



Overview

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Tier-based Licensing

The Cisco Nexus 1000V for Microsoft Hyper-V uses a tier-based licensing approach with the following editions:

- **Essential**—No additional 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 Cisco Nexus 1000V for Microsoft Hyper-V features. As soon as the switch is configured to use the Advanced edition, it checks the appropriate licenses out from the license pool.

The Advanced edition includes the following features:

- DHCP Snooping
- IP Source Guard
- Dynamic ARP Inspection
- Virtual Security Gateway (VSG) and Microsoft Hyper-V

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**

The Cisco Nexus 1000V for Microsoft Hyper-V software is licensed as N1KV_MSFT_LAN_SERVICES_PKG. Cisco VSG and ASA 1000V services are packaged and licensed separately.

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 results in a service disruption.

Types of Licenses

Default Licenses

There are 512 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**

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 are not brought up.
- Any existing vEthernet interfaces remain down with the “VEM Unlicensed” status if the switch configuration changes or the module or port flaps.

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.

Permanent Licenses

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.

After you purchase a license package, you then install the package on your VSM. The license package name is similar to the following: N1KV_MSFT_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 Cisco Nexus 1000V for Microsoft Hyper-V 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 ordered. If the number of licenses installed is less than or equal to 64, the number of overdraft licenses provided is 16 (or 30 percent of the installed licenses).

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 N1KV_MSFT_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

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 or the licenses remain unavailable to any other VEMs in the system.

This process enables 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

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](#).
