



## Overview

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## Cisco Nexus 1000V Multi-Hypervisor Licensing

The Cisco Nexus 1000V for Microsoft Hyper-V uses a multi-hypervisor licensing approach, which allows you to migrate a license from one Cisco Nexus 1000V switch platform type to another. For example, you can migrate the license from a Cisco Nexus 1000V for VMware switch to a

The Cisco Nexus 1000V multi-hypervisor licenses have the following editions:

- **Essential**—No licenses are required. All basic features are available and all Virtual Ethernet Modules (VEMs) are automatically licensed to use these basic features. The necessary default licenses are automatically checked out from the Cisco license pool.
- **Advanced**—A license is required for each CPU socket on each VEM in order to use the advanced features. When the switch is configured with the Advanced edition license, the switch checks out the appropriate licenses from the license pool.

The Advanced edition license includes the following features:

- DHCP Snooping
- IP Source Guard
- Dynamic ARP Inspection
- Virtual Security Gateway (VSG)

You can switch between the editions at any time as long as you have the appropriate licenses available for the Advanced edition. All modules must use either the Essential edition or the Advanced edition. You cannot mix the two and have some modules use the Essential edition while others use the Advanced edition.

**Note**

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The Cisco Nexus 1000V platform is licensed as NEXUS1000V\_LAN\_SERVICES\_PKG.

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You can use the **show switch edition** command to display the current switch edition and other licensing information.

## Licensing and High Availability

- 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 may result in a service disruption.

## Types of Licenses

### Default Licenses

There are 1024 default licenses pre-installed with the Cisco Nexus 1000V for Microsoft Hyper-V software that allow you to try the Advanced Edition before purchasing permanent licenses. You need one license for each CPU socket on each VEM.

Default licenses are invalidated when one of the following occurs:

- You install a permanent license file.
- You install an evaluation license file.
- The license trial period expires.

**Caution**

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

- New vEthernet interfaces are not brought up.

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If you need additional licenses to cover all VEM CPU sockets, you must obtain either permanent licenses or evaluation licenses from Cisco.com. For additional licensing information, contact your Cisco representative or visit [www.cisco.com/go/license](http://www.cisco.com/go/license).

## Permanent Licenses

Cisco Nexus 1000V permanent licenses do not expire. You can purchase permanent licenses for a fixed number of VEM CPU sockets. You need one license for each CPU socket on each VEM. The license file specifies the number of licenses that you have purchased.

When you 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 the CPU sockets in the CPUs in all of your VEMs. If you do not have enough licenses available to cover all of the CPU sockets on a particular VEM, no licenses are applied to that VEM. The entire VEM remains unlicensed until sufficient licenses become available to cover all of its CPU sockets.

Any extra licenses are placed into a pool of available licenses on the VSM to be used as needed.

To license VEM hosts, you must purchase a license package, you then install the package on your VSM. The license package name is `NEXUS1000V_LAN_SERVICES_PKG`.

After installing permanent licenses, you can remove the evaluation license file from the pool if desired.

## Evaluation Licenses

Evaluation licenses allow you to try the Cisco Nexus 1000V switch before you purchase permanent licenses.

The 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. Instead, evaluation licenses expire only when the license file reaches its expiration date. The validity period might vary and the expiration date is mentioned in the license file.



### 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 are not brought up.
- vEthernet interfaces 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, you can remove the evaluation license file from the pool if desired.

Evaluation license packs are available from [Cisco.com](https://www.cisco.com).

## Overdraft Licenses

Overdraft licenses are used when the installed licenses are used up. Overdraft licenses can prevent a service disruption if 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 that you installed. If you installed 64 or more licenses, the number of overdraft licenses provided is 30 percent of the installed licenses. If you installed less than 64 licenses, the number of overdraft licenses is 16.

The expiration of an overdraft license is tied to the expiration date of the installed license.

# 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. Please contact your Cisco account team or partner to purchase Licenses or downgrade to Essential Edition. To activate your purchased licenses, click on www.cisco.com/go/license.
```

A system message similar to the following is generated if there are not enough licenses available for a particular VEM:

```
%VEM_MGR_UNLICENSED: License for VEM 7 could not be obtained. Please contact your Cisco account team or partner to purchase Licenses or downgrade to Essential Edition. To activate your purchased licenses, click on www.cisco.com/go/license.
```

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

```
%VEM_MGR_UNLICENSED_MODS: Modules are not licensed. This will result in network connectivity issues. Please contact your Cisco account team or partner to purchase Licenses or downgrade to Essential Edition. 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. Before you can uninstall a license file, you must first return all licenses from its VEMs to the pool.

Once a license has been assigned to the VEM, you can configure how the system treats that license if the VEM goes out of service for any reason.

## Nonvolatile Licensing

The Cisco Nexus 1000V switch uses nonvolatile licensing as the default licensing method. With nonvolatile licensing, once a license has been assigned to a VEM, it remains checked out to that VEM even if the VEM is offline. If you want to decommission a VEM, you must manually return its licenses to the pool using the **license transfer** and **no vem** commands or the licenses remain unavailable to any other VEMs in the system. For more information about these commands, see the *Cisco Nexus 1000V Command Reference* for your platform.

Keeping the license checked out allows the VEM to return to service immediately after it comes back online. The VEM does not have to wait while acquiring new licenses.

## Volatile Licensing

With volatile licensing, when any VEM goes offline its licenses are immediately returned to the VSM license pool. Once the VEM comes back online, it must acquire new licenses from the license pool.

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
- Evaluation license expiration

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.

**Caution**

Service Disruption—Volatile licenses are removed from a VEM during a loss in connectivity and must be reassigned when connectivity resumes. We recommend that you use nonvolatile licensing and you transfer unused licenses as described in [Transferring Licenses to the License Pool](#).

## Feature History

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

Feature History	Releases	Feature Information
Multi Hypervisor Licensing	4.2(1)SV2(2.2)	This feature was introduced.

