



Installing and Configuring Licenses

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Information About Installing Licenses

The Cisco VSG software is available for download at the following URL:<http://www.cisco.com/en/US/products/ps11208/index.html>

When you download the software from the above location, you are prompted to fill the online form. When the form has been completed appropriately, you will receive an email that contains the software license claim certificate. The number of licenses you receive depends on how many VEMs you indicate you have and how many CPU sockets you indicate are available on those VEMs.

Upgrading Licenses

Before you upgrade VSM to the latest Microsoft Hyper-V release, ensure that sufficient VSG Hyper-V licenses are installed on the VSM. Follow the standard license installation procedure to install a new license.

Prerequisites for Installing and Configuring Licenses

- You have a copy of your existing license file(s) with the host ID of the existing VSM.
- A license file is tied to each VSM by the host ID, or the serial number, that is associated with the VSM device.
- A license file contains the number of licenses that you ordered for your VSM. One license is required for each CPU on each VEM.
- A VSM can have more than one license file depending on the number of installed VEM CPUs.
- If you have multiple license files stacked on your VSM, repeat the configuration procedures for each license file.

Guidelines and Limitations

Permanent licenses have the following guidelines and limitations:

- If you modify a permanent license key file, the license key file is invalidated.
- When you purchase permanent licenses, the license key file is sent to you in an e-mail. The license key authorizes use on only the host ID device. You must obtain a separate license key file for each of your VSMs.
- A license file contains the number of licenses that you ordered for your VSM. One license is required for each CPU on each VEM.
- A VSM can have more than one license file depending on the number of installed VEM CPUs.
- You must have a role equivalent to that of network-admin to install, uninstall, or copy a permanent license file. For information about user accounts and roles, see the *Cisco Nexus 1000V Security Configuration Guide*.
- If you are installing multiple permanent licenses for the same VSM, also called license stacking, each permanent license key filename must be unique.
- Licenses cannot be applied to a VEM unless there are enough licenses in the pool to cover all of its CPUs.
- If a license is in use, you cannot delete its license file. You must first transfer all licenses from the VEMs to the VSM license pool before uninstalling the license file.
- When you install a permanent license file, all default licenses are invalidated. Installing a permanent license file has no effect on evaluation licenses. For more detailed information on licenses, see the [Information About Licenses](#)

Cisco VSG License Configuration Default Parameters

Parameter	Default
volatile license	Enabled Licenses are returned to the VSM pool when a VEM has no VM that has Cisco VSG service configured or the VEM is out of service.

Obtaining and Installing a License

Obtain the license file that is required for each VSM, and then install it.

Obtaining the License File

Use the following procedure to obtain a license file for a VSM.

Before You Begin

Before beginning this procedure, you must know or do the following:

- A license file is tied to each VSM by the host ID or the serial number that is associated with the VSM device.
- Make sure that you have your product authorization key (PAK). The PAK is found in your software license claim certificate. If you cannot locate your software license claim certificate, contact [Cisco Technical Support](#).
- You are logged in to the CLI in EXEC mode.
- In this procedure, you must copy a license file, which means that your username must have a role that is equivalent to that of the network-admin role that allows you to copy files. For information about user accounts and roles, see the *Cisco Nexus 1000V Security Configuration Guide*.

Procedure

Step 1 switch# show license host-id

Obtain the serial number, also called the host ID, for your VSM.

Note The host ID includes everything that appears after the equal sign (=). In this example, the host ID is 1280389551234985805. You will need the host ID for Product License Registration.
License hostid: VDH=1280389551234985805

Step 2 From your software license claim certificate, locate the product authorization key (PAK).

You will need the PAK for Product License Registration.

Step 3 Go to the Software Download site.

Step 4 From the Software Download site, go to the [Product License Registration](#) site.

Step 5 From the Product License Registration site, follow the instructions for registering your VSM license.

The license key file is sent to you in an e-mail. The license key authorizes use on only the host ID device. You must obtain separate license key file(s) for each of your VSMs.

Caution The license key file is invalidated if you modify it.

Step 6 Save your license to a TFTP server.

Step 7 switch# **copy scp://user@license_path/file bootflash:**
Copy your license to bootflash on the VSM.

Example:

The following example shows you how to copy your license to bootflash on the VSM.

```
switch# copy scp://user@linux-box.cisco.com/home/user/nlkv_license.lic bootflash:
Enter vrf (If no input, current vrf 'default' is considered):
user@linux-box.cisco.com's password:
nlkv_license.lic                               100% 252      0.3KB/s   00:00
switch#
```

Installing the License File on the VSM

Use the following procedure to install the license file(s) on a VSM. Installing multiple licenses is called stacking.

Before You Begin

- Default licenses are invalidated when a permanent license file is installed. Make sure that the license file you are installing contains the number of licenses needed to cover all VEMs.
- This procedure installs the license file using the name, license_file.lic. You can specify a different name if needed.
- If you are installing multiple licenses for the same VSM, also called license stacking, make sure that each license key filename is unique.
- Repeat this procedure for each additional license file you are installing, or stacking, on the VSM.
- You are logged in to the CLI in EXEC mode.
- You must have a role with privileges equivalent to that of the network-admin role to install a license. For information about user accounts and roles, see the *Cisco Nexus 1000V Security Configuration Guide*.

Procedure

	Command or Action	Purpose
Step 1	switch# install license bootflash:filename	Installs the license from the active VSM console. Note If you specify a license file name, the file is installed with the specified name. Otherwise, the default filename is used. The license is installed on the VSM and each VEM automatically acquires a license for every CPU socket.
Step 2	switch# show license file filename	Verifies the license installation by displaying the license configured for the VSM.
Step 3	switch# show license usage package_name	Verifies the license installation by displaying it in the license usage table. Note If you already have VEMs using Cisco VSG services, the output of this command shows VEMs and sockets
Step 4	switch# copy running-config startup-config	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

The following example shows how to install a license file on the VSM:

```
switch# install license
bootflash:license_file.lic
Installing license ..done
switch# show license file
license_file.lic
switch# show license usage
NEXUS_VSG_MSFT_SERVICES_PKG
switch# copy running-config startup-config
```

The following example shows how to install a license file and then display its contents and usage:

```
n1000v# install license bootflash:license_file.lic
Installing license ..done
switch# show license file license_file.lic
SERVER this_host ANY
VENDOR cisco
INCREMENT NEXUS_VSG_MSFT_SERVICES_PKG cisco 1.0 permanent 10 \
  HOSTID=VDH=1575337335122974806 \
  NOTICE="<LicFileID>license_file.lic</LicFileID><LicLineID>0</LicLineID> \
  <PAK>PAK12345678</PAK>" SIGN=3AF5C2D26E1A
switch# show license usage NEXUS_VSG_MSFT_SERVICES_PKG
```

```
-----
Feature Usage Info
-----
```

```
Installed Licenses : 10
Default Eval Licenses : 0
Max Overdraft Licenses : 16
Installed Licenses in Use : 2
```

```

Overdraft Licenses in Use : 0
Default Eval Lic in Use : 0
Licenses Available : 24
Shortest Expiry : Never
-----
Application
-----
VEM 3 - Socket 1
VEM 3 - Socket 2
-----

```

Transferring Licenses

You can transfer licenses between VEMs and uninstall a license by transferring it from a VEM to the VSM license pool.

Transferring Licenses Between VEMs

Use the following procedure to transfer licenses from one VEM to another. For example, you might transfer licenses between VEMs after moving a VM from one host to another.

Before You Begin

Before beginning this procedure, you must know or do the following:

- You are logged in to the CLI in EXEC mode.
- You know the VEM that you want to transfer licenses from and the number of licenses it has.
- You know the VEM that you are transferring licenses to and the number of licenses required.
- You know the number of CPUs installed on the destination VEM.
- Licenses cannot be transferred to a VEM unless there are enough licenses in the pool to cover all of its CPUs.
- Licenses cannot be transferred to a VEM that does not have a VSG service configured.
- When licenses are successfully transferred from one VEM to another, the virtual machines on the source VEM can no longer use Cisco VSG services and the virtual machines on the destination VEM can now use Cisco VSG services.
- For detailed information about the fields in the output of these commands, see the *Cisco Nexus 1000V Command Reference*

Procedure

-
- Step 1** `vservice license type vsg transfer src-module mod_no dst-module mod_no`
 Transfers the licenses from one VEM to another.
mod_no—The VEM module number
- Step 2** `show license usage package_name`
 Verifies the transfer by displaying the licenses in use on each VEM.
-

The following example shows how to transfer licenses between VEMs

```
switch# vservice license type vsg transfer src-module 5 dst_module 6
switch# show license usage
```

The following example shows how to transfer a license from VEM 3 to VEM 5 and verify the transfer in the license usage:

```
switch# vservice license type vsg src-module 3 dst_module 5
switch# show license usage NEXUS_VSG_MSFT_SERVICES_PKG
```

```
-----
Feature Usage Info
-----
```

```
Installed Licenses : 10
Eval Licenses : 0
Max Overdraft Licenses : 512
Installed Licenses in Use : 4
Overdraft Licenses in Use : 0
Eval Licenses in Use : 0
Licenses Available : 512
-----
```

```
Application
-----
```

```
VEM 4 - Socket 1
VEM 4 - Socket 2
VEM 5 - Socket 1
VEM 5 - Socket 2
-----
```

Transferring Licenses to the License Pool

Use the following procedure to transfer licenses from a VEM to the VSM license pool. For example, you might remove a license from a VEM and transfer it to the VSM license pool.

Before You Begin

Before beginning this procedure, you must know or do the following:

- You are logged in to the CLI in EXEC mode.
- When you transfer its licenses to the VSM license pool, all VMs on the VEM can no longer use the Cisco VSG service.
- For detailed information about the fields in the output of these commands, see the *Cisco Nexus 1000V Command Reference*

Procedure

Step 1 `vservice license type vsg transfer src-module mod_no license_pool`

Transfers the licenses from a VEM to the license pool. All virtual machines on the VEM can no longer use the Cisco VSG service.

Step 2 `show license usage package_name`

Verifies the transfer by displaying the licenses in use on each VEM.

This example shows how to transfer licenses to the license pool:

```
switch(config)# vservice license type vsg transfer src-module 5 license-pool
switch# show license usage
```

This example shows how to display the licenses in use on each VEM. Notice that the licenses on VEM 5 are no longer in use.

```
switch# vservice license type vsg transfer src-module 5 license-pool
```

```
switch# show license usage NEXUS_VSG_MSFT_SERVICES_PKG
```

```
-----
Feature Usage Info
-----
Installed Licenses : 10
Eval Licenses :    0
Max Overdraft Licenses : 16
Installed Licenses in Use : 2
Overdraft Licenses in Use : 0
Eval Licenses in Use : 0
Licenses Available :   24
-----
Application
-----
VEM 4 - Socket 1
VEM 4 - Socket 2
```




Note You can use the following command to transfer a license from a license pool to a VEM machine: **vservice license type vsg transfer license-pool dst-module mode_no**

Uninstalling a License

Use the following procedure to uninstall a license that is not in use.

Before You Begin

Before beginning this procedure, you must know or do the following:



Caution

When you uninstall a license file from a VSM, the VMs on the VEMs can no longer use Cisco VSG services, which could cause a service disruption in your network.

- You are logged in to the CLI in EXEC mode.
- If a license is in use, you cannot delete it. This procedure includes instructions for transferring all licenses from the VEMs to the VSM license pool before uninstalling the license file.
- Only users with the network-admin role can uninstall licenses. For information on user accounts and roles, see the *Cisco Nexus 1000V Security Configuration Guide*.
- For detailed information about the fields in the output of these commands, see the *Cisco Nexus 1000V Command Reference*.

Procedure

	Command or Action	Purpose
Step 1	copy running-configure terminal ftp://server/path/filename	Copies the VSM running configuration to a remote server.
Step 2	show license brief	Identifies the name of the license file to uninstall.
Step 3	show license usage package_name	Displays the licenses in use on each VEM so that you can transfer them back to the VSM license pool before uninstalling the license file.
Step 4	vservice license type vsg transfer src-module mod_no license-pool	Transfers the licenses from the VEM back to the VSM license pool. As the licenses are transferred from a VEM, the VMs on the VEM can no longer use the Cisco VSG service. Note Repeat this procedure for each VEM until all licenses in use have been transferred back to the VSM license pool.

	Command or Action	Purpose
Step 5	clear license <i>license_name</i>	Begins the uninstall of the named license file
Step 6	copy running-config startup-config	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration

This example shows how to uninstall a license:

```
switch# copy running-configure terminalftp:
switch# show license brief
Enterprise.lic
switch#
switch# show license usage
switch# vsg license type vsg transfer src-module 3 license-pools
switch#
switch# clear license Enterprise.lic
Clearing license Enterprise.lic:
SERVER this_host ANY
VENDOR cisco
Do you want to continue? (y/n) y
Clearing license ..done
switch(config)# copy running-config startup-config
```

This example shows how to uninstall a license that is no longer in use. In this example, the file to uninstall is the Enterprise.lic file.

```
switch# show license brief
Enterprise.lic
switch#
switch# show license usage NEXUS_VSG_MSFT_SERVICES_PKG
```

```
-----
Feature Usage Info
```

```
-----
Installed Licenses : 512
Eval Licenses : 0
Max Overdraft Licenses : 512
Installed Licenses in Use : 4
Overdraft Licenses in Use : 0
Eval Licenses in Use : 0
Licenses Available : 512
```

```
-----
Application
```

```
-----
VEM 3 - Socket 1
VEM 3 - Socket 2
VEM 4 - Socket 1
VEM 4 - Socket 2
```

```

-----
switch# vservice license type vsg transfer src-module 3 license-pool
switch# vservice license type vsg transfer src-module 4 license-pool
switch# clear license Enterprise.lic
Clearing license Enterprise.lic:
SERVER this_host ANY
VENDOR cisco
Do you want to continue? (y/n) y
Clearing license ..done
switch(config)# copy running-config startup-config

```

This example displays the licenses in use on each VEM.

```

switch# show license usage
NEXUS_VSG_MSFT_SERVICES_PKG
-----
Feature Usage Info
-----
Installed Licenses : 512
Eval Licenses : 0
Max Overdraft Licenses : 512
Installed Licenses in Use : 4
Overdraft Licenses in Use : 0
Eval Licenses in Use : 0
Licenses Available : 512
-----
Application
-----
VEM 3 - Socket 1
VEM 3 - Socket 2
VEM 4 - Socket 1
VEM 4 - Socket 2
-----
switch#

```

Configuring Nonvolatile Licenses

Enabling Nonvolatile Licenses

Use the following procedure to enable nonvolatile licenses so that whenever a VEM is taken out of service, it keeps its license and does not return the license to the VSM pool of available licenses.

Before You Begin

Before beginning this procedure, you must know or do the following:

- You are logged in to the CLI in EXEC mode.
- A nonvolatile license is disabled by default. The licenses are returned to the VSM pool when a VEM is removed from service or no VMs use Cisco VSG service on the VEM.

Procedure

	Command or Action	Purpose
Step 1	<code>configure terminal</code>	Places you into global configuration mode.
Step 2	<code>no vservice license type vsg volatile</code>	Enables nonvolatile licenses in the running configuration.
Step 3	<code>copy running-config startup-config</code>	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

The following example shows how to enable nonvolatile licenses:

```
switch# configure terminal
switch(config)# no vservice license type vsg volatile
switch(config)# copy running-config startup-config
```

Disabling Nonvolatile Licenses

Use the following procedure to disable nonvolatile licenses so that when a VEM is taken out of service, its licenses are returned to the VSM pool of available licenses.

Before You Begin

Before beginning this procedure, you must know or do the following:

- You are logged in to the CLI in EXEC mode.
- Your license must be in nonvolatile mode to configure for volatile mode.
- For detailed information about the fields in the output of these commands, see the *Cisco Nexus 1000V Command Reference*.

**Note**

For the Cisco VSG, the licenses are by default volatile. We recommend that you leave the Cisco VSG license configuration to be volatile by default.

The volatile licenses feature is disabled by default for the Cisco Nexus 1000V Series Switch. That is, the licenses in VEMs are nonvolatile and are not released when a VEM is removed from service.

If you configure the license from nonvolatile to volatile, if the VEM does not use the Cisco VSG services, the license possessed by the VEM is returned to the license pool.

Procedure

	Command or Action	Purpose
Step 1	<code>configure terminal</code>	Places you into global configuration mode.
Step 2	<code>vservice license type vsg volatile</code>	Disables nonvolatile licenses in the running configuration.
Step 3	<code>copy running-config startup-config</code>	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

This example shows how to disable Nonvolatile Licenses:

```
switch# configure terminal
switch(config)# vservice license type vsg volatile
switch(config)# copy running-config startup-config
```

Verifying the License Configuration

Use one of the following commands to verify the configuration:

Command	Purpose
<code>show license</code>	Displays the license filename for the VSM.
<code>show license brief</code>	Displays the license installed on the VSM.
<code>show license file <i>filename</i></code>	Displays the contents of the license file installed on the VSM, including the license filename and the expiration date for evaluation licenses.
<code>show license usage</code>	Displays the total number of licenses in use on the VEMs.

Command	Purpose
<code>show license usage <i>package_name</i></code>	Displays statistics about the number of evaluation and permanent licenses available, installed, and in use on the VSM.

The following example shows how to use the `show license usage` command to display the license usage.

```
switch# show license usage NEXUS_VSG_MSFT_SERVICES_PKG
-----
Feature Usage Info
-----
      Installed Licenses : 10
      Default Eval Licenses : 0
      Max Overdraft Licenses : 16
      Installed Licenses in Use : 2
      Overdraft Licenses in Use : 0
      Default Eval Lic in Use : 0
      Licenses Available : 24
      Shortest Expiry      : 25 May 2010
-----
Application
-----
VEM 3 - Socket 1
VEM 4 - Socket 1
-----
```

The following example shows how to use the `show license brief` command to display the license name:

```
switch# show license brief
Enterprise.lic
switch#
```

The following example shows how to use the `show license file` command to display the evaluation license parameters:

```
switch# show license file eval.lic
SERVER this_host ANY
VENDOR cisco
INCREMENT NEXUS_VSG_MSFT_SERVICES_PKG cisco 1.0 1-dec-2010 16 \
  HOSTID=VDH=0871396331270074457 \
  NOTICE="<LicFileID>eval.lic</LicFileID><LicLineID>0</LicLineID> \
  <PAK>dummyPak</PAK>" SIGN=E08A38544DBE
```

The following example shows how to use the `show license file` command to display the evaluation license parameters:

```
switch# show license file Enterprise.lic
SERVER this_host ANY
VENDOR cisco
INCREMENT NEXUS_VSG_MSFT_SERVICES_PKG cisco 1.0 permanent 16 \
  HOSTID=VDH=0871396331270074457 \
  NOTICE="<LicFileID>Enterprise.lic</LicFileID><LicLineID>0</LicLineID> \
  <PAK>dummyPak</PAK>" SIGN=E08A38544DBE
```

Changing the Serial Number in a License

Use the following procedure to change the serial number, or host ID, associated with a license. This process is also called rehosting and is required if you replace a VSM in your network with a new VSM.

The process for changing the serial number is as follows:

- Obtaining the License File
- Installing the License File on the VSM

- Verifying the License Configuration

**Caution**

When you remove a VSM from your network, the vEthernet interfaces on the VEMs are removed from service and the traffic flowing to them from the virtual machines is dropped. This traffic flow is not resumed until you add a new VSM and new license file with the new host ID.

Obtaining a License File for Rehosting

Use the following procedure to obtain a license file for a new VSM host, if the old VSM host is lost or destroyed.

Before You Begin

Before beginning this procedure, you must know or do the following:

- A license file is tied to each VSM by the host ID, or the VSM serial number.
- You are logged in to the CLI in EXEC mode.
- You must copy a license file. Your username must have the network-admin role that allows you to copy files. For information about user accounts and roles, see the *Cisco Nexus 1000V Security Configuration Guide*.

Procedure

Step 1 switch# **show license host-id**

Note The host ID number appears after the equal sign (=). In this example, the host ID is 1280389551234985805.

Obtain the serial number, also called the host ID, for your new VSM.

License hostid: VDH=1280389551234985805

Step 2 E-mail the following information to licensing@cisco.com, requesting the license file to be rehosted to the new host ID:

- The new host ID
- A copy of the existing license file from the old VSM

A new license key file, with the host ID of the new VSM, is sent to you in an e-mail within 48 hours.

Note Do not modify the license key file. The license key file is invalidated if you modify it.

Step 3 Save your license to a TFTP server.**Step 4** switch#**copy scp://user@linux-box.cisco.com/home/user/n1kv_license.lic bootflash:**
Copy your license to bootflash on the VSM.

This example shows how to copy your license to bootflash on the VSM

```
switch# copy scp://user@linux-box.cisco.com/home/user/nlkv_license.lic bootflash:
Enter vrf (If no input, current vrf 'default' is considered):
user@linux-box.cisco.com's password:
nlkv_license.lic                               100% 252      0.3KB/s   00:00
switch#
```