



Overview

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Cisco Nexus 1000V Multi-Hypervisor Licensing

The Cisco Nexus 1000V 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 Cisco Nexus 1000V for Microsoft Hyper-V switch. Likewise, you can migrate the license from a Cisco Nexus 1000V for KVM to a Cisco Nexus 1000V for VMware.

You can swap 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.

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

License Editions and Versions

The Cisco Nexus 1000V supports Essential and Advanced license editions. Beginning with Cisco Nexus NX-OS 5.2(1)SV3(1.1), Cisco Nexus NX-OS Release 5.2(1)SK3(1.1), and Cisco Nexus NX-OS Release 5.2(1)SM3(1.1), the Advanced license supports license versioning.

Essentials License Edition

Essentials is the default license edition that comes with the Cisco Nexus 1000V software. All basic features are available and all Virtual Ethernet Modules (VEMs) are automatically licensed to use these basic features. No additional license is required to use these basic features.

The Essentials Edition comes with a 60-day trial for the Advanced Edition.

Essentials Edition supports the following number of resources:

Switch	Software Release	Number of Hosts	Number of Virtual Ports
Cisco Nexus 1000V for VMware	4.2(1)SV2(2.2) and lower	128	4096
Cisco Nexus 1000V for KVM	5.2(1)SK3(1.1)	20	4096
Cisco Nexus 1000V for Microsoft	5.2(1)SM3(1.1)	64	4096

Advanced Edition License

The Advanced Edition license package name is NEXUS_1000V_LAN_SERVICES_PKG. An Advanced Edition license is required for each CPU socket on each VEM in order to use the advanced features. To license VEM hosts, you must purchase a license package and then install the package on your Virtual Supervisor Module (VSM).

The Advanced Edition license supports the following versions:

- Advanced Edition 1.0 (Nexus1000V_LAN_SERVICES_PKG 1.0)—Any license file that was generated for Release 4.2(1)SV2(2.2) software or earlier has the Advanced 1.0 version.
- Advanced 3.0 (Nexus1000V_LAN_SERVICES_PKG 3.0)— If you purchased Cisco Nexus 1000V Release 5.2(1)SK3(2.2) software or Cisco Nexus 1000V Release 5.2(1)SM3(1.1) software, you must install the Advanced 3.0 license. If you have Cisco Nexus 1000V Release 4.2(1)SV2(2.2) software or earlier and have the Advanced 1.0 license installed, you must upgrade to the Advanced 3.0 license either by installing it directly or by upgrading to it using an Advanced 3.0 upgrade license. If you have the Advanced 3.0 license already installed, using the **switch edition advanced** command configures the switch with the Advanced 3.0 Edition license. When the Advanced license is installed, the switch immediately acquires the appropriate licenses from the license pool.



Note

Cisco Nexus 1000V Multi-Hypervisor License, version 1.0 can not co-exist with version 3.0 license. Make sure that you have enough license count to cover all the physical CPU sockets of all the Cisco Nexus 1000V VEM modules before replacing version 1.0 license with version 3.0 license.

The following table provides additional details about each license version.

Table 1: Advanced 1.0 and 3.0 License Features for Cisco Nexus 1000V for VMware

License Version	Minimum Software Release	Features	Maximum Resources
Advanced 1.0 ¹	4.2(1)SV2(1.1)	<ul style="list-style-type: none"> • Cisco TrustSec • DHCP snooping • Dynamic ARP Inspection • IP Source Guard • VXLAN Gateway <p>Note Starting with Release 5.2(1)SV3(1.15), Cisco Nexus 1000V for VMware vSphere does not support the VXLAN Gateway feature. The VXLAN gateway feature is still supported on earlier releases.</p> <p>Note The Cisco Virtual Security Gateway (VSG) is also available with this license. When you purchase Cisco VSG, you can install it and begin using it. No separate or additional license is required.</p>	<p>Advanced 1.0 supports the following number of resources:</p> <ul style="list-style-type: none"> • 128 hosts • 4096 virtual ports
Advanced 3.0 ²	5.2(1)SV3(1.1)	<ul style="list-style-type: none"> • VXLAN BGP Control Plane • BPDU Guard <p>Note Starting with Release 5.2(1)SV3(1.15), Cisco Nexus 1000V for VMware vSphere does not support the VXLAN Gateway feature. The VXLAN gateway feature is still supported on earlier releases.</p> <p>Note The Cisco VSG is also available with this license. When you purchase Cisco VSG, you can install it and begin using it. No separate or additional license is required.</p>	<p>Advanced 3.0 supports the following number of resources:</p> <ul style="list-style-type: none"> • 256 hosts • 12,288 virtual ports

¹ Advanced 1.0 supports all of the features in the Essential edition plus the listed features.

² Advanced 3.0 supports all of the features in the Essential and Advanced 1.0 editions plus the listed features.

Table 2: Advanced 3.0 License Features for Cisco Nexus 1000V for KVM

License Version	Minimum Software Release	Features	Maximum Resources
Advanced 3.0 ³	5.2(1)SK3(2.2)	<ul style="list-style-type: none"> • Cisco Virtual Security Gateway • Layer 3 Forwarding 	Advanced 3.0 supports the following number of resources: <ul style="list-style-type: none"> • 128 hosts • 8192 virtual ports

³ Advanced 3.0 supports all of the features in the Essential edition plus the listed features.

Table 3: Advanced 3.0 License Features for Cisco Nexus 1000V for Microsoft

License Version	Minimum Software Release	Features	Maximum Resources
Advanced 3.0 ⁴	5.2(1)SM3(1.1)	<ul style="list-style-type: none"> • DHCP Snooping • Dynamic ARP Inspection • IP Source Guard 	Advanced 3.0 supports the following number of resources: <ul style="list-style-type: none"> • 128 hosts • 8192 virtual ports

⁴ Advanced 3.0 supports all of the features in the Essential edition plus the listed feature.

This example shows how to display the output for the Advanced 1.0 license:

```
switch# show license
nlkv_license_1_0.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT NEXUS1000V LAN SERVICES_PKG cisco 1.0 permanent 16 \
  HOSTID=VDH=7647652151359566304 \
  NOTICE="<LicFileID>nlkv_license_1_0.lic</LicFileID><LicLineID>0</LicLineID> \
  <PAK>dummyPak</PAK>" SIGN=5BC8912C52AC
```

This example shows how to display the output for the Advanced 1.0 to 3.0 upgrade license:

```
switch# show license
upgrade_3_0.lic:
SERVER this_host ANY
VENDOR cisco
UPGRADE NEXUS1000V LAN SERVICES_PKG cisco 1.0 3.0 permanent 16 \
  HOSTID=VDH=7647652151359566304 \
  NOTICE="<LicFileID>upgrade_3_0.lic</LicFileID><LicLineID>0</LicLineID> \
  <PAK>dummyPak</PAK>" SIGN=3A919916D30C
```

This example shows how to display the output for the Advanced 3.0 license:

```
switch# show license
nlkv_license_3_0.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT NEXUS1000V LAN SERVICES_PKG cisco 3.0 permanent 16 \
  HOSTID=VDH=7647652151359566304 \
  NOTICE="<LicFileID>nlkv_license_3_0.lic</LicFileID><LicLineID>0</LicLineID> \
  <PAK>dummyPak</PAK>" SIGN=5BC8912C52AC
```

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 might cause 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.

There are 1024 default licenses preinstalled with the Cisco Nexus 1000V software that are valid for 60 days from the date of VSM installation. These default licenses allow you to use the Cisco Nexus 1000V Advanced Edition license for a 60-day trial period before you must purchase permanent licenses.

**Note**

The trial period and other licensing information are only relevant to the Advanced Edition license. The Essential Edition license is free and valid forever.

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:

- New vEthernet interfaces are not brought up.

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.

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 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).

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.

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

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.

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*.

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](#).

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 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.
```

License Expiry Warnings

As the evaluation license expiration date approaches, the license expiry warning log message informs Advanced edition users about the need to install permanent licenses or change the system to the Essential edition before the evaluation license expiration date. When the Advanced edition is active, messages are logged every day starting from 4 weeks before the license expiry date and every hour on the last day before the licenses expire.

After the expiration date, the existing modules and the interfaces continue to operate and the switch continues to forward the traffic, but if an interface or module flaps, it stays down until the valid licenses are installed or the switch is changed to the Essential edition. In addition, any new interfaces or modules come up in the unlicensed state.

You can disable the advanced features and change the switch edition to Essential even after the licenses have expired.