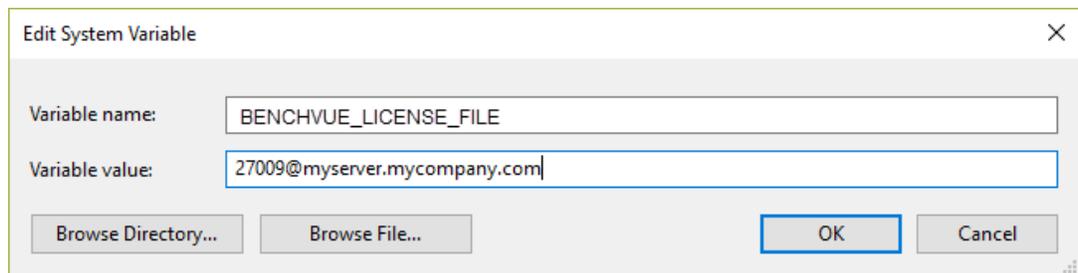
Clients of a Microsoft Windows license server can run Windows and/or Linux. These instructions are for Windows client setup. See [Manual Setup: Floating Licenses on Linux](#) for Linux client setup.

Step 1: Provide access to licenses

Once you have successfully configured all the license servers, configure each client (the instruments and/or computers on which you will run Keysight products) to point to the appropriate license server. To do this, set the environment variable `<PRODNAME>_LICENSE_FILE` to contain the list of license files and/or license servers to search when a license is requested for this product, where `<PRODNAME>` is the short name of the product, matching the prefix of the `<PRODNAME>.xml` file installed with each product at `C:\ProgramData\Keysight\Licensing\Configuration`. (If this client will run multiple Keysight products, set a variable for each.) Specify the network license server in the format of `port@host.domain` or, if no static TCP port is used on the license server, use the format `@host.domain`. (Your port will typically be 27009. You can find your "host.domain" value in **Control Panel, System, Full computer name**.)

To set the environment variables, go to **Control Panel, System, Advanced system settings, System Properties, Advanced, Environment Variables, System Variables**.

Example



Manual Setup: Node-Locked Licenses on Linux

This section describes how to set up node-locked licenses (locked to a particular computer or instrument), including perpetual, time-based, and trial licenses.

Prerequisite task: Install Keysight License Server

On the computer or instrument where you plan to run your licensed Keysight software, follow these steps to download and install the Keysight License Server. This is necessary to set up the local license server required for counted node-locked licenses.

1. First, run `ps -ef | grep agileesofd` to see whether there is already an `agileesofd` process running on your license server.
2. If you find such a process:
 1. Determine the path to its executable by executing `readlink -f /proc/<pid>/exe`. Make note of this path.

2. Go to that location and run `lmtools.exe`.
3. In the LMTTOOLS window, go to the Config Services tab and take note of the **Path to the license file**. This is where you'll put your new licenses.
4. Close LMTTOOLS.
5. Kill the `agileesofd` process.
3. Open your web browser and navigate to <http://www.keysight.com/find/licenseserver>.
4. Download the `agileesofd-<version>-<platform>.tar.gz` archive.
5. Untar the files, either:
 1. to the executable location from Step 1 above, or
 2. if you do not have an existing location, to `/opt/keysight/licensing/agileesofd`.

Step 1: Obtain a license file

1. If you have ordered a licensed Keysight product, you'll receive (typically by email) a license certificate. Note the order number and certificate number.
2. Determine your host ID in one of these ways:
 - Execute `lmutil lmhostid` to get the FlexNet host ID directly.

NOTE

If you see a `No such file or directory` error when you try to run `lmutil`, then you need to install the [Linux Standard Base library](#). Use `yum` to install `redhat-lsb`.

- Execute `/sbin/ifconfig -a`
Examine the `ifconfig` results to find your Ethernet interface (often called `eth0`) and use its hardware address (`HWaddr`).
- 1. Go to <http://www.keysight.com/find/softwaremanager> to obtain your license file. Follow the instructions on screen to enter your order number, certificate number, and host ID. Your license file will be emailed to you.

NOTE

If you haven't done this before, you may need to create an account and/or add the Software Manager capability.

Step 2: Save the license file

NOTE

Be sure to save the license file on the same system (instrument or computer) where you plan to use the licensed Keysight software.

To save the license file for use by Keysight Licensing:

1. Make a copy of the license file on your hard disk, either:
 - in the license file directory from Step 1 above, or
 - if you do not have an existing location, in `/var/opt/keysight/licensing/licenses/server`.
2. Open or cat the license files in the directory to ensure they all specify the same port value (between 27000 and 27009, inclusive) in their SERVER statements. If not, edit them to have the same port value. You will experience licensing failures if the licenses have conflicting port numbers. See [Port Number Conflicts](#) for more information.
3. Set the file permissions so that it can be read by `lmgrd`. For example:


```
chmod a+r <filename.lic>
```

 This example gives all users read access to the license.

Step 3: Start the license server manager

NOTE

You must install a license (Step 2 above) before you can start the license server manager and vendor daemon.

Start the license server manager (`lmgrd`) and the vendor daemon (`agileesofd`) on the machine to which the license is tied as follows:

1. Change directory to the location of your license server files (typically `/opt/keysight/licensing/agileesofd`).
2. Run the following command to start `lmgrd`:


```
./lmgrd -c <license file path> -l <license log file path>
```

 where:
 - [<license file path>](#) specifies one or more full path names to the license file(s).
 - [<license log file path>](#) is the full path name to the debug log file.

Automate FlexNet license server startup

To automate the license server startup upon system reboot, add something similar to the following sample script in the system boot services directory or in `/etc/rc.d/init.d`.

```
#!/bin/sh
#
# Sample FlexNet startup script for restarting Keysight License Server
#
### BEGIN INIT INFO
# Provides: license server
# Required-Start: $network
# Required-Stop:
# Default-Start: 3 4 5
# Default-Stop:
# Description: Start License Server
### END INIT INFO
```

```
sudo /opt/keysight/licensing/agileesofd/lmgrd -c /var/opt/keysight/licensing/licenses/server -
l /var/log/keysight/licensing/log/license-server.log
echo "Starting Keysight FlexNet license daemon..."
sleep 5
```

Once you implement your version of the FlexNet startup script using the above sample, follow the steps below to complete the automation:

1. Change to the system boot services directory `/etc/rc.d/init.d`.
2. Create a startup script (for example, `keysight-lmgrd-restart`) in the system boot services directory.
3. Insert your FlexNet startup script (above) into the startup script.

4. Set the permissions for this script as follows:

```
chmod 755 keysight-lmgrd-restart
chown root keysight-lmgrd-restart
chgrp sys keysight-lmgrd-restart
```

5. If this machine is your license server, run this command: `/sbin/chkconfig --add keysight-lmgrd-restart`
6. Create a system service file (`keysight-lmgrd.service`), with the contents shown below, in the system boot services directory `/etc/systemd/system`.

```
[nit]
Description=Keysight License Service
After= multi-user.target

[Service]
Type=simple
ExecStart= /etc/rc.d/init.d/keysight-lmgrd-restart.sh
TimeoutStartSec=0

[Install]
WantedBy=default.target
```

7. From the terminal, execute the command: `systemctl enable keysight-lmgrd.service`

The license server will be automatically started as soon as the system is restarted.

NOTE

If you see one of these errors when you start `lmgrd`:

```
lmgrd: /lib64/ld-lsb-x86-64.so.3:
bad ELF interpreter: No such file or
directory
lmgrd: No such file or directory
```

then you need to install the [Linux Standard Base library](#). Use `yum` to install `redhat-lsb`.

If you need to stop the license server manually, execute the following (substituting your license location if it is different):

```
lmutil lmdown -c
/var/opt/keysight/licensing/licenses
```

Manual Setup: Node-Locked Licenses on Windows

This section describes how to set up node-locked licenses (locked to a particular computer or instrument), including perpetual, time-based, and trial licenses.

Prerequisite task: Install Keysight License Server

On the computer or instrument where you plan to run your licensed Keysight software, follow these steps to download and install the Keysight License Server. This is necessary to set up the local license server required for counted node-locked licenses.

1. Run Task Manager to see whether there is already an *agileesofd* process running on your license server. It may be listed as **VendorDaemon agileesofd**.
2. If you find such a process:
 1. Determine the path to its executable:
 1. Right-click the process in Task Manager.
 2. Select **Properties**.
 3. Make note of the full path, shown in the **Location** field.
 2. Open a command prompt, go to the executable path, and run *lmtools.exe*.
 3. In the LMTTOOLS window, go to the Config Services tab and take note of the **Path to the license file**. This is where you'll put your new licenses.
4. Close LMTTOOLS.
5. Right-click the *agileesofd* process in Task Manager and select **End task**.
3. On your license server machine, open your web browser and navigate to <http://www.keysight.com/find/licenseserver>.
4. Download the *agileesofd-<version>-<platform>.zip* archive.
5. Extract the files to *C:\Program Files\Common Files\Keysight\Licensing\Agileesofd*.

Step 1: Obtain a license file

1. If you have ordered a licensed Keysight product, you'll receive (typically by email) a license certificate. Note the order number and certificate number.
2. Determine your host ID in one of these ways:

- From your executable path (typically `C:\Program Files\Common Files\Keysight\Licensing\Agileesofd`), execute `lmutil lmhostid` to get the FlexNet host ID directly.
- Execute `getmac /v /fo list`. Your host ID is listed under **Connection Name: Ethernet** as the **Physical Address**.

```

Connection Name: Ethernet
Network Adapter: Intel(R) Ethernet Connection (2) I218-LM
Physical Address: 48-0F-CF-62-40-2C
Transport Name: \Device\Tcpip_{AB9A8FD0-41EF-45C3-8E44-27930974677A}

Connection Name: VMware Network Adapter VMnet1
Network Adapter: VMware Virtual Ethernet Adapter for VMnet1

```

3. Go to <http://www.keysight.com/find/softwaremanager> to obtain your license file. Follow the instructions on screen to enter your order number, certificate number, and host ID. Your license file will be emailed to you.

NOTE

If you haven't done this before, you may need to create an account and add the Software Manager capability.

Step 2: Save the license file

NOTE

Be sure to save the license file on the same system (instrument or computer) where you plan to use the licensed Keysight software.

To save the license file for use by Keysight Licensing:

1. Make a copy of the license file on your hard disk, either:
 - in the license file directory from Step 1 above, or
 - if you do not have an existing location, in `C:\ProgramData\Keysight\Licensing\Licenses\Server`.
2. Open or view the license files in the directory to ensure they all specify the same port value (between 27000 and 27009, inclusive) in their SERVER statements. If not, edit them to have the same port value. You will experience licensing failures if the licenses have conflicting port numbers. See [Port Number Conflicts](#) for more information.

Step 3: Start the license server manager

NOTE

You must install a license (Step 2 above) before you can start the license server.

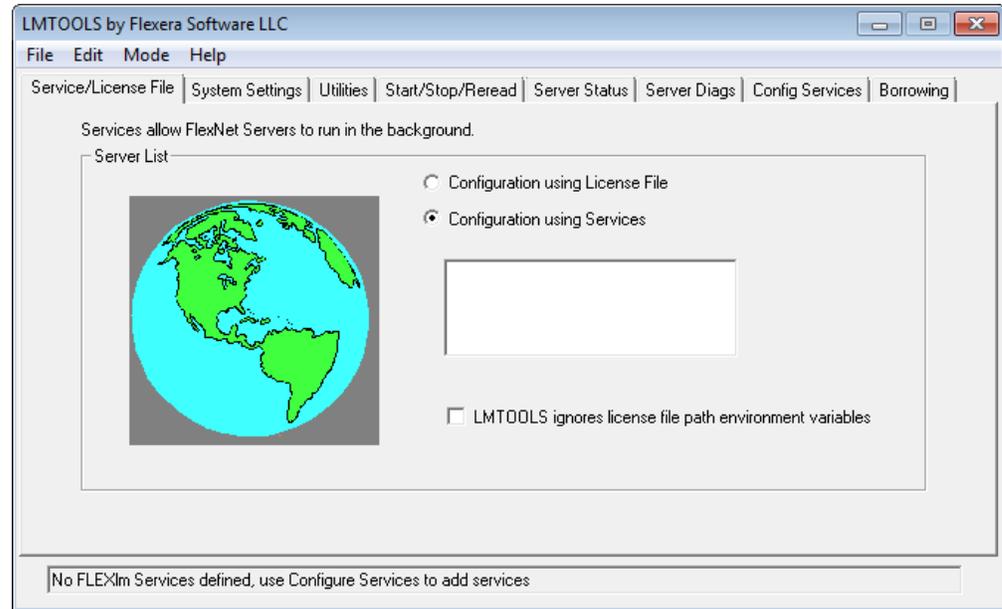
Counted node-locked licenses require the license server manager to run on the local machine.

To start the FlexNet license server manager (*lmgrd*) and vendor daemon (*agileesofd*) and automate their restart upon PC reboot, configure a Windows service as follows:

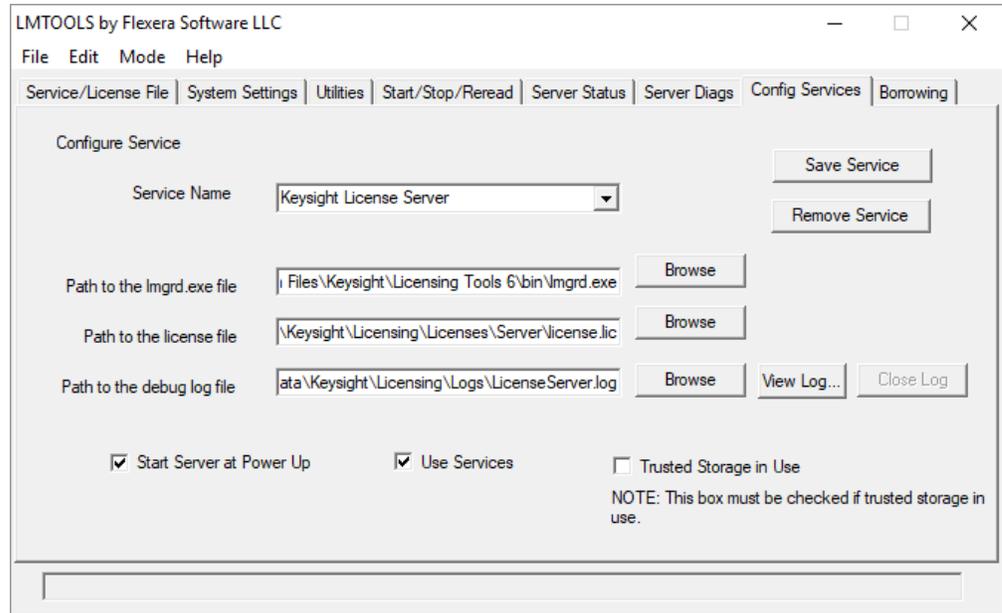
NOTE

You must have administrator privileges to configure a Windows service. The service will run under the local system account as the special *Local Server* user, which does not have special system privileges. This means you should consider the following:

- The log file must be in a location that is writable by all users. If you specify a log file location that is not writable, the service will immediately exit, and will not indicate any errors (it returns an exit code of 0 even though it encountered an error). Since the log file was not writable, you will have no error message anywhere to indicate what went wrong, or even that there was a problem.
 - The license files must be in a location that is readable by all users. If you specify a location that isn't readable, the log file will contain an error indicating that the license file couldn't be found.
 - Keysight recommends you put the log file and license files somewhere under *C:\ProgramData\Keysight*, which will allow them to inherit the appropriate permissions.
1. Run *lmtools.exe* from *C:\Program Files\Common Files\Keysight\Licensing\Agileesofd*. The **LMTOOLS** window is displayed.
 2. In the **Service/License File** tab, select the **Configuration using Services** option.



3. Click the **Config Services** tab and enter the following details. See the NOTE above for additional information about paths.
 1. **Service Name:** For compatibility with Keysight EDA products, use the name **EEsof EDA License Server**.
 2. **Path to the lmgrd.exe file:** Click **Browse** and specify the path to the *lmgrd.exe* file on the license server (for example, *C:\Program Files\Common Files\Keysight\Licensing\Agileesofd\lmgrd.exe*).
 3. **Path to the license file:** Click **Browse** and specify the path to the license file on the license server (for example, *C:\ProgramData\Keysight\Licensing\Licenses\Server\license.lic*).
If you have multiple license files for multiple Keysight products, include them all.
Path to the debug log file: Click **Browse** and specify the path to the debug log file on the license server (for example, *C:\ProgramData\Keysight\Licensing\Log\LicenseServer.log*).
 4. Select the **Use Services** option.
 5. Select the **Start Server at Power Up** option.
 6. Click **Save Service**. The following figure shows the configured services in the LMTOOLS window.



7. Click the **Start/Stop/Reread** tab and observe that your service shows up in the **FlexNet license services installed on this computer** list.
8. To start the service, on the **Start/Stop/Reread** tab, select your service and click **Start Server**.

NOTE To verify that the license server manager and the vendor daemon are running, click the **Config Services** tab again and click **View Log**. A log window appears that indicates whether *lmgrd* and *agilesofd* are up and running.

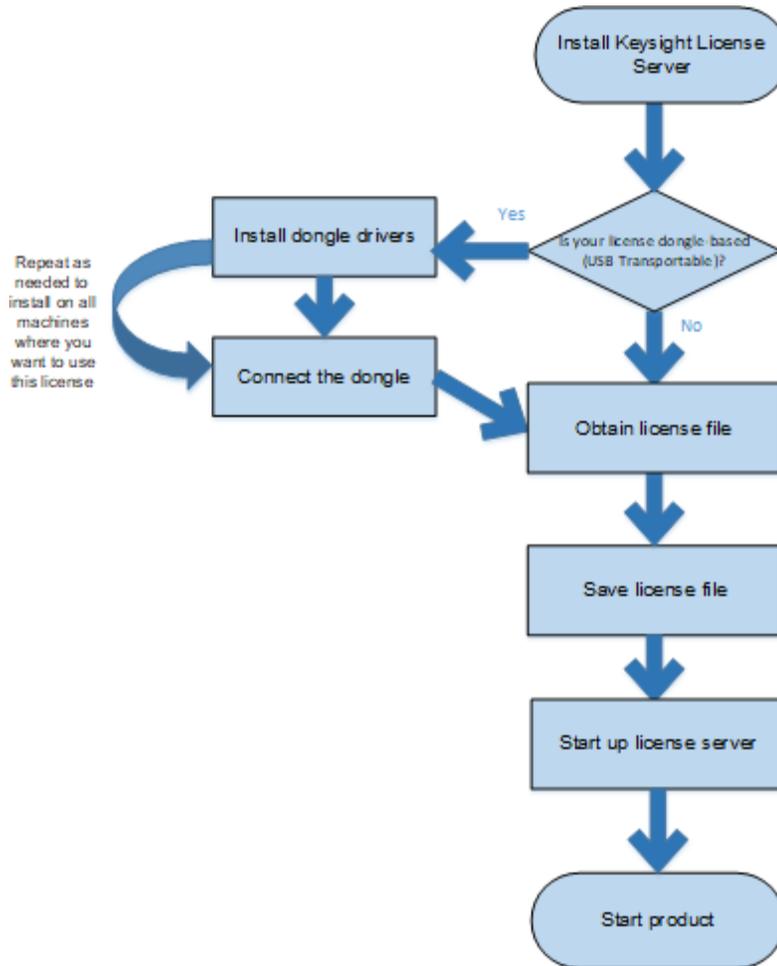
If you need to stop the license server, execute the following (substituting your license location if it is different):

```
lmutil lmdown -c
C:\ProgramData\Keysight\Licensing\Licenses
```

Manual Setup: USB Portable Licenses on Linux

This section describes how to set up USB portable licenses, which are locked to a USB key (dongle).

License setup process: USB portable licenses



Prerequisite task: Install Keysight License Server

On each computer or instrument where you plan to run your licensed Keysight software, follow these steps to download and install the Keysight License Server.

This is necessary to set up the local license server required for USB portable licenses.

1. First, run `ps -ef | grep agileesofd` to see whether there is already an *agileesofd* process running on your license server.
2. If you find such a process:
 1. Determine the path to its executable by executing `readlink -f /proc/<pid>/exe`. Make note of this path.
 2. Go to that location and run *lmtools.exe*.
 3. In the LMTTOOLS window, go to the Config Services tab and take note of the **Path to the license file**. This is where you'll put your new licenses.
 4. Close LMTTOOLS.
 5. Kill the *agileesofd* process.

3. Open your web browser and navigate to <http://www.keysight.com/find/licenseserver>.
4. Download the *agileesofd- \langle version \rangle - \langle platform \rangle .tar.gz* archive.
5. Untar the files, either:
 1. to the executable location from Step 1 above, or
 2. if you do not have an existing location, to */opt/keysight/licensing/agileesofd*.

Step 1: Install dongle drivers

Follow these steps on each system (instrument or computer) that is intended to run Keysight product(s) with USB portable license(s).

1. Download the FLEXID10 USB Dongle Driver from <http://www.keysight.com/find/LicensingUsbDriver>.
2. Ensure that the USB dongle is not connected to your system.
3. Change directory to the location of your license server files (such as */opt/keysight/licensing/agileesofd*).
4. Execute the following command (you may need root privileges): `rpm -i WkRt-Lin-6.32.1504-500.x86_64.rpm`
5. Connect the USB dongle to your local machine.
6. To determine whether the FlexNet ID of the USB dongle is correct, type:
`lmutil lmhostid -flexid`

NOTE

For more information and detailed instructions, see the *FlexNet Publisher Driver Installation Guide for FlexNet ID Dongles*, available from <https://flexeracommunity.force.com/customer/CCDocumentation> (login required).

Step 2: Connect the dongle

Make sure that the dongle is securely attached to the USB port of your computer. Some systems may require up to a few minutes to detect the dongle; therefore, make sure to allow sufficient time before the next step

Step 3: Obtain a license file

1. If you have ordered a licensed Keysight product, you'll receive (typically by email) a license certificate. Note the order number and certificate number.
2. Determine your dongle ID in one of these ways:
 - Before you install the hardware key on your machine, you can read the ID directly from the key.
 - If you have installed the hardware key on your machine, and have also already installed your licenses and the FlexNet software, go to `/opt/keysight/licensing/agileesofd` and enter the following command to check the ID:

```
lmutil lmhostid -flexid
```

This ID is a valid USB Key serial number: 9 or 1, a dash, and 8 hexadecimal characters. Examples: **9-1234abcd** or **10-1234abcd**.

NOTE

If you see a `No such file or directory` error when you try to run `lmutil`, then you need to install the [Linux Standard Base library](#). Use `yum` to install `redhat-lsb`.

3. Go to <http://www.keysight.com/find/softwaremanager> to obtain your license file. Follow the instructions on screen to enter your order number, certificate number, and dongle ID. Your license file will be emailed to you.

NOTE

If you haven't done this before, you may need to create an account and/or add the Software Manager capability.

Step 4: Save the license file

NOTE

Be sure to save the license file on *each* system (instrument or computer) where you plan to use the licensed Keysight software.

To save the license file for use by Keysight Licensing:

1. Make a copy of the license file on your hard disk, either in the license file directory from Step 1 above, or if you do not have an existing location:
 - If the license is served and counted (license file contains a `SERVER` line), place it in `/var/opt/keysight/licensing/licenses/server`
 - If the license is unserved and uncounted (license file does not contain a `SERVER` line), place it in `/var/opt/keysight/licensing/licenses/other`

See [Recognize Your License Type](#) for more information.

2. Open or cat the license files in the directory to ensure they all specify the same port value (between 27000 and 27009, inclusive) in their SERVER statements. If not, edit them to have the same port value. You will experience licensing failures if the licenses have conflicting port numbers. See [Port Number Conflicts](#) for more information.
3. Set the file permissions so that it can be read by *lmgrd*. For example:

```
chmod a+r <filename.lic>
```

 This example gives all users read access to the license.

Step 5: Start the license server manager

NOTE

You must install a license (Step 4 above) before you can start the license server manager and vendor daemon.

If all your licenses are unserved, uncounted licenses (do not contain a SERVER line), you do not need to start the license server manager, and you have now finished your setup.

Start the license server manager (*lmgrd*) and the vendor daemon (*agileesofd*) on the machine to which the license is tied as follows:

1. Change directory to the location of your license server files (typically */opt/keysight/licensing/agileesofd*).
2. Run the following command to start *lmgrd*:

```
./lmgrd -c <license file path> -l <license log file path>
```

 where:
 - [<license file path>](#) specifies one or more full path names to the license file(s).
 - [<license log file path>](#) is the full path name to the debug log file.

Automate FlexNet license server startup

To automate the license server startup upon system reboot, add something similar to the following sample script in the system boot services directory or in */etc/rc.d/init.d*.

```
#!/bin/sh
#
# Sample FlexNet startup script for restarting Keysight License Server
#
### BEGIN INIT INFO
# Provides: license server
# Required-Start: $network
# Required-Stop:
# Default-Start: 3 4 5
# Default-Stop:
# Description: Start License Server
### END INIT INFO
```

```
sudo /opt/keysight/licensing/agileesofd/lmgrd -c /var/opt/keysight/licensing/licenses/server -
l /var/log/keysight/licensing/log/license-server.log
echo "Starting Keysight FlexNet license daemon..."
sleep 5
```

Once you implement your version of the FlexNet startup script using the above sample, follow the steps below to complete the automation:

1. Change to the system boot services directory `/etc/rc.d/init.d`.
2. Create a startup script (for example, `keysight-lmgrd-restart`) in the system boot services directory.
3. Insert your FlexNet startup script (above) into the startup script.

4. Set the permissions for this script as follows:

```
chmod 755 keysight-lmgrd-restart
chown root keysight-lmgrd-restart
chgrp sys keysight-lmgrd-restart
```

5. If this machine is your license server, run this command: `/sbin/chkconfig --add keysight-lmgrd-restart`
6. Create a system service file (`keysight-lmgrd.service`), with the contents shown below, in the system boot services directory `/etc/systemd/system`.

```
[nit]
Description=Keysight License Service
After= multi-user.target

[Service]
Type=simple
ExecStart= /etc/rc.d/init.d/keysight-lmgrd-restart.sh
TimeoutStartSec=0

[Install]
WantedBy=default.target
```

7. From the terminal, execute the command:


```
systemctl enable keysight-lmgrd.service
```

The license server will be automatically started as soon as the system is restarted.

NOTE

If you see one of these errors when you start `lmgrd`:

```
lmgrd: /lib64/ld-lsb-x86-64.so.3:
bad ELF interpreter: No such file or
directory
lmgrd: No such file or directory
```

then you need to install the [Linux Standard Base library](#). Use `yum` to install `redhat-lsb`.

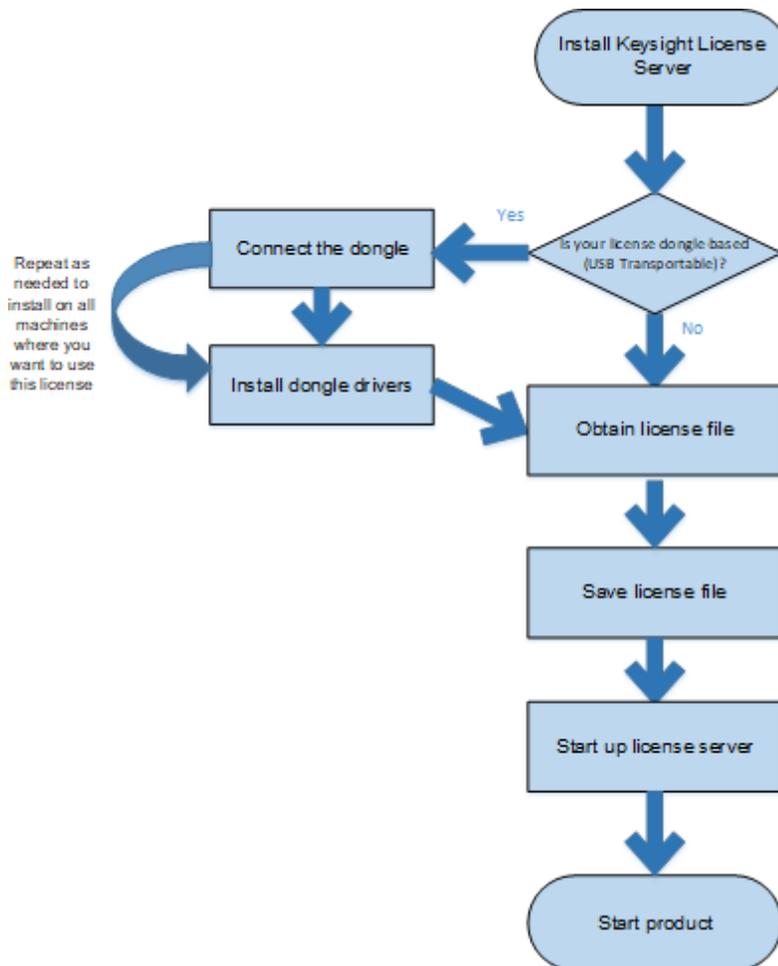
If you need to stop the license server manually, execute the following (substituting your license location if it is different):

```
lmutil lmdown -c
/var/opt/keysight/licensing/licenses
```

Manual Setup: USB Portable Licenses on Windows

This section describes how to set up USB portable licenses, which are locked to a USB key (dongle).

License setup process: USB portable licenses



Prerequisite task: Install Keysight License Server

On the computer or instrument where you plan to run your licensed Keysight software, follow these steps to download and install the Keysight License Server.

This is necessary to set up the local license server required for counted node-locked licenses.

1. Run Task Manager to see whether there is already an *agileesofd* process running on your license server. It may be listed as **VendorDaemon agileesofd**.
2. If you find such a process:
 1. Determine the path to its executable:
 1. Right-click the process in Task Manager.
 2. Select **Properties**.
 3. Make note of the full path, shown in the **Location** field.
 2. Open a command prompt, go to the executable path, and run *lmtools.exe*.
 3. In the LMTTOOLS window, go to the Config Services tab and take note of the **Path to the license file**. This is where you'll put your new licenses.
4. Close LMTTOOLS.
5. Right-click the *agileesofd* process in Task Manager and select **End task**.
3. On your license server machine, open your web browser and navigate to <http://www.keysight.com/find/licenseserver>.
4. Download the *agileesofd-<version>-<platform>.zip* archive.
5. Extract the files to *C:\Program Files\Common Files\Keysight\Licensing\Agileesofd*.

Step 1: Connect the dongle

Make sure that the dongle is securely attached to the USB port of your computer. Some systems may require up to a few minutes to detect the dongle; therefore, make sure to allow sufficient time before the next step.

Step 2: Install dongle drivers

Repeat these steps on each machine on which you plan to use the USB portable license:

1. Download the FLEXID10 USB Dongle Driver package for your platform from <http://www.keysight.com/find/LicensingUsbDriver>.
2. The driver files are provided in .zip format. Extract the files to a convenient location on the machine.
3. Execute *Setup64.exe* (on 64-bit Windows) or *Setup32.exe* (on 32-bit Windows).
4. Follow the installer prompts, accepting the default values.

For more information and detailed instructions, see the *FlexNet Publisher Driver Installation Guide for FlexNet ID Dongles*, available from <https://flexeracommunity.force.com/customer/CCDocumentation> (login required).

Step 3: Obtain a license file

1. If you have ordered a licensed Keysight product, you'll receive (typically by email) a license certificate. Note the order number and certificate number.
2. Determine your dongle ID in one of these ways:
 - Before you install the hardware key on your PC, you can read the ID directly from the key.
 - If you have installed the hardware key on your PC, and have also already installed your licenses and the FlexNet software, go to *C:\Program Files\Common Files\Keysight\License Manager 6\bin* or *C:\Program Files\Common Files\Keysight\Licensing\Agileesofd* and enter the following command to check the ID:

```
lmutil lmhostid -flexid
```

This ID is a valid USB Key serial number: 9 or 10, a dash, and 8 hexadecimal characters. Examples: **9-1234abcd** or **10-1234abcd**.

3. Go to <http://www.keysight.com/find/softwaremanager> to obtain your license file. Follow the instructions on screen to enter your order number, certificate number, and dongle ID. Your license file will be emailed to you.

NOTE

If you haven't done this before, you may need to create an account and add the Software Manager capability.

Step 4: Save the license file

NOTE

Be sure to save the license file on *each* system (instrument or computer) where you plan to use the licensed Keysight software.

To save the license file for use by Keysight Licensing:

1. Make a copy of the license file on your hard disk, either in the license file directory from Step 1 above, or if you do not have an existing location:
 - If the license is served and counted (license file contains a *SERVER* line), place it in *C:\ProgramData\Keysight\Licensing\Licenses\Server*
 - If the license is unserved and uncounted (license file does not contain a *SERVER* line), place it in *C:\ProgramData\Keysight\Licensing\Licenses\Other*

See [Recognize Your License Type](#) for more information.

2. Open or view the license files in the directory to ensure they all specify the same port value (between 27000 and 27009, inclusive) in their *SERVER* statements. If not, edit them to have the same port value. You will experience

licensing failures if the licenses have conflicting port numbers. See [Port Number Conflicts](#) for more information.

Step 5: Start the license server manager

NOTE

You must install a license (Step 4 above) before you can start the license server.

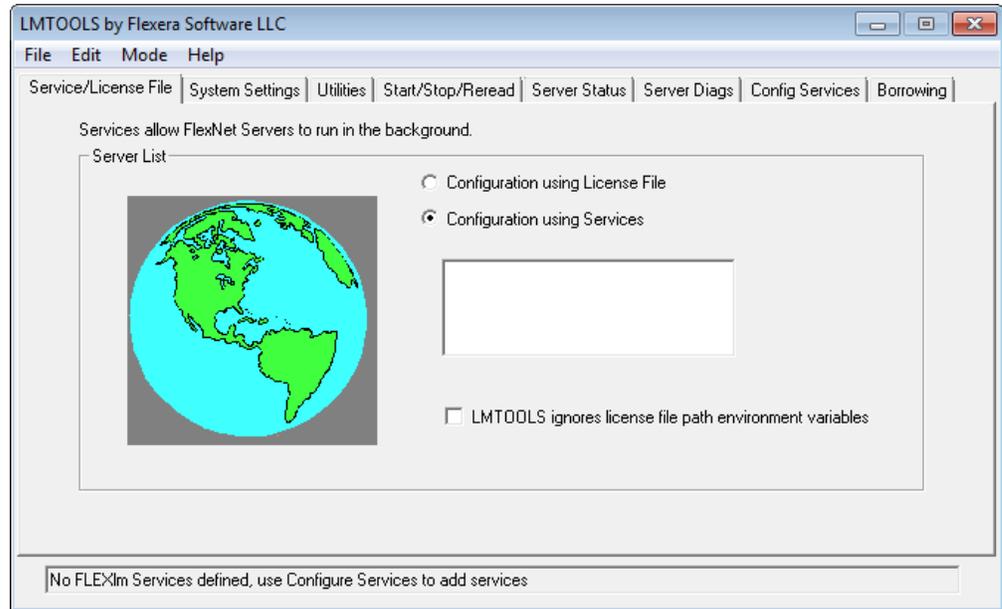
If all your licenses are unserved, uncounted licenses (do not contain a `SERVER` line), you do not need to start the license server manager, and you have now finished your setup.

To start the FlexNet license server manager (*lmgrd*) and vendor daemon (*agileesofd*) and automate their restart upon PC reboot, configure a Windows service as follows:

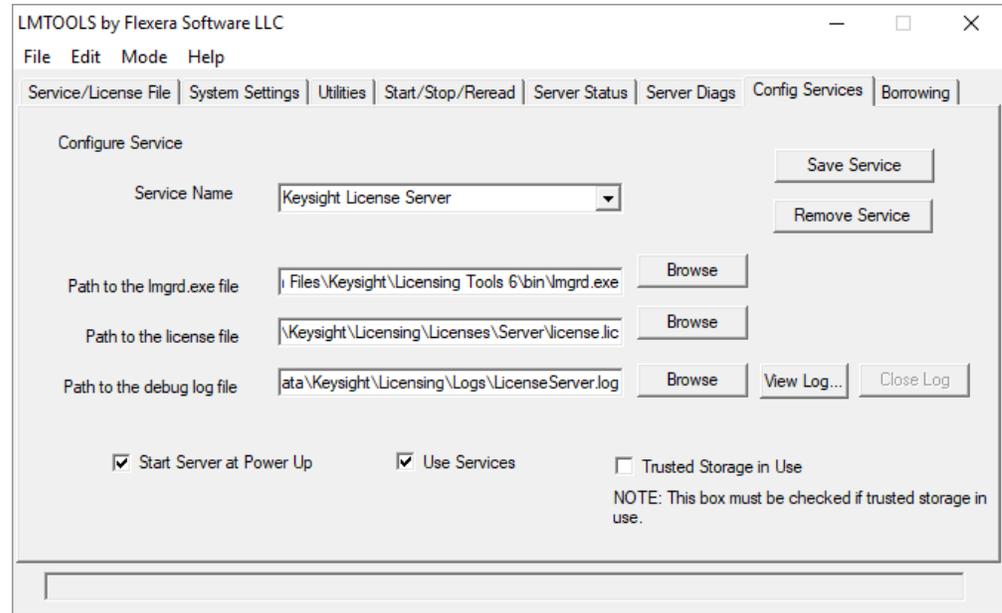
NOTE

You must have administrator privileges to configure a Windows service. The service will run under the local system account as the special *Local Server* user, which does not have special system privileges. This means you should consider the following:

- The log file must be in a location that is writable by all users. If you specify a log file location that is not writable, the service will immediately exit, and will not indicate any errors (it returns an exit code of 0 even though it encountered an error). Since the log file was not writable, you will have no error message anywhere to indicate what went wrong, or even that there was a problem.
 - The license files must be in a location that is readable by all users. If you specify a location that isn't readable, the log file will contain an error indicating that the license file couldn't be found.
 - Keysight recommends you put the log file and license files somewhere under *C:\ProgramData\Keysight*, which will allow them to inherit the appropriate permissions.
1. Run *lmtools.exe* from *C:\Program Files\Common Files\Keysight\Licensing\Agileesofd*. The **LMTTOOLS** window is displayed.
 2. In the **Service/License File** tab, select the **Configuration using Services** option.



3. Click the **Config Services** tab and enter the following details. See the NOTE above for additional information about paths.
 1. **Service Name:** For compatibility with Keysight EDA products, use the name **EEsof EDA License Server**.
 2. **Path to the lmgrd.exe file:** Click **Browse** and specify the path to the *lmgrd.exe* file on the license server (for example, *C:\Program Files\Common Files\Keysight\Licensing\Agileesofd\lmgrd.exe*).
 3. **Path to the license file:** Click **Browse** and specify the path to the license file on the license server (for example, *C:\ProgramData\Keysight\Licensing\Licenses\Server\license.lic*).
If you have multiple license files for multiple Keysight products, include them all.
Path to the debug log file: Click **Browse** and specify the path to the debug log file on the license server (for example, *C:\ProgramData\Keysight\Licensing\Log\LicenseServer.log*).
4. Select the **Use Services** option.
5. Select the **Start Server at Power Up** option.
6. Click **Save Service**. The following figure shows the configured services in the LMTOOLS window.



7. Click the **Start/Stop/Reread** tab and observe that your service shows up in the **FlexNet license services installed on this computer** list.
8. To start the service, on the **Start/Stop/Reread** tab, select your service and click **Start Server**.

NOTE To verify that the license server manager and the vendor daemon are running, click the **Config Services** tab again and click **View Log**. A log window appears that indicates whether *lmgrd* and *agileesofd* are up and running.

If you need to stop the license server, execute the following (substituting your license location if it is different):

```
lmutil lmdown -c
```

```
C:\ProgramData\Keysight\Licensing\Licenses
```


Advanced Licensing Configuration Options

This section provides information on various advanced licensing configuration options:

[Accessing Floating Licenses through a Firewall](#)

[Creating an Options File](#)

[Licensing Environment](#)

[Multiple Server Configurations](#)

[Setting Up Triple-Redundant License Servers](#)

Accessing Floating Licenses through a Firewall

You can access (check out) FlexNet licenses through a firewall (or router) as per your license agreement. To enable license checkout, configure your firewall to allow TCP/IP communication through the TCP ports used by *lmgrd* and *agileesofd*.

Step 1. Specify TCP port numbers

Specify a TCP port number for *lmgrd* on the `SERVER` line of your license file, and for *agileesofd* on the `VENDOR` lines. Stop and restart the license servers after you modify the port numbers.

NOTE

The port numbers must be the same for all licenses on one server. *lmgrd* will fail if license files have conflicting port numbers.

If no port is specified on the `SERVER` line, one of the default ports in the range 27000 to 27009 is used. If no port is specified on the `VENDOR` line, a port is chosen by the operating system at runtime; this may not work if a firewall is in place and the port used is not opened in the firewall.

Example

```
SERVER myserver 00809AC7123F8 27009
VENDOR agileesofd C:\Program Files\Common Files\Keysight\License Manager
6\agileesofd\agileesofd port=1705
```

Step 2. Configure the firewall

On both the license server and license client machines, configure your firewall (or router) to allow TCP communication through the TCP ports you specified in Step 1.

Step 3. Edit the licensing configuration to include the port number

On the client side, change the value of the environment variable `KAL_LICENSE_FILE` to include the port number assigned to the license server, as shown:

```
KAL_LICENSE_FILE=27009@myserver.myDomain
```

After you set the environment variable, clients outside of the firewall will be able to access licenses from your server.

NOTE

Some clients may time out before they can connect to a license server through a firewall. The default timeout period is 3 seconds. If you need a longer timeout period, you can modify FlexNet environment variable `FLEXLM_TIMEOUT` to a larger value. Refer to [FlexNet Publisher's License Administrator Guide](#) for details.

Creating an Options File

An *options file* allows administrators to control licensing parameters of FlexNet floating licensing:

- Restricts and/or reserves the use of features based on user, hostname, or display name.
- Controls the level of information logged about license usage.
- Controls parameters of borrowing, including the "low water" level (number of licenses that cannot be borrowed), users to be included or excluded from borrowing, maximum borrow period

NOTE

- You can create an options file using any text editor.
- Ideally, you should keep this file in the same directory as your license files.

For details of how to create an options file and of the options that can be defined, refer to the [FlexNet Publisher License Administration Guide](#).

Licensing Environment

This table describes the environment used by Keysight licensing. In some cases, these may be Windows registry keys, rather than environment variables.

Viewing the licensing environment

To see the values of all the listed environment variables and registry keys, run Keysight License Manager 6 and select **Environment** from the menu on the left.

Working with environment variables

When possible, use Keysight License Manager 6 to set licensing environment variables, including the `<PRODUCT>_LICENSE_FILE` variable. If the `<PRODUCT>_LICENSE_FILE` variable is set to a new license file (or if the contents of a license file are changed), then the license server manager and vendor daemon (*lmgrd* and *agileesofd*) must be restarted for the change to take effect. This will be done automatically by Keysight License Manager 6. If the license server managers are not restarted, then your Keysight software may not be able to obtain a license. For information on starting the license server manager, see the [Keysight Licensing FAQs](#).

However, if you have already set up licenses on your system manually – that is, using the FlexNet tools rather than the Keysight License Manager – you should continue to set up subsequent licenses manually, using the procedures in [Manual License Setup](#). This is because the manual process involves creating environment variables for license search paths, but the Keysight License Manager (on Microsoft Windows) uses registry entries for the same purpose. Environment variables override registry entries; therefore, if you use the Keysight License Manager after using the manual process, your changes will not take effect.

Because some values may be stored in either environment variables or registry keys, the best way to examine the values is to run Keysight License Manager 6 and select **Environment**.

Environment variables and registry keys

Variable/Key Name	Description
<code>KAL_LICENSE_MANAGER_BIN_PATH</code>	This is where licensing tools are installed, including Keysight License Manager 6 and Flexera tools. <ul style="list-style-type: none"> Windows: <code>C:\Program Files\Common Files\Keysight\License Manager 6\bin</code>
<code><PRODUCT>_LICENSE_FILE</code>	Specifies the list of license files/servers to search when a license is requested by a particular Keysight product. Each Keysight product has a dedicated variable to serve this purpose. Normally, these variables are set by Keysight License Manager 6, using information provided by each product's installation.
<code>AGILEESOFD_DEBUG_MODE</code>	Turns on the debug mode in the <i>agileesofd</i> vendor daemon when this variable is set to anything other than 0, no , or off . Since this variable is only read at server startup, you need to stop and restart the license server to allow this setting to take effect.
<code>AGILEESOFD_SERVER_LOGFILE</code>	The log file used by <i>agileesofd</i> . This file records general information at all times, and debug information when <code>AGILEESOFD_DEBUG_MODE</code> is on.
<code>AGILEESOFD_SERVER_</code>	The search path used by <i>lmgrd</i> and <i>agileesofd</i> to find licenses to serve.

CONFIG

Multiple Server Configurations

Keysight Licensing supports all the popular server configurations supported by FlexNet. This includes redundant servers as well as multiple servers. Refer to the [FlexNet Publisher License Administration Guide](#) for details.

Specific instructions for triple-redundant servers are available in [Setting Up Triple-Redundant License Servers](#).

Setting Up Triple-Redundant License Servers

Configuring triple-redundant license servers (also called three-server redundancy) allows your licensed products to continue to operate even if one of the three servers goes down. To configure triple-redundant license servers, you *must* have license files issued for the three redundant servers.

To configure triple-redundant license servers

1. Start by reviewing Chapter 14, "Ensuring License Availability", in the FlexNet Publisher License Administration Guide, installed with your Keysight licensing software at *C:\Program Files\Common Files\Keysight\License Manager 6* or *C:\Program Files\Common Files\Keysight\Licensing\Agileesofd* (on Windows) or */opt/keysight/licensing/agileesofd* (on Linux).
2. Follow the instructions in the section of Chapter 14, "Configuring License Servers for Three-Server Redundancy".

Tips for setting up servers

- The license files must have been issued for triple-redundant servers and must contain `SERVER` lines for each of the servers, as shown in the following example:

```
SERVER firstHost DOBF9C261574 27009 PRIMARY_IS_MASTER HEARTBEAT_INTERVAL=10
SERVER secondHost B88A6060903C 27009
SERVER thirdHost 000C29078EBE 27009
USE_SERVER
VENDOR agileesofd
INCREMENT myFeature agileesofd 2018.09 21-sep-2018 1 ...
```

- The license files installed on each of the three servers must be identical to each other.
- The host name for each server (e.g. firstHost in above example) must be defined in `SERVER` lines. You can edit the host names; you *cannot* edit the host IDs.
- The TCP/IP port value used by each server (e.g. 27009 in the above example) must be defined in the `SERVER` lines. You can edit the port values (again, you *cannot* edit the host IDs).
- The Keysight License Manager does not support configuration of triple server redundancy, so you must use Flexera tools – either *lmtools* or *lmadmin* – to perform the configuration.
- Start up the license servers in the same order that they are designated: primary, then secondary, then tertiary servers (that is, in the same order as they appear in the license files). This will ensure that your designated primary server takes the role of master.
- The license search path environment variable (`<PRODUCT>_LICENSE_FILE`) on the client should include all three servers in the same order as specified in the license files. This ensures that checkout requests are satisfied efficiently in the minimum possible time.
- The delimiter between the three server values in the license search path environment variable is a comma (for Windows) or a colon (for Linux), rather than the typical semicolon used between values for multiple single servers.

Windows example:

```
KAL_LICENSE_
FILE=27009@firstHost,27009@secondHost,27009@thirdHost
```

Linux example:

```
KAL_LICENSE_
FILE=27009@firstHost:27009@secondHost:27009@thirdHost
```

Multiple vendor daemons

Be aware that the license server manager (*lmadmin* or *lmgrd*), when configured for triple-redundant servers, cannot start and manage multiple vendor daemons. If you need to use multiple vendor daemons on a triple-redundant system, you must run separate instances of the license server manager on that system to support each vendor daemon. Make sure you use a different port number for each instance.

NOTE

Different Keysight products may use different vendor daemons, typically *agileesofd* and *agilent*.

Tips for troubleshooting

- When each of the redundant servers starts up, it will continually try to contact the other two servers. In the log files you'll see several "Connection attempt" and "Failed to connect" messages until the servers establish communication

and a quorum (two out of three) is reached. Once a quorum is reached, the licenses being served will be shown as available in the primary server's log file.

- If you start and stop a server multiple times in quick succession while configuring the triple-redundant servers, it is possible that the TCP/IP port may not get released between a stop and the next start. This may result in the error "Fail to open the TCP port number in the license." You can check to see if port is still in use by running `netstat -n -b` at the command line (this requires your console to have administrator privileges). If the port is not released in a reasonable amount of time, you may need to restart the computer.

Keysight Licensing FAQs

The following table lists frequently asked questions about Keysight Licensing.

Question	Answer
<p>Where can I find licensing tools such as lmgrd, lmutil, etc.?</p>	<p>The default locations are:</p> <p>Windows: <i>C:\Program Files\Common Files\Keysight\License Manager 6\bin</i> or <i>C:\Program Files\Common Files\Keysight\Licensing\Agileesofd</i></p> <p>Linux : <i>/opt/keysight/licensing/agileesofd</i></p>
<p>Where should I put my license file?</p>	<p><i>If you use Keysight License Manager 6 to install your licenses, they will automatically be copied to the right place (the directories listed below).</i></p> <p><i>If you are using manual processes (Flexera tools) and you have an existing license directory, continue to use that directory. If not, use the following guidelines.</i></p> <p>On the Windows platform, copy your license file to one of the subdirectories of <i>C:\ProgramData\Keysight\Licensing\Licenses:</i></p> <ul style="list-style-type: none"> - <i>Server</i> subdirectory for counted, served licenses - <i>Other</i> subdirectory for uncounted, unserved licenses <p>On Linux, copy your license file to one of the subdirectories of <i>/var/opt/keysight/licensing/licenses:</i></p> <ul style="list-style-type: none"> - <i>server</i> subdirectory for counted, served licenses - <i>other</i> subdirectory for uncounted, unserved licenses
<p>How can I manually start the license server?</p>	<p>Start the FlexNet license server manager and vendor daemon (<i>lmgrd</i> and <i>agileesofd</i>) as follows:</p> <ol style="list-style-type: none"> 1. Open a command prompt and change directory to: <ul style="list-style-type: none"> - Windows: <i>C:\Program Files\Common Files\Keysight\License Manager 6\bin</i> or <i>C:\Program Files\Common Files\Keysight\Licensing\Agileesofd</i> - Linux: <i>/opt/keysight/licensing/agileesofd</i> 2. Specify the full path and location of the license file and the license log file, respectively, by typing the following command <pre>lmgrd.exe -c <license file path> -l <license log file path></pre> <p>where:</p> <ul style="list-style-type: none"> - <license file path> specifies one or more fully-qualified directory names or full path names of the license file(s) - <license log file path> is the full path name to the debug log file <p>NOTE If there are spaces in your path names, use double quotes around the path names.</p>

```
lmgrd.exe -c "C:\ProgramData\Keysight\Licensing\Licenses\Server;
C:\ProgramData\Keysight\Licensing\Licenses\Other" -l
"C:\ProgramData\Keysight\Licensing\Log\PC1_server_log.txt"
```

NOTE

If you see one of these errors when you start *lmgrd* on Linux:

```
lmgrd: /lib64/ld-1sb-x86-64.so.3: bad ELF interpreter:
No such file or directory
lmgrd: No such file or
directory
```

then you need to install the [Linux Standard Base library](#). Use `yum` to install `redhat-1sb`.

- How can I stop the license server?** To stop *lmgrd* and *agilesofd*, go to the directory where your licensing tools are installed, and execute:
- ```
lmutil lmdown -c
"C:\ProgramData\Keysight\Licensing\Licenses\Server;
C:\ProgramData\Keysight\Licensing\Licenses\Other"
or
lmutil lmdown -c
"/var/opt/keysight/licensing/licenses/server;
/var/opt/keysight/licensing/licenses/other"
```
- Can I change the port number in my license file?** You will not normally need to modify the `SERVER` line of your local node-locked license file. Licenses provided by the Keysight Software Manager (KSM) will have a port number of 27009 on the `SERVER` line. If you do want to use a different port number, then you need to modify all of your license files for a given license server to have the same port number in order for the license sever to recognize them and start properly. If you need to access licenses through a firewall, you may need to modify the port number on the `VENDOR` line of your license file(s). Refer to [Accessing Licenses through a Firewall](#).
- What are the default SERVER and VENDOR ports?** Licenses provided by the Keysight Software Manager (KSM) typically have a port number of 27009 on the `SERVER` line; if no port is specified on the `SERVER` line, one of the default ports in the range 27000 to 27009 is used. If no port is specified on the `VENDOR` line, a port is chosen by the operating system at runtime. (This will not work if a firewall is in place; see [Accessing Licenses through a Firewall](#).)
- Why am I getting a license** If your Keysight product cannot obtain a floating license, that usually means that other users have all the licenses in use. Some licenses may be borrowed (i.e., reserved for a period of time to be used offline). Check the **License usage** tab of

- denial message?** Keysight License Manager 6 to see how many license counts are in use. Occasionally you may receive a license denial message unexpectedly. When that happens, check to see if there are any "runaway" Keysight processes that need to be killed, as they might be holding on to a license.
- When should I change FLEXLM\_TIMEOUT?** Keysight recommends using a port number and not changing `FLEXLM_TIMEOUT`. `FLEXLM_TIMEOUT` is used by Flexera software when connecting to a license server. The default value of 3 seconds (3000000 microseconds) is sufficient to allow remote connections with typical latencies. You generally will not need to change it. This value is also used when scanning for ports, when no port is specified in the license file or in the server string. If you know that there are no latency issues with a server, you can reduce the value of `FLEXLM_TIMEOUT`. The minimum possible value is 200 milliseconds (200000 microseconds).
- Do I need to explicitly specify a TCP/IP port?** If you do not specify the TCP/IP port for the license server during license setup, you may experience checkout delays, unexpected behavior, and/or license checkout failure on the Windows platform. Therefore, it is highly recommended that you always explicitly specify the TCP/IP port associated with each license server.
- What can I do to clean my existing license setup?** On Windows, when you suspect that your license setup is outdated or behaving strangely, run `lmtools`, then go to the **Start/Stop/Reread** tab and restart the Windows service related to Keysight Licensing.
- How do I find the Flex ID of my hardware key (USB dongle)?** You need the ID of your hardware security key to get licenses from Keysight. You may also need this information when you contact Keysight Technical Support. There are two ways to find this ID:
- Before you install the hardware key on your PC, you can read the ID directly from the key.
  - If you have installed the hardware key on your PC, and have also already installed your licenses and the FlexNet software, go to your licensing tools directory and enter the following command to check the ID:  

```
lmutil lmhostid -flexid
```
- This ID is a valid USB key serial number: 9 or 10, a dash, and 8 hexadecimal characters. Examples: **9-1234abcd** or **10-1234abcd**.
- How do I find my host ID?** There are several ways to determine the host ID of your local system (computer or instrument):
- From the directory containing your licensing tools, execute  

```
lmutil lmhostid
```

to get the FlexNet host ID directly.
  - On Windows, execute  

```
getmac /v /fo list
```

Your host ID is listed as the **Physical Address** of the physical Network Adapter.

- On Linux, execute `/sbin/ifconfig -a eth0` Examine the `ifconfig` results to find your Ethernet interface (often called `eth0`) and use its hardware address (`HWaddr`).

**How can I borrow a floating license to use off-line?**

Most Keysight floating licenses can be borrowed for up to 365 days. Once you have borrowed a license, you can disconnect from the network and continue to use the license until its return date, or until you explicitly return it.

- To borrow a license, start Keysight License Manager 6, and select **Borrow license** from the menu at the left. Select the return date. (The maximum borrow period is 365 days unless overridden by an **options file**.) You can then disconnect from the network and use the borrowed license to run the licensed product without a connection to the license server.
- To return a license, reconnect to the network, with access to the license server from which you borrowed the license. Select **Borrow license** and then **Return a license**.
- If you don't return a borrowed license explicitly, it will revert to the server at midnight (23:59:59) on the return date that you specified when you borrowed it. This means it will no longer be available to your offline machine, and will be available to other clients to be checked out from the server.

**NOTE**

Keysight recommends that you always use Keysight License Manager 6 or the menus of your Keysight product to borrow licenses. Due to a FlexNet limitation, it is possible for early returns to be attributed to the wrong user if you use the Flex tools (`lmutil` `lmborrow`) or environment variable (`LM_BORROW`)

**I used Keysight License Manager 6 to set up a license for one of my Keysight products, and now I want to use it to**

Once you have chosen a product from the **Select license usage** dialog box (which is presented at various points in the setup flow, depending on what you are doing), if you want to select a different product, you must close Keysight License Manager 6 and re-open it. If you started Keysight License Manager 6 from a menu of your Keysight product, that product will be selected automatically; you will need to open Keysight License Manager 6 from your Start menu to open it with no product selected.

set up a  
different  
product's  
license.  
How can I  
do that?



## How to Troubleshoot Problems

This section lists troubleshooting steps that can help you resolve common problems with Keysight licensing.

### Before you start

#### Consider rebooting the machine.

A restart will often quickly and easily resolve transient problems caused by software or hardware changes.

### Follow these test steps

#### Test 1: Operating system

##### Are you using an unsupported platform?...

Ensure that you're using a [supported operating system](#).

Note that virtual machines (such as VMWare) are not supported.

#### Test 2: Flexera software version

##### Run: `lmutil lmstat -v`

Flexera utilities, run from the command line, are a fundamental tool used in the license troubleshooting process.

A. Open a command line interpreter:

- Windows: command prompt
- Linux: terminal window **as root user**

B. Change directory to the location for Flexera utilities:

```
Windows cd C:\Program Files\Common Files\Keysight\License Manager 6\bin
 or cd C:\Program Files\Common
 Files\Keysight\Licensing\Agileesofd
```

```
Linux cd /opt/keysight/licensing/agileesofd
```

**Don't have the directory?** Install Keysight Licensing from <http://www.keysight.com/find/LicensingSupport>.

C. Run `lmstat` to view the Flexera software version.

```
Windows lmutil lmstat -v
Linux ./lmutil lmstat -v
```

Note the version v11.13.1.4 or better.

lmutil - Copyright (c) 1989-2015 Flexera Software LLC. All Rights Reserved.

lmstat v11.13.1.4 build 179569 x64\_n6

**Is Linux showing `lmutil: No such file or directory`?** Install the [Linux Standard Base library](#). On RHEL, it's `redhat-lsb`, which is installed through yum.

**Is your Flexera software version out of date?** Install a newer version: <http://www.keysight.com/find/LicensingSupport>.

**NOTE**

If you're using a floating (network) license, go to [Floating License Problems](#).

### Test 3: License manager status

**Run: `lmutil lmstat -lm`**

Run `lmstat` to see license manager status:

```
Windows lmutil lmstat -lm
Linux ./lmutil lmstat -lm
```

```
lmutil - Copyright (c) 1989-2015 Flexera Software LLC. All Rights Reserved.
```

```
Flexible License Manager status on Mon 4/23/2018 14:03
```

```
[Detecting lmgrd processes...]
```

```
License server status: 27009@PC1
```

```
License file(s) on PC1:C:\ProgramData\Keysight\Licensing\Licenses\Server\>941784_1001302725.lic
```

```
PC1: license server UP (MASTER) v11.13.1
```

#### Verify...

- The license file (.lic) is listed
- The license server is **UP**  
**lmgrd not running?** Skip to [Test 7: Inspect License Log](#)

### Test 4: Keysight license daemon status

**Run: `lmutil lmstat -S agileesofd`**

Keysight Licensing requires the *agileesofd* vendor daemon to be running. (For floating licenses, the daemon will be running on the license server machine.)

Run `lmstat` to see the vendor daemon status.

```
Windows lmutil lmstat -S agileesofd
Linux ./lmutil lmstat -S agileesofd
```

lmutil - Copyright (c) 1989-2015 Flexera Software LLC. All Rights Reserved.  
Flexible License Manager status on Mon 10/23/2017 14:19

[Detecting lmgrd processes...]

License server status: 27009@PC1

License file(s) on PC1:

C:\ProgramData\Keysight\Licensing\Licenses\Server\941784\_1001302725.lic:

PC1: license server UP v11.13.1

Vendor daemon status (on PC1):

agileesofd: UP v11.13.1

Feature usage info:

Users of b\_sigstu\_x\_lmr: (Total of 1 license issued; Total of 0 licenses in use)

### Verify...

- **The vendor daemon (*agileesofd*) is UP.**  
There could be several causes of a problem with the vendor daemon. You should consider...
  - Restarting the machine
  - Re-installing the licensing software: See [Setting Up Licenses](#).
  - ...Or proceed to Test 7: Inspect License Log
  - **Only one *agileesofd* process is running.**  
Check the running processes on the machine for an already running instance of *agileesofd*.
  - This could be due to multiple services previously set up on the same machine. If this applies, explore the Windows services on the machine to ensure that only one exists for Keysight Licensing.
  - **The version of *agileesofd* is 6.0 or greater.**  
Examine the properties of *agileesofd.exe* to find its version. Versions earlier than 6.0 do not support early return of borrowed licenses.

### Test 5: License file (.lic) exists

#### Inspect the active license directory...

List the files

Windows dir C:\ProgramData\Keysight\Licensing\Licenses\Server

```

dir C:\ProgramData\Keysight\Licensing\Licenses\Other
Linux ls -al /var/opt/keysight/licensing/licenses/server
 ls -al /var/opt/keysight/licensing/licenses/other

```

**Verify...**

- A license file exists in the expected location.
- The license file has an *.lic* extension.
- Only license files are in the directory. Remove any files that do not have a *.lic* extension.
- All license files in the directory use the same port. Open or view the *.lic* files and determine whether they all specify the same port value (between 27000 and 27009, inclusive) in their SERVER statements. If not, edit them to have the same port value. You will experience licensing failures if the licenses have conflicting port numbers. See [Port Number Conflicts](#) for more information.

Linux only:

- **Verify the license file has read permissions for all users.**

To fix permissions, execute:

```

chmod a+r /var/opt/keysight/licensing/licenses/server/*
chmod a+r /var/opt/keysight/licensing/licenses/other/*

```

**Need a license file?** See [Setting Up Licenses](#).

If you're using a USB dongle, Test 6: FLEXID is correct

**Run: `lmutil lmhostid -flexid`**A. Run `lmutil lmhostid -flexid` to determine the FlexNet ID of the connected dongle

```

lmutil - Copyright (c) 1989-2015 Flexera Software LLC. All Rights Reserved.
The FlexNet host ID of this machine is "FLEXID=10-0bebf3bd"

```

- If `missing dongle driver` is reported, follow the dongle driver installation instructions in [Setting Up USB Portable Licenses](#) to install it.
  - If The FlexNet host ID of this machine is "", check to see if the dongle is plugged in appropriately.
- B. Open your license file in your preferred text editor (notepad, gedit, etc).
- C. Find the host ID. Here's an example *.lic* file with host ID `FLEXID=10-0bebf3bd`.

```

#
For a Keysight Licensing overview and detailed instructions,
see http://www.keysight.com/find/AdvancedLicensingSupport
#

```

```
Use of this license constituted acceptance of the Keysight end-user
license agreement at http://www.keysight.com/find/sweula
#
SERVER this_host FLEXID=10-0bebf3bd 27009
USE_SERVER
VENDOR agileesofd
Product: N7640APPC-1FL LMR, PC application, node-locked 12 month license Expires: 16-
OCT-2018
INCREMENT b_sigstu_x_lmr agileesofd 2018.1016 16-oct-2018 1 VENDOR_
STRING="40b0341a9df1P=#1003D=#Signal_Studio_X_for_LMR: RFZ2AQN D2HWSGS
X1J2HXG JWEJWVY 2BHAHBG 2CELGBJ XJLCRXF TGRAM" HOSTID=FLEXID=10-0bebf3bd
SIGN="0029 81D7 708F 2B79 95CB 64A2 6227 6D0E 72B4 3902 E301 F3E4 900B A504 7731
25AF A34C 9A70 8626 7F31 4DBB"
```

### Verify...

- The host ID in the active license file matches the host ID of the machine.

**NOTE**

**Need a license?** Obtain a license file:

- [Setting Up Licenses](#)

otherwise, Test 6: Host ID is correct

### Run: `lmutil lmhostid`

A. Run `lmutil lmhostid` to determine the host ID of the machine.

`lmutil` - Copyright (c) 1989-2015 Flexera Software LLC. All Rights Reserved.  
The FlexNet host ID of this machine is "480fcf62402c"

- B. Open your license file in your preferred text editor (notepad, gedit, etc).  
C. Find the host ID. Here's an example .lic file with the host ID 40b0341a9df1 .

```
Use of this license constituted acceptance of the Keysight end-user
license agreement at http://www.keysight.com/find/sweula
#
SERVER this_host 40b0341a9df1 27009
USE_SERVER
VENDOR agileesofd
Product: N7640APPC-1FL LMR, PC application, node-locked 12 month license Expires: 16-
OCT-2018
```

```
INCREMENT b_sigstu_x_lmr agileesofd 2018.1016 16-oct-2018 1 VENDOR_
STRING="40b0341a9df1P=#1003D=#Signal_Studio_X_for_LMR : RFZ2AQN D2HWSGS
X1J2HXG JWEJWVY 2BHAHBG 2CELGBJ XJLCRXF TGRAM" HOSTID=40b0341a9df1
SIGN="0029 81D7 708F 2B79 95CB 64A2 6227 6D0E 72B4 3902 E301 F3E4 900B A504
7731 25AF A34C 9A70 8626 7F31 4DBB"
```

### Verify...

- The host ID in the active license file matches the host ID of the machine.

Recommendation: Remove any files that have the wrong host ID. They shouldn't cause problems, but they are confusing and unnecessary.

**NOTE**

**Need a license?** Obtain a license file:

- [Setting Up Licenses](#)

## Test 7: Inspect license log

### Inspect the license server log...

The license manager (*lmgrd*) and its vendor daemon (*agileesofd*) append text to a log file for most license actions. The log file is a timestamped record of most licensing activities.

**NOTE**

Most licensing operations add entries to the log file.

Frequently refresh your editor to see the most recent entries (messages since you opened the log file).

A. Open the log file with your preferred text editor. You can find the location of the log file by running Keysight License Manager 6, selecting **Environment**, and locating the `AGILEESOFD_SERVER_LOGFILE`. The file name in the Keysight License Manager 6 window is a clickable link to open the log file in a text editor.

Typical locations for log files are:

Windows `C:\ProgramData\Keysight\Licensing\Log\PC1_server_log.txt`

Linux `/var/log/keysight/licensing/log/pc1-server-log`

B. Search the log for these keywords to find common problems:

| Find...                                            | Problem                                                                                                                                                                                    |
|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EXPIRED                                            | License has expired                                                                                                                                                                        |
| agileesofd exited                                  | vendor daemon shut down. (Reason will be described on next line of log file.)                                                                                                              |
| Failed to open the TCP port number in the license. | There is another version of <i>lmgrd</i> running, that needs to be stopped. In certain cases on Linux, <i>lmgrd</i> will refuse to use a port number until the machine has been restarted. |
| EESOF                                              | Verify that the vendor daemon version is 2018.06 or higher. This will                                                                                                                      |

appear as something like:  
 (agileesofd) EESOF 2018.06 (06/07/2018)

## Test 8: Unexpected background processes

Windows `tasklist | FIND "lm"`  
 Linux `ps -ef |grep lm`

### Verify:

- There are not any unexpected Flexera software tools running.

## Test 9: Repeated entries in LICENSE\_PATH variables

Examine the <PRODUCT>\_LICENSE\_PATH values:

- On 64-bit Windows systems, find these in the Environment tab in Keysight License Manager 6
- On other systems, use **Control Panel, System, Advanced system settings, System Properties, Advanced, Environment Variables, System Variables**. Note that some values may also be in the Windows registry.

### Verify:

- No <PRODUCT>\_LICENSE\_PATH value includes the same directory or server multiple times.
- No <PRODUCT>\_LICENSE\_PATH value includes invalid directories or servers (for example, outdated entries for license servers that no longer exist).

Repeated or invalid values in these variables can cause licensing performance problems.

### Still having problems?

Restart your machine or follow [Flexera Communication Problems](#).

## Floating License Problems

### NOTE

**Consider rebooting the server and or client machine.**

A restart will often quickly and easily resolve transient problems caused by software or hardware changes.

If you see unexpected behavior of borrowed licenses

**NOTE**

Keysight recommends that you always use Keysight License Manager 6 or the menus of your Keysight product to borrow licenses. Due to a FlexNet limitation, it is possible for early returns to be attributed to the wrong user if you use the Flex tools (`lmutil` `lmborrow`) or environment variable (`LM_BORROW`).

## Step 1: Verify the license server

**Test 1.1:** License server UP**Run:** `lmutil lmstat -a`

A. Log in to the license server machine.

If you do not have permission to use the license server machine, proceed to Step 2: Verify the license client.

B. Open a command line interpreter and change directory to the location for Flexera utilities.

```
Windows cd C:\Program Files\Common Files\Keysight\License
 Manager 6\bin
 or
 cd C:\Program Files\Common Files\Key-
 sight\Licensing\Agileesofd
Linux cd /opt/keysight/licensing/agileesofd
```

C. Use `lmstat` to see the license server status.

```
Windows lmutil lmstat -a
Linux ./lmutil lmstat -a
```

```
lmutil - Copyright (c) 1989-2015 Flexera Software LLC. All Rights Reserved.
Flexible License Manager status on Thu 10/26/2017 13:19
```

```
License server status: 27009@server1.com
License file(s) on computer1.com.com: /var/opt/keysight/licensing/licenses/server/942839_
1001301945.lic:
```

```
server1.com: license server UP (MASTER) v11.13.1
```

```
Vendor daemon status (on server1.com):
```

```
agileesofd: UP v11.13.1
```

Feature usage info:

Users of b\_sigstu\_x\_lmr: (Total of 1 license issued; Total of 0 licenses in use)

### Verify

- There is only one *lmgrd* (not multiple at different ports)
- license server UP (MASTER)
- *agileesofd*: UP
- The necessary licenses are available for checkout. (Example: Total of 1 license issued; Total of 0 licenses in use)

### To stop the server...

```
Windows cd C:\Program Files\Common Files\Keysight\License
Manager 6\bin(or cd C:\Program Files\Common
Files\Keysight\Licensing\Agileesofd)lmutil lmdown -
c C:\ProgramData\Keysight\Licensing\Licenses\Server
Linux cd /opt/keysight/licensing/agileesofd./lmutil
lmdown -c /var/-
opt/keysight/licensing/licenses/server
```

#### NOTE

Shutdown failed: Cannot connect to license server system. (-15,570:115 "Operation now in progress")

This happens when *lmgrd* is already stopped.

### To start the server...

```
Windows cd C:\Program Files\Common Files\Keysight\License
Manager 6\bin(or cd C:\Program Files\Common
Files\Keysight\Licensing\Agileesofd) lmgrd -c
C:\Program Files\Common Files\Key-
sight\Licensing\Licenses\Server
Linux cd /opt/keysight/licensing/agileesofd ./lmgrd -c
/var/opt/keysight/licensing/licenses/server
```

#### NOTE

Can't make directory /usr/tmp/.flexlm, errno: 2(No such file or directory).

This error occurs if the directory */usr/tmp*, used by the license manager, is missing on your system.

This error doesn't prevent the license manager from checking out licenses.

Solution: Create a symbolic link */usr/tmp* that points to */tmp*. For example:

```
sudo -ln -s /tmp /usr/tmp
```

License server will not start and the debug log shows an error Not a valid server hostname, exiting

The license server will not start when the server hostname in the license file does not match the server's actual host name.

Solution: If only the server hostname is incorrect, you can manually correct it in the license file by editing the license file in Notepad and changing the server hostname in the `SERVER` line. If the MAC address has also changed, the license file will need to be regenerated with the new information: contact support for a new license file (<http://www.keysight.com/find/contactus>).

### Test 1.2: Unexpected background processes

If there are multiple license managers running, unexpected results can occur...

Windows `tasklist | FIND "lm"`

Linux `ps -ef |grep lm`

### Verify

- There are not any unexpected Flexera software tools running.

### Test 1.3: Take note of `<port>@<server-name>`

Run: `lmutil lmstat -lm`

Windows `cd C:\Program Files\Common Files\Keysight\License Manager 6\bin (or cd C:\Program Files\Common Files\Keysight\Licensing\Agileesofd)lmutil lmstat -lm`

Linux `cd /opt/keysight/licensing/agileesofd./lmutil lmstat -lm`

lmutil - Copyright (c) 1989-2015 Flexera Software LLC. All Rights Reserved.

Flexible License Manager status on Mon 10/30/2017 10:49

License server status: 27007@server1.site.com

License file(s) on server1.site.com: /var/opt/keysight/licensing/licenses/server/943297\_1001302552.lic:

server1.site.com: license server UP (MASTER) v11.13.1

Take note of the `<port>` and `<server-name>` of the license manager (in this example, `27007@server1.site.com`). This will be used for license client tests (below).

## Step 2: Verify the license client

### Test 2.1: Network connection

#### Ping the license server...

A. Log in to the license client machine.

B. Open a command line interpreter.

C. Ping the remote license server to ensure it is on the network:

```
ping <server-name>
```

For `<server-name>`, use the value found on the server in the previous test (**Test 1.3**)

Example: `ping server1.site.com`

Verify that `ping` can successfully transmit packets from the client to the license server.

#### NOTE

Flexera supports multiple ways of identifying your server.

Examples are:

- 156.140.113.7
- server1.site.com
- server1

### Test 2.2: Flexera connectivity

#### Run: `lmutil lmdiag -c`

A. Log in to the license client machine.

B. Open a command line interpreter.

C. Run diagnostic

```
Windows cd C:\Program Files\Common Files\Keysight\License
 Manager 6\bin(or cd C:\Program Files\Common
 Files\Keysight\Licensing\Agileesofd) lmutil lmdiag
 -a -c <port>@<license-server>
```

```
Linux cd /opt/keysight/licensing/agileesofd
 ./lmutil lmdiag -a -c <port>@<license-server>
```

Example: `lmutil lmdiag -a -c 27009@server1.site.com`

lmutil - Copyright (c) 1989-2015 Flexera Software LLC. All Rights Reserved.

FlexNet diagnostics on Mon 10/30/2017 13:15

-----  
License file: 27009@server1.site.com  
-----

"b\_sigstu\_x\_lmr" v2018.1025, vendor: agileesofd, expiry: 1-jan-0  
License server: 156.140.113.7  
floating license starts: 1-jan-1990, no expiration date

This license can be checked out  
-----

## Verify

- The license server and *agileesofd* are UP
- The licenses are floating licenses and are not in use by other users.
- No errors are reported

### NOTE

**Error:** Can't fetch the requested information!!

Perform **Test 1.1** License Server UP (above)

If the server is running, then **FlexNet communications** might be blocked. See [Flexera Communication Problems](#).

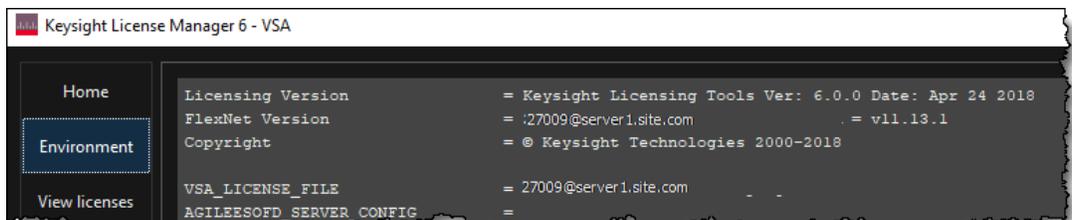
**Test 2.3:** <PRODNAME>\_LICENSE\_FILE

**Run:** `lmdiag -c <PRODNAME_LICENSE_FILE>`

In this test, we are verifying that the search path for the selected product's license files has been correctly set.

### A. Check the value of the variable/registry key

To find this value, run Keysight License Manager 6 and select the **Environment** tab. Locate the entry that corresponds to your Keysight product's name: for example, `VSA_LICENSE_FILE` for the VSA product.



B. Run `lmutil lmdiag -c <PRODDNAME_LICENSE_FILE>`

Type the value you found in the previous step. Example: `lmutil lmdiag -c 27009@server1.site.com`

lmutil - Copyright (c) 1989-2015 Flexera Software LLC. All Rights Reserved.  
FlexNet diagnostics on Mon 10/30/2017 13:15

```

License file: 27009@server1.site.com

```

```
"b_sigstu_x_lmr" v2018.1025, vendor: agileesofd, expiry: 1-jan-0
License server: 27009@server1.site.com
floating license starts: 1-jan-1990, no expiration date
```

This license can be checked out

```

```

## Verify

- The `<port>@<server-name>` value of `<PRODDNAME>_LICENSE_FILE` matches values from the previous test (Test 2.2)
- Output from `lmdiag` matches output from the previous test (Test 2.2)

**Test 2.4:** Verify feature can be checked out

**Run:** `lmutil lmdiag -c <port>@<server-name> <feature name to be checked>`

In some instances, the license server is working, the client setup is correct, licenses are available for use (not in use by others), license versions are correct, and the licenses are not expired, but a license still cannot be checked out. This can be caused by accidental installation of a node-locked license file tied to the host ID of the machine intended to be the floating (network) license server. Use the `<port>@<server-name>` that you recorded in previous tests.

```
Windows cd C:\Program Files\Common Files\Keysight\License
Manager 6\bin(or cd C:\Program Files\Common
Files\Keysight\Licensing\Agileesofd) lmutil lmdiag
-c <port>@<server-name> <feature name to be
checked>
```

```
Linux cd /opt/keysight/licensing/agileesofd
./lmutil lmdiag -c <port>@<server-name> <feature
name to be checked>
```

Example: `lmutil lmdiag -c 27009@server1.site.com b_sigstu_x_lmr`

lmutil - Copyright (c) 1989-2015 Flexera Software LLC. All Rights Reserved.  
FlexNet diagnostics on Mon 10/30/2017 13:15

```

License file: 27009@server1.site.com

```

```
"b_sigstu_x_lmr" v2018.1025, vendor: agileesofd, expiry: 1-jan-0
License server: 27009@server1.site.com
floating license starts: 1-jan-1990, no expiration date
```

This license can be checked out

```

```

Verify that the license can be checked out. This confirms that the server has a valid network license.

**Test 2.5:** Clean license folder

**Remove expired or invalid license files...**

Avoid unexpected problems by cleaning up the active licenses folders.

Use `lmdiag` to view the license folders

```
Windows lmutil lmdiag -c C:\ProgramData\Keysight\Licensing\Licenses\Server
 lmutil lmdiag -c C:\ProgramData\Keysight\Licensing\Licenses\Other
Linux lmutil lmdiag -c /var/opt/keysight/licensing/licenses/server
 lmutil lmdiag -c /var/opt/keysight/licensing/licenses/other
```

If licenses are found, consider removing them if they are expired or unnecessary.

**If using LIC files instead of environment to redirect...**

A. Open your license file in your preferred text editor (notepad, gedit, etc) .

B. Find the `SERVER` line.

The format of the `SERVER` line is:

```
SERVER host hostid [port]
```

Example:

```
SERVER server1.site.com 40b0341a9df1 27009
```

## Verify

- The `host` matches the `<server-name>` from **Test 1.3** (above)
- The `hostid` matches the host ID of the license server machine.
- The `port` matches the `<port>` of the license server machine from **Test 1.3** (above)

**Test 2.6:** Unexpected background processes

If there are multiple license managers running, unexpected results can occur...

Windows `tasklist | FIND "lm"`

Linux `ps -ef |grep lm`

## Verify

- There are not any unexpected Flexera software tools running.

## Flexera Communication Problems

Third-party programs may block or interfere with Flexera communications. This section addresses how to resolve these issues. FlexNet communication blockage and/or interference is most typically due to firewalls, and less often to antivirus software; these causes are covered here. However, it can also be caused by VPN tunnel programs or other third-party programs. Blockage/interference from those programs is beyond the scope of this document.

Since firewall and antivirus software are typical causes of FlexNet communication problems, you should investigate these possibilities first. The quickest way to investigate is to temporarily disable your firewall and antivirus software.

**NOTE**

Ensure that disabling any security software (such as firewall or antivirus) is done in such a manner that it does not cause harm to your system. Keysight cannot be held responsible for any harm caused. Keysight recommends that you work with your local IT support professional.

Perform this test by methodically running `lmutil lmstat -c @<server-name>` across different permutations of disabling firewall and antivirus software. When `lmstat` reports a correct license path and reports `lmgrd` and `agileesofd` UP after a firewall or antivirus is disabled, this is a positive test result (implicating the disabled software). The `lmstat` result when there is no communications blockage will be similar to this:

lmutil - Copyright (c) 1989-2015 Flexera Software LLC. All Rights Reserved.

Flexible License Manager status on Thu 10/26/2017 13:19

[Detecting lmgrd processes...]

License server status: 27009@server1.com

License file(s) on server1.com: /var/opt/keysight/licensing/licenses/server/942839\_1001301945.lic:

server1.com: <mark>license server UP (MASTER) v11.13.1</mark>

Vendor daemon status (on server1.com):

agileesofd: UP v11.13.1

Below is an example test matrix. Keysight recommends you start by disabling your firewall.

|        | Client Firewall | Server Firewall | Client Antivirus | Server Antivirus |
|--------|-----------------|-----------------|------------------|------------------|
| Test 1 | off             | on              | on               | on               |
| Test 2 | on              | off             | on               | on               |
| Test 3 | off             | off             | on               | on               |
| Test 4 | off             | off             | off              | on               |
| Test 5 | off             | off             | off              | off              |

If both firewall and antivirus on server and client machines are simultaneously disabled (in other words, all security software on both license client and server is turned off) and `lmsstat` does not give a positive result, then some other third-party software might be causing the issue. Consult with your IT professional.

If, after running the above tests, you identify an interfering firewall and/or antivirus, then you must configure exceptions in these tools so that the FlexNet software functions properly. The steps to do this are covered here; however, due to the wide variation in firewall and antivirus user interfaces and use models, only generic instructions are provided.

1. Edit the current license file on the license server machine. Add a port number for both `lmgrd` and `agileesofd` as shown below:

```
SERVER this_host B8AC6F80C09D 27005
VENDOR agileesofd PORT=5346
#
INCREMENT b_hb_layout_momentum agileesofd 2.9 31-mar-2013 1 VENDOR_STRING...
```

Stop and restart the license server so that these changes can take effect.

2. Firewall and antivirus exclusions:
  1. Firewall: Specify TCP port numbers 27005 and 5346 to be allowed through the firewall on both license server and license client machines.

2. Firewall and/or antivirus: Configure the following executables as exclusions (both are typically installed in *C:\Program Files\Common Files\Keysight\License Manager 6\agileesofd\*):

*agileesofd.exe*

*lmgrd.exe*

## Port Number Conflicts

All the Keysight licenses on your system must use the same port. If license files have conflicting port numbers, or if some licenses have port numbers and others do not, you will experience licensing failures.

To check and correct the port numbers in your license files, first list the files in your licensing directories:

```
Windows dir C:\ProgramData\Keysight\Licensing\Licenses\Server
 dir C:\ProgramData\Keysight\Licensing\Licenses\Other
Linux ls -al /var/opt/keysight/licensing/licenses/server
 ls -al /var/opt/keysight/licensing/licenses/other
```

Open or view each .lic file to determine whether they all specify the same port value (between 27000 and 27009, inclusive) in their SERVER statements. The format of the SERVER statement is:

```
SERVER host hostid [port] [PRIMARY_IS_MASTER] [HEARTBEAT_INTERVAL=seconds]
```

For example, a license file with port 27009 might have the following SERVER statement:

```
SERVER my_server 17007ea8 27009
```

With no port number specified, the file might look like this:

```
SERVER my_server 17007ea8
```

If your license files have different port numbers, or if not all your license files have port numbers, choose a single port number to use (between 27000 and 27009, inclusive). Then open each license file in your preferred text editor (notepad, gedit, etc.) and modify it to specify that port number.

When you add a new license to a machine, if its port number does not match others already installed, the license installation will fail. You may see an error message explaining that the port number does not match. In this case, check the port number of your currently installed licenses, as described above, then edit the new .lic file to match. Once you have edited the license file, try adding it again.

## Migrating from Older Versions of Keysight Licensing

This section describes the differences and equivalencies of Keysight License Manager versions, as well as actions you can take to minimize headaches when using different generations of Keysight licenses together.

- [If You Are Using Keysight Floating License Manager...](#)
- [If You Have EDA Products...](#)

### If You Are Using Keysight Floating License Manager

You can replace use of the older Keysight Floating License Manager with Keysight License Manager 6, which can manage more of your Keysight licenses (including [Keysight EDA products](#)).

#### Adopting Keysight License Manager 6

To use the new License Manager:

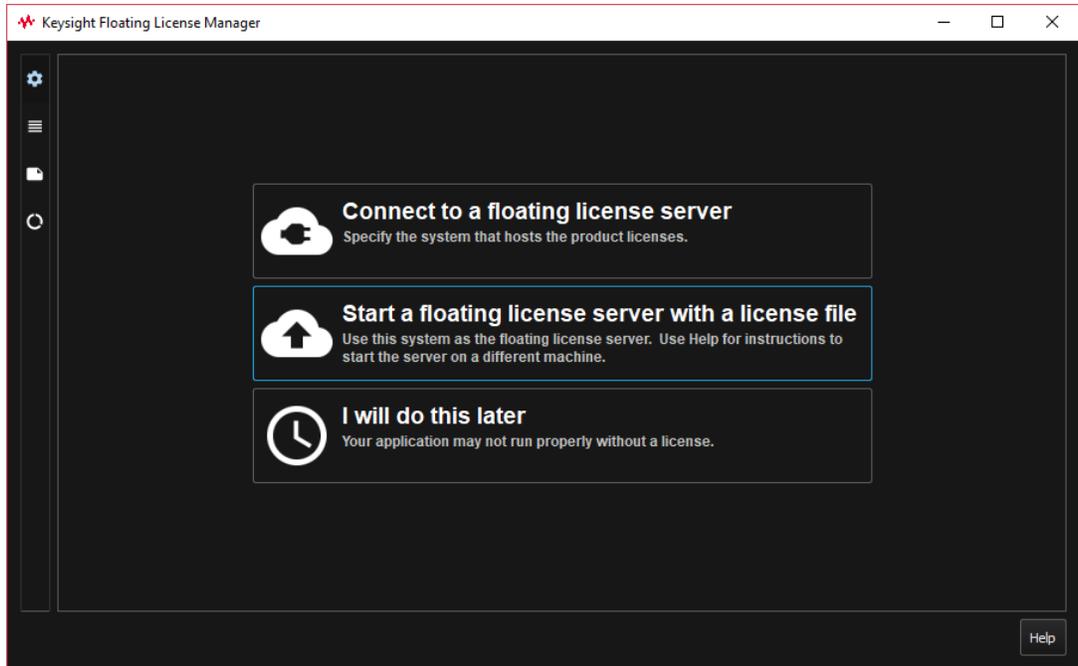
1. Install Keysight License Manager 6 from <http://www.keysight.com/find/licensing-support>.
2. Run Keysight License Manager 6 and add all your licenses by clicking **Add/remove a license on your local machine** and specifying each license file on this machine. This is necessary to ensure the license files are copied to the location used by Keysight License Manager 6.

**Do not uninstall the Keysight Floating License Manager or remove its installation directory.** Some products may look in that directory for tools that they need to run.

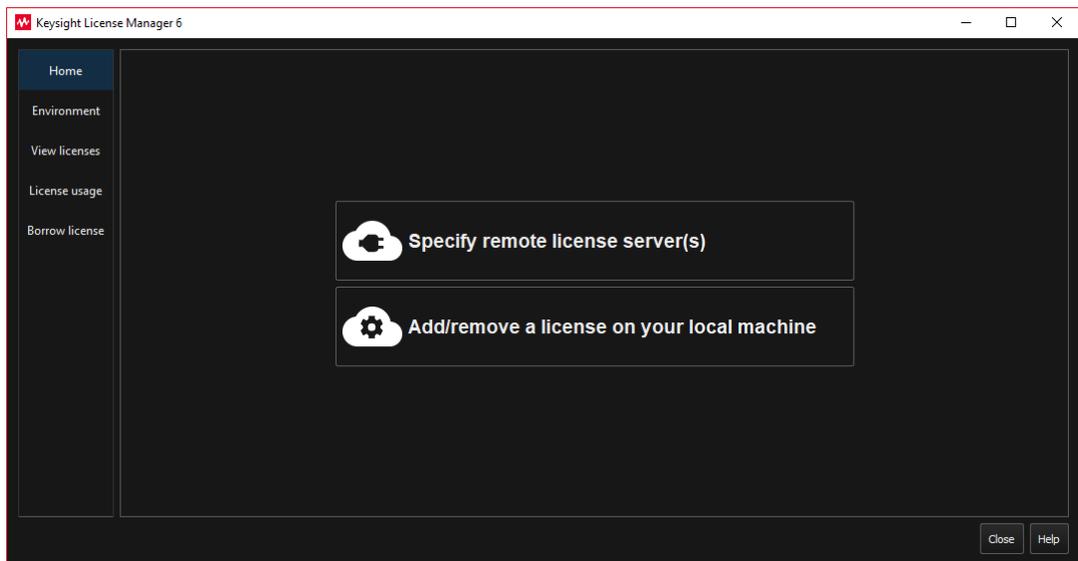
#### Using Keysight License Manager 6

Here are the Keysight Floating License Manager and Keysight License Manager 6, shown for comparison:

#### Keysight Floating License Manager



## Keysight License Manager 6



The following table shows the functional equivalency between the two tools.

| Keysight Floating License Manager                                                                 | Keysight License Manager 6         | Function                                                                                                                                         |
|---------------------------------------------------------------------------------------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Start a floating license server with a license file (or "Change floating license server files" if | Add/remove a license on your local | Installs a license on the machine where the tool is running (this may be the machine where the licensed product will run, or it may be a network |

|                                                                                               |                                  |                                                                                          |
|-----------------------------------------------------------------------------------------------|----------------------------------|------------------------------------------------------------------------------------------|
| the server is already running)                                                                | machine                          | license server) and starts the license server process                                    |
| Connect to a floating license server                                                          | Specify remote license server(s) | Allows you to configure where your licensed product will look to find floating licenses. |
| I will do this later                                                                          | Close button                     | Closes the tool without making any changes to your licensing.                            |
|  Configure   | Home                             | Takes you to the "home" initial screen of the tool.                                      |
|  Environment | Environment                      | Displays environment variables and other system configuration information.               |
|  Licenses    | View licenses                    | Displays a list of available licenses.                                                   |
|  Usage       | License usage                    | Displays the usage of floating licenses.                                                 |
| Not in this tool; you'll need to use Keysight License Manager 6 for this purpose.             | Borrow license                   | Allows you to use a floating (network) license offline for an extended period of time.   |

## If You Have EDA Products

You can use Keysight License Manager 6 to manage licenses for your Keysight EEs of Electronic Design Automation (EDA) software, instead of using the product-specific License Manager that came with your product. If you use License Manager 6, you can manage more of your Keysight licenses in the same tool, instead of using one tool for EDA products and one or more different tool(s) for your other Keysight products.

### Adopting Keysight License Manager 6

To use the new License Manager, simply install Keysight License Manager 6 from <http://www.keysight.com/find/licensing-support>, and run it to manage your licenses.

**Do not uninstall the EDA License Manager or remove its installation directory.** Your EDA products will look in that directory for tools that they need to run.

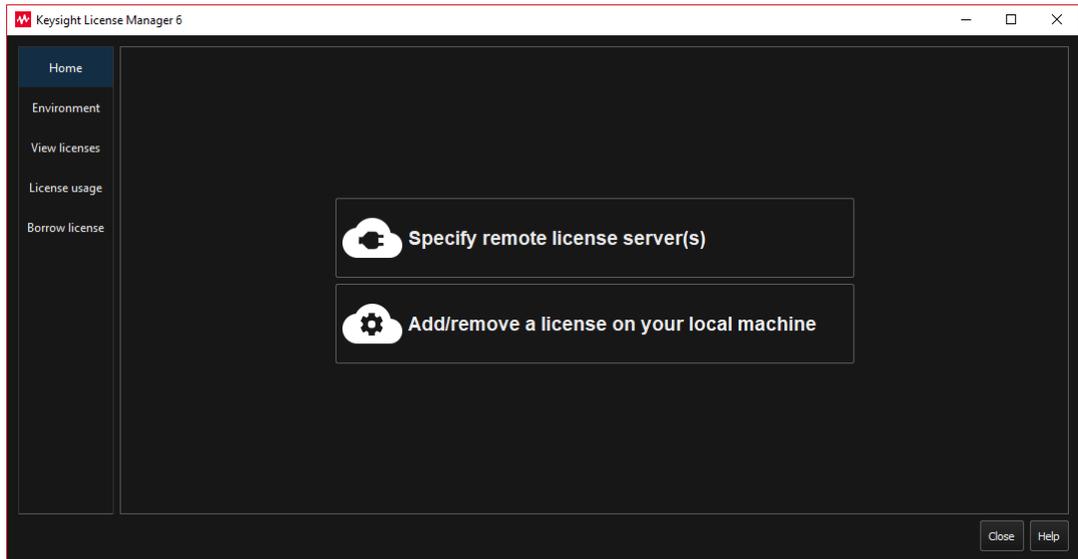
### Using Keysight License Manager 6

Here are the EDA License Manager (the blurred graphic represents the logo of any individual EDA product) and Keysight License Manager 6, shown for comparison:

#### EDA License Manager



### Keysight License Manager 6



The following table shows the functional equivalency between the two tools.

| EDA License Manager           | Keysight License Manager 6                 | Function                                                                                                                  |
|-------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Add or replace a license file | Add/remove a license on your local machine | Installs a license on the machine where the tool is running (this may be the machine where the licensed product will run, |

|                                                                     |                                                                                                                                   |                                                                                                                                                                          |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Add or replace a network license server                             | Specify remote license server(s)                                                                                                  | or it may be a network license server) and starts the license server process<br>Allows you to configure where your licensed product will look to find floating licenses. |
| Request additional licenses                                         | Not in this tool; go to <a href="http://www.keysight.com/find/softwaremanager">http://www.keysight.com/find/softwaremanager</a> . | Takes you to the <b>Keysight Software Manager</b> web site.                                                                                                              |
| Change the default product license                                  | Not in this tool; you'll need to use the EDA License Manager for this purpose.                                                    | When there are multiple licenses available for the same product/feature, but in different bundles, this option allows you to choose which one is preferred.              |
| Configure                                                           | Home                                                                                                                              | Takes you to the "home" initial screen of the tool.                                                                                                                      |
| Environment                                                         | Environment                                                                                                                       | Displays environment variables and other system configuration information.                                                                                               |
| Licenses                                                            | View licenses                                                                                                                     | Displays a list of available licenses.                                                                                                                                   |
| Usage                                                               | License usage                                                                                                                     | Displays the usage of floating licenses.                                                                                                                                 |
| Descriptions                                                        | Not in this tool; you'll need to use the EDA License Manager for this purpose.                                                    | Provides a list of available license bundles for a specific product, and the description of each bundle.                                                                 |
| Diagnose                                                            | Not in this tool; you'll need to use the EDA License Manager for this purpose.                                                    | Performs a systematic license setup troubleshooting flow specific to Keysight EDA products.                                                                              |
| My Support ID                                                       | Not in this tool; you can get your support ID from the Help menu of most products.                                                | Displays your Keysight support ID.                                                                                                                                       |
| Not in this tool; you'll need to use Keysight License Manager 6 for | Borrow license                                                                                                                    | Allows you to use a floating (network) license offline for an extended period of time.                                                                                   |

this purpose.

## Glossary and Abbreviations

The following table lists commonly used licensing terms and abbreviations in Keysight Licensing.

| <b>Term</b>                             | <b>Definition</b>                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Feature</b>                          | A licensed capability. Features are used to construct an element or a bundle license.                                                                                                                                                                                                                                                                                                                                                             |
| <b>Elements</b>                         | An element includes one or more features. It is the lowest level of license sold. All the features therein are reserved when the element license is checked out.                                                                                                                                                                                                                                                                                  |
| <b>Bundle</b>                           | Includes all the features from the elements that make up the bundle. It is sold as a whole and all the features therein are reserved when the bundle is checked out.                                                                                                                                                                                                                                                                              |
| <b>FlexNet</b>                          | The third-party licensing technology that the Keysight Licensing scheme is based on.                                                                                                                                                                                                                                                                                                                                                              |
| <b>FlexNet ID Dongle</b>                | A serialized hardware key that can be attached to a USB port of a computer to limit or lock software access to whoever has the dongle attached to his/her system via the associated Keysight license file. A license dongle always has a unique ID called the FlexNet ID.                                                                                                                                                                         |
| <b>FlexNet ID Dongle Device Drivers</b> | These drivers must be installed before the dongle device can serve as the locking device for a license.                                                                                                                                                                                                                                                                                                                                           |
| <b>Floating (Network) License</b>       | A license that can be shared among multiple users across a network. It can be installed on a license server using a host ID or a dongle to fulfill the license requests from one or more client machines. In this configuration, the license server and client machine are different machines. Floating license support is provided for single and multiple servers (including distributed product servers, peak servers, and redundant servers). |
| <b>Host ID</b>                          | Specifies the unique ID of a machine. It is also referred to as MAC address or the physical address or CPU ID of a computer system.                                                                                                                                                                                                                                                                                                               |
| <b>Hot Swapping</b>                     | An automatic release of a pulled bundle or core/environment license, replacing it with a different bundle type during runtime and checkout of another bundle license.                                                                                                                                                                                                                                                                             |
| <b>Job Control</b>                      | A means to enforce a license count for a feature per job invocation. A feature has job control if each invocation of it consumes one count of its associated license. Job control is used to limit the amount of concurrent usage of a feature within one count of its encompassing element or bundle consumption. Job-controlled features include simulators and model sets.                                                                     |
| <b>License File</b>                     | Each Keysight license is stored in a file. The license files are locked to the license server using an identity obtained from the computer or from a USB dongle.                                                                                                                                                                                                                                                                                  |

|                                              |                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>License Pool</b>                          | A collection of purchased licenses for the same feature or capability.                                                                                                                                                                                                                                            |
| <b>License Security</b>                      | Licenses are secured by a feature name (sometimes called a codeword) tied to a host ID or USB dongle.                                                                                                                                                                                                             |
| <b>License Server Manager (lmgrd)</b>        | One of the components of FlexNet technology. <i>lmgrd</i> is the license daemon process running on the license server system to manage vendor daemon processes (such as <i>agileesofd</i> ) that govern the use of licensed features.                                                                             |
| <b>Node-Locked License</b>                   | Node-locking means that the application can be used only on a specific host or on a host that has a specific dongle physically connected. It allows a single instance of a Keysight product to be used on a single computer with a single display. The user, license, and computer must be physically co-located. |
| <b>Transportable License</b>                 | A transportable license is a type of node-locked license, which can be unlocked from one client host and then locked to another client host, via a network enabled process where the customer interacts with the Keysight Software Manager website.                                                               |
| <b>UDH</b>                                   | User, Display, and Host. Keysight licenses are typically tied to a single user, single display, and single host.                                                                                                                                                                                                  |
| <b>Vendor Daemon (agileesofd or agilent)</b> | Keysight Licensing uses either or both of the <i>agileesofd</i> and <i>agilent</i> vendor daemons (depending on the types of licenses in use). The vendor daemon partners with <i>lmgrd</i> to perform license usage policing for the license codewords issued by Keysight.                                       |

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