Cisco Nexus 1000V License Configuration Guide, Release 4.2(1)SV1(5.2)

First Published: November 01, 2009

Last Modified: October 01, 2012

C O N T E N T S

Preface

This preface contains the following sections:

Audience

This publication is for experienced network administrators who configure and maintain Cisco Nexus devices .

This guide is for network administrators and server administrators with the following experience and knowledge:

- An understanding of virtualization
- Using VMware software to create a virtual machine and configure a VMware vSwitch

Note Knowledge of VMware vNetwork Distributed Switch is not required.

Document Conventions

Command descriptions use the following conventions:

Convention	Description
bold	Bold text indicates the commands and keywords that you enter literally as shown.

Convention	Description
Italic	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.
[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.
variable	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
screen font	Terminal sessions and information the switch displays are in screen font.
boldface screen font	Information you must enter is in boldface screen font.
italic screen font	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 Nexus 1000V Series NX-OS Software

This section lists the documents used with the Cisco Nexus 1000V and available on Cisco.com at the following URL:

http://www.cisco.com/en/US/products/ps9902/tsd_products_support_series_home.html

General Information

Cisco Nexus 1000V Documentation Roadmap

Cisco Nexus 1000V Release Notes

Cisco Nexus 1000V and VMware Compatibility Information

Install and Upgrade

Cisco Nexus 1000V Installation and Upgrade Guide

Configuration Guides

Cisco Nexus 1000V High Availability and Redundancy Configuration Guide

Cisco Nexus 1000V Interface Configuration Guide

Cisco Nexus 1000V Layer 2 Switching Configuration Guide

Cisco Nexus 1000V License Configuration Guide

Cisco Nexus 1000V Network Segmentation Manager Configuration Guide

Cisco Nexus 1000V Port Profile Configuration Guide

Cisco Nexus 1000V Quality of Service Configuration Guide

Cisco Nexus 1000V Security Configuration Guide

Cisco Nexus 1000V System Management Configuration Guide

Cisco Nexus 1000V VXLAN Configuration Guide

Programming Guide

Cisco Nexus 1000V XML API Configuration Guide

Reference Guides

Cisco Nexus 1000V Command Reference

Cisco Nexus 1000V MIB Quick Reference

Troubleshooting and Alerts

Cisco Nexus 1000V Troubleshooting Guide

Cisco Nexus 1000V Password Recovery Procedure

Cisco NX-OS System Messages Reference

Virtual Services Appliance Documentation

The *Cisco Nexus Virtual Services Appliance* documentation is available at http://www.cisco.com/en/US/ products/ps9902/tsd_products_support_series_home.html.

Virtual Security Gateway Documentation

The *Cisco Virtual Security Gateway for Nexus 1000V Series Switch* documentation is available at http:// www.cisco.com/en/US/products/ps11208/tsd_products_support_model_home.html.

Virtual Wide Area Application Services (vWAAS) Documentation

The *Virtual Wide Area Application Services* documentation is available at http://www.cisco.com/en/US/ products/ps6870/tsd_products_support_series_home.html.

ASA 1000V Cloud Firewall Documentation

The *ASA 1000V Cloud Firewall* documentation is available at http://www.cisco.com/en/US/products/ps12233/ 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 . 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

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS version 2.0.

New and Changed Information for this Release

The following table provides an overview of the significant changes to this guide for this current release. The table does not provide an exhaustive list of all changes made to the configuration guides or of the new features in this release.

- New and Changed Information for License Configuration, page 1

New and Changed Information for License Configuration

This section lists new and changed content in this document by software release and where it is located.

To find additional information about new features or command changes, see the *Cisco Nexus 1000V Release Notes* and *Cisco Nexus 1000V Command Reference*.

Table 1: New and Changed Features for the Cisco Nexus 1000V License Configuration Guide

Feature	Description	Changed in Release	Where Documented
Supporting Licenses	Updated the number and the trial period of the default licenses.	4.2(1)SV1(5.2)	Overview, on page 3
vEthernet interfaces	vEthernet interfaces are no longer brought down immediately when their licenses expire.	4.2(1)SV1(5.1)	Overview, on page 3
Monitoring license usage	A system message is generated every hour listing the modules that are unlicensed.	4.2(1)SV1(4a)	Overview, on page 3
Monitoring license usage	A system message is generated when more licenses are being used than are installed.	4.2(1)SV1(4)	Overview, on page 3

Feature	Description	Changed in Release	Where Documented
Transferring licenses from the license pool to VEMs	Added the **svs license transfer license_pool dst-vem module** command. This command transfers licenses from the license pool to the VEMs.	4.2(1)SV1(4)	Installing and Configuring Licenses, on page 9
Display license information	The **show module vem** *module* **license-info** command was added. This command displays the license mode and the usage of licenses by each module.	4.2(1)SV1(4)	Overview, on page 3
Evaluation licenses	Evaluation licenses are included in the software image. Additional evaluation licenses can be downloaded from Cisco.com and installed separately. Evaluation licenses downloaded from Cisco.com can be of varied duration.	4.2(1)SV1(3)	Overview, on page 3
Display license expiration	The **show license usage package_name** command output is updated to show the date of the nearest license expiration.	4.2(1)SV1(3)	Installing and Configuring Licenses, on page 9
Evaluation licenses	Evaluation licenses are available as part of the software installation or upgrade. A separate evaluation license file no longer needs to be installed.	4.2(1)SV1(2)	Overview, on page 3
License statistics	The **show license usage package_name** command output is updated to show the number of evaluation and permanent licenses that are available, installed, and in use on the VSM.	4.2(1)SV1(2)	Installing and Configuring Licenses, on page 9

C H A P T E R 2

Overview

This chapter includes the following sections:

Information About Licenses

One Cisco Nexus 1000V license is needed for each installed server CPU on every Virtual Ethernet Module (VEM) in the distributed architecture. There is no limit to the number of cores per CPU.

Figure 1: Cisco Nexus 1000V Distributed Architecture
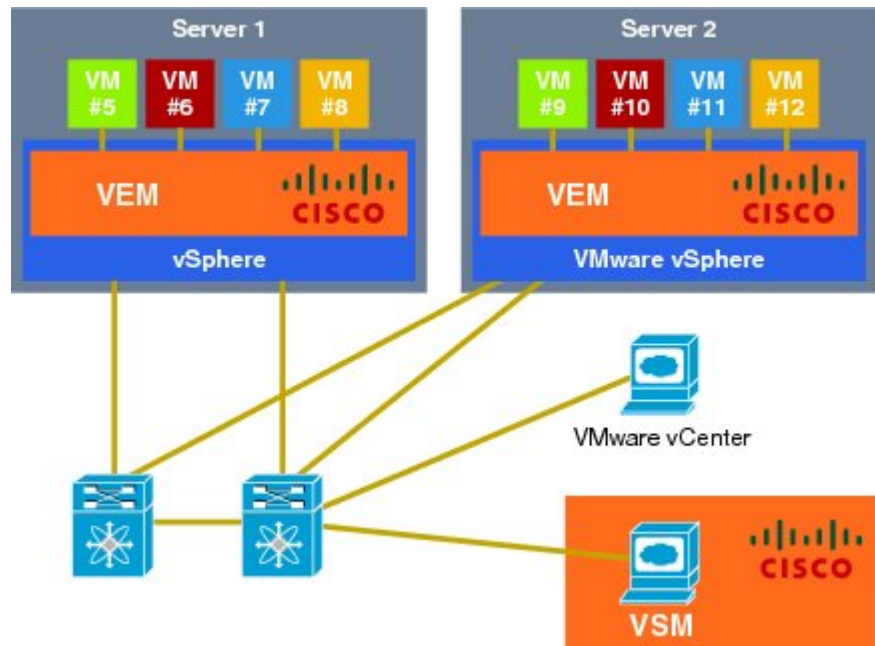
Licensing and High Availability

The following describes licensing high availability (HA) for the Cisco Nexus 1000V:

- License installation is a nondisruptive process.

- The license file is shared by both Virtual Supervisor Modules(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 service disruption.

Types of Licenses

This section includes the following topics:

- Permanent Licenses
- Default Licenses

> • Evaluation Licenses
>
> • Overdraft 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 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 do not have enough licenses to cover all of the CPUs, no licenses are applied to the VEM.

Note If your license does not have the capacity to cover all CPUs in a particular VEM, any licenses that could have been applied to that VEM are placed into a pool of available licenses on the VSM to be used as needed. The VEM remains unlicensed until sufficient 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 license package shown in the following table is an example of a license package name.

Table 2: License Package

License Package	Description
NEXUS1000V_LAN_SERVICES_PKG	Virtual Ethernet Module (VEM)

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

Default Licenses

512 default licenses are pre installed in your Cisco Nexus 1000V software and are valid for 239 days from the date of installation. These default licenses allow you to use the Cisco Nexus 1000V for a 239-day trial period before purchasing permanent licenses.

Default licenses are invalidated when one of the following occurs:

• You install a permanent license file or an evaluation license file.

Make sure your license file has enough capacity for all VEMs that are covered by your VSM. If not, your default licenses will be invalidated.

• 239 days after installation of the VSM.

⚠ **Caution** Service Disruption—Even though virtual Ethernet (vEthernet) interfaces are not dropped on unlicensed VEMs, the following events might affect the vEthernet interfaces:

- Any new vEthernet interfaces will not be brought up

- vEthernet interfaces will remain down with a "VEM Unlicensed" reason if there is a reattach due to a configuration change, module flap, or a port flap.

If you need additional licenses to cover all VEM CPU sockets, you must obtain either permanent licenses or evaluation licenses from Cisco.com.

Evaluation Licenses

Evaluation licenses, valid for 239 days, are available from Cisco.com in packages of 512 licenses. Evaluation licenses allow you to evaluate the Cisco Nexus 1000V before purchasing permanent licenses.

The 239-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** Service Disruption—Even though vEthernet interfaces are not dropped on unlicensed VEMs, the following events might affect the vEthernet interfaces:

- Any new vEthernet interfaces will not be brought up

- vEthernet interfaces will remain down with a "VEM Unlicensed" reason if there is a reattach due to a configuration change, module flap, or a port flap.

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 a service disruption in the event you exceed the number of permanent or evaluation licenses specified in your license file. The number of overdraft licenses provided is based on the number of licenses ordered.

Monitoring Licensing Usage

A system message similar to the following is generated when more licenses are being used than are installed. This message indicates that you should add more permanent licenses:

```
%LICMGR-2-LOG_LIC_USAGE: Feature NEXUS1000V_LAN_SERVICES_PKG is using 17 licenses, only 16
 licenses are installed.
```

A system message similar to the following is generated every hour with a list of modules that are unlicensed:

```
%VEM_MGR_UNLICENSED_MODS: Modules 3-10 are not licensed, this will result in network
connectivity issues. Please contact your Cisco account team or partner to purchase licenses.
 To activate your purchased licenses, click on www.cisco.com/go/license.
```

Pool of Available Licenses

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

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

- Clock change in the VSM system clock

- 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 when it comes back online.

Volatile Licenses

The volatile license feature 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. 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 taken out of service. When returned to service, the VEM resumes normal activity without further interruption.

The Volatile Licenses feature is disabled by default. That is, the licenses in VEMs are nonvolatile and are not released when a VEM is removed from service.

⚠

Caution Service Disruption—Volatile licenses are removed from a VEM during a loss in connectivity and are not returned to the VEM when connectivity resumes. We recommend that volatile licenses remain disabled (the default), and that you transfer unused licenses using the Transferring Licenses to the License Pool procedure.

C H A P T E R **3**

Installing and Configuring Licenses

This chapter includes the following sections:

Information About Licenses

For detailed information about licenses, see the Overview section.

Licensing Guidelines and Limitations

Use the following guidelines and limitations when configuring the permanent licenses:

- If you modify a permanent license key file, it 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 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 sufficient 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.

Default License Configuration Settings

Table 3: License Defaults

Parameter	Default
license filename	n1kv_license.lic
volatile license	disabled By default, the licenses are not returned to the VSM pool when a VEM is removed from the service.

Obtaining and Installing a License

This section describes how to obtain the license file that is required for each VSM and then install it. This section includes the following topics:

- Obtaining the License File

- Installing the License File on the VSM

Before You Begin

Before beginning the procedures in this section, you must know or do the following:

- A license file is tied to each VSM by the host ID or the serial number associated with the VSM device.

- A license file contains the number of licenses 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.

Obtaining the License File

You can obtain a license file for a VSM.

- A license file is tied to each VSM by the host ID or the serial number associated with the VSM device.
- A license file contains the number of licenses 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.

Before You Begin

- Make sure that you have your product authorization key (PAK),which is in your software license claim certificate.

  If you cannot locate your software license claim certificate, contact contact Cisco Technical Support.

- You are logged in to the CLI in EXEC mode.
- In this procedure, you must copy a license file. This process requires that your username has a role equivalent to that of the network-admin role which allows you to copy files. For information about user accounts and roles, see the *Cisco Nexus 1000V Security Configuration Guide*.

Procedure

Step 1 Obtain the serial number, also called the host ID, for your VSM: **show license host-id**

```
switch# show license host-id
License hostid: VDH=1280389551234985805
```
Note   The host ID includes everything that appears after the equal sign (=). In this example, the host ID is 1280389551234985805.

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

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 website, 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 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#
```

Installing the License File on the VSM

You can install the license files 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, Release 4.2(1)SV1(5.1).

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 filename, 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 installed, the output of this command shows installed VEMs and sockets.
Step 4	switch# **copy running-config startup-config**	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

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

```
switch# install license bootflash:license_file.lic
Installing license ..done
switch# show license file license_file.lic
SERVER this_host ANY
VENDOR cisco
```

```
INCREMENT NEXUS1000V_LAN_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 NEXUS1000V_LAN_SERVICES_PKG
----------------------------------------
Feature Usage Info
----------------------------------------
        Installed Licenses : 10
     Default Eval Licenses : 0
    Max Overdraft Licenses : 16
Installed Licenses in Use : 4
Overdraft Licenses in Use : 0
    Default Eval Lic in Use : 0
    Default Eval days left : 0
        Licenses Available : 22
           Shortest Expiry : Never
----------------------------------------
Application
----------------------------------------
VEM 3 - Socket 1
VEM 4 - Socket 1
VEM 4 - Socket 2
VEM 5 - Socket 1
----------------------------------------
switch#
```

Verifying the License Configuration

To verify the license configuration, perform one of the following tasks:

Table 4: License Configuration Show Commands

Command	Purpose
show license	Displays the license filename for the VSM.
show license brief	Displays the license installed on the VSM.
show license file *filename*	Displays the contents of the license file installed on the VSM, including the license filename and the expiration date for evaluation licenses.
show license usage	Displays the total number of licenses in use on the VEMs.
show license usage *package_name*	Displays statistics about the number of evaluation and permanent licenses available, installed, and in use on the VSM.
show module vem [*module*] **license-info**	Displays the license mode and the usage of licenses by each module.

Transferring Licenses

This section includes the following topics that describe how to transfer licenses between VEMs and uninstall a license by transferring it from a VEM to the VSM license pool:

- Transferring Licenses Between VEMs

- Transferring Licenses to the License Pool

- Transferring Licenses from the License Pool to VEMs

Transferring Licenses Between VEMs

You can transfer licenses from one VEM to another, for example, after moving a VM from one host to another.

- Licenses cannot be transferred to a VEM unless there are sufficient licenses in the pool to cover all of its CPUs.

- When licenses are successfully transferred from one VEM to another, the virtual Ethernet interfaces on the source VEM are removed from service, and the virtual Ethernet interfaces on the destination VEM are brought into service. The licenses on the source VEM are checked in regardless of any failure that might occur while the destination module is being licensed.

Before You Begin

- 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.

Procedure

	Command or Action	Purpose
Step 1	switch# **svs license transfer src-vem** *vem_no* **dst-vem** *vem_no*	Transfers the licenses from one VEM to another.
Step 2	switch# **show license usage** *package_name*	Verifies the transfer by displaying the licenses in use on each VEM.

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

```
switch# svs license transfer src-vem 3 dst-vem 5
switch(config)#
switch# show license usage NEXUS1000V_LAN_SERVICES_PKG
--------------------------------------
Feature Usage Info
--------------------------------------
```

```
      Installed Licenses : 29
   Default Eval Licenses : 0
   Max Overdraft Licenses : 16
Installed Licenses in Use : 2
Overdraft Licenses in Use : 0
    Default Eval Lic in Use : 0
   Default Eval days left : 0
      Licenses Available : 43
         Shortest Expiry : 01 Jul 2011
----------------------------------------
Application
----------------------------------------
VEM 5 - Socket 1
VEM 5 - Socket 2
----------------------------------------
switch#
```

Transferring Licenses to the License Pool

You can transfer licenses from a VEM to the VSM license pool when, for example, removing a license from a VEM.

Before You Begin

- You are logged in to the CLI in EXEC mode.

- When you transfer its licenses to the VSM license pool, all virtual Ethernet interfaces on the VEM are removed from service.

Procedure

	Command or Action	Purpose
Step 1	switch# **svs license transfer src-vem** *vem_no* **license_pool**	Transfers the licenses from a VEM to the license pool.
Step 2	switch# **show license usage** *package_name*	Verifies the transfer by displaying the licenses in use on each VEM.

This example shows how to display the licenses in use on each VEM. Notice that the licenses on VEM 3 are no longer in use.

```
switch# show license usage NEXUS1000V_LAN_SERVICES_PKG
----------------------------------------
Feature Usage Info
----------------------------------------
      Installed Licenses : 10
   Default Eval Licenses : 0
   Max Overdraft Licenses : 16
Installed Licenses in Use : 3
Overdraft Licenses in Use : 0
    Default Eval Lic in Use : 0
   Default Eval days left : 0
      Licenses Available : 23
         Shortest Expiry : Never
----------------------------------------
Application
----------------------------------------
VEM 4 - Socket 1
VEM 4 - Socket 2
```

```
VEM 5 - Socket 1
--------------------------------------
switch#
```

Transferring Licenses from the License Pool to VEMs

You can use this procedure to transfer licenses from a license pool to a VEM. The VEM will be licensed only if there are enough available licenses.

When you transfer licenses from the license pool to the VEM, if there are enough licenses available the module will be licensed and all the virtual Ethernet interfaces that were powered down will be powered up.

Before You Begin

You are logged in to the CLI in EXEC mode.

Procedure

	Command or Action	Purpose
Step 1	switch#**svs license transfer license_pool dst-vem** *module*	Transfers a license from the license pool to the VEM. The value of *module* can be from 3 to 66.
Step 2	switch# **show module vem** *module* **license-info**	Verifies the transfer by displaying the licenses in use on each VEM.

This example shows how to display the licenses in use on each VEM.

```
switch# show module vem 3 license-info
Licenses are Sticky
Mod     Socket Count   License Usage Count    License Version   License Status
---     ------------   -------------------    --------------    --------------
3       1              1                      1.0               licensed
switch#
```

Uninstalling a License

You can uninstall a license that is not in use. 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.

⚠️

Caution   Service Disruption—When you uninstall a license file from a VSM, the vEthernet interfaces on the VEMs are removed from service and the traffic flowing to them from virtual machines is dropped. This traffic flow is not resumed until you add a new license file with licenses for the VEMs. We recommend that you notify the server administrator that you are uninstalling a license, and this action will cause the vEthernet interfaces to shut down.

Before You Begin

- You are logged in to the CLI in EXEC mode.

- 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*.

Procedure

	Command or Action	**Purpose**
Step 1	switch# **copy running-config tftp:**//*server/path/filename*	Copies the VSM running configuration to a remote server.
Step 2	switch# **show license brief**	Identifies the name of the license file to uninstall.
Step 3	switch# **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	switch# **svs license transfer src-vem** *vem_no* **license_pool**	Transfers the licenses from the VEM back to the VSM license pool.
Step 5	Repeat the above step for each VEM until all licenses in use have been transferred back to the VSM license pool.	
Step 6	switch# **clear license** *license_name*	Begins the uninstall of the named license file.
Step 7	switch# **copy running-config startup-config**	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

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 NEXUS1000V_LAN_SERVICES_PKG
--------------------------------------
Feature Usage Info
--------------------------------------
       Installed Licenses : 29
     Default Eval Licenses : 0
    Max Overdraft Licenses : 16
Installed Licenses in Use : 2
Overdraft Licenses in Use : 0
   Default Eval Lic in Use : 0
   Default Eval days left : 0
        Licenses Available : 43
          Shortest Expiry : 01 Jul 2011
--------------------------------------
Application
--------------------------------------
VEM 5 - Socket 1
VEM 5 - Socket 2
```

```
--------------------------------------
switch# svs license transfer src-vem 3 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
switch(config)#
```

Configuring Volatile Licenses

This section provides information about enabling and disabling the volatile license feature and includes the following sections:

- Enabling Volatile Licenses

- Disabling Volatile Licenses

Enabling Volatile Licenses

You can enable volatile licenses so that whenever a VEM is taken out of service, its licenses are returned to the VSM pool of available licenses.

Note Service Disruption—Volatile licenses are removed from a VEM during a loss in connectivity and the system will try to get the required licenses when connectivity resumes. We recommend that the volatile licenses remain disabled and that you transfer unused licenses using the Transferring Licenses to the License Pool, on page 15 section.

A volatile license is disabled by default. That is, by default, licenses are not returned to the VSM pool when a VEM is removed from service.

Before You Begin

You are logged in to the CLI in EXEC mode.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch# **svs license volatile**	Enables volatile licenses in the running configuration.
Step 3	switch(config)# **copy running-config startup-config**	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

This example shows how to enable a volatile license:

```
switch# configure terminal
switch(config)# svs license volatile
switch(config)# copy running-config startup-config
switch(config)#
```

Disabling Volatile Licenses

You can disable volatile licenses so that whenever a VEM is taken out of service its licenses are not returned to the VSM pool of available licenses.

Note   By default, the licenses are non volatile (sticky) in nature, which is the recommended configuration. This configuration ensures that the licenses are reserved for a VEM. Even after a period of brief connectivity loss between the VEM and the VSM, the VEM is guaranteed to get the needed licenses.

Before You Begin

You are logged in to the CLI in EXEC mode.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch# **no svs license volatile**	Disables volatile licenses in the running configuration.
Step 3	switch(config)# **copy running-config startup-config**	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

This example shows how to disable a volatile license:

```
switch# configure terminal
switch(config)# no svs license volatile
switch(config)# copy running-config startup-config
switch(config)#
```

Changing the Serial Number in a License

You can 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.

Caution   Service Disruption—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 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.

- A license file is tied to each VSM by the host ID, or the serial number, associated with the VSM device.

- A license file contains the number of licenses 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 this process for each license file.

Before You Begin

- You have a copy of your existing license files with the host ID of the existing VSM.

- 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 Obtain the serial number, also called the host ID, for your new VSM:
```
switch# show license host-id
License hostid: VDH=1280389551234985805
```
Note The host ID number appears after the equal sign (=). In this example, the host ID is 1280389551234985805.

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

- The new host ID
- The new host ID

A new license key file, with the host ID of the new VSM, is sent to you in 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 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#
```

Obtaining a License File for Rehosting

You can 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   Obtain the serial number, also called the host ID, for your new VSM:
```
switch# show license host-id
License hostid: VDH=1280389551234985805
```
Note   NoteThe host ID number appears after the equal sign (=). In this example, the host ID is 1280389551234985805. You will need the host ID in step 5.

Example:

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

A copy of the existing license file from the old VSM

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   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 table includes only the updates for those releases that have resulted in additions or changes to the feature.

Table 5: Feature History

Feature Name	Releases	Feature Information
Default license	4.2(1)SV1(5.2)	512 default licenses that are valid for 240 days are included in the software image.

Feature Name	Releases	Feature Information
Evaluation license	4.0(4)SV1(3)	16 evaluation licenses that are valid for 60 days are included in the software image. More evaluation licenses of varied durations can be downloaded from Cisco.com and installed separately.
Evaluation license	4.0(4)SV1(2)	Evaluation licenses are part of the software installation or upgrade. A separate evaluation license file no longer needs to be installed.
show license usage *package_name* command	4.0(4)SV1(2)	The **show license usage** *package_name* 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.

CHAPTER 4

Licensing Terminology

This chapter includes the following sections:

Licensing Terminology

Table 6: 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.
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.

Term	Definition
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 only be used 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, that allows you to obtain a license key. You use this key at a website to register for your license. After you register, your license key file and installation instructions are sent to you in 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 Cisco Technical Support.
Stacking	The process of adding multiple license files on a single VSM.
Volatile licenses	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.
	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.
	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.

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