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Cisco Nexus 1000V License Configuration Guide, Release 4.2(1) SV1(4)

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Cisco Nexus 1000V License Configuration Guide, Release 4.2(1) SV1(4)

New and Changed Information

This section lists the new and changed information in this document by release, and where it is located.

Table 1 New and Changed Information in Release 4.2(1)SV1(4)

Feature	Description	Changed in Release	Where Documented
Monitoring license usage	A system message is generated when more licenses are being used than are installed.	4.2(1)SV1(4)	Chapter 1, "Overview"
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)	Chapter 2, "Installing and Configuring Licenses"
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)	Chapter 2, "Installing and Configuring Licenses"

Table 2 New and Changed Information in Release 4.0(4)SV1(3)

Feature	Description	Changed in Release	Where Documented
Evaluation licenses	A total of 16 evaluation licenses are included in the software image. Additional evaluation licenses can be downloaded from Cisco.com and installed separately. The evaluation licenses in the Cisco Nexus 1000V software are good for 60 days. Evaluation licenses downloaded from Cisco.com can be of varied duration.	4.0(4)SV1(3)	Chapter 1, "Overview"
Display license expiration	The **show license usage** *package_name* command output is updated to show the date of the nearest license expiration.	4.0(4)SV1(3)	Chapter 2, "Installing and Configuring Licenses"

Table 3 New and Changed Information in Release 4.0(4)SV1(2)

Feature	Description	Changed in Release	Where Documented
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.	4.0(4)SV1(2)	Chapter 1, "Overview"
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.	4.0(4)SV1(2)	Chapter 2, "Installing and Configuring Licenses"

CONTENTS

Preface

The License Configuration document describes licensing and how to install and configure a software license package on your VSM.

This preface describes the following aspects of this document:

Audience

This publication is for experienced network administrators who configure and maintain Cisco Nexus 1000V software.

Organization

This guide is organized as follows:

Chapter and Title	Description
Chapter 1, “Overview”	Provides an overview of licensing for the Cisco Nexus 1000V.
Chapter 2, “Installing and Configuring Licenses”	Describes how to do the following: • Obtain a license file and then install it on the VSM. • Transfer a license between VEMs. • Release a license from a VEM. • Enable and disable volatile licenses. • Uninstall a license. • Change the serial number/host ID in a license.
Chapter 3, “Licensing Terminology”	Defines license terminology.

Document Conventions

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.

Tip Means *the following information will help you solve a problem.*

Command descriptions use these conventions:

Convention	Description
boldface font	Commands and keywords are in boldface.
italic font	Arguments for which you supply values are in italics.
[ ]	Elements in square brackets are optional.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Screen examples use these conventions:

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

Available Documents

This section lists the documents used with the Cisco Nexus 1000 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, Release 4.2(1)SV1(4)

Cisco Nexus 1000V Release Notes, Release 4.2(1)SV1(4)

Cisco Nexus 1000V Compatibility Information, Release 4.2(1)SV1(4)

Cisco Nexus 1010 Management Software Release Notes, Release 4.2(1)SP1(2)

Install and Upgrade

Cisco Nexus 1000V Virtual Supervisor Module Software Installation Guide, Release 4.2(1)SV1(4)

Cisco Nexus 1000V Software Upgrade Guide, Release 4.2(1)SV1(4)

Cisco Nexus 1000V VEM Software Installation and Upgrade Guide, Release 4.2(1)SV1(4)

Cisco Nexus 1010 Virtual Services Appliance Hardware Installation Guide

Cisco Nexus 1010 Software Installation and Upgrade Guide, Release 4.2(1)SP1(2)

Configuration Guides

Cisco Nexus 1000V License Configuration Guide, Release 4.2(1)SV1(4)

Cisco Nexus 1000V Getting Started Guide, Release 4.2(1)SV1(4)

Cisco Nexus 1000V High Availability and Redundancy Configuration Guide, Release 4.2(1)SV1(4)

Cisco Nexus 1000V Interface Configuration Guide, Release 4.2(1)SV1(4)

Cisco Nexus 1000V Layer 2 Switching Configuration Guide, Release 4.2(1)SV1(4)

Cisco Nexus 1000V Port Profile Configuration Guide, Release 4.2(1)SV1(4)

Cisco Nexus 1000V Quality of Service Configuration Guide, Release 4.2(1)SV1(4)

Cisco Nexus 1000V Security Configuration Guide, Release 4.2(1)SV1(4)

Cisco Nexus 1000V System Management Configuration Guide, Release 4.2(1)SV1(4)

Cisco Nexus 1010 Software Configuration Guide, Release 4.2(1)SP1(2)

Programming Guide

Cisco Nexus 1000V XML API User Guide, Release 4.2(1)SV1(4)

Reference Guides

Cisco Nexus 1000V Command Reference, Release 4.2(1)SV1(4)

Cisco Nexus 1000V MIB Quick Reference

Cisco Nexus 1010 Command Reference, Release 4.2(1)SP1(2)

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Troubleshooting and Alerts

Cisco Nexus 1000V Troubleshooting Guide, Release 4.2(1)SV1(4)

Cisco Nexus 1000V Password Recovery Guide

Cisco NX-OS System Messages Reference

Virtual Security Gateway Documentation

Cisco Virtual Security Gateway for Nexus 1000V Series Switch Release Notes, Release 4.2(1)VSG(1)

Cisco Virtual Security Gateway, Release 4.2(1)VSG1(1) and Cisco Virtual Network Management Center, Release 1.0.1 Installation Guide

Cisco Virtual Security Gateway for Nexus 1000V Series Switch License Configuration Guide, Release 4.2(1)VSG1(1)

Cisco Virtual Security Gateway for Nexus 1000V Series Switch Configuration Guide, Release 4.2(1)VSG1(1)

Cisco Virtual Security Gateway for Nexus 1000V Series Switch Command Reference, Release 4.2(1)VSG1(1)

Virtual Network Management Center

Release Notes for Cisco Virtual Network Management Center, Release 1.0.1

Cisco Virtual Security Gateway, Release 4.2(1)VSG1(1) and Cisco Virtual Network Management Center, Release 1.0.1 Installation Guide

Cisco Virtual Network Management Center CLI Configuration Guide, Release 1.0.1

Cisco Virtual Network Management Center GUI Configuration Guide, Release 1.0.1

Cisco Virtual Network Management Center XML API Reference Guide, Release 1.0.1

Network Analysis Module Documentation

Cisco Network Analysis Module Software Documentation Guide, 4.2

Cisco Nexus 1000V NAM Virtual Service Blade Installation and Configuration Guide

Network Analysis Module Command Reference Guide, 4.2

User Guide for the Cisco Network Analysis Module Virtual Service Blades, 4.2

Cisco Network Analysis Module Software Release Notes, 4.2

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.

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CHAPTER 1

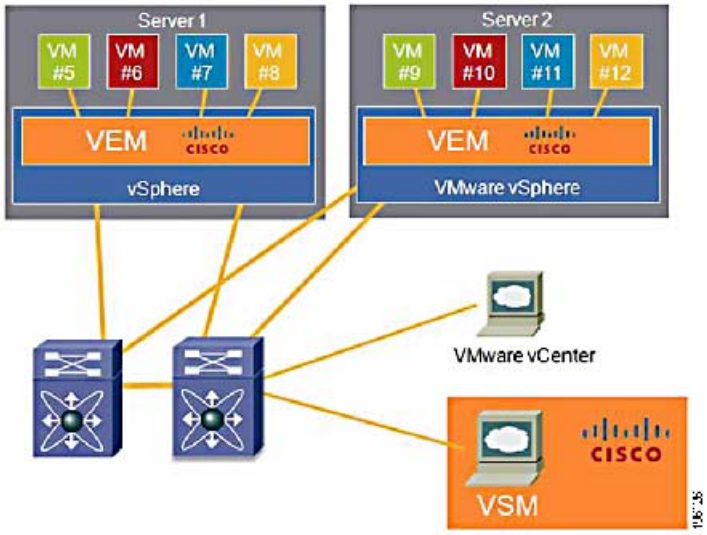
Overview

This chapter describes licensing for the Cisco Nexus 1000V software in the following topics.

Information About Licenses

One Cisco Nexus 1000V license is needed for each installed server CPU on every VEM in the distributed architecture (Figure 1). 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 for the Cisco Nexus 1000V:

- 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 service disruption. For more information, see the "Uninstalling a License" section on page 2-10.

Types of Licenses

This section includes the following topics:

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 are short by 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 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 Table 1 is an example of a license package name.

Table 1 License Package

License Package	Description
NEXUS1000V_LAN_SERVICES_PKG.	Virtual Ethernet Module (VEM)

For more information, see Chapter 2, "Installing and Configuring Licenses."

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 the "Uninstalling a License" section on page 2-10.

Default Licenses

Sixteen default licenses are pre-installed in your Cisco Nexus 1000V software and are good for 60 days from the date of installation. These default licenses let you use the Cisco Nexus 1000V for a 60 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.

  Since it invalidates default licenses, make sure your license file has enough capacity for all VEMs covered by your VSM.
- 60 days after installation of the VSM.

Caution Service Disruption—The vEthernet interfaces on unlicensed 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.

If you need additional licenses to cover all VEM CPU sockets, then you must obtain either permanent licenses or evaluation licenses from Cisco.com. For more information, see the "Evaluation Licenses" section on page 1-3.

Evaluation Licenses

Evaluation licenses, valid for 60 days, are available from Cisco.com in packages of 16 licenses. Evaluation licenses let you evaluate the Cisco Nexus 1000V before purchasing 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 Service Disruption—If your evaluation licenses expire, your VEMs are unlicensed, the vEthernet interfaces 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.

After installing permanent licenses, if your evaluation licenses are no longer used, you can remove them from the pool. For more information, see the "Uninstalling a License" section on page 2-10.

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 License 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.

Pool of Available Licenses

If you have licenses that are unused, the VSM stores these 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 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, then 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 is part of the process and requires no action on your part since 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.

In contrast, if its licenses are nonvolatile, then 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. Cisco recommends that volatile licenses remain disabled (the default), and that you transfer unused licenses using the "Transferring Licenses to the License Pool" procedure on page 2-8.

For more details, see Chapter 2, "Installing and Configuring Licenses."

CHAPTER 2

Installing and Configuring Licenses

This chapter describes how to install and configure licenses and includes the following sections:

Information About Licenses

For detailed information about licenses, see Chapter 1, “Overview.”

Guidelines and Limitations

Use the following guidelines and limitations when configuring 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, Release 4.2(1)SV1(4)*.

- 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. For more information, see the "Types of Licenses" section on page 2.

Default Settings

Table 2-1 lists the default settings in the license configuration.

Table 2-1 License Defaults

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

BEFORE YOU BEGIN

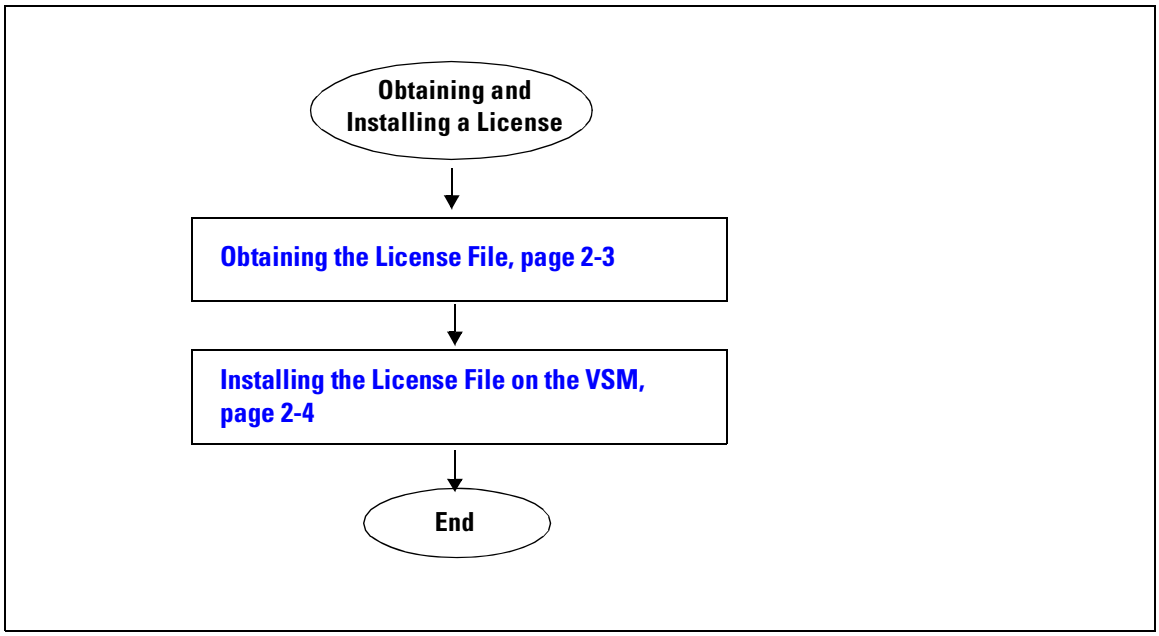
Before beginning the procedures in this section, you must know or do the following:

- 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.

Flow Chart: Obtaining and Installing a License

Use the flow chart in Figure 1 to guide you through the process of installing a license on a VSM. After completing a procedure, return to the flow chart to make sure you complete all procedures in the correct sequence.

Figure 1 Flow Chart: Obtaining and Installing a License



Obtaining the License File

You can use this 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 associated with the VSM device.
- Make sure that you have your product authorization key (PAK), 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. This requires that your username have 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, Release 4.2(1)SV1(4)*.

PROCEDURE

Step 1 Obtain the serial number, also called the host ID, for your VSM:

```
n1000v# 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. You will need the host ID in Step 4.

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

You will need the PAK in Step 4.

Step 3 Go to the Product License Registration site.

Step 4 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 5 Copy your license key file to bootflash on the VSM.

copy [*source url*] *filename* [*destination filesystem:*] *filename*

Note The file in bootflash: must have a filename that ends in .lic One that ends in .LIC will not work.

Example:

```
n1000v# copy scp://user@linux-box.cisco.com/home/user/n1kv_license.lic bootflash:
n1kv_license.lic
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

n1000v#
```

Installing the License File on the VSM

You can use this procedure to install the license file(s) on a VSM. Installing multiple licenses is called stacking.

BEFORE YOU BEGIN

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

- 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. For more information, see the "Default Licenses" section on page 3.

- 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(4)*.

SUMMARY STEPS

1. **install license bootflash:** *filename*
2. **show license file** *filename*
3. **show license usage** *package_name*
4. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose

Step 1	**install license bootflash:** *filename*
	
	Example:
	`n1000v# install license bootflash:license_file.lic`
	`Installing license ..done`
	`n1000v#`
		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	**show license file** *filename* **Example:** `n1000v# show license file license_file.lic`	Verifies the license installation by displaying the license configured for the VSM.
Step 3	**show license usage** *package_name* **Example:** `n1000v#show license usage NEXUS1000V_LAN_SERVICES_PKG`	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	**copy running-config startup-config** **Example:** `n1000v(config)# copy running-config startup-config`	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

Example Configuration

This 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
```

```
n1000v# 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
n1000v# 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 : 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 use the following procedures in this section to transfer licenses between VEMs and uninstall a license by transferring it from a VEM to the VSM license pool.

- Transferring Licenses Between VEMs, page 2-6
- Transferring Licenses to the License Pool, page 2-8
- Transferring Licenses from the License Pool to VEMs, page 2-9

Transferring Licenses Between VEMs

You can use this procedure to transfer licenses from one VEM to another, for example, 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 sufficient licenses in the pool to cover all of its CPUs.

- When licenses are successfully transferred from one VEM to another, then 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.
- For detailed information about the fields in the output of these commands, see the *Cisco Nexus 1000V Command Reference, Release 4.2(1)SV1(4)*.

SUMMARY STEPS

1. **svs license transfer src-vem** *vem_no* **dst-vem** *vem_no*
2. **show license usage** *package_name*

DETAILED STEPS

	Command	Purpose

Step 1	**svs license transfer src-vem** *vem_no* **dst-vem** *vem_no*
	
	Example:
	`n1000v# svs license transfer src-vem 3 dst-vem 5`
	`n1000v(config)#`
		Transfers the licenses from one VEM to another.

Step 2	**show license usage** *package_name* **Example:** `n1000v#show license usage`	Verifies the transfer by displaying the licenses in use on each VEM.

EXAMPLES

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

```
n1000v# svs license transfer src-vem 3 dst-vem 5
n1000v(config)#
n1000v# show license usage NEXUS1000V_LAN_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

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

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 virtual Ethernet interfaces on the VEM are removed from service.
- For detailed information about the fields in the output of these commands, see the *Cisco Nexus 1000V Command Reference, Release 4.2(1)SV1(4)*.

SUMMARY STEPS

1. **svs license transfer src-vem** *vem no* **license_pool**
2. **show license usage** *package_name*

DETAILED STEPS

	Command	Purpose

Step 1	**svs license transfer src-vem** *vem_no* **license_pool**
	
	Example:
	`n1000v# svs license transfer src-vem 3 license_pool`
	`n1000v(config)#`
		Transfers the licenses from a VEM to the license pool. All virtual Ethernet interfaces on the VEM are removed from service.

Step 2	**show license usage** *package_name* **Example:** `n1000v# show license usage`	Verifies the transfer by displaying the licenses in use on each VEM.

EXAMPLES

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

```
n1000v#show license usage NEXUS1000V_LAN_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
--------------------------------------
```

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.

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 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.
- For detailed information about the fields in the output of these commands, see the *Cisco Nexus 1000V Command Reference, Release 4.2(1)SV1(4)*.

SUMMARY STEPS

1. **svs license transfer license_pool dst-vem** *module*
2. **show module vem** *module* **license-info**

DETAILED STEPS

	Command	Purpose
Step 1	**svs license transfer license_pool dst-vem** *module* **Example:** n1000v# svs license transfer license license_pool dst-vem 3 n1000v(config)#	Transfers a license from the license pool to the VEM. The value of *module* can be from 3 - 66.
Step 2	**show module vem** *module* **license-info** **Example:** n1000v# show module vem 3 license-info	Verifies the transfer by displaying the licenses in use on each VEM.

EXAMPLES

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

```
n1000v#show license usage NEXUS1000V_LAN_SERVICES_PKG
--------------------------------------
Feature Usage Info
--------------------------------------
       Installed Licenses : 16
            Eval Licenses : 0
   Max Overdraft Licenses : 16
Installed Licenses in Use : 4
Overdraft Licenses in Use : 0
     Eval Licenses in Use : 0
       Licenses Available : 28
          Shortest Expiry : Never
--------------------------------------
Application
--------------------------------------
VEM 4 - Socket 1
VEM 4 - Socket 2
--------------------------------------
```

Uninstalling a License

You can use this 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 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.

- 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, Release 4.2(1)SV1(4)*.
- For detailed information about the fields in the output of these commands, see the *Cisco Nexus 1000V Command Reference, Release 4.2(1)SV1(4)*.

SUMMARY STEPS

1. **copy running-config tftp://***server/path/filename*
2. **show license brief**
3. **show license usage** *package_name*
4. **svs license transfer src-vem** *vem no* **license_pool**
5. Repeat 4. for each VEM.
6. **clear license** *license_name*
7. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose

Step 1	**copy running-config tftp://***server/path/filename*
	
	Example:
	`n1000v# copy running-config tftp:`
	`n1000v(config)#`
		Copies the VSM running configuration to a remote server.

Step 2	**show license brief**
	
	Example:
	`n1000v# show license brief`
	`Enterprise.lic`
	`n1000v#`
		Identifies the name of the license file to uninstall.

	Command	Purpose

Step 3	**show license usage** *package_name*
	
	Example:
	`n1000v# show license usage`
	`NEXUS1000V_LAN_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`
	`----------`
	`n1000v#`
		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	**svs license transfer src-vem** *vem_no* **license_pool**
	
	Example:
	`n1000v# svs license transfer src-vem 3 license_pool`
	`n1000v#`
		Transfers the licenses from the VEM back to the VSM license pool.
		
		As the licenses are transferred from a VEM, its vEthernet interfaces are shut down and the following syslog is generated:
		
		PLATFORM-2-PFM_VEM_UNLICENSED

Step 5	Repeat Step 4 for each VEM until all licenses in use have been transferred back to the VSM license pool.	

Step 6	**clear license** *license_name*
	
	Example:
	`n1000v# 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`
		Begins the uninstall of the named license file.
		
		In this example, the Enterprise.lic file is uninstalled.

Step 7	**copy running-config startup-config** **Example:** `n1000v(config)# copy running-config startup-config`	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

EXAMPLES

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.

```
n1000v# show license brief
Enterprise.lic
n1000v#
n1000v# show license usage NEXUS1000V_LAN_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
--------------------------------------
n1000v# svs license transfer src-vem 3 license_pool
n1000v# 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
n1000v(config)# copy running-config startup-config
```

Configuring Volatile Licenses

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

Enabling Volatile Licenses

You can use this procedure to 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" section on page 8.

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 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.

SUMMARY STEPS

1. **config t**
2. **svs license volatile**
3. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose

Step 1	**config t**
	
	Example:
	`n1000v# config t`
	`n1000v(config)#`
		Places you into global configuration mode.

Step 2	**svs license volatile**
	
	Example:
	`n1000v(config)# svs license volatile`
	`n1000v(config)#`
		Enables volatile licenses in the running configuration.

Step 3	**copy running-config startup-config** **Example:** `n1000v(config)# copy running-config startup-config`	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

Disabling Volatile Licenses

You can use this procedure to disable volatile licenses so that when 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. This is the recommended configuration. This will ensure 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

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

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

- 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.
- For detailed information about the fields in the output of these commands, see the *Cisco Nexus 1000V Command Reference, Release 4.2(1)SV1(4)*.

SUMMARY STEPS

1. **config t**
2. **no svs license volatile**
3. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose

Step 1	**config t**
	
	Example:
	`n1000v# config t`
	`n1000v(config)#`
		Places you into CLI Global Configuration mode.

Step 2	**no svs license volatile**
	
	Example:
	`n1000v(config)# no svs license volatile`
	`n1000v(config)#`
		Disables volatile licenses in the running configuration.

Step 3	**copy running-config startup-config** **Example:** `n1000v(config)# copy running-config startup-config`	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

Verifying the License Configuration

Use the following commands to verify the license configuration.

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. Example 2-1 on page 16 Example 2-2 on page 16

Command	Purpose
show license usage	Displays the total number of licenses in use on the VEMs. Example 2-3 on page 16
show license usage *package_name*	Displays statistics about the number of evaluation and permanent licenses available, installed, and in use on the VSM. Example 2-4 on page 17
show module vem [*module*] **license-info**	Displays the license mode and the usage of licenses by each module. Example 2-5 on page 17 Example 2-6 on page 17

Example 2-1 Evaluation License

```
n1000v# show license file eval.lic
SERVER this_host ANY
VENDOR cisco
INCREMENT NEXUS1000V_LAN_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
```

Example 2-2 Permanent license

```
n1000v# show license file Enterprise.lic
SERVER this_host ANY
VENDOR cisco
INCREMENT NEXUS1000V_LAN_SERVICES_PKG cisco 1.0 permanent 16 \
    HOSTID=VDH=0871396331270074457 \
    NOTICE="<LicFileID>Enterprise.lic</LicFileID><LicLineID>0</LicLineID> \
    <PAK>dummyPak</PAK>" SIGN=E08A38544DBE
```

Example 2-3 show license usage

```
n1000v# show license usage
Feature                      Ins  Lic      Status   Expiry Date    Comments
                                 Count
--------------------------------------------------------------------------------
NEXUS_VSN_SERVICES_PKG        No     0   Unused             -
NEXUS1000V_LAN_SERVICES_PKG   No     1   In use     None    -
--------------------------------------------------------------------------------
n1000v#
```

Example 2-4 show license usage NEXUS1000V_LAN_SERVICES_PKG

```
n1000v# 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 : 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
--------------------------------------
n1000v#
```

Example 2-5 show module vem license-info

```
n1000v# show module vem license-info

Licenses are Sticky
Mod  Socket Count License Usage Count License Version  License Status
---  ------------ ------------------- ---------------  --------------
3    2            2                   1.0              licensed
4    2            2                   1.0              licensed
```

Example 2-6 show module vem 3 license-info

```
n1000v# show module vem 3 license-info

Licenses are Sticky
Mod  Socket Count License Usage Count License Version  License Status
---  ------------ ------------------- ---------------  --------------
3    2            2                   1.0              licensed
```

Changing the Serial Number in a License

You can use this 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.

This section includes the following topics:

BEFORE YOU BEGIN

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

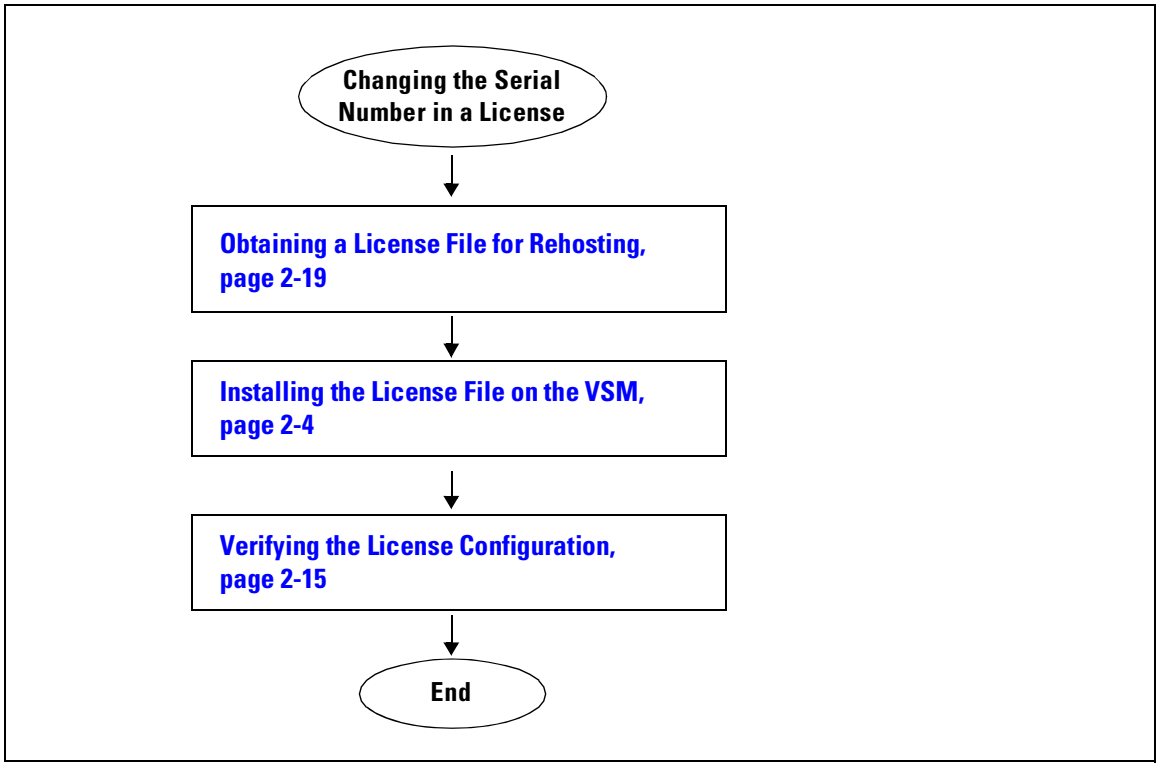
Caution Service Disruption—When you remove a VSM from your network, the vEthernet interfaces on the VEMs are removed from service and the traffic flowing to them from virtual machines is dropped. This traffic flow is not resumed until you add a new VSM and new license file with the new host ID.

- 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, 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.

Flow Chart: Changing the Serial Number in a License

Use the flow chart in Figure 2 to guide you through the process required to change the serial number, or host ID, in an existing license. After completing a procedure, return to the flow chart to make sure you complete all procedures in the correct sequence.

Figure 2 Flow Chart: Changing the Serial Number in a License



Obtaining a License File for Rehosting

You can use this 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, Release 4.2(1)SV1(4)*.

PROCEDURE

Step 1 Obtain the serial number, also called the host ID, for your new VSM:

```
n1000v# 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. You will need the host ID in Step 4.

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

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.

```
n1000v@ 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
n1000v@
```

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 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** *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.

CHAPTER 3

Licensing Terminology

Table 3-1 describes the terminology used in Cisco Nexus 1000V licensing.

Table 3-1 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.
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.

Table 3-1 Licensing Terminology (continued)

Term	Definition
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.

INDEX

C

D

E

F

H

I

K

L

O

P

R

S

T

U

V