



## **Cisco Virtual Security Gateway for VMware vSphere License Configuration Guide, Release 4.2(1)VSG2(1.1)**

**First Published:** June 21, 2013

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Text Part Number: OL-29530-01

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Licensing Terminology 21



## Preface

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This preface contains the following sections:

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- [Related Documentation for Cisco Virtual Security Gateway for VMware vSphere](#), page vi
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- [Obtaining Documentation and Submitting a Service Request](#), page vii

## Audience

This publication is for network administrators and server administrators who understand virtualization.

## Document Conventions

Command descriptions use the following conventions:

Convention	Description
<b>bold</b>	Bold text indicates the commands and keywords that you enter literally as shown.
<i>Italic</i>	Italic text indicates arguments for which the user supplies the values.
[x]	Square brackets enclose an optional element (keyword or argument).
[x   y]	Square brackets enclosing keywords or arguments separated by a vertical bar indicate an optional choice.
{x   y}	Braces enclosing keywords or arguments separated by a vertical bar indicate a required choice.

Convention	Description
[x {y   z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.
<i>variable</i>	Indicates a variable for which you supply values, in context where italics cannot be used.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Examples use the following conventions:

Convention	Description
<code>screen font</code>	Terminal sessions and information the switch displays are in screen font.
<b><code>boldface screen font</code></b>	Information you must enter is in boldface screen font.
<i><code>italic screen font</code></i>	Arguments for which you supply values are in italic screen font.
<>	Nonprinting characters, such as passwords, are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

This document uses the following conventions:



**Note**

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.



**Caution**

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

## Related Documentation for Cisco Virtual Security Gateway for VMware vSphere

This section lists the documents available for Cisco Virtual Security Gateway and related products.

### Cisco Virtual Security Gateway Documentation

The *Cisco Virtual Security Gateway for VMware vSphere* documentation is available at [http://www.cisco.com/en/US/products/ps13095/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/ps13095/tsd_products_support_series_home.html).

*Cisco Virtual Security Gateway for VMware vSphere Release Notes*

*Cisco VSG for VMware vSphere and Cisco VNMC Installation and Upgrade Guide*

*Cisco Virtual Security Gateway for VMware vSphere License Configuration Guide*

*Cisco Virtual Security Gateway for VMware vSphere Configuration Guide*

*Cisco Virtual Security Gateway for VMware vSphere Troubleshooting Guide*

*Cisco Virtual Security Gateway for VMware vSphere Command Reference*

*Cisco vPath and vServices Reference Guide for VMware vSphere*

### Cisco Virtual Network Management Center Documentation

The *Virtual Network Management Center* documentation is available at [http://www.cisco.com/en/US/products/ps11213/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/ps11213/tsd_products_support_series_home.html).

### Related Documentation for Nexus 1000V Series NX-OS Software

The *Cisco Nexus 1000V Series Switch* documents are available on Cisco.com at the following URL:

[http://www.cisco.com/en/US/products/ps9902/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/ps9902/tsd_products_support_series_home.html)

## Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to [vsg-docfeedback@cisco.com](mailto:vsg-docfeedback@cisco.com). We appreciate your feedback.

## Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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# Overview

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This chapter contains the following sections:

- [Information About Licenses, page 1](#)
- [Pool of Available Licenses, page 3](#)
- [Licensing and High Availability, page 3](#)
- [License Volatility, page 4](#)

## Information About Licenses

Cisco VSG licenses are delivered in a Software License Claim Certificate by e-mail. The number of licenses that you request depends on the number of Virtual Ethernet Modules (VEMs) and the number of CPU sockets on each VEM that are using Cisco VSG services.

One license is needed for each installed server CPU on every VEM, and the Cisco VSG license packages are installed and configured on the Cisco Nexus 1000V Virtual Supervisor Module (VSM).

To understand more fully the terms associated with the Cisco VSG and licensing, see [Licensing Terminology](#)

## Types of Licenses

### Permanent Licenses

You can purchase permanent licenses for a fixed number of VEM CPU sockets. Permanent licenses do not expire. The number of licenses is specified in the license file that you have purchased.

When you subsequently upgrade to a new software release, all previously installed permanent licenses remain in effect.

When you purchase permanent licenses, make sure to request enough licenses to cover all of your installed CPUs in all of your VEMs. Before licenses are applied to a VEM, enough licenses must be available to cover all of the CPUs in that VEM. If you are lacking one CPU, then no licenses are applied to the VEM.

**Note**

If your license does not have the capacity to cover all CPUs in a particular VEM, then any licenses that could have been applied to that VEM are, instead, placed into a pool of available licenses on the VSM to be used as needed. The VEM remains unlicensed until enough licenses are available to cover all CPUs in the VEM.

After you purchase a license package, you then install the package on your VSM. The following table displays the license package names.

**Table 1: License Package**

License Package	Description
NEXUS1000V_LAN_SERVICES_PKG	Virtual Ethernet Module (VEM)
NEXUS_VSG_SERVICES_PKG	VEM to use Cisco VSG services

After installing permanent licenses, if your evaluation licenses are no longer used, you can remove the evaluation license file from the pool. For more information, see, [Uninstalling a License](#).

## Default Licenses

Sixteen Cisco VSG default licenses (NEXUS\_VSG\_SERVICES\_PKG) are preinstalled on the VSM. These default licenses enable you to use the Cisco VSG for a 60-day trial period before you must purchase permanent licenses. Default licenses are invalidated when one of the following occurs:

- 60 days have passed since the installation of the VSM.
- You install a permanent license file or an evaluation license file.

Because permanent licenses invalidate default licenses, make sure that your license file has enough capacity for all VEMs that are covered by your VSM

**Caution**

The vEthernet interfaces on unlicensed VEMs cannot use Cisco VSG services. If you need additional licenses to cover all VEM CPU sockets, then you must obtain either permanent licenses or evaluation licenses from Cisco.com.

## Evaluation Licenses

Evaluation licenses are available in packages of 16 licenses that are valid for 60 days to enable you to evaluate the Cisco VSG before you purchase permanent licenses. The 60-day evaluation period starts when you install the evaluation license file.

Unlike default licenses, an evaluation license is not invalidated when you install a permanent license. Evaluation licenses expire when the license file reaches its expiration date.

**Caution**

If your evaluation licenses expire, your VEMs are unlicensed. The vEthernet interfaces on unlicensed VEMs cannot use Cisco VSG services.

After installing permanent licenses, if your evaluation licenses are no longer used, you can remove them from the pool.

## Overdraft Licenses

Overdraft licenses can prevent losing Cisco VSG security services if you exceed the number of permanent or evaluation licenses that are specified in your license file. The number of overdraft licenses provided is based on the number of licenses that you ordered.

# Pool of Available Licenses

If you have licenses that are unused, the VSM stores these licenses in a pool of available licenses. If your license does not have the capacity to cover all CPUs in a particular VEM, then any licenses that could have been applied to that VEM are, instead, placed into the pool to be used as needed. If a VEM is no longer using Cisco VSG services, its licenses are returned to the pool. Before you can uninstall a license, you must first return all licenses from their VEMs to the pool.

If any licensed VEM is offline during a renegotiation of licenses, its licenses are returned to the VSM license pool. Once the VEM comes back online, it acquires its licenses from the VSM if any virtual machine on the VEM has Cisco VSG service enabled.

The following events trigger a renegotiation and synchronization of licenses between the VSM and its VEMs:

- Clock change in the VSM system clock
- HA switchover
- VSM reload
- Installing a new license file
- Clearing an existing license file

During the license renegotiation process, system messages alert you if licenses are returned to the VSM pool for a VEM that is offline. This process requires no action on your part because the licenses are returned to the VEM as needed when it comes back online.

# Licensing and High Availability

Licensing in a high-availability environment has the following configuration guidelines and limitations:

- License installation is a nondisruptive process.
- The license file is shared by both VSMs in an HA pair.
- If your system has dual supervisors, the licensed software runs on both supervisor modules and provides failover protection.
- Uninstalling a license file results in a loss of Cisco VSG security service.

# License Volatility

The volatile license feature automatically captures unused licenses when a VEM is taken out of service or when there are no VMs using any Cisco VSG services on the VEM and adds them to the VSM license pool so that they can be reused by another VEM. When you enable this feature, any time a VEM is taken out of service, either automatically or manually, its licenses are returned to the VSM license pool.

If its licenses are nonvolatile, the VEM does not release them when you take the VEM out of service.



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**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.

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# Installing and Configuring Licenses

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This chapter includes the following sections:

- [Information About Installing Licenses, page 5](#)
- [Prerequisites for Installing and Configuring Licenses, page 5](#)
- [Guidelines and Limitations, page 6](#)
- [Cisco VSG License Configuration Default Parameters, page 6](#)
- [Obtaining and Installing a License , page 7](#)
- [Transferring Licenses, page 10](#)
- [Uninstalling a License, page 12](#)
- [Verifying the License Configuration, page 17](#)
- [Changing the Serial Number in a License, page 18](#)
- [Feature History for Licenses, page 19](#)

## Information About Installing Licenses

The Cisco VSG software is available for download at the following URL: [http://www.cisco.com/en/US/products/ps13095/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/ps13095/tsd_products_support_series_home.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.

## 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](#), on page 1

## Cisco VSG License Configuration Default Parameters

Parameter	Default
volatile license	<p>Enabled</p> <p>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.</p> <p>16 evaluation licenses are available for 60 days.</p>

# 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
<b>Step 1</b>	switch# <b>install license bootflash:</b> <i>filename</i>	Installs the license from the active VSM console. <b>Note</b> 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.
<b>Step 2</b>	switch# <b>show license file</b> <i>filename</i>	Verifies the license installation by displaying the license configured for the VSM.



	Command or Action	Purpose
<b>Step 3</b>	switch# <b>show license usage</b> <i>package_name</i>	Verifies the license installation by displaying it in the license usage table. <b>Note</b> If you already have VEMs using Cisco VSG services, the output of this command shows VEMs and sockets
<b>Step 4</b>	switch# <b>copy running-config startup-config</b>	(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_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_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_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_SERVICES_PKG

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

Installed Licenses : 10
Eval Licenses :    0
Max Overdraft Licenses : 16
Installed Licenses in Use :    4
Overdraft Licenses in Use :    0
Eval Licenses in Use :    0
Licenses Available :    22

-----
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_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**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	<b>copy running-configure terminal</b> <code>ftp://server/path/filename</code>	Copies the VSM running configuration to a remote server.
<b>Step 2</b>	<b>show license brief</b>	Identifies the name of the license file to uninstall.
<b>Step 3</b>	<b>show license usage</b> <i>package_name</i>	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.
<b>Step 4</b>	<b>vservice license type vsg transfer</b> <b>src-module</b> <i>mod_no</i> <b>license-pool</b>	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. <b>Note</b> Repeat this procedure for each VEM until all licenses in use have been transferred back to the VSM license pool.
<b>Step 5</b>	<b>clear license</b> <i>license_name</i>	Begins the uninstall of the named license file
<b>Step 6</b>	<b>copy running-config</b> <b>startup-config</b>	(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_SERVICES_PKG
```

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

```
Installed Licenses : 10
Eval Licenses : 0
Max Overdraft Licenses : 16
Installed Licenses in Use : 4
Overdraft Licenses in Use : 0
Eval Licenses in Use : 0
Licenses Available : 22
```

```
-----
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_SERVICES_PKG
```

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

```
Installed Licenses : 10
```

```

Eval Licenses : 0
Max Overdraft Licenses : 16
Installed Licenses in Use : 4
Overdraft Licenses in Use : 0
Eval Licenses in Use : 0
Licenses Available : 22
-----
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
<b>Step 1</b>	<b>configure terminal</b>	Places you into global configuration mode.
<b>Step 2</b>	<b>no vservice license type vsg volatile</b>	Enables nonvolatile licenses in the running configuration.

	Command or Action	Purpose
<b>Step 3</b>	<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
<b>Step 1</b>	<code>configure terminal</code>	Places you into global configuration mode.
<b>Step 2</b>	<code>vservice license type vsg volatile</code>	Disables nonvolatile licenses in the running configuration.



	Command or Action	Purpose
<b>Step 3</b>	<b>copy running-config startup-config</b>	(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
<b>show license</b>	Displays the license filename for the VSM.
<b>show license brief</b>	Displays the license installed on the VSM.
<b>show license file <i>filename</i></b>	Displays the contents of the license file installed on the VSM, including the license filename and the expiration date for evaluation licenses.
<b>show license usage</b>	Displays the total number of licenses in use on the VEMs.
<b>show license usage <i>package_name</i></b>	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_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 NEXUS1_VSG_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 permanent license parameters:

```
switch# show license file Enterprise.lic
SERVER this_host ANY
VENDOR cisco
INCREMENT NEXUS_VSG_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](mailto: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/n1kv_license.lic bootflash:
Enter vrf (If no input, current vrf 'default' is considered):
user@linux-box.cisco.com's password:
n1kv_license.lic                               100% 252      0.3KB/s   00:00
switch#
```

## Feature History for Licenses

This section provides the release history for the license feature.

Feature name	Releases	Feature Information
Evaluation license	4.0(4)SV1(3)	16 evaluation licenses that are good for 60 days are included in the software image. More evaluation licenses of varied durations can be downloaded from <a href="http://www.cisco.com">http://www.cisco.com</a> and installed separately.

Feature name	Releases	Feature Information
Evaluation license	4.0(4)SV1(2)	Evaluation licenses are part of the software installation or upgrade. A separate evaluation license file no longer must be installed.
<b>show license usage</b> <i>package_name</i> command	4.0(4)SV1(2)	The show license usage filename command output is updated to show statistics about the number of evaluation and permanent licenses available, installed, and in use on the VSM.
License	4.0(4)SV1(1)	This feature was introduced.



## Licensing Terminology

- [Licensing Terminology, page 21](#)

### Licensing Terminology

The following table describes the terminology used in Cisco VSG and Cisco Nexus 1000V licensing.

**Table 2: Licensing Terminology**

Term	Definition
Evaluation license	A temporary license. Evaluation licenses are valid for a specified number of days and are tied to a host ID (device serial number).
Host ID	A unique chassis serial number that is specific to each device.
Incremental license	A license for additional CPU sockets that were not included in the initial license file. License keys are incremental-if you purchase some CPU sockets now and others later, the license file and the software detect the sum of all sockets for the specified device.
License enforcement	A mechanism that prevents a feature from being used without first obtaining a license.
License key file	A file that specifies the total licensed CPU sockets for your system. Each file is uniquely named and is specific to a VSM. The file contains digital signatures to prevent tampering and modification. License keys are required to use the product and are enforced within a specified time span.

Term	Definition
Licensed application	A software application or component that requires a license to be used.
Licensed feature	Permission to use a particular feature through a license file, a hardware object, or a legal contract. This permission is limited to the number of users, number of instances, time span, and the implemented device.
Missing license	If the bootflash has been corrupted or a supervisor module replaced after you have installed a license, that license shows as "missing." The product still works. You should reinstall the license as soon as possible.
Node locked license	A license that can be used only on a particular device using the unique host ID for the device.
Permanent license	A license that is not time bound is called a permanent license.
Product Authorization Key (PAK)	A unique code, provided in the software license claim certificate, which allows you to obtain a license key. You use this key to register for your license. After you register, your license key file and installation instructions are sent to you in an e-mail.
Rehosting	The process of changing a license to reflect a different device serial number, or host ID. A host ID is unique to each device, for example VSM.
Software license claim certificate	A document entitling its rightful owner to use licensed features on one device as described in that document. This document provides the product authorization key (PAK).
Support	If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact <a href="#">Cisco Technical Support</a>
Stacking	The process of adding multiple license files on a single VSM.

Term	Definition
Volatile licenses	<p>A feature that automatically captures unused licenses when a VEM is taken out of service and adds them to the VSM license pool so that they can be reused by another VEM.</p> <p>In contrast, if its licenses are nonvolatile, then the VEM does not release them during a loss in network connectivity with the VSM. When connectivity is returned, the VEM can resume normal activity without further interruption.</p> <p>Volatile licenses are disabled by default. That is, the licenses in VEMs are nonvolatile and are not released when a VEM is removed from service.</p>







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