



# CHAPTER 1

## Overview

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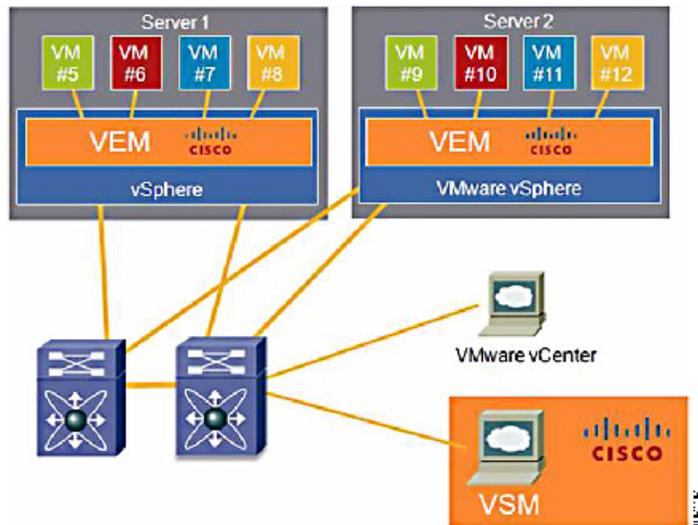
This chapter describes licensing for the Cisco Nexus 1000V software in the following topics.

- [Information About Licenses](#), page 1-1
- [Licensing and High Availability](#), page 1-2
- [Types of Licenses](#), page 1-2
- [Monitoring License Usage](#), page 1-4
- [Pool of Available Licenses](#), page 1-4
- [Volatile Licenses](#), page 1-4

## 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



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## 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](#), page 1-2
- [Default Licenses](#), page 1-3
- [Evaluation Licenses](#), page 1-3
- [Overdraft Licenses](#), page 1-4

## 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.”](#)

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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

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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.

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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

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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.

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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.

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## 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.
```

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 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.

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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**

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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](#).

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For more details, see [Chapter 2, “Installing and Configuring Licenses.”](#)

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