



VIRTUAL GPU LICENSE SERVER VERSION 2018.06

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User Guide



TABLE OF CONTENTS

Chapter 1. Introduction to the NVIDIA vGPU Software License Server	1
1.1. Overview of NVIDIA vGPU software Licensing.....	1
1.2. NVIDIA vGPU Software License Server High Availability.....	2
1.3. Overview of the NVIDIA vGPU Software Licensing Process.....	3
Chapter 2. Installing the NVIDIA vGPU Software License Server	4
2.1. Platform Requirements.....	4
2.1.1. Hardware and Software Requirements.....	4
2.1.2. Platform Configuration Requirements.....	5
2.1.3. Network Ports and Management Interface.....	5
2.1.4. High Availability Requirements.....	5
2.2. Installing the NVIDIA vGPU Software License Server on Windows.....	6
2.2.1. Installing the Java Runtime Environment on Windows.....	6
2.2.2. Setting the JRE and JVM locations for New Installations with OpenJDK.....	7
2.2.3. Installing the License Server Software on Windows in Graphical Mode.....	9
2.2.4. Installing the License Server Software on Windows in Console Mode.....	12
2.2.5. Migrating an Existing Installation of NVIDIA vGPU Software License Server to OpenJDK on Windows.....	14
2.3. Installing the NVIDIA vGPU Software License Server on Linux.....	16
2.3.1. Installing the Java Runtime Environment on Linux.....	16
2.3.2. Installing and Running the Apache Tomcat Server on Linux.....	16
2.3.3. Installing the License Server Software on Linux in Graphical Mode.....	18
2.3.4. Installing the License Server Software on Linux in Console Mode.....	23
2.3.5. Migrating an Existing Installation of NVIDIA vGPU Software License Server to OpenJDK on Linux.....	25
Chapter 3. Managing Licenses on the NVIDIA vGPU Software License Server	27
3.1. Accessing the License Server Management Interface.....	27
3.2. Obtaining the License Server's MAC Address.....	28
3.3. Enabling Failover Support on the Primary and Secondary License Servers.....	29
3.4. Registering Your License Server and Getting License Files.....	31
3.5. Installing a License.....	33
3.6. Verifying High Availability Setup of the License Server.....	35
3.7. Viewing Information About Installed Licenses.....	35
3.7.1. Viewing the Properties of All Installed Licensed Features.....	36
3.7.2. Viewing the Details of a Single Licensed Feature.....	37
3.7.3. Viewing Information About All Borrowed Licenses.....	37
3.7.4. Viewing the Details of a Single Licensed Client.....	38
3.7.5. About the License Borrow Period.....	38
3.8. Reserving Licenses.....	39
3.8.1. Creating License Reservations.....	39
3.8.2. Deleting License Reservations.....	41

3.8.3. Exporting and Importing License Reservations.....	42
3.9. Removing Licenses from a License Server.....	43
3.10. Converting an Evaluation License Server to a Permanent License Server.....	44
Chapter 4. Troubleshooting the NVIDIA vGPU Software License Server.....	45
4.1. Obtaining Diagnostic Information from the License Server Log files.....	45
4.1.1. Log File Locations and Types.....	45
4.1.2. Changing the License Server Log Level.....	46
4.2. Management Interface Connection Errors.....	47
4.3. License Server Connection Errors.....	48
4.4. License Upload Failures.....	49
4.4.1. License Response Fails Trust Criteria.....	49
4.4.2. Capability Response Rejected - Response Time Too Old.....	49
4.4.3. Capability Response Rejected - Update Time Invalid.....	49
4.4.4. Capability Response Rejected - Response Enterprise ID Does Not Match the Server....	49
4.5. Trusted Storage Database Errors.....	50
4.5.1. Restoring the Trusted Storage Database from a Backup.....	50
4.5.1.1. Restoring the Trusted Storage Database from a Backup on Windows.....	50
4.5.1.2. Restoring the Trusted Storage Database from a Backup on Linux.....	51
4.5.2. Deleting the Trusted Storage Database.....	51
4.5.2.1. Deleting the Trusted Storage Database on Windows.....	51
4.5.2.2. Deleting the Trusted Storage Database on Linux.....	52
Chapter 5. Uninstalling the NVIDIA vGPU Software License Server.....	53
5.1. Uninstalling the NVIDIA vGPU Software License Server on Windows.....	53
5.2. Uninstalling the NVIDIA vGPU Software License Server on Linux.....	55

LIST OF FIGURES

Figure 1	NVIDIA vGPU Software Licensing Architecture	1
Figure 2	Oracle Java SE 32-Bit Runtime Environment Installation on Windows	7
Figure 3	License Agreements on Windows	9
Figure 4	Destination Folder Selection on Windows	10
Figure 5	Firewall Settings on Windows	11
Figure 6	Completed License Server Installation on Windows	12
Figure 7	Verifying the Apache Tomcat Installation	18
Figure 8	License Agreements on Linux	19
Figure 9	Destination Folder Selection on Linux	20
Figure 10	Apache Tomcat Server Path on Linux	21
Figure 11	Firewall Settings on Linux	22
Figure 12	Completed License Server Installation on Linux	23
Figure 13	License Server Management Interface	28
Figure 14	Obtaining the License Server's MAC Address	29
Figure 15	License Server Settings for Enabling Failover Support	30
Figure 16	Selecting a License File	34
Figure 17	Successful Upload of a License File	34
Figure 18	Viewing Licensed Feature Properties	36
Figure 19	Licensed Feature Usage Details	37
Figure 20	Viewing License Usage	38
Figure 21	Licensed Client Details	38
Figure 22	Adding a License Reservation	39
Figure 23	Submitting a Pending Reservation	40
Figure 24	Listing Reservations	41

Figure 25	Deleting a Reservation	42
Figure 26	Exporting and Importing License Reservations	43
Figure 27	Changing the License Server Log Level	47
Figure 28	Apache Tomcat Status in the Windows Services Application	47
Figure 29	License Server Connection Error	48
Figure 30	License Server Status in the Windows Services Application	48
Figure 31	Starting the Uninstaller from Windows Control Panel	53
Figure 32	Starting the Uninstaller in Windows Explorer from the License Server Installation Directory.....	54
Figure 33	Running the License Server Uninstaller on Windows	55
Figure 34	Running the License Server Uninstaller on Linux	56

LIST OF TABLES

Table 1 Licensed Feature Properties	36
Table 2 Log File Locations	45

Chapter 1.

INTRODUCTION TO THE NVIDIA vGPU SOFTWARE LICENSE SERVER

The NVIDIA vGPU software License Server is used to serve a pool of floating licenses to NVIDIA vGPU software licensed products. The License Server is designed to be installed locally within a customer's network, and be configured with licenses obtained from the NVIDIA Software Licensing Center.

1.1. Overview of NVIDIA vGPU software Licensing

NVIDIA vGPU software is a licensed product. Licensed vGPU functionalities are activated during guest OS boot by the acquisition of a software license served over the network from an NVIDIA vGPU software license server. The license is returned to the license server when the guest OS shuts down.

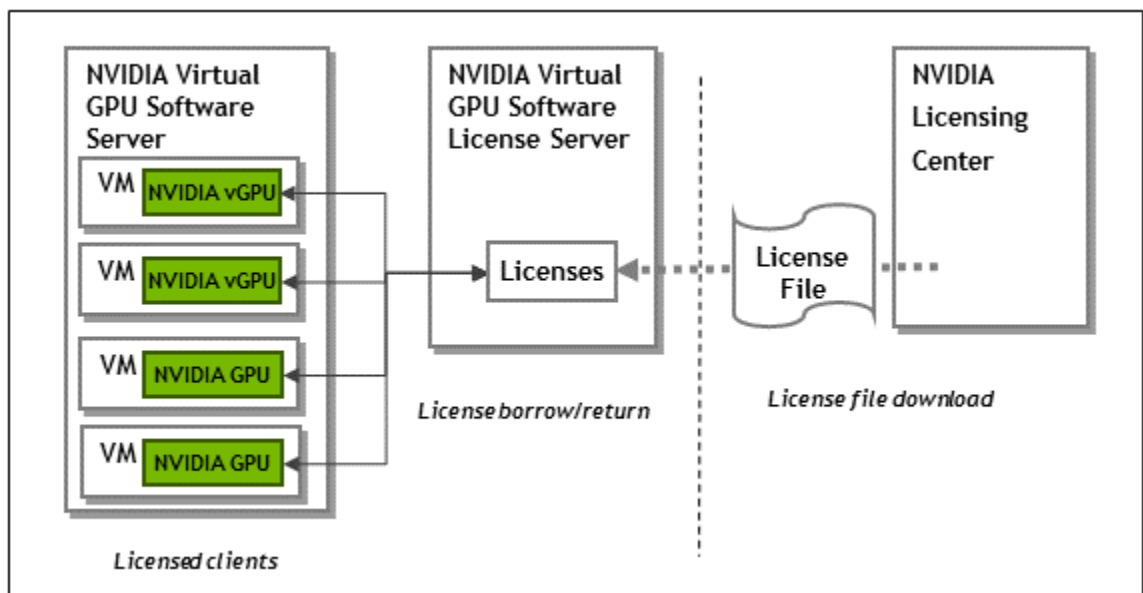


Figure 1 NVIDIA vGPU Software Licensing Architecture

The licenses served by the NVIDIA vGPU software license server are obtained from the NVIDIA Software Licensing Center as downloadable license files, and installed into the license server through its management interface.

1.2. NVIDIA vGPU Software License Server High Availability

To provide NVIDIA vGPU software clients with continued access to NVIDIA vGPU software features if a single license server fails, you can configure the license server for high availability. High availability requires two license servers in a *failover* configuration:

- ▶ A *primary* license server, which is actively serving licenses to NVIDIA vGPU software clients
- ▶ A *secondary* license server, which acts as a backup for the primary license server

Configuring two servers in a failover configuration increases availability because simultaneous failure of two servers is rare. The primary and secondary license servers work together to ensure that licenses in the enterprise remain continually available to NVIDIA vGPU software clients.

If the primary license server fails, failover occurs and the secondary server can continue to serve licenses for up to the license server maintenance interval, which is three days.



To ensure that licenses in the enterprise remain continually available after failure of the primary license server, return the primary server to service **within three days** of the failure. Furthermore, the remaining server becomes a single point of failure. Therefore, you should return the failed server to service as quickly as possible to restore high availability support for the license server.

During normal operation, the primary license server periodically updates the secondary server with information about the licenses that are being served to clients. However, when the primary server is returned to service after a failure, it is not updated with information from the secondary server about licenses that were served while the primary server was out of service.

For more information about configuring the license server for high availability, see [High Availability Requirements](#).

1.3. Overview of the NVIDIA vGPU Software Licensing Process

The following table lists the major tasks in the process of licensing NVIDIA vGPU software and provides a cross-reference to instructions for performing each task.



If you are configuring the license server for high availability, you must perform some tasks for both the primary license server and the secondary license server. For more information, see [High Availability Requirements](#).

Task	Instructions
Get your NVIDIA vGPU software and NVIDIA vGPU software License Server software.	<i>Virtual GPU Software Quick Start Guide</i>
Install the NVIDIA vGPU software License Server software.	Installing the NVIDIA vGPU Software License Server
Access the management interface of the license server.	Accessing the License Server Management Interface
Get the MAC address of the license server.	Obtaining the License Server's MAC Address
HA license servers only: Enable failover support.	Enabling Failover Support on the Primary and Secondary License Servers
Register your license server, generate licenses, and download license files.	Registering Your License Server and Getting License Files
Install a license.	Installing a License
View available licenses.	Viewing Information About Installed Licenses
Reserve and release licenses.	Reserving Licenses
Move a license to a new server.	<ol style="list-style-type: none"> Removing Licenses from a License Server Registering Your License Server and Getting License Files
Convert a trial license server to a permanent license server.	Converting an Evaluation License Server to a Permanent License Server
Configure licensed NVIDIA vGPU software products for use with license server.	<i>Virtual GPU Client Licensing User Guide</i>
Troubleshoot the license server.	Troubleshooting the NVIDIA vGPU Software License Server
Uninstall the license server software.	Uninstalling the NVIDIA vGPU Software License Server

Chapter 2.

INSTALLING THE NVIDIA vGPU SOFTWARE LICENSE SERVER

You can install the NVIDIA vGPU software license server on Windows and Linux systems that meet the license server's platform requirements. If you require high availability for the license server, you must install the license server both on the system that you will use as the primary license server **and** on the system that you will use as the secondary license server.

The license server requires a Java runtime environment and an Apache Tomcat server. Before you install the license server software, ensure that the required software is already installed on each license server host machine that you are using:

- ▶ On Windows, you need ensure only that the Java runtime environment is installed. The Apache Tomcat server is included in the license server installer for Windows.
- ▶ On Linux, you must ensure that both the Java runtime environment and the Apache Tomcat server are installed.

Also ensure that you have obtained your NVIDIA vGPU software and NVIDIA vGPU software License Server software. For more information, refer to *Virtual GPU Software Quick Start Guide*.

2.1. Platform Requirements

Before proceeding, ensure that you have a platform suitable for hosting the license server.

2.1.1. Hardware and Software Requirements

- ▶ The hosting platform may be a physical or virtual machine (VM). NVIDIA recommends using a host that is dedicated solely to running the license server.
- ▶ The recommended minimum configuration is 2 CPU cores and 4 Gbytes of RAM. A high-end configuration of 4 or more CPU cores with 16 Gbytes of RAM is suitable for handling up to 150,000 licensed clients.
- ▶ The hosting platform must run a supported operating system.

- ▶ On Windows platforms, .NET Framework 4.5 or later is required.



Before proceeding with the installation, refer to [Virtual GPU License Server Release Notes](#) for details of supported operating systems and known issues.

2.1.2. Platform Configuration Requirements

- ▶ The platform must have a fixed (unchanging) IP address. The IP address may be assigned dynamically by DHCP or statically configured, but must be constant.
- ▶ The platform must have at least one unchanging Ethernet MAC address, to be used as a unique identifier when registering the server and generating licenses in the NVIDIA Software Licensing Center.
- ▶ The platform's date and time must be set accurately. NTP is recommended.

2.1.3. Network Ports and Management Interface

The license server requires TCP port 7070 to be open in the platform's firewall, to serve licenses to clients. By default, the installer will automatically open this port.

The license server's management interface is web-based, and uses TCP port 8080. The management interface itself does not implement access control; instead, the installer does not open port 8080 by default, so that the management interface is only available to web browsers running locally on the license server host. Access to the management interface is therefore controlled by limiting remote access (via VNC, RDP, etc.) to the license server platform.



If you choose to open port 8080 during license server installation, or at any time afterwards, the license server's management interface is unprotected.

2.1.4. High Availability Requirements

If you plan to configure high availability for the license server by configuring a primary server and a secondary server, these requirements must be met:

- ▶ Both servers must run the same version of the NVIDIA vGPU Software License Server software.
- ▶ The clocks on both servers must be accurate and synchronized. NTP is recommended.
- ▶ The same license configuration file must be installed on both servers. This file is configured to include the Ethernet MAC addresses of both servers.

If you are configuring the license server for high availability, you must perform the following tasks for both the primary license server and the secondary license server:

- ▶ Installing the license server:
 - ▶ [Installing the NVIDIA vGPU Software License Server on Windows](#)
 - ▶ [Installing the NVIDIA vGPU Software License Server on Linux](#)
- ▶ [Obtaining the License Server's MAC Address](#)

- ▶ [Enabling Failover Support on the Primary and Secondary License Servers](#)
- ▶ [Registering Your License Server and Getting License Files](#)
- ▶ [Installing a License](#)
- ▶ [Verifying High Availability Setup of the License Server](#)
- ▶ [Reserving Licenses](#)

2.2. Installing the NVIDIA vGPU Software License Server on Windows

The license server requires a Java runtime environment, which must be installed separately before you install the license server.



If you require high availability for the license server, you must install the license server both on the system that you will use as the primary license server **and** on the system that you will use as the secondary license server.

2.2.1. Installing the Java Runtime Environment on Windows

If a suitable 32-bit Java runtime environment (JRE) version is not already installed on your system, download a supported 32-bit Oracle Java SE JRE or OpenJDK JRE and install it before running the NVIDIA license server installer.

- ▶ Oracle Java SE JRE downloads are available from the java.com: Java + You website.
- ▶ OpenJDK JRE downloads are available from the [Community builds using source code from OpenJDK project](#) on GitHub.

If you are installing OpenJDK to migrate from Oracle Java SE JRE, see [Migrating an Existing Installation of NVIDIA vGPU Software License Server to OpenJDK on Windows](#).



Install the 32-bit Java runtime, regardless of whether your platform is 32-bit Windows or 64-bit Windows. If a 64-bit Java runtime is already installed, remove it before installing the 32-bit version to ensure that future updates to the Java software can be applied correctly.



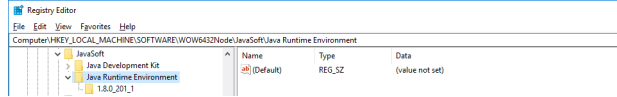
Figure 2 Oracle Java SE 32-Bit Runtime Environment Installation on Windows

If you are using OpenJDK and have not yet installed the license server software, you must set `JAVA_HOME` before installing the license server software. For instructions see [Setting the JRE and JVM locations for New Installations with OpenJDK](#).

2.2.2. Setting the JRE and JVM locations for New Installations with OpenJDK

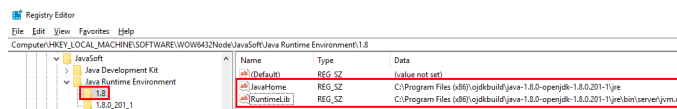
The license server installer obtains the JRE and JVM locations that Apache Tomcat requires from a registry key. This registry key specifies the correct locations for the Oracle Java SE JRE. If you are using OpenJDK, you must update this registry key to specify the correct locations for the OpenJDK JRE before installing the license server software.

1. Open the Windows **Registry Editor** and navigate to Computer \HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\JavaSoft\Java Runtime Environment.

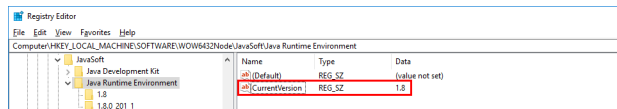


2. Add the registry key for Open JDK JRE version 1.8 and add the `JavaHome` and `RuntimeLib` string values to this key.
 - a) If it does not exist already, add the key `1.8` as a subkey of `Java Runtime Environment`.
 - b) To the key `1.8`, add new string values named `JavaHome` and `RuntimeLib`, and set their **Data** values as described in the following table.

Name	Data Value
JavaHome	<p>The full path to the <code>jre</code> folder of your OpenJDK installation, for example, <code>C:\Program Files (x86)\ojdkbuild\java-1.8.0-openjdk-1.8.0.201-1\jre</code>.</p> <div style="background-color: #d9ead3; padding: 5px; border: 1px solid #ccc;"> <p>Ensure that the path does not include any trailing characters, such as a slash or a space. If the <code>JavaHome</code> string value already exists, edit its Data value to remove any trailing characters.</p> </div>
RuntimeLib	<p>The full path to the JVM DLL file <code>jvm.dll</code> of your OpenJDK installation, for example, <code>C:\Program Files (x86)\ojdkbuild\java-1.8.0-openjdk-1.8.0.201-1\jre\bin\server\jvm.dll</code>.</p>



3. To the key `Java Runtime Environment`, add a new string value named `CurrentVersion` and set its **Data** value to `1.8`.



4. From the **View** menu, choose **Refresh** to confirm that the registry keys were added and updated as required.

Install the license server software as explained in the following topics:

- ▶ [Installing the License Server Software on Windows in Graphical Mode](#)
- ▶ [Installing the License Server Software on Windows in Console Mode](#)

2.2.3. Installing the License Server Software on Windows in Graphical Mode

1. Unzip the license server installer and run `setup.exe`.
2. Accept the EULA for the license server software and the Apache Tomcat software used to support the license server's management interface.

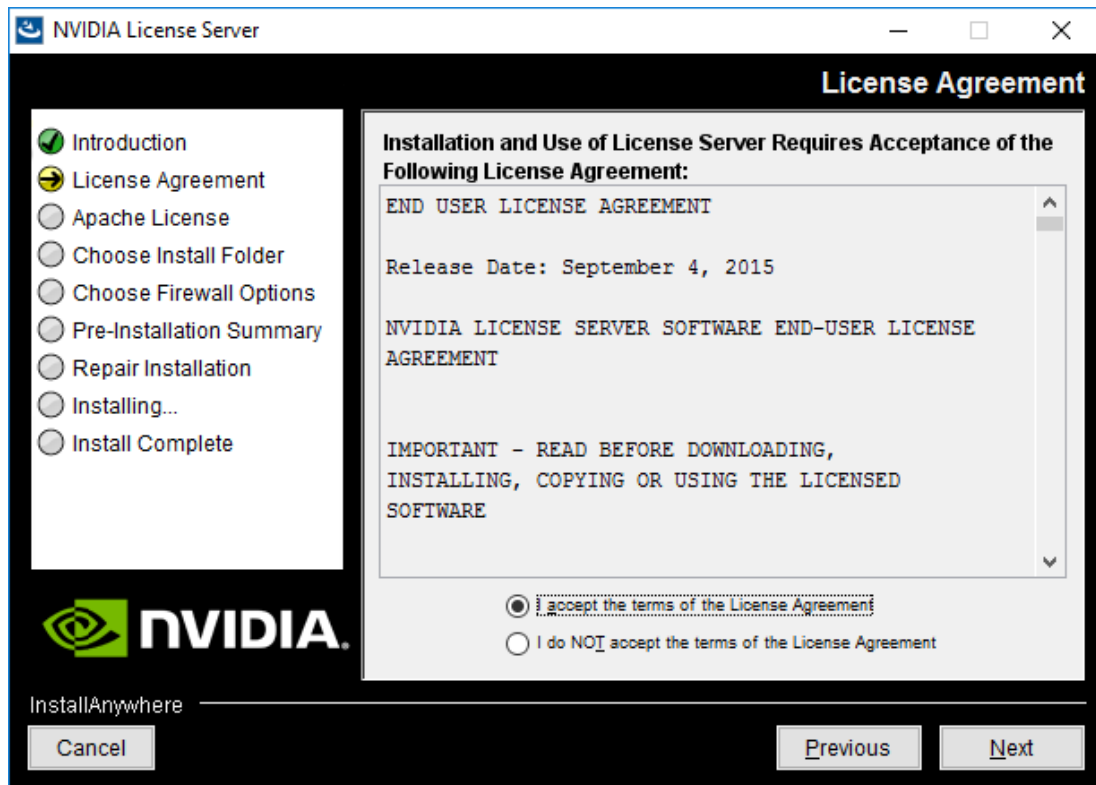


Figure 3 License Agreements on Windows

3. Choose the destination folder where you want the license server software to be installed.

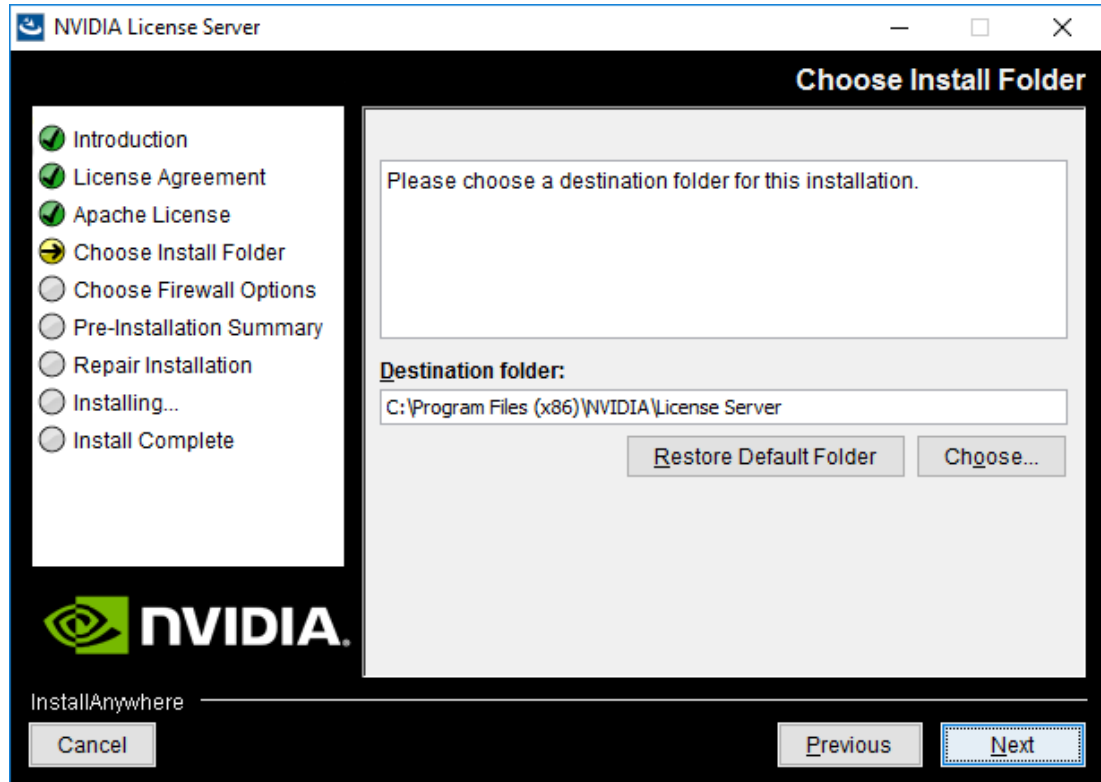


Figure 4 Destination Folder Selection on Windows

4. In the **Choose Firewall Options** dialog box, select the ports to be opened in the firewall.

To enable remote clients to access licenses from the server and prevent remote access to the management interface, use the default setting, which sets ports as follows:

- ▶ Port 7070 is open to enable remote clients to access licenses from the server.
- ▶ Port 8080 is closed to ensure that the management interface is available only through a web browser running locally on the license server host.

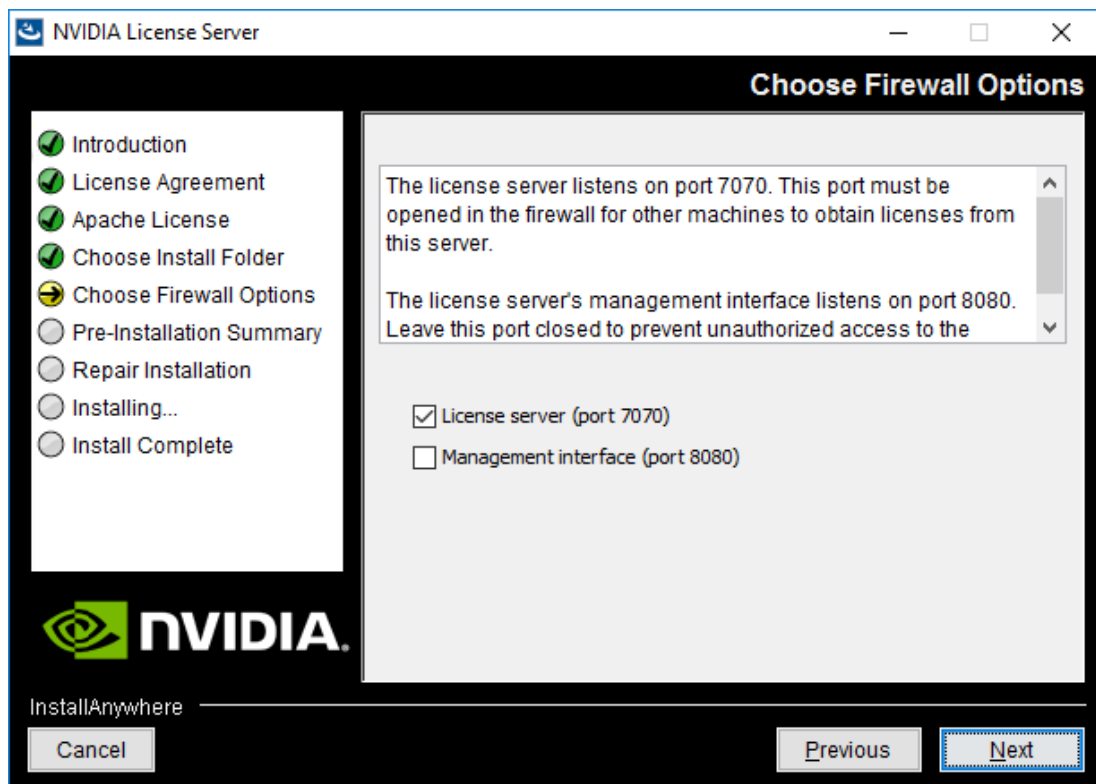


Figure 5 Firewall Settings on Windows

5. After installation has completed successfully, click **Done** to exit the installer.

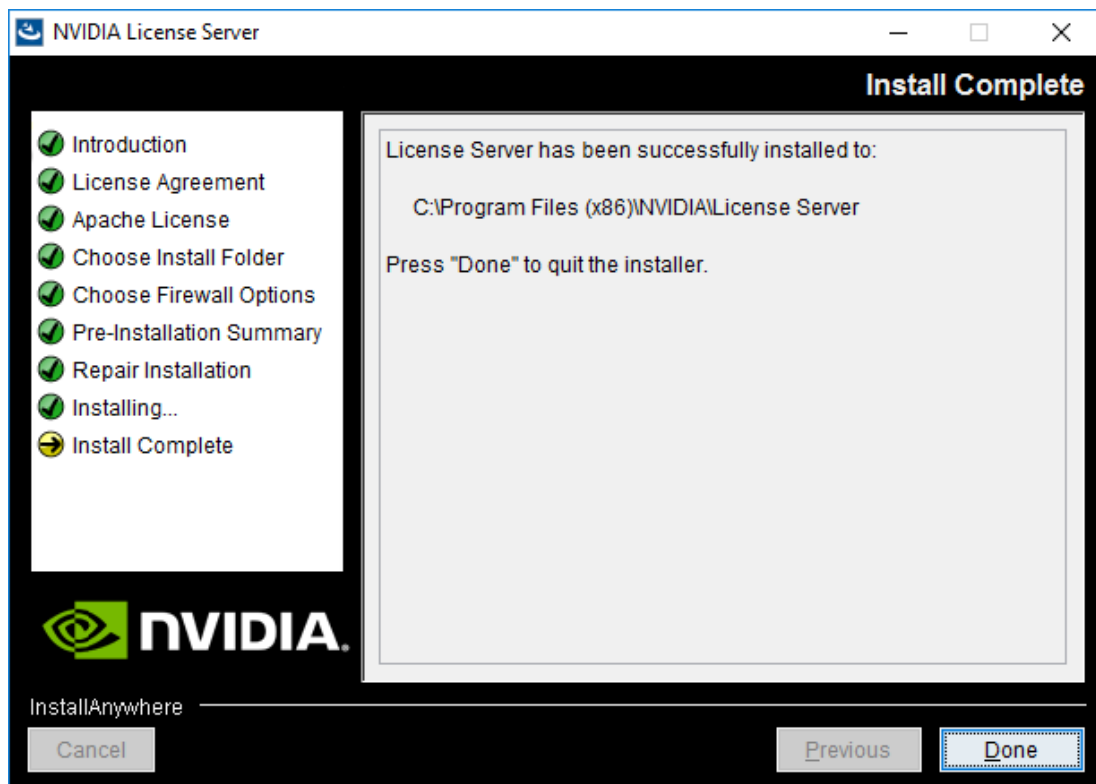


Figure 6 Completed License Server Installation on Windows

After quitting the installer, verify the installation by accessing the License Server management interface as explained in [Accessing the License Server Management Interface](#).

2.2.4. Installing the License Server Software on Windows in Console Mode

Support for installation in Windows console mode is introduced in this license server release (2018.06). It is **not** supported in earlier license server releases. The license server installer for earlier releases must be run in a graphical desktop environment. Installation in silent mode is **not** supported in any release.

1. Extract the contents of the license server zip archive.
2. Run the extracted setup binary.

```
C:\> setup.exe -i console
```

The **Introduction** screen of the **InstallAnywhere** installer is displayed.

3. In the **Introduction** screen, press **Enter** to continue.

4. In the **License Agreement** screen, press **Enter** each time you are prompted to page through the license agreement.
When you reach the end of the license agreement, you are prompted to accept its terms.
5. Type **y** to accept the terms of the license agreement and proceed with installation.
6. In the **Apache License Agreement** screen, press **Enter** each time you are prompted to page through the license agreement.
When you reach the end of the license agreement, you are prompted to accept its terms.
7. Type **y** to accept the terms of the license agreement and proceed with installation.
8. In the **Choose Install Folder** screen, specify where you want the license server software to be installed:
 - ▶ Press **Enter** to accept the default installation folder.
 - ▶ Enter the absolute path to the destination folder where you want the license server software to be installed.
9. In the **Choose Firewall Options** screen box, select the ports to be opened in the firewall.

The options for selecting ports to be opened in the firewall are presented as follows:

```
-->1- License server (port 7070)
    2- Management interface (port 8080)
```

- ▶ Press **Enter** to accept the default setting.
- ▶ Enter a comma-separated list of numbers that represent your choice of ports to be opened.

To enable remote clients to access licenses from the server and prevent remote access to the management interface, use the default setting, which sets ports as follows:

- ▶ Port 7070 is open to enable remote clients to access licenses from the server.
- ▶ Port 8080 is closed to ensure that the management interface is available only through a web browser running locally on the license server host.

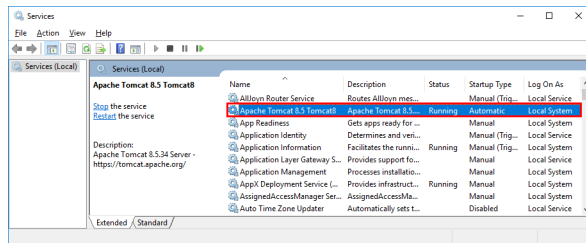
10. In the **Pre-Installation Summary** screen, review your choices and press **Enter** to start the installation.
After installation has completed successfully, the **Install Complete** screen is displayed.
11. In the **Install Complete** screen, press **Enter** to exit the installer.

After quitting the installer, verify the installation by accessing the license server management interface as explained in [Accessing the License Server Management Interface](#).

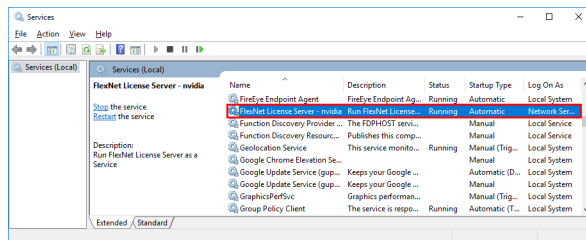
2.2.5. Migrating an Existing Installation of NVIDIA vGPU Software License Server to OpenJDK on Windows

If you no longer want to use Oracle Java SE JRE with your existing installation of NVIDIA vGPU software license server, you can replace the Oracle Java SE JRE with the OpenJDK JRE.

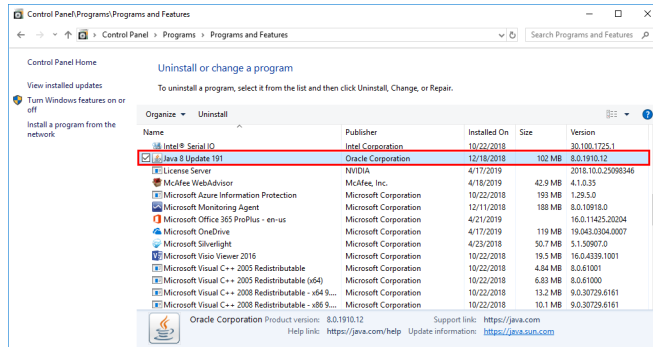
1. Use the **Services** application to confirm that the **Apache Tomcat 8.5 Tomcat8** service is running.



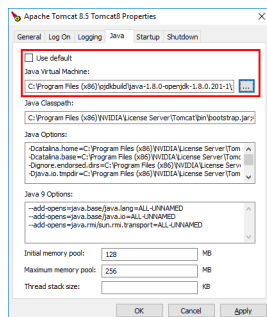
2. Use the **Services** application to confirm that the **FlexNet License Server - nvidia** service is running.



3. In the **Services** application, context-click the **FlexNet License Server - nvidia** service and choose **Stop**.
4. In the **Services** application, context-click the **Apache Tomcat 8.5 Tomcat8** service and choose **Stop**.
5. Uninstall Oracle Java SE JRE.
 - a) Open **Windows Control Panel**. and under **Programs**, follow the **Uninstall a program link**.
 - b) Context-click the installed Oracle Java SE JRE program, choose **Uninstall**, and if you are prompted to confirm that you want to uninstall the program, click **Yes**.



6. Install OpenJDK.
7. Ensure that Apache Tomcat can locate your OpenJDK JRE.
 - a) In **Windows File Explorer**, navigate to the `bin` folder of your **Apache Tomcat** installation.
By default, this folder is `%SystemDrive%\Program Files (x86)\NVIDIA\License Server\Tomcat\bin`.
 - b) Double-click the **Tomcat8w** application in this folder.
 - c) In the **Apache Tomcat 8.5 Tomcat8 Properties** window that opens, click the **Java** tab.
 - d) Deselect the **Use default** option, set **Java Virtual Machine** to the full path to the JVM DLL file `jvm.dll` of your OpenJDK installation, for example, `C:\Program Files (x86)\ojdkbuild\java-1.8.0-openjdk-1.8.0.201-1\jre\bin\server\jvm.dll`, and click **OK**.



8. In the **Services** application, context-click the **Apache Tomcat 8.5 Tomcat8** service and choose **Start**.
9. In the **Services** application, context-click the **FlexNet License Server - nvidia** service and choose **Start**.
10. Confirm that the license server is working by accessing the license server management interface as explained in [Accessing the License Server Management Interface](#).

2.3. Installing the NVIDIA vGPU Software License Server on Linux

The license server requires a Java runtime environment and an Apache Tomcat server, which must be installed separately before you install the license server software.



If you require high availability for the license server, you must install the license server both on the system that you will use as the primary license server **and** on the system that you will use as the secondary license server.

2.3.1. Installing the Java Runtime Environment on Linux

If a suitable Java runtime environment (JRE) version is not already installed on your system, you can install OpenJDK from your Linux distribution's package repositories.

If you are installing OpenJDK to migrate from Oracle Java SE JRE, see [Migrating an Existing Installation of NVIDIA vGPU Software License Server to OpenJDK on Linux](#).



For information about installing Oracle Java SE JRE, see the [Java Platform, Standard Edition Documentation](#) in the Oracle Help Center.

1. Determine whether a version of Java is installed on your system.

```
[nvidia@localhost ~]$ java -version
```

If a Java version is installed, the version is shown as follows and no further action is required.

```
java version "1.7.0_51"
OpenJDK Runtime Environment (rhel-2.4.5.5.el7-x86_64 u51-b31)
OpenJDK 64-Bit Server VM (build 24.51-b03, mixed mode)
[nvidia@localhost ~]$
```

2. Use your Linux distribution's package manager to install OpenJDK.
 - ▶ For distributions based on Red Hat, use the yum package manager to install the java package.

```
[nvidia@localhost ~]$ sudo yum install java
```

- ▶ For distributions based on Debian, use the apt package manager to install the default-jdk package.

```
[nvidia@localhost ~]$ sudo apt install default-jdk
```

2.3.2. Installing and Running the Apache Tomcat Server on Linux

The license server's management interface requires an Apache Tomcat server.

1. Use your Linux distribution's package manager to install the required Apache Tomcat packages.
 - ▶ For distributions based on Red Hat, use the `yum` package manager to install the `tomcat` and `tomcat-webapps` packages.

```
[nvidia@localhost ~]$ sudo yum install tomcat tomcat-webapps
```

- ▶ For distributions based on Debian, use the `apt` package manager to install the `tomcat-release` package. For example, for Apache Tomcat 8, run:

```
[nvidia@localhost ~]$ sudo apt install tomcat8
```

2. After installing the packages, enable the Tomcat service for automatic startup on boot.

- ▶ For distributions based on Red Hat, enable the `tomcat` service.

```
[nvidia@localhost ~]$ sudo systemctl enable tomcat.service
```

- ▶ For distributions based on Debian, enable the `tomcat-release` service. For example, for Apache Tomcat 8, run:

```
[nvidia@localhost ~]$ sudo systemctl enable tomcat8.service
```

3. Start the Tomcat service.

- ▶ For distributions based on Red Hat, start the `tomcat` service.

```
[nvidia@localhost ~]$ sudo systemctl start tomcat.service
```

- ▶ For distributions based on Debian, start the `tomcat-release` service. For example, for Apache Tomcat 8, run:

```
[nvidia@localhost ~]$ sudo systemctl start tomcat8.service
```

4. Verify that the Tomcat service is operational by opening the URL `http://localhost:8080` in a web browser.

The home page of the default Tomcat web application should be displayed, as shown in [Figure 7](#).

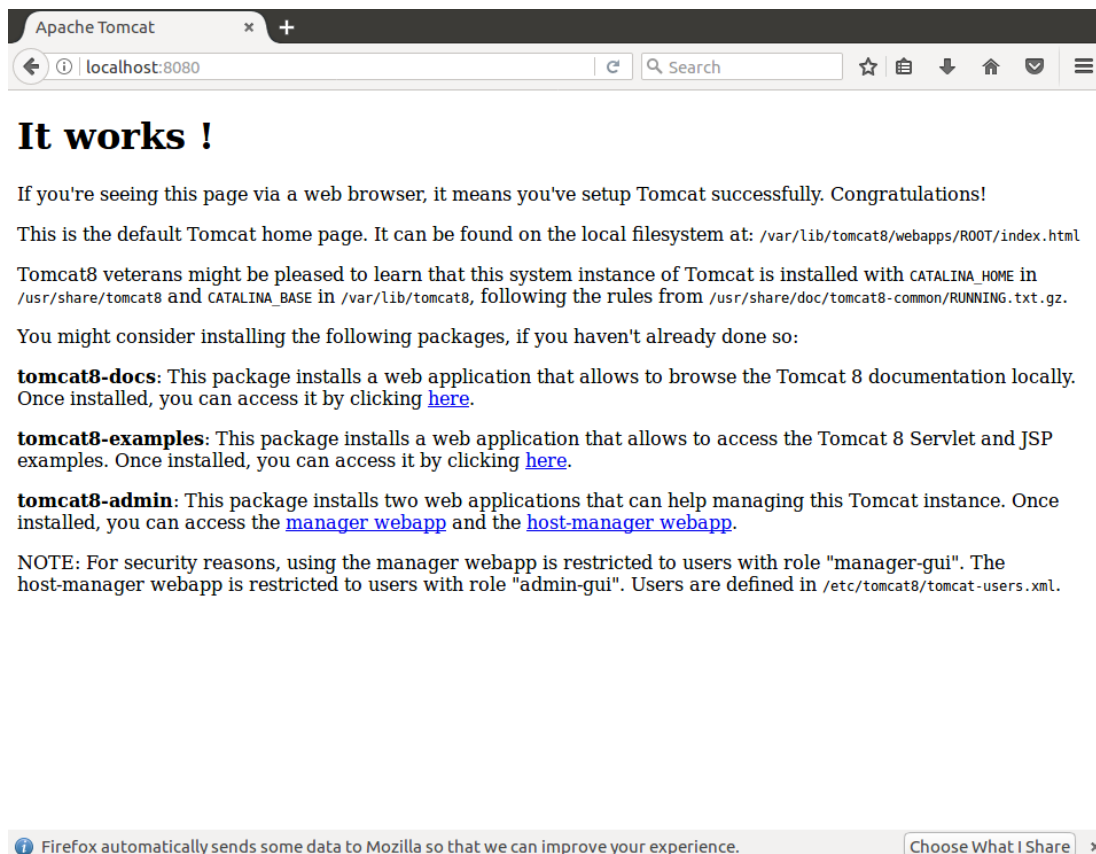


Figure 7 Verifying the Apache Tomcat Installation

Do not relocate the `webapps` folder, which is where Web applications are deployed on Apache Tomcat Server. If you relocate this folder, the installation of the license server software may fail.

2.3.3. Installing the License Server Software on Linux in Graphical Mode

1. Extract the contents of the license server ZIP archive.

```
[nvidia@localhost ~]$ unzip NVIDIA-ls-linux-2018.06.0.24304595.zip
```

2. Add execute permission to the extracted setup binary file.

```
[nvidia@localhost ~]$ chmod +x setup.bin
```

3. As root, run the extracted setup binary.

```
[nvidia@localhost ~]$ sudo ./setup.bin
```

4. Accept the EULA to proceed with installation.

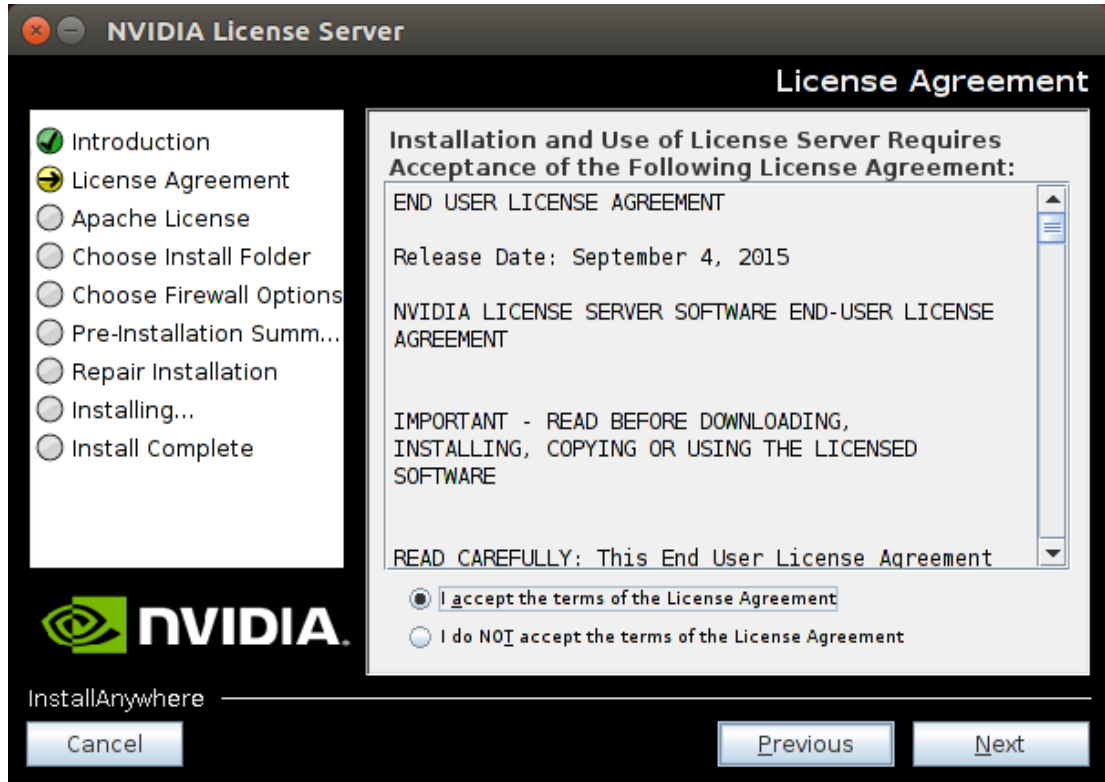


Figure 8 License Agreements on Linux

5. Choose the destination folder where you want the license server software to be installed.

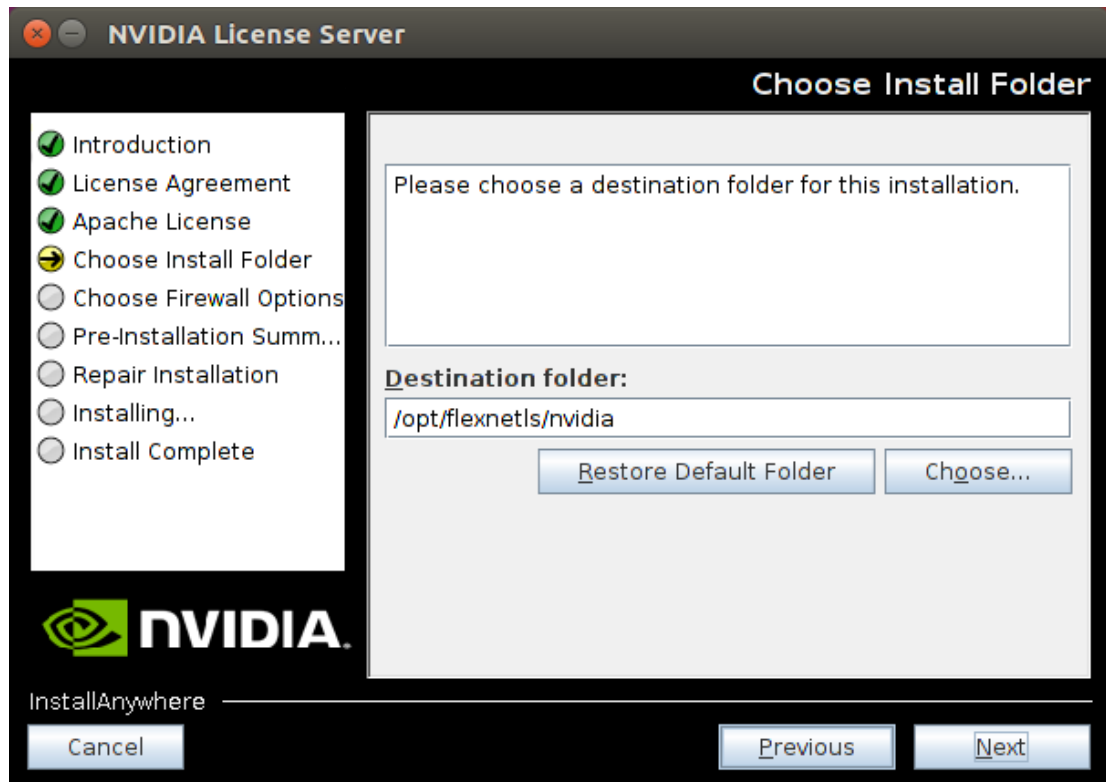


Figure 9 Destination Folder Selection on Linux

6. Specify the path to the folder on the local host that contains the webapps folder. Web applications are deployed on Apache Tomcat Server to the webapps folder.
 - ▶ For distributions based on Red Hat, the default path to this folder is `/usr/share/tomcat`.
 - ▶ For distributions based on Debian, the default path to this folder is `/var/lib/tomcatrelease`, for example `/var/lib/tomcat8`, for Apache Tomcat 8.

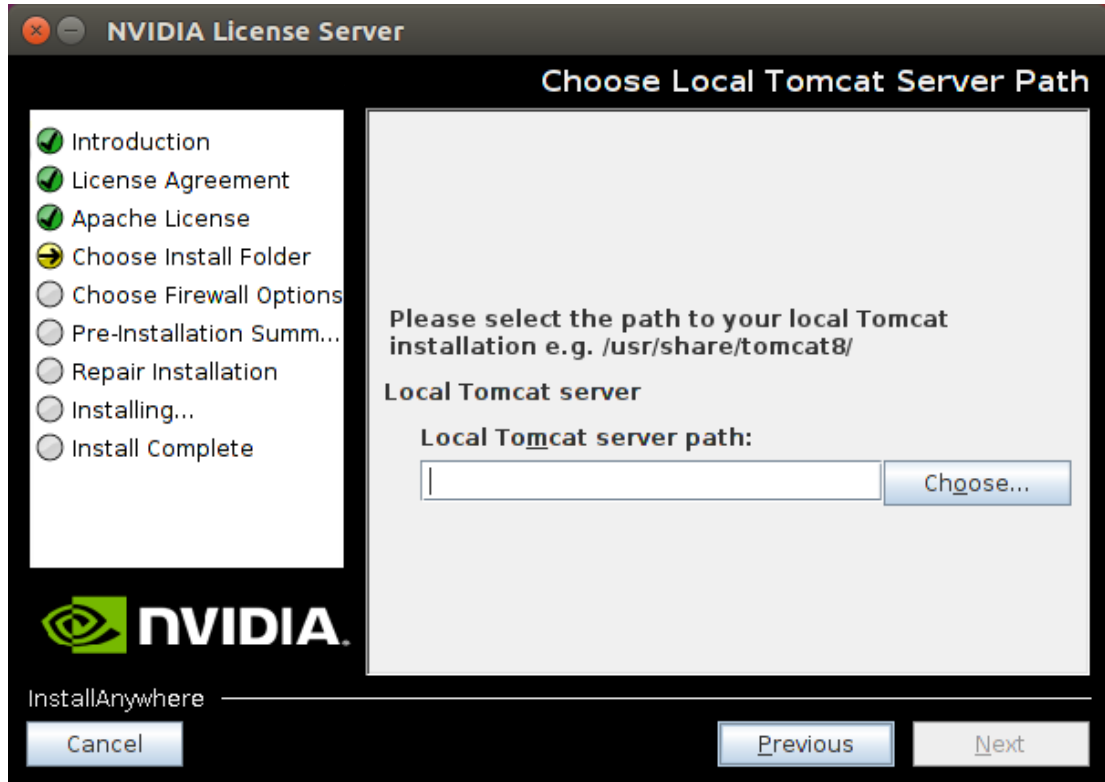


Figure 10 Apache Tomcat Server Path on Linux

7. In the **Choose Firewall Options** dialog box, shown in [Figure 11](#), select the ports to be opened in the firewall.

To enable remote clients to access licenses from the server and prevent remote access to the management interface, use the default setting, which sets ports as follows:

- ▶ Port 7070 is open to enable remote clients to access licenses from the server.
- ▶ Port 8080 is closed to ensure that the management interface is available only through a web browser running locally on the license server host.

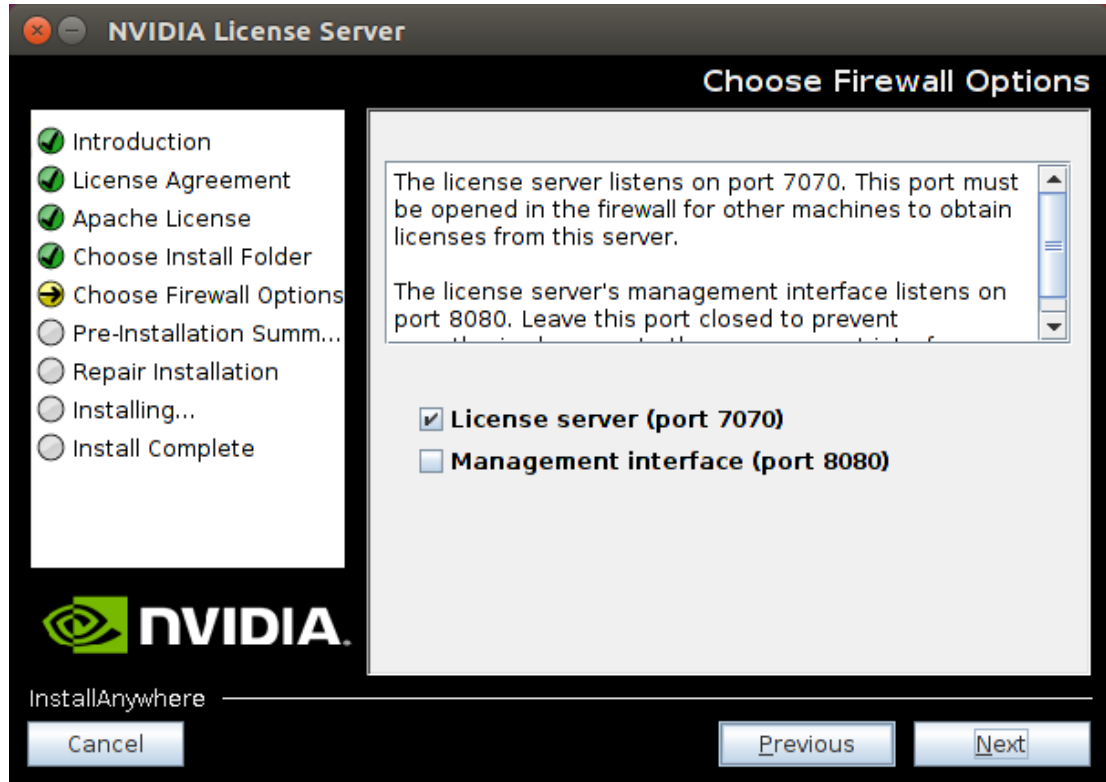


Figure 11 Firewall Settings on Linux

8. After installation has completed successfully, click **Done** to exit the installer.



Figure 12 Completed License Server Installation on Linux

After quitting the installer, verify the installation by accessing the license server management interface as explained in [Accessing the License Server Management Interface](#).

2.3.4. Installing the License Server Software on Linux in Console Mode



Support for installation in Linux console mode is introduced in this license server release (2018.06). It is **not** supported in earlier license server releases. The license server installer for earlier releases must be run in a graphical desktop environment. Installation in silent mode is not supported in any release.

1. Extract the contents of the license server ZIP archive.

```
[nvidia@localhost ~]$ unzip NVIDIA-ls-linux-2018.06.0.24304595.zip
```

2. Add execute permission to the extracted setup binary file.

```
[nvidia@localhost ~]$ chmod +x setup.bin
```

3. As root, run the extracted setup binary.

```
[nvidia@localhost ~]$ sudo ./setup.bin -i console
```

The **Introduction** screen of the **InstallAnywhere** installer is displayed.

4. In the **Introduction** screen, press **Enter** to continue.
5. In the **License Agreement** screen, press **Enter** each time you are prompted to page through the license agreement.
When you reach the end of the license agreement, you are prompted to accept its terms.
6. Type **y** to accept the terms of the license agreement and proceed with installation.
7. In the **Choose Install Folder** screen, specify where you want the license server software to be installed:
 - ▶ Press **Enter** to accept the default installation folder.
 - ▶ Enter the absolute path to the destination folder where you want the license server software to be installed.
8. In the **Choose Local Tomcat Server Path** screen, enter the path to the folder on the local host that contains the `webapps` folder.

Web applications are deployed on Apache Tomcat Server to the `webapps` folder.

- ▶ For distributions based on Red Hat, the default path to this folder is `/usr/share/tomcat`.
 - ▶ For distributions based on Debian, the default path to this folder is `/var/lib/tomcatrelease`, for example `/var/lib/tomcat8`, for Apache Tomcat 8.
9. In the **Choose Firewall Options** screen box, select the ports to be opened in the firewall.

The options for selecting ports to be opened in the firewall are presented as follows:

```
->1- License server (port 7070)
    2- Management interface (port 8080)
```

- ▶ Press **Enter** to accept the default setting.
- ▶ Enter a comma-separated list of numbers that represent your choice of ports to be opened.

To enable remote clients to access licenses from the server and prevent remote access to the management interface, use the default setting, which sets ports as follows:

- ▶ Port 7070 is open to enable remote clients to access licenses from the server.
- ▶ Port 8080 is closed to ensure that the management interface is available only through a web browser running locally on the license server host.

10. In the **Pre-Installation Summary** screen, review your choices and press **Enter** to start the installation.
After installation has completed successfully, the **Install Complete** screen is displayed.
11. In the **Install Complete** screen, press **Enter** to exit the installer.

After quitting the installer, verify the installation by accessing the license server management interface as explained in [Accessing the License Server Management Interface](#).

2.3.5. Migrating an Existing Installation of NVIDIA vGPU Software License Server to OpenJDK on Linux

If you no longer want to use Oracle Java SE JRE with your existing installation of NVIDIA vGPU software license server, you can replace the Oracle Java SE JRE with the OpenJDK JRE.

1. Check status of the Apache Tomcat service.

- ▶ For distributions based on Red Hat, check the status of the `tomcat` service.

```
[nvidia@localhost ~]$ systemctl status tomcat.service
```

- ▶ For distributions based on Debian, check the status of the `tomcatrelease` service. For example, for Apache Tomcat 8, run:

```
[nvidia@localhost ~]$ sudo systemctl status tomcat8.service
```

2. Check the status of the NVIDIA vGPU software license server `flexnetls-nvidia` service.

```
[nvidia@localhost ~]$ systemctl status flexnetls-nvidia.service
```

3. Stop the NVIDIA vGPU software license server `flexnetls-nvidia` service.

```
[nvidia@localhost ~]$ systemctl stop flexnetls-nvidia.service
```

4. Stop the Apache Tomcat service.

- ▶ For distributions based on Red Hat, stop the `tomcat` service.

```
[nvidia@localhost ~]$ sudo systemctl stop tomcat.service
```

- ▶ For distributions based on Debian, stop the `tomcatrelease` service. For example, for Apache Tomcat 8, run:

```
[nvidia@localhost ~]$ sudo systemctl stop tomcat8.service
```

5. Use your Linux distribution's package manager to install OpenJDK.

- ▶ For distributions based on Red Hat, use the `yum` package manager to install the `java` package.

```
[nvidia@localhost ~]$ sudo yum install java
```

- ▶ For distributions based on Debian, use the `apt` package manager to install the `default-jdk` package.

```
[nvidia@localhost ~]$ sudo apt install default-jdk
```

6. Optional: Uninstall Oracle Java SE JRE.

For information about uninstalling Oracle Java SE JRE, see [How do I uninstall Java for Linux?](#) on the java.com: Java + You website.

7. Ensure that Apache Tomcat can locate your OpenJDK JRE.

- a) Get the parent of the `jre` folder for your OpenJDK installation.

The following example gets the parent of the `jre` folder for an installation of 64-bit OpenJDK 8.

```
[nvidia@localhost ~] update-java-alternatives -l
java-1.8.0-openjdk-amd64      1081      /usr/lib/jvm/java-1.8.0-
openjdk-amd64
```

- b) Open the file `/etc/default/tomcat8` in a plain text editor and edit the value of the `JAVA_HOME` environment variable to specify the full path to the `jre` folder of your OpenJDK installation.

The following example sets `JAVA_HOME` for an installation of 64-bit OpenJDK 8.

```
JAVA_HOME=/usr/lib/jvm/java-8-openjdk-amd64/jre
```

8. Start the Apache Tomcat service.

- ▶ For distributions based on Red Hat, start the `tomcat` service.

```
[nvidia@localhost ~]$ sudo systemctl start tomcat.service
```

- ▶ For distributions based on Debian, start the `tomcatrelease` service. For example, for Apache Tomcat 8, run:

```
[nvidia@localhost ~]$ sudo systemctl start tomcat8.service
```

9. Start the NVIDIA vGPU software license server `flexnetls-nvidia` service.

```
[nvidia@localhost ~]$ systemctl start flexnetls-nvidia.service
```

10. Confirm that the license server is working by accessing the license server management interface as explained in [Accessing the License Server Management Interface](#).

Chapter 3.

MANAGING LICENSES ON THE NVIDIA VGPU SOFTWARE LICENSE SERVER

Managing licenses on the NVIDIA vGPU software license server involves installing licenses on the license server and controlling and monitoring the usage of installed licenses. You manage the license server in a web browser through the license server management interface.

3.1. Accessing the License Server Management Interface

Access the license server management interface to verify that the license server is operating correctly or to manage licenses on the license server.

- ▶ If the license server host does not permit remote access, open a web browser on the license server host and connect to the URL `http://localhost:8080/licserver`.
- ▶ If the license server host's network firewall is configured to permit remote access to the license server, open a web browser on a remote machine and connect to the URL `http://hostname:8080/licserver`, where `hostname` is the fully-qualified domain name or IP address of the license server host.

The browser should display the home page for the license server management interface, as shown in [Figure 13](#).

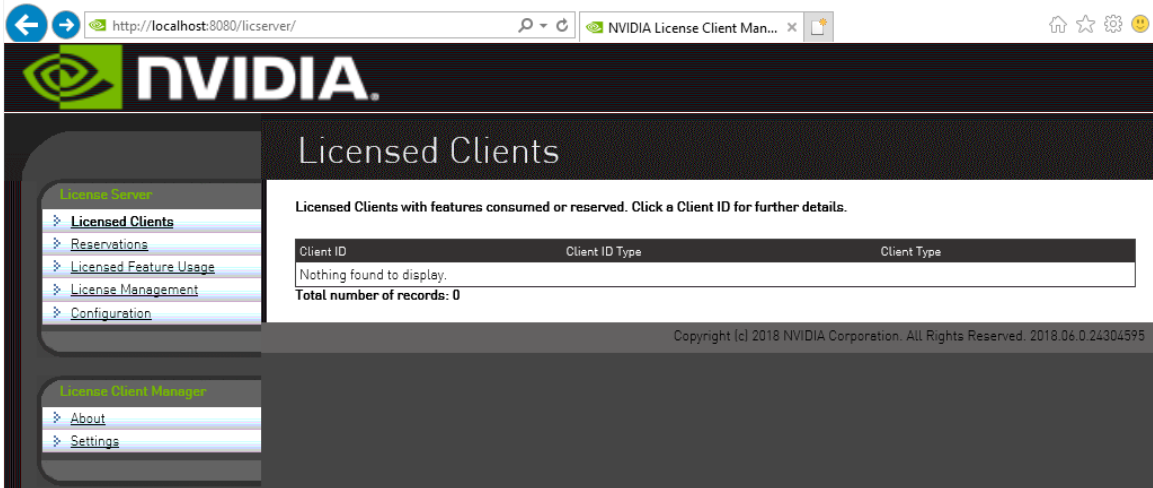


Figure 13 License Server Management Interface

If the management interface is not displayed, consult [Management Interface Connection Errors](#) for troubleshooting steps.

3.2. Obtaining the License Server's MAC Address

The license server's Ethernet MAC address uniquely identifies your server to the NVIDIA Software Licensing Center. You will need this address to register your license server with the NVIDIA Software Licensing Center to generate license files.



If you are configuring the license server for high availability, you will need the MAC address of both the primary license server and the secondary license server.

1. In the license server management interface, select **Configuration**.
2. On the **License Server Configuration** page that opens, in the **Server host ID** drop-down list, select the platform's ETHERNET address.

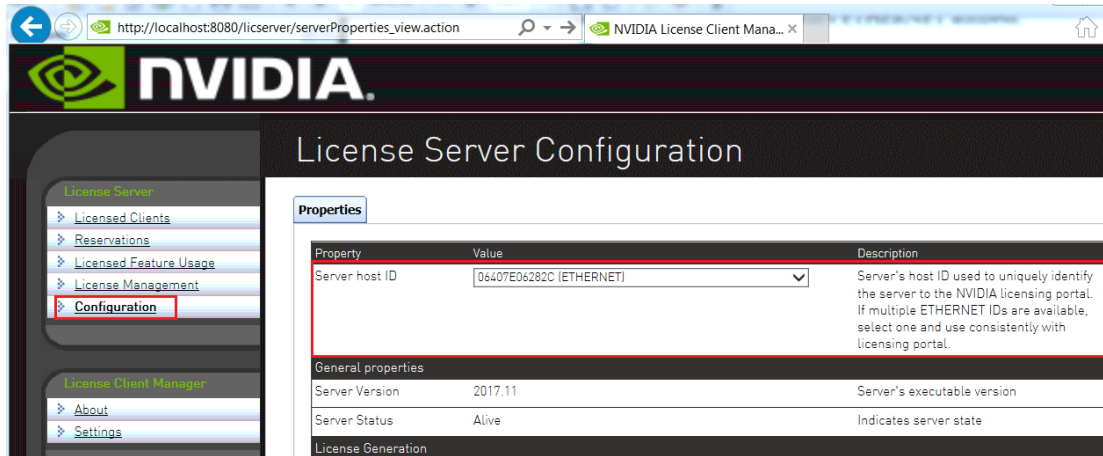


Figure 14 Obtaining the License Server's MAC Address

You must use the same ETHERNET ID to consistently identify the server when generating licenses on the NVIDIA Licensing Portal. If your platform has multiple Ethernet interfaces, multiple ETHERNET entries may be displayed in the **Server host ID** drop-down list. To ensure that you use the same ETHERNET ID to consistently to identify the server, select one entry that corresponds to a primary (nonremovable) interface on the platform.

3.3. Enabling Failover Support on the Primary and Secondary License Servers

If you are configuring high availability for the license server, you must enable failover support on both the primary license server **and** on the secondary license server. Set the same options on **both** servers.

1. In the license server management interface, select **Configuration**. The **License Server Configuration** page opens.

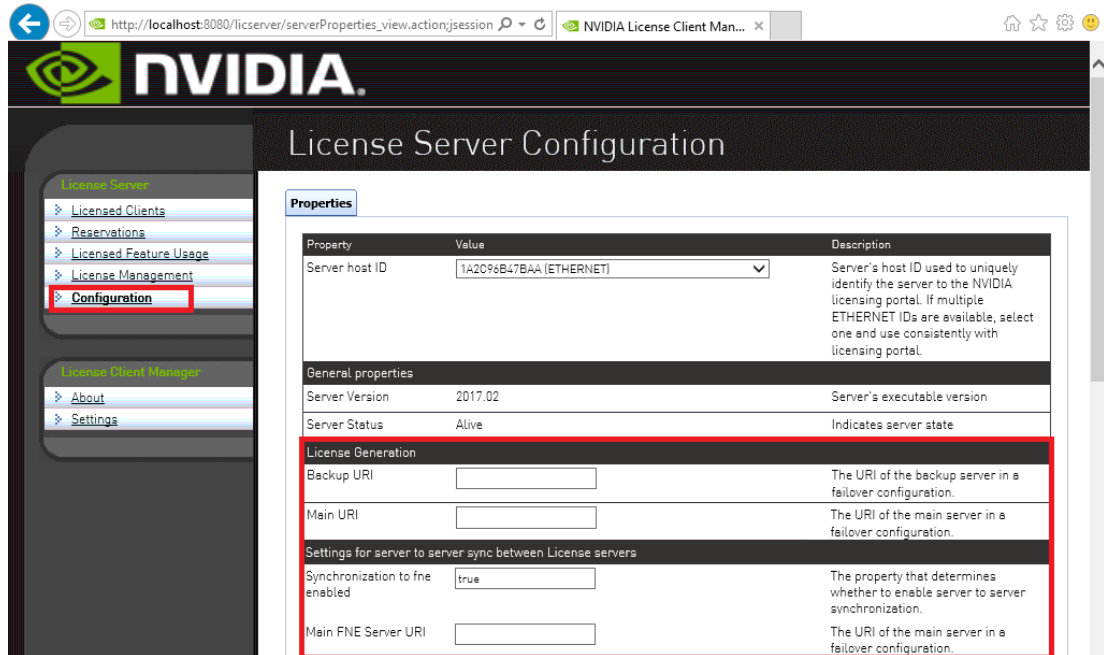


Figure 15 License Server Settings for Enabling Failover Support

2. Under **License Generation**, use the **Backup URI** and **Main URI** fields to set the URI to each server in a failover configuration.
 - a) In the **Backup URI** field, enter **http://secondary-server:7070/fne/bin/capability**.
 - b) In the **Main URI** field, enter **http://primary-server:7070/fne/bin/capability**.

secondary-server
The fully-qualified domain name (for example, `gridlicense2.example.com`) or the IP address (for example, `10.31.20.46`) of the secondary license server.

primary-server
The fully-qualified domain name (for example, `gridlicense1.example.com`) or the IP address (for example, `10.31.20.45`) of the primary license server.
3. Set the options under **Settings for server to sync between License servers** as follows:
 - a) Set the **Synchronization to fne enabled** option to **true**.
 - b) In the **Main FNE Server URI** field, enter **http://primary-server:7070/fne/bin/capability**.

primary-server
The fully-qualified domain name (for example, `gridlicense1.example.com`) or the IP address (for example, `10.31.20.45`) of the primary license server.
4. Click **Save**.

3.4. Registering Your License Server and Getting License Files

To be able to generate and download licenses from the NVIDIA Software Licensing Center, you must register your license server. Before downloading a license file, you must generate the file by mapping to it the add-ons that correspond to your licenses. The license file is empty by default and does not contain any licenses until you map add-ons to it.



If you require high availability for the license server, you must register a secondary server when the primary server is registered. If you do not register a secondary server when the primary server is registered, you **cannot** register the secondary server later.

1. If you are not already logged in, log in to the [NVIDIA Enterprise Application Hub](#) and click **NVIDIA LICENSING PORTAL** to go to the NVIDIA Software Licensing Center.
2. In the navigation pane of the **NVIDIA Software Licensing Center** page, under **GRID Licensing**, select **Register License Server**.
3. On the **Register License Server** page that opens, provide the details of your license server.
 - a) In the **MAC Address** field, enter the MAC address of your primary license server.
Enter **only** the numbers and letters in the address. Do **not** enter any spaces or punctuation.
If you have only one license server configured, enter its MAC address in this field.
 - b) In the **Backup License Server ID** field, enter the MAC address of your secondary license server.
Enter **only** the numbers and letters in the address. Do **not** enter any spaces or punctuation.
If you have only one license server configured, leave this field unset.
 - c) Optional: Provide an alias and site name for your license server.
If you do not provide an alias, it is set to the MAC address of your license server. You can edit the alias after your license server is registered.
If you do not provide a site name, your license server is registered without a site name. You **cannot** add a site name after your license server is registered.
 - d) Click **Create**.



NVIDIA SOFTWARE LICENSING CENTER > REGISTER LICENSE SERVER

Software & Services

- Product Information
- Product Search
- License History
- Search Line Items
- Recent Product Releases
- Redeem Product Activation Keys

Rendering Licensing

- Search Licenses
- View Licenses By Host
- View Licenses Generated by User

Grid Licensing

- Search License Servers
- Register License Server**

Administration

- Account Administrators
- Account Members
- Change Password

Register License Server

To register a license server to your account, provide the MAC address and additional information below.

Note: Please do not use special characters (:-_./) or spaces in the MAC Address.

MAC address*

Backup License Server ID

Alias

Site Name

Create

4. On the **View Server** page that opens, follow the **Map Add-Ons** link.

View Server

MAC address 00005E0053FF

ID Type ETHERNET

Alias

Site Name

[Map Add-Ons](#) [Remove Add-Ons](#) [View History](#) [View Served Clients](#) [Download License File](#)

Add-Ons

Add-On Name	Status	Entitlement	Units Mapped	Expiration	Downloadable Items
-------------	--------	-------------	--------------	------------	--------------------

No add-ons are currently mapped.

5. On the **Map Add-Ons** page that opens, in the **Qty to add** field, enter the number of licenses you want to add to your license file and click **Map Add-Ons**.

Map Add-Ons

Search Add-Ons for Server [00005E0053FF](#)

Activation Code

Entitlement ID

Add-On Name

Feature Name

Search

Add-On Name	Activation Code	Entitlement	Expiration	Available Units in Line Item	Total Units in Line Item	Qty to Add
GRID Evaluation Edition	GRIDEvaPAK241844:ONmTn 46wWB9408F	GRIDEvaPAK241844:ONmTn 46wWB9408F (93030833)	Sep 25, 2017	128	128	<input type="text"/>

Map Add-Ons

You can also configure and register multiple servers and distribute your NVIDIA vGPU software licenses across them by mapping add-ons to servers as necessary.

After clicking **Map Add-Ons**, you are returned to the **View Server** page.

6. Back on the **View Server** page, follow the **Download License File** link and save the `.bin` license file to your license server for installation.



The `.bin` license file is valid for 72 hours. If you do not install the file within 72 hours of downloading it, you must download it again.

3.5. Installing a License

NVIDIA vGPU software licenses are distributed as `.bin` files for download from the NVIDIA Software Licensing Center.



If you have configured high availability for the license server, you must install the license both on the primary license server **and** on the secondary license server.

Before installing a license, ensure that you have downloaded the license file from the NVIDIA Software Licensing Center.

1. In the license server management interface, select **License Management**.
2. On the **License Management** page that opens, click **Choose File**.

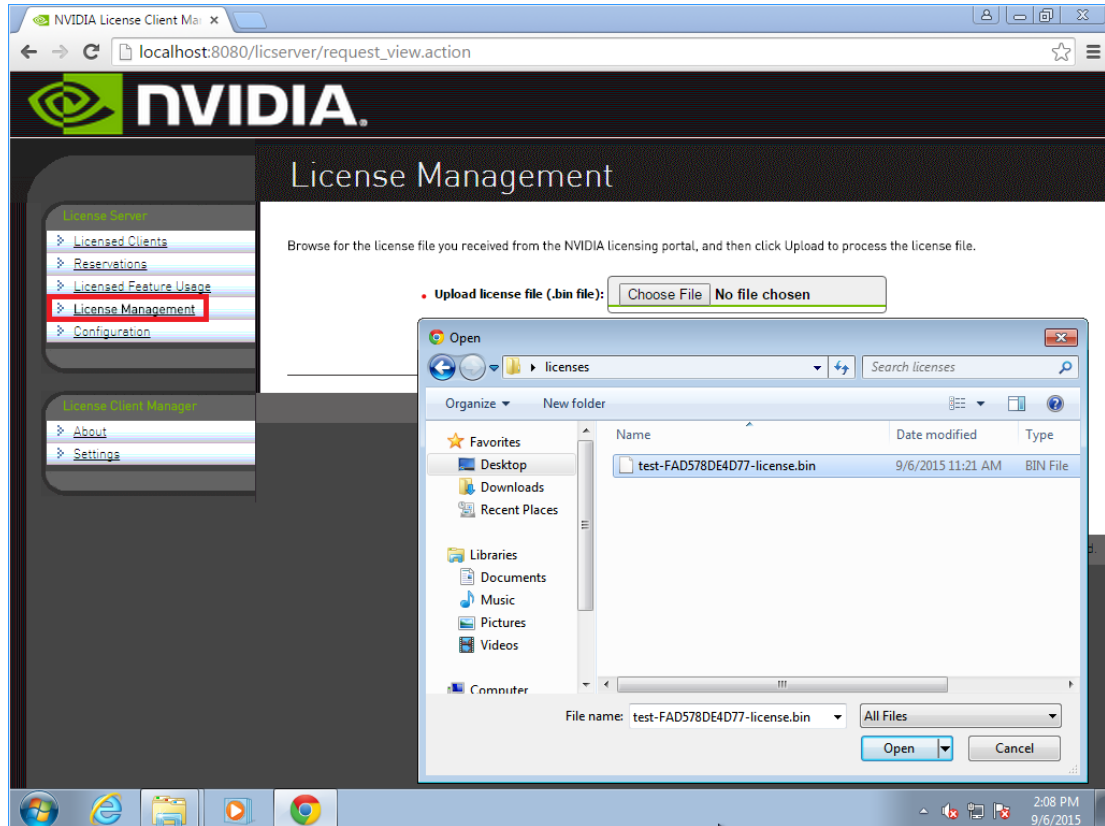


Figure 16 Selecting a License File

3. In the file browser that opens, select the `.bin` file and click **Open**.
4. Back on the **License Management** page, click **Upload** to install the license file on the license server.

The license server should confirm successful installation of the license file.

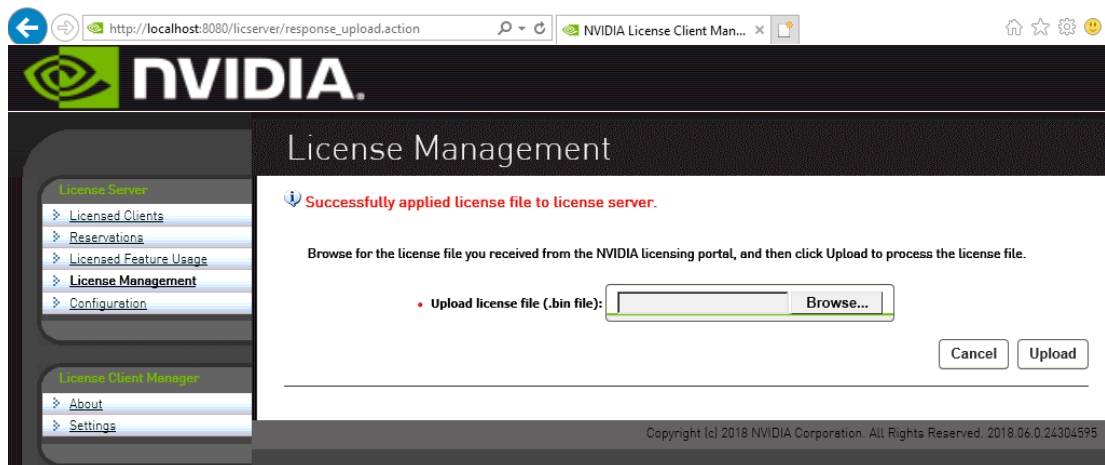


Figure 17 Successful Upload of a License File

5. If you have configured high availability for the license server, restart the license server service on the primary license server **and** on the secondary license server.

- ▶ On Windows, use the **Service Manager**, which is accessible from **Task Manager**, to restart the **FNLS-nvidia** service.
- ▶ On Linux, as root, restart the `flexnetls-nvidia` service.

```
[nvidia@localhost ~]$ sudo systemctl restart flexnetls-nvidia
```

3.6. Verifying High Availability Setup of the License Server

The license server log file indicates the failover role of the given license server and its synchronization status.

For the location of the log file on your platform, refer to [Log File Locations and Types](#).

In the license server log file, search for the string that designates the server role. The line that contains the string and the lines that follow it indicate the role and status of the server.

- ▶ For the primary server, search for the string `main server`.

```
23:29:25,655 INFO Server is designated as a main server in a failover
configuration
23:29:29,041 INFO Received sync request from the backup server
23:34:31,815 INFO Generated sync message for the backup server
```

- ▶ For the secondary server, search for the string `backup server`.

```
00:39:53,290 INFO Server is designated as a backup server in a failover
configuration
00:39:55,388 INFO Starting sync from main server
00:39:56,784 INFO Successfully completed sync from main server
```



Tip When a client acquires a license from the primary server, the number of available licensed features is reduced by 1 on both the primary and the secondary servers. When the license server is operating, you can verify its high availability setup by confirming that the count of available licenses on the primary and the secondary servers changes as expected as clients acquire licenses from the server.

3.7. Viewing Information About Installed Licenses

From the license server management interface, you can find out which licenses are installed on the server, view detailed information about individual licenses, and see how licensed clients are using the installed licenses.

3.7.1. Viewing the Properties of All Installed Licensed Features

By viewing licensed feature properties, you can see the licenses that are installed on the server and get detailed information about each installed license feature.

In the license server management interface, select **Licensed Feature Usage**.

The **Licensed Feature Usage** page that opens lists all licensed features installed on the license server.

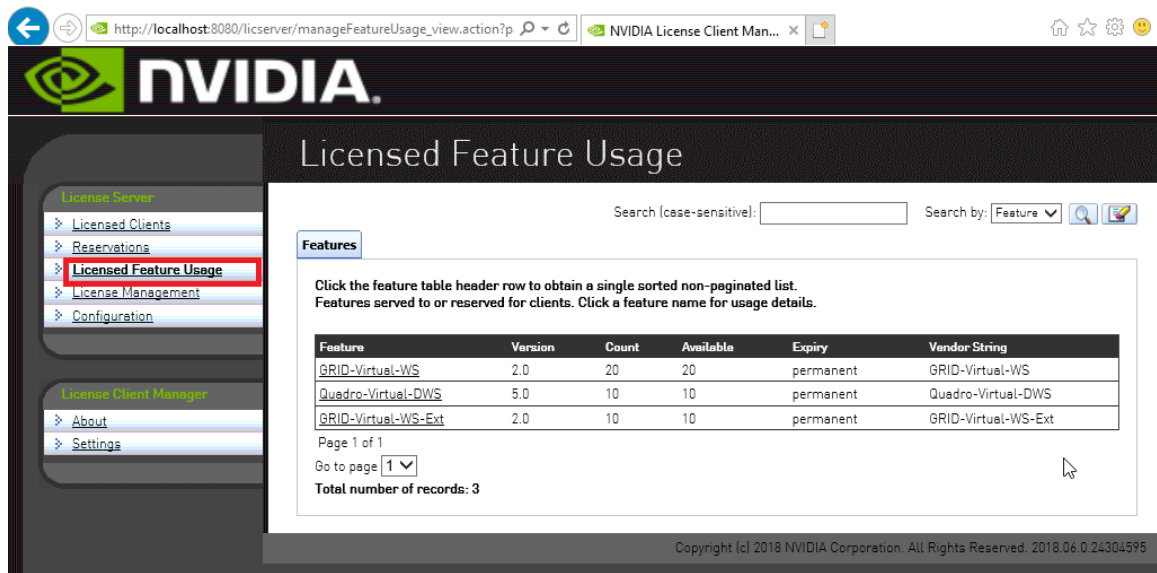


Figure 18 Viewing Licensed Feature Properties

For each licensed feature, the properties in the following table are displayed.

Table 1 Licensed Feature Properties

Property	Description
Feature	An abbreviated name for the feature.
Version	The version number associated with the feature.
Count	The number of licenses for the feature that are currently installed on the license server. Each concurrent user of a feature normally consumes one license.
Available	The number of licenses for the feature that are currently available to borrow from the server. This number decreases as users borrow licenses from the server, and increases as licenses are returned.

Property	Description
Expiry	The date on which the right to use the licensed feature expires. If the licenses are perpetual use licenses, they have no expiration date. Perpetual licenses are indicated by <code>permanent</code> in place of an expiration date.

3.7.2. Viewing the Details of a Single Licensed Feature

For each installed license feature, you can view detailed information about the feature.

1. In the license server management interface, select **Licensed Feature Usage**.
2. On the **Licensed Feature Usage** page that opens, click the individual licensed feature about which you want detailed information.

The **Licensed Feature Details** page that opens shows information about the feature.

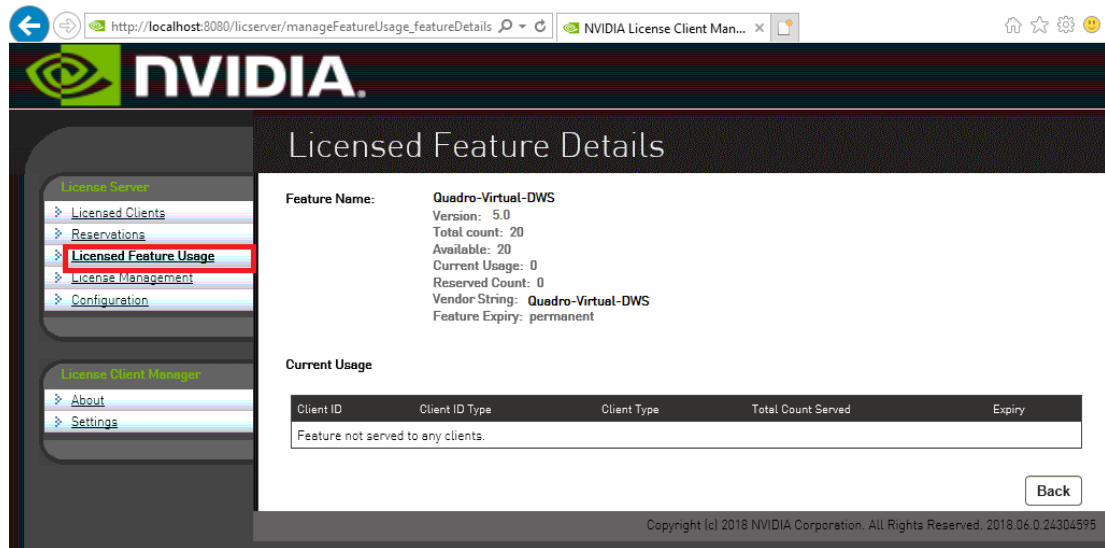


Figure 19 Licensed Feature Usage Details

3.7.3. Viewing Information About All Borrowed Licenses

By viewing information about all borrowed licenses, you can find out which licenses have been borrowed from the license server and are in use by a licensed client.

In the license server management interface, select **Licensed Clients**.

The **Licensed Clients** page that opens lists the NVIDIA vGPU software client virtual machines are using licensed features.

The example in [Figure 20](#) shows that one NVIDIA vGPU software client virtual machine is using a Quadro-Virtual-DWS license.

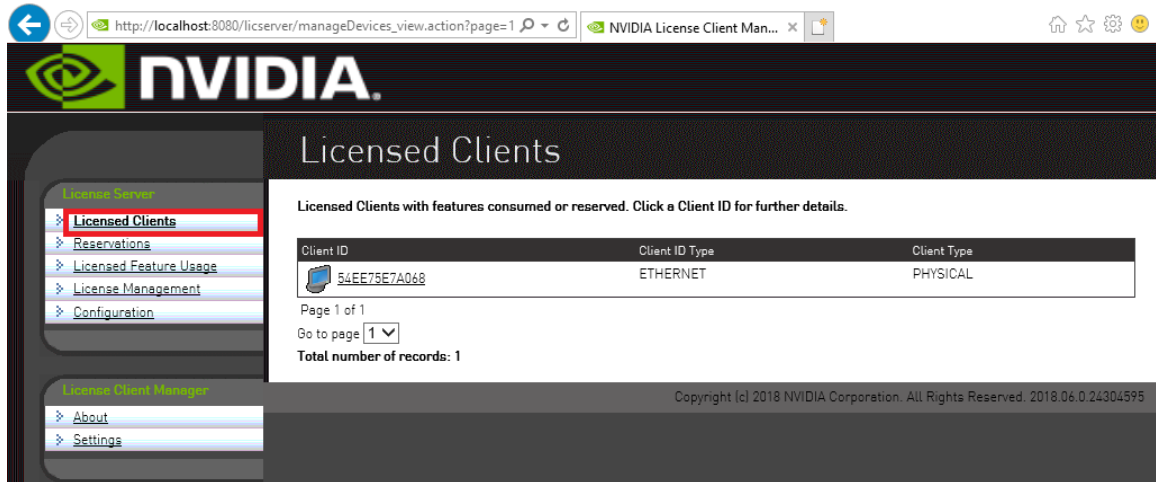


Figure 20 Viewing License Usage

3.7.4. Viewing the Details of a Single Licensed Client

1. In the license server management interface, select **Licensed Clients**.
2. On the **Licensed Clients** page that opens, click the **Client ID** of the licensed client about which you want detailed information.

The **Client Details** page opens to show detailed information about the licensed client.

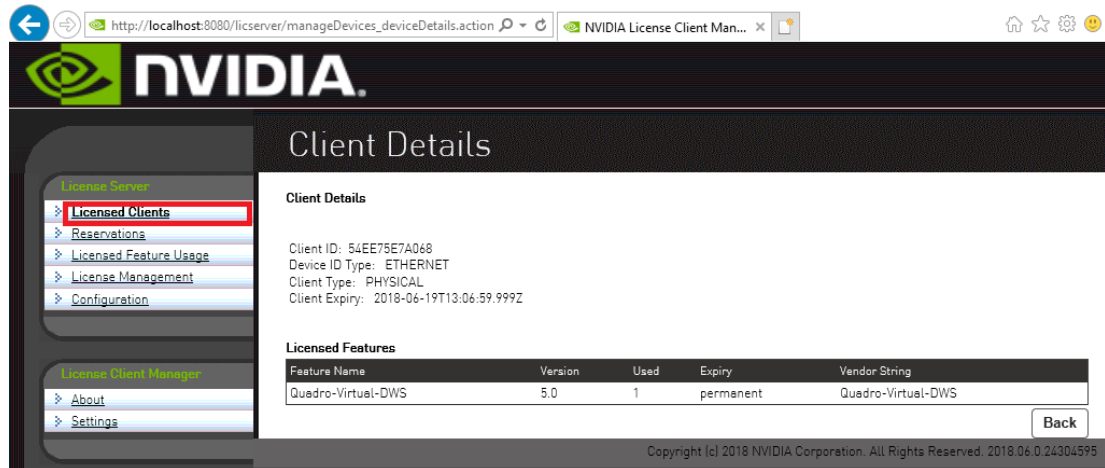


Figure 21 Licensed Client Details

3.7.5. About the License Borrow Period

At the end of the borrow period, typically multiple days, a borrowed license is automatically freed by the license server for use by other clients, and becomes unavailable on the licensed client that previously held it. While active, a licensed client renews its license periodically to ensure the borrow period does not expire, if it continues to use the license and has ongoing network connectivity to the license server.

3.8. Reserving Licenses

Licenses are normally distributed to clients on a first-come, first-served basis. Reservations allow licenses to be set aside for specific clients, ensuring that those clients can always obtain a license.

3.8.1. Creating License Reservations

The license server management interface enables you to set up several new reservations and submit them to the license server in a single group.

After creating a group of license reservations, you cannot use the management UI to delete individual reservations in the group or to add new reservations to the group. If you try to use the management UI to delete a single entry from the **Reservation** page, all entries on the page are deleted. For more information about this issue and its workaround, see [Virtual GPU License Server Release Notes](#).

In an HA configuration, create identical license reservations on the primary license server and the secondary license server. To ensure that the license reservations are identical on both servers, you can export reservations from one server and import them into the other server as explained in [Exporting and Importing License Reservations](#).

1. In the license server management interface, select **Reservations**. The **License Reservations** page opens.
2. Add each reservation that you want to create to the list of pending reservations.

The screenshot shows the NVIDIA License Client Management interface. The browser address bar displays `http://localhost:8080/licserver/reservation_view.action`. The page title is "Add Reservation". On the left, a navigation menu includes "License Server" (with sub-items "Licensed Clients", "Reservations", "Licensed Feature Usage", "License Management", "Configuration") and "License Client Management" (with sub-items "About", "Settings"). The "Reservations" item is highlighted. The main form contains the following fields:

- Group Name:** [Text input field]
- Client ID:** [Text input field with value "6EEA4236CF9F"]
- Feature Name:** [Text input field with value "Quadro-Virtual-DWS"]
- Version:** [Text input field with value "5.0"]
- Count:** [Text input field with value "1"]

Below the form are "Clear" and "Add" buttons. A legend indicates that a red dot next to a field name denotes a required field. The footer of the page reads "Copyright (c) 2017 NVIDIA Corporation. All Rights Reserved. 5.1.0.23376826".

Figure 22 Adding a License Reservation

- a) On the **License Reservations** page, click **Add**.
- b) On the **Add Reservation** page that opens, provide the details of the client for which you are creating the reservation and click **Add**.

Group Name

(Optional) Enter the name you want to assign to this reservation group.

Client ID

Enter the client's Ethernet MAC address without spaces. All letters in the MAC address **must** be in upper case.

Feature Name

Enter the licensed feature name as listed on the **Licensed Feature Usage** page, which is shown in [Viewing the Properties of All Installed Licensed Features](#).

Version

Enter the version number listed for the feature listed on the **Licensed Feature Usage** page.

Count

Set to the number of licenses that you want to reserve for the client.

3. After adding all reservations that you want to create, click **Submit** to commit the pending reservations to the license server.

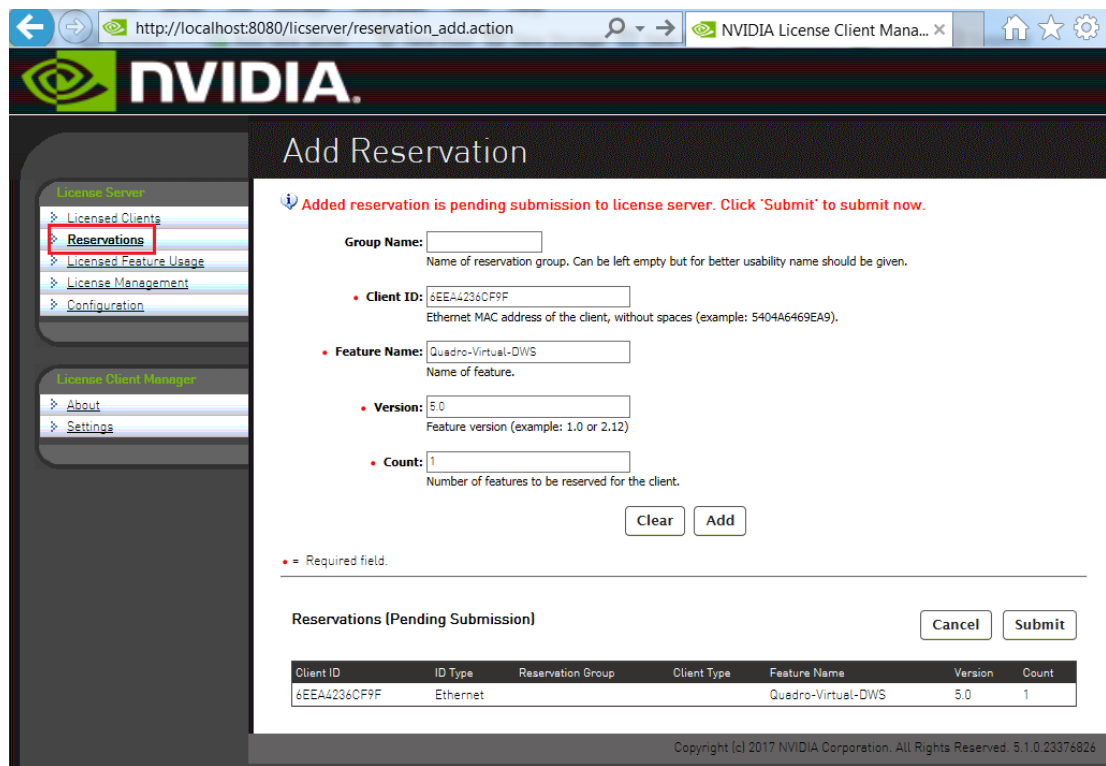


Figure 23 Submitting a Pending Reservation

After the reservations are submitted, the **License Reservations** page shows a list of currently stored reservations on the server.

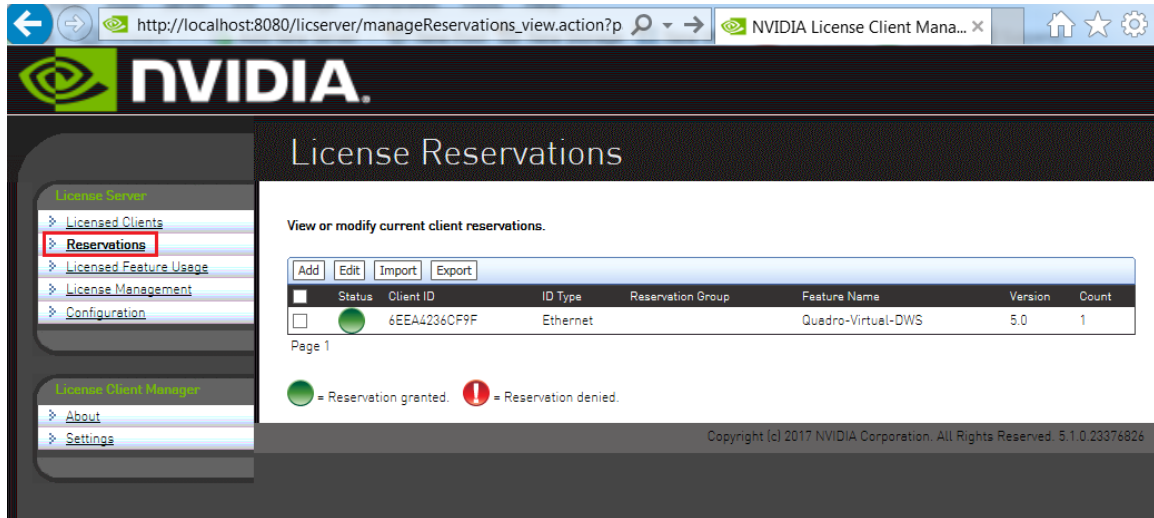


Figure 24 Listing Reservations

If GRID Virtual Workstation licenses and licenses are available on the same license server, GRID Virtual Workstation licenses are assigned first, even to clients that have reserved licenses.

3.8.2. Deleting License Reservations

If a client no longer requires a license that is reserved for it, delete the reservation to release the license for distribution to other clients.

1. In the license server management interface, select **Reservations**.
2. On the **License Reservations** page that opens, select the reservations that you want to delete and click **Edit**.

The **License Reservations** page is updated to replace the existing buttons on the page with the **Delete** button.

3. On the updated **License Reservations** page, click **Delete**.

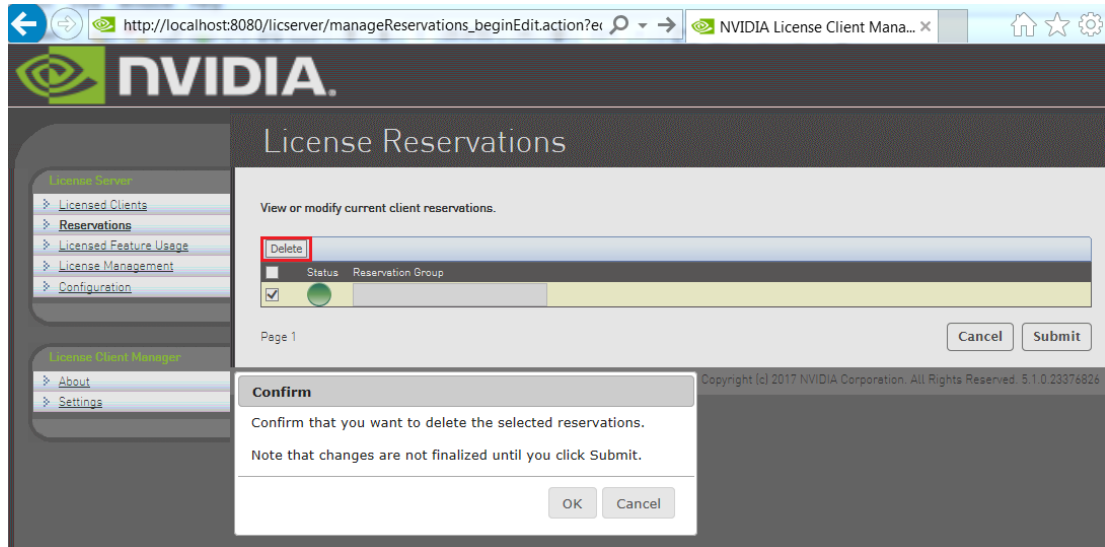



Figure 25 Deleting a Reservation

4. In the confirmation dialog box that opens, click **OK**.

3.8.3. Exporting and Importing License Reservations

Exporting license reservations downloads the current reservation list as an XML file through your web browser. Importing license reservations from an XML file replaces the license server's current reservation list with the contents of the file.

 Because importing license reservations from a file replaces the license server's current reservation list, any reservations on the server that are not in the file are lost.

1. In the license server management interface, select **Reservations**.
2. On the **License Reservations** page that opens, do one of the following:
 - ▶ To export license reservations, click **Export**.
 - ▶ To import license reservations, click **Import**, browse to the XML file that contains the reservations, and click **Upload**.

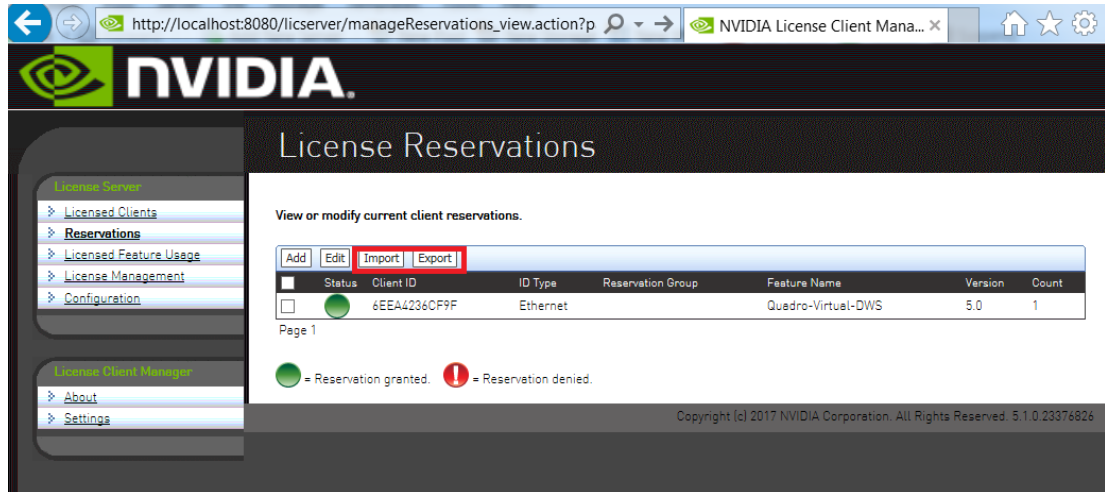


Figure 26 Exporting and Importing License Reservations

3.9. Removing Licenses from a License Server

Remove licenses from a license server if they are no longer needed or in preparation for migrating them to a new server. Removing licenses involves generating and downloading a license file from which you have removed the add-ons that correspond to the licenses that you want to remove.

1. If you are not already logged in, log in to the NVIDIA Software Licensing Center.
2. In the navigation pane of the **NVIDIA Software Licensing Center** page, under **GRID Licensing**, select **Search License Servers**.
3. On the **Search Servers** page that opens, select the license server from which you want to remove licenses.
4. On the **View Server** page that opens, follow the **Remove Add-Ons** link.

View Server

MAC address 00005E0053FF
 ID Type ETHERNET
 Alias
 Site Name

[Map Add-Ons](#) [Remove Add-Ons](#) [View History](#) [View Served Clients](#) [Download License File](#)

Add-Ons

Add-On Name	Status	Entitlement	Units Mapped	Expiration	Downloadable Items
No add-ons are currently mapped.					

5. On the **Remove Add-Ons** page that opens, in the **Qty to Remove** field, enter the number of licenses you want to remove and click **Remove Add-Ons**.

Remove Add-Ons

Device ID [00005E0053FF](#)
 ID Type ETHERNET
 Alias Test License Server

Add-Ons in Device

Add-On Description	Activation Code	Entitlement	Expiration	Currently on Device	Quantity to Remove
GRID Evaluation Edition	GRIDEvalPAK241844:O NmTnn46wWB9408F	GRIDEvalPAK241844:O NmTnn46wWB9408F (93030833)	Sep 25, 2017	10	<input type="text"/>

Remove Add-Ons

After clicking **Remove Add-Ons**, you are returned to the **View Server** page.

- Back on the **View Server** page, follow the **Download License File** link and save the .bin license file to your license server.



You **must** download the license file after you remove add-ons. If you do not download the license file, the licenses that correspond to the add-ons that you removed from the license file are not removed from the server.

If you removed licenses in preparation for migrating them to a new server, add them to the server as explained in [Registering Your License Server and Getting License Files](#).

3.10. Converting an Evaluation License Server to a Permanent License Server

If you purchase NVIDIA vGPU software licenses after evaluating the software, you can use the same license server that you registered for your evaluation licenses to serve your permanent licenses.

- Log in to the NVIDIA Software Licensing Center with the account that you created for getting your evaluation licenses.
- Get the NVIDIA vGPU software for the licenses that you purchased.
For instructions, refer to [Virtual GPU Software Quick Start Guide](#).
- Get your new license files as explained in [Registering Your License Server and Getting License Files](#).



Follow the steps **only** for mapping add-ons and downloading the license file. Do not try to register your license server again. If you try to register a license server that is already registered, the attempt fails and you are warned that the MAC address is already in use.

Chapter 4.

TROUBLESHOOTING THE NVIDIA VGPU SOFTWARE LICENSE SERVER

You can troubleshoot some common issues with the license server yourself without the need to obtain help from NVIDIA.



Before troubleshooting, review *Virtual GPU License Server Release Notes* for information about known issues and potential workarounds.

4.1. Obtaining Diagnostic Information from the License Server Log files

The license server log files contain diagnostic information to help with troubleshooting. If necessary, you can increase the amount of information in the log files by changing the log level of the license server.

4.1.1. Log File Locations and Types

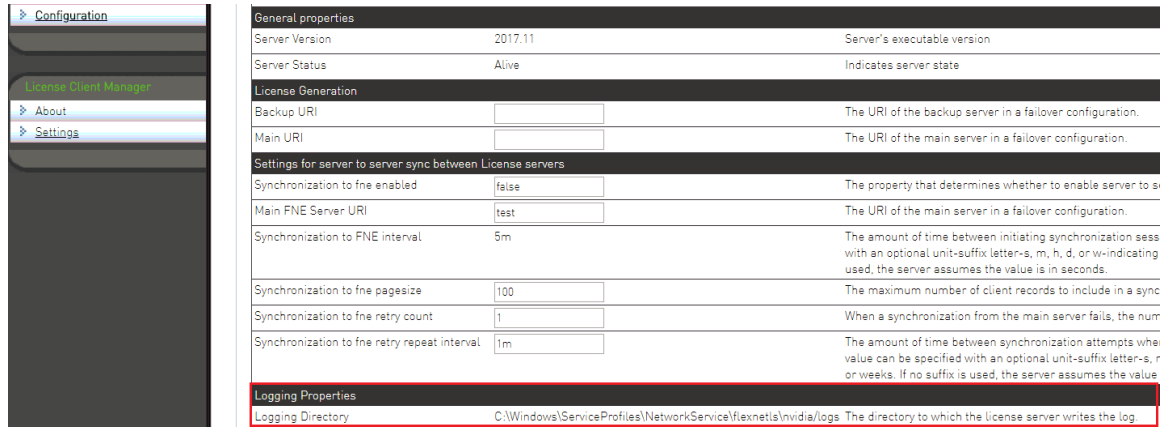
Log files from the installer and license server are in the locations in the following table.

Table 2 Log File Locations

Host OS	Log	Location
Windows	Installer	%SystemDrive%\Program Files (x86)\NVIDIA\License Server\Log
	License server	%SystemDrive%\Windows\ServiceProfiles\NetworkService\flexnetls\nvidia\logs
Linux	Installer	/opt/flexnetls/nvidia/Logs/
	License server	/var/opt/flexnetls/nvidia/logs

To confirm the location of the license server log files, use the license server management interface: Select **Configuration** and click the **Properties** tab.

The location of the log files is displayed on the **License Server Configuration** page in the **Logging Directory** field.



The license server generates these types of runtime log files:

- ▶ Management interface accesses are recorded in `access_* . request . log` files.
- ▶ License server activity is recorded in `flexnetls_* . log` files.

4.1.2. Changing the License Server Log Level

The default log level of the license server is **INFO**.

To adjust the amount of information in the log files, set the log level to a different level.

1. In the license server management interface, select **Configuration** and click the **Properties** tab.
2. On the **License Server Configuration** page, in the **Logging Threshold** field, enter a new log level, for example **WARN** or **ERROR**, and click **Save**.

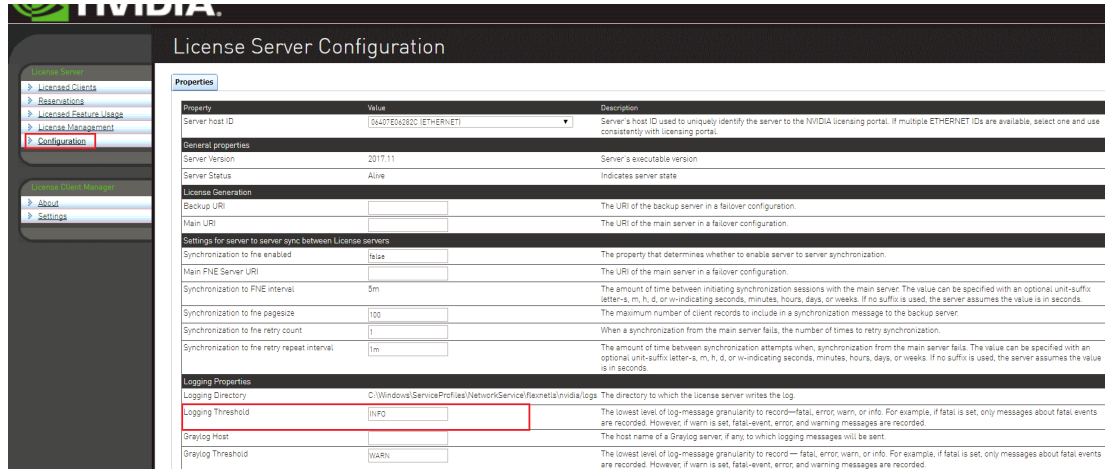


Figure 27 Changing the License Server Log Level

All messages at or below the level you set are recorded in the log file. For example, if you set the log level to **WARN**, fatal-event, error, and warning messages are recorded.

4.2. Management Interface Connection Errors

The management interface at `http://hostname:8080/licserver` might be unreachable because the license server host's firewall disallows remote access to server TCP port 8080 or because the Apache Tomcat service is not running on the server.

1. If you are trying to access the management interface from a remote machine, try accessing the interface locally from the license server host.
To access the interface locally, open a web browser on the license server host and connect to the URL `http://localhost:8080/licserver`.
2. If you can access the management interface locally, ensure that the license server host's firewall is configured to allow remote access to server TCP port 8080.
3. If you cannot access the management interface locally, verify that the Apache Tomcat service is running on the license server host.
 - ▶ On Windows, use the **Services** application to restart the service if it is not running.

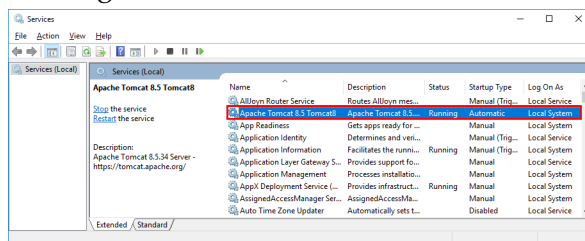


Figure 28 Apache Tomcat Status in the Windows Services Application

- ▶ On Linux, check the status of the `tomcat` service.

```
[nvidia@localhost ~]$ systemctl status tomcat.service
tomcat.service - Apache Tomcat Web Application Container
  Loaded: loaded (/usr/lib/systemd/system/tomcat.service; enabled)
  Active: active (running) since Fri 2019-04-19 07:39:11 PDT; 9h ago
  Main PID: 1373 (java)
  CGroup: /system.slice/tomcat.service
          └─1373 java -classpath /usr/share/tomcat/bin/bootstrap.jar:/
usr/sh...
```

4.3. License Server Connection Errors

If the license server’s management interface cannot establish a connection to the license server, the management interface displays an error message.

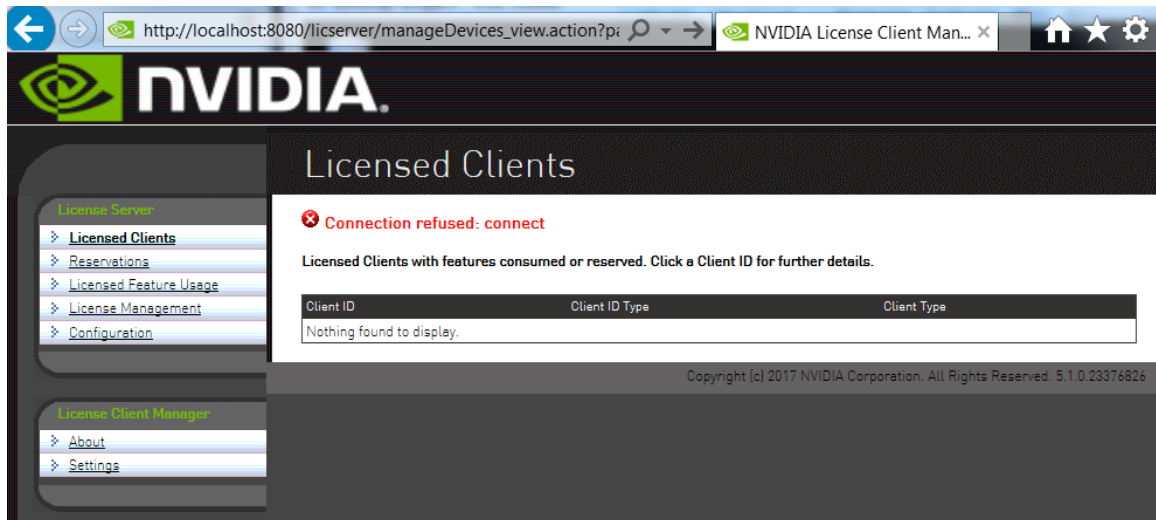


Figure 29 License Server Connection Error

1. Verify that the license service is running.
 - ▶ On Windows, use the **Services** application to restart the service if it is not running.

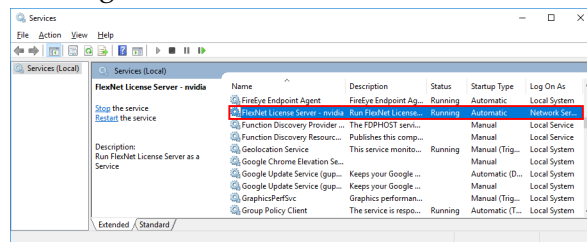


Figure 30 License Server Status in the Windows Services Application

- ▶ On Linux, check the status of the flexnetls-nvidia service.

```
[nvidia@localhost ~]$ systemctl status flexnetls-nvidia.service
flexnetls-nvidia.service - LSB: start and stop FlexNet License Server
  Loaded: loaded (/etc/rc.d/init.d/flexnetls-nvidia)
```

```

Active: active (running) since Fri 2019-04-19 14:44:34 PDT; 2h 49min
ago
Process: 4502 ExecStart=/etc/rc.d/init.d/flexnetls-nvidia start
(code=exited, status=0/SUCCESS)
CGroup: /system.slice/flexnetls-nvidia.service
├─4567 java -Dbase.dir=/var/opt/flexnetls/nvidia -jar /opt/
flexnet...
└─4609 java -Dbase.dir=/var/opt/flexnetls/nvidia -jar /opt/
flexnet...

```

2. Inspect the license server log files, which are described in [Log File Locations and Types](#).

4.4. License Upload Failures

Errors may occur during an attempt to upload a license file to the license server.

4.4.1. License Response Fails Trust Criteria

The license server reports a trust failure if it attempts to reload a license file that's already loaded.

Verify that the license file being uploaded is not already active on the server.

4.4.2. Capability Response Rejected - Response Time Too Old

The license server reports this error if the license file you are attempting to upload has expired. Licenses generated on the NVIDIA licensing portal must be installed onto your license server within 24 hours of generation.

Generate a new license file on the licensing portal and promptly upload the new file to your license server.

4.4.3. Capability Response Rejected - Update Time Invalid

The license server reports this error if the license server is already configured with a license file that is newer than the license file you are attempting to upload.

You cannot roll back an active license to an older license file.

4.4.4. Capability Response Rejected - Response Enterprise ID Does Not Match the Server

The license server reports this error if you are trying to download a license file to a license server on which licenses from a different customer account are installed.

To resolve this issue:

1. Stop the license server.
2. Delete the license server's trusted storage database.

3. Restart the license server.
4. Download and install the new license.

4.5. Trusted Storage Database Errors

Errors in the trusted storage database, such as corruption of the database, can prevent the license server from reading the database. If it cannot read the database, the license server cannot start.

You can correct errors in the trusted storage database in one of the following ways:

- ▶ Restoring the database from a backup
- ▶ Deleting the database and then reinstalling licenses on the license server

4.5.1. Restoring the Trusted Storage Database from a Backup

The license server automatically backs up the database after every 1,000 license checkouts or after every five-minute interval in which a change has taken place, whichever event occurs first. If no change to the database occurs during a five-minute interval, the database is not backed up. Backups are triggered by changes such as the checkout, renewal, or release of a license.

4.5.1.1. Restoring the Trusted Storage Database from a Backup on Windows

Before restoring the trusted storage database from a backup, ensure that the following prerequisites are met:

- ▶ The `JAVA_HOME` environment variable is set to the folder where the Java runtime environment is installed on the license server host.
- ▶ The `TRUSTED_STORAGE_DIR` environment variable is set to `%SystemDrive%\Windows\ServiceProfiles\NetworkService\flexnetls\nvidia`, which is the folder that contains the trusted storage database files.

1. Open a **Command Prompt** window and change to the `license-server-installation-folder\server` folder.

license-server-installation-folder

The folder in which the license server software is installed. The default license server installation folder is `%SystemDrive%\Program Files (x86)\NVIDIA\License Server`.

For example:

```
C:\>cd C:\Program Files (x86)\NVIDIA\License Server\server
C:\Program Files (x86)\NVIDIA\License Server\server>
```

2. In the **Command Prompt** window, run the command to restore the database.


```
C:\Program Files (x86)\NVIDIA\License Server\server>flexnetls.bat -restore-  
database
```

The database is restored to the location defined in the TRUSTED_STORAGE_DIR environment variable.

4.5.1.2. Restoring the Trusted Storage Database from a Backup on Linux

Before restoring the trusted storage database from a backup, ensure that the following prerequisites are met:

- ▶ The JAVA_HOME environment variable is set to the directory where the Java runtime environment is installed on the license server host.
- ▶ The TRUSTED_STORAGE_DIR environment variable is set to /var/opt/flexnetls/nvidia/, which is the directory that contains the trusted storage database files.

1. Change to the *license-server-installation-dir/server* directory.
license-server-installation-dir

The directory in which the license server software is installed. The default license server installation directory is /opt/flexnetls/nvidia.

For example:

```
$ cd /opt/flexnetls/nvidia/server
```

2. Run the command to restore the database.

```
$ flexnetls --restore-database
```

The database is restored to the location defined in the TRUSTED_STORAGE_DIR environment variable.

4.5.2. Deleting the Trusted Storage Database

Deleting the trusted storage database clears all information about license assignments and allocations.

After deleting the trusted storage database, reinstall your licenses on the license server as explained in [Installing a License](#).

4.5.2.1. Deleting the Trusted Storage Database on Windows

1. Close any web browser windows that are accessing the license server.
2. Stop the FlexNet License Server - nvidia service.
 - a) Start **Task Manager** and in the **Windows Task Manager** window that opens, click the **Services** button.
 - b) In the **Services** window that opens, context-click **FlexNet License Server - nvidia** and from the menu that pops up, choose **Stop**.

3. Delete all files in the %SystemDrive%:\Windows\ServiceProfiles\NetworkService\flexnetls\nvidia folder, which contains the trusted storage database files.
4. Start the FlexNet License Server - nvidia service.
 - a) Start **Task Manager** and in the **Windows Task Manager** window that opens, click the **Services** button.
 - b) In the **Services** window that opens, context-click **FlexNet License Server - nvidia** and from the menu that pops up, choose **Start**.

4.5.2.2. Deleting the Trusted Storage Database on Linux

This task requires system administrator privileges.

1. Close any web browser windows that are accessing the license server.
2. Stop the flexnetls-nvidia service.

```
# sudo systemctl stop flexnetls-nvidia.service
```

3. Delete all files in the /var/opt/flexnetls/nvidia/ directory, which contains the trusted storage database files.

```
# sudo \rm -rf /var/opt/flexnetls/nvidia/*
```

4. Start the flexnetls-nvidia service.

```
# sudo systemctl start flexnetls-nvidia.service
```

Chapter 5.

UNINSTALLING THE NVIDIA vGPU SOFTWARE LICENSE SERVER

You can uninstall the NVIDIA vGPU software License Server when it is no longer required.

5.1. Uninstalling the NVIDIA vGPU Software License Server on Windows

1. Start the license server uninstaller.

You can start the license server uninstaller in **Windows Control Panel** or in **Windows Explorer** from the license server installation directory.

- ▶ In **Windows Control Panel**, open the **Programs and Features** pane, select **License Server** from the publisher NVIDIA, and click **Uninstall/Change**.

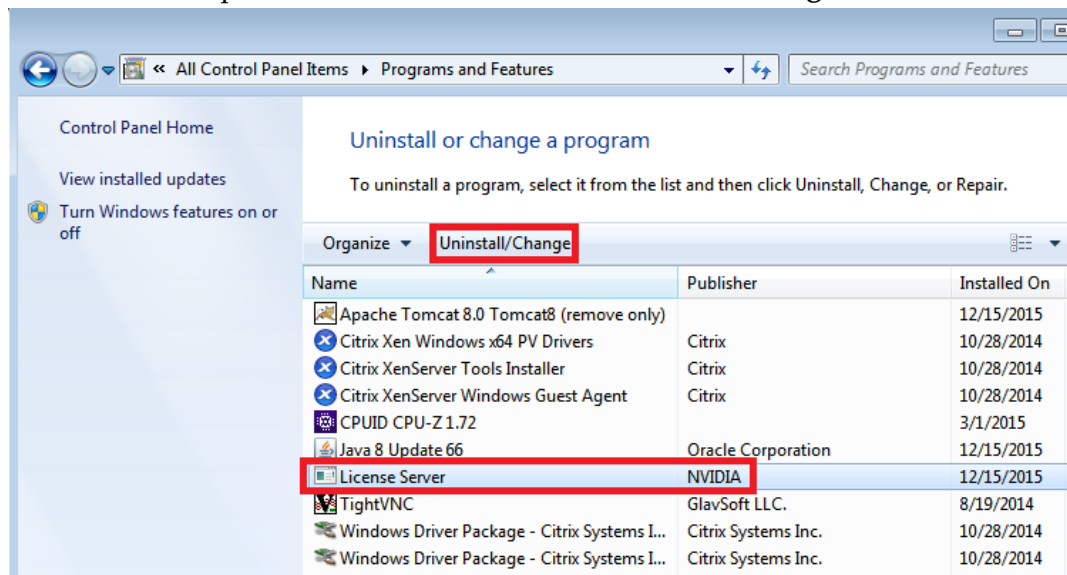


Figure 31 Starting the Uninstaller from Windows Control Panel

- ▶ In **Windows Explorer**, open the license server installation directory and double-click the **Change License Server Installation** application.

The default license server installation directory is C:\Program Files (x86)\NVIDIA\License Server.

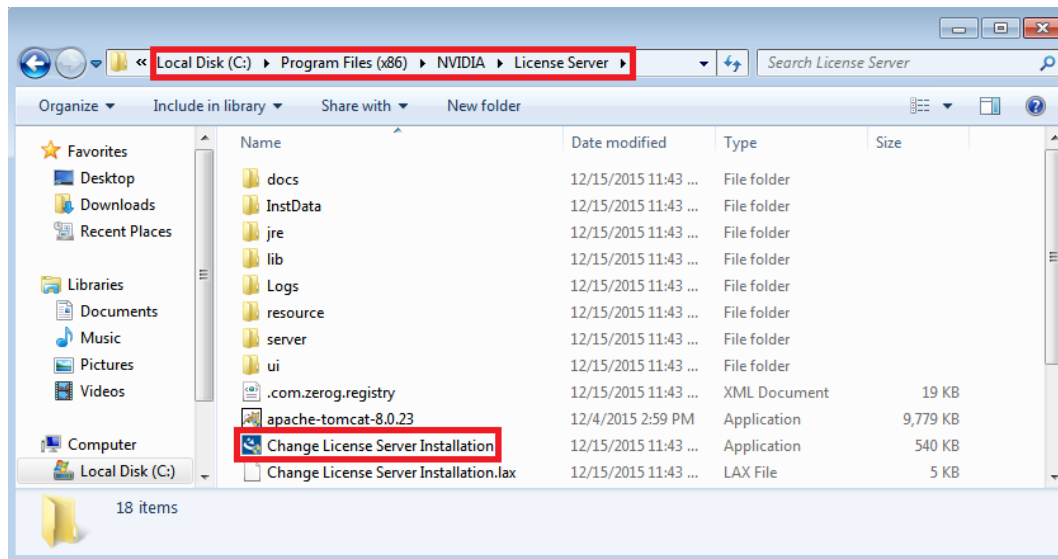


Figure 32 Starting the Uninstaller in Windows Explorer from the License Server Installation Directory

If the license server software was installed in console mode, the uninstaller runs in console mode. Otherwise, the **Configure License Server** dialog box opens.

2. If the **Configure License Server** dialog box opens, ensure that the **Uninstall Product** option is selected and click **Next**.

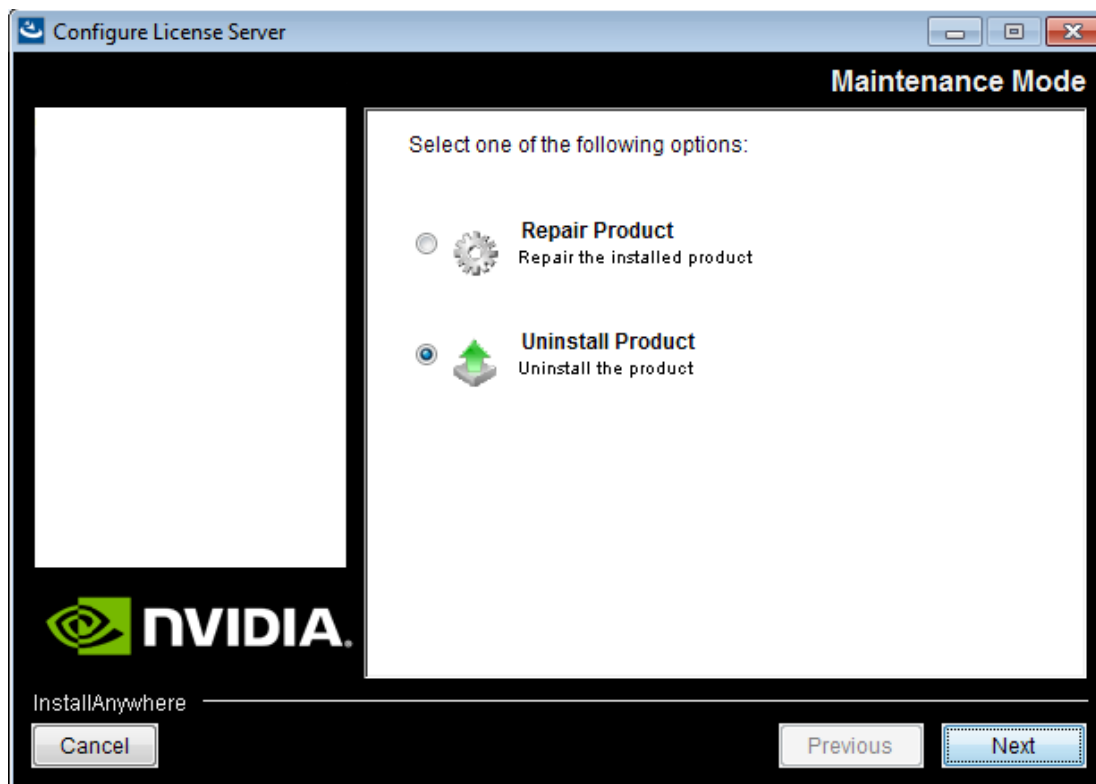


Figure 33 Running the License Server Uninstaller on Windows

3. When prompted, confirm that you want to uninstall the license server.

5.2. Uninstalling the NVIDIA vGPU Software License Server on Linux

1. Start the license server uninstaller.
 - a) Change to the license server installation directory.
The default license server installation directory is `/opt/flexnetls/nvidia`.

```
[nvidia@localhost ~]$ cd /opt/flexnetls/nvidia
```

- b) As root, run the Change License Server Installation command.

```
[nvidia@localhost ~]$ sudo ./Change\ License\ Server\ Installation
```

If the license server software was installed in console mode, the uninstaller runs in console mode. Otherwise, the **Configure License Server** window opens.

2. If the **Configure License Server** window opens, ensure that the **Uninstall Product** option is selected and click **Next**.

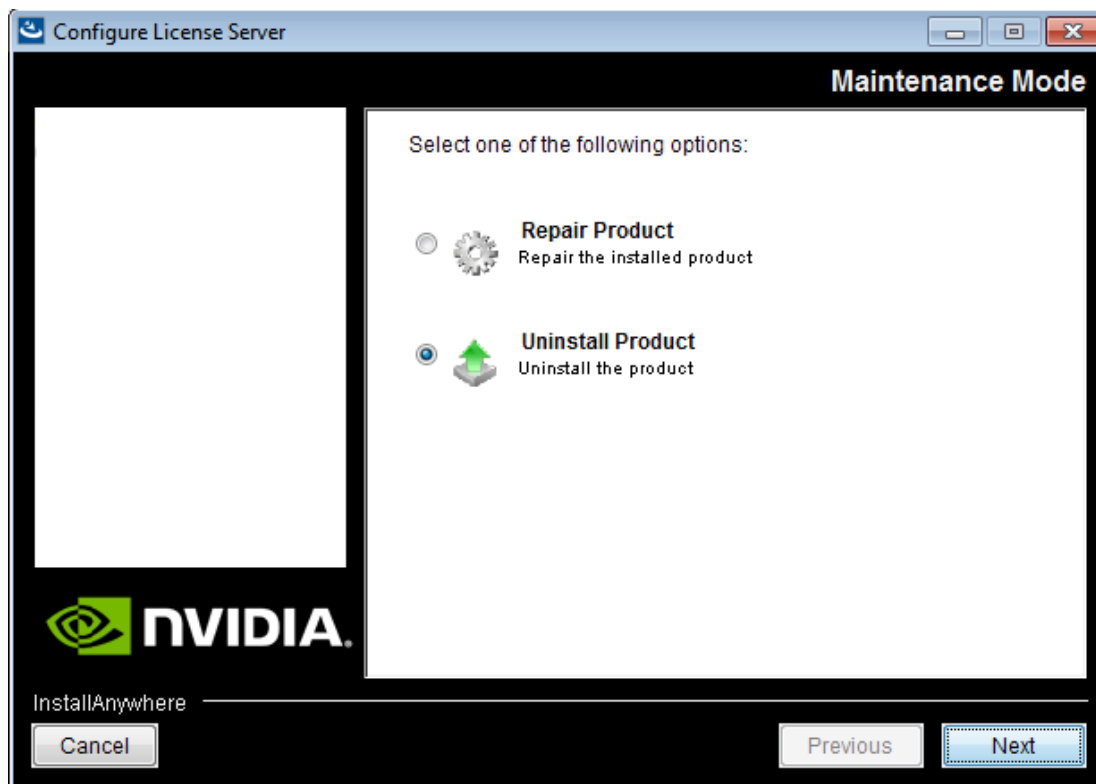


Figure 34 Running the License Server Uninstaller on Linux

3. When prompted, confirm that you want to uninstall the license server.

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