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Preface

This preface describes the audience, organization, and conventions of the Cisco NX-OS Licensing Guide. It also provides information on how to obtain related documentation.

- Audience, on page vii
- Document Conventions, on page vii
- Communications, Services, and Additional Information, on page viii

Audience

This publication is for experienced users who configure and maintain Cisco NX-OS devices.

Document Conventions

As part of our constant endeavor to remodel our documents to meet our customers' requirements, we have modified the manner in which we document configuration tasks. As a result of this, you may find a deviation in the style used to describe these tasks, with the newly included sections of the document following the new format.

Command descriptions use the following conventions:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>bold</strong></td>
<td>Bold text indicates the commands and keywords that you enter literally as shown.</td>
</tr>
<tr>
<td><em>Italic</em></td>
<td>Italic text indicates arguments for which the user supplies the values.</td>
</tr>
<tr>
<td>[x]</td>
<td>Square brackets enclose an optional element (keyword or argument).</td>
</tr>
<tr>
<td>[x</td>
<td>y]</td>
</tr>
<tr>
<td>{x</td>
<td>y}</td>
</tr>
<tr>
<td>Convention</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>[x {y</td>
<td>z}]</td>
</tr>
<tr>
<td></td>
<td>choices within optional or required elements. Braces and a vertical bar</td>
</tr>
<tr>
<td></td>
<td>within square brackets indicate a required choice within an optional</td>
</tr>
<tr>
<td></td>
<td>element.</td>
</tr>
<tr>
<td>variable</td>
<td>Indicates a variable for which you supply values, in context where italics</td>
</tr>
<tr>
<td></td>
<td>cannot be used.</td>
</tr>
<tr>
<td>string</td>
<td>A nonquoted set of characters. Do not use quotation marks around the string</td>
</tr>
<tr>
<td></td>
<td>or the string will include the quotation marks.</td>
</tr>
</tbody>
</table>

Examples use the following conventions:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>screen font</code></td>
<td>Terminal sessions and information the switch displays are in screen font.</td>
</tr>
<tr>
<td><code>boldface screen font</code></td>
<td>Information you must enter is in boldface screen font.</td>
</tr>
<tr>
<td><code>italic screen font</code></td>
<td>Arguments for which you supply values are in italic screen font.</td>
</tr>
<tr>
<td><code>&lt; &gt;</code></td>
<td>Nonprinting characters, such as passwords, are in angle brackets.</td>
</tr>
<tr>
<td><code>[ ]</code></td>
<td>Default responses to system prompts are in square brackets.</td>
</tr>
<tr>
<td><code>!</code>, <code>#</code></td>
<td>An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.</td>
</tr>
</tbody>
</table>

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.

---

**Communications, Services, and Additional Information**

- To receive timely, relevant information from Cisco, sign up at [Cisco Profile Manager](#).
- To get the business impact you’re looking for with the technologies that matter, visit [Cisco Services](#).
- To submit a service request, visit [Cisco Support](#).
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit [Cisco Marketplace](#).
- To obtain general networking, training, and certification titles, visit [Cisco Press](#).
• To find warranty information for a specific product or product family, access Cisco Warranty Finder.

Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.
Licensing Cisco NX-OS Software Features

This chapter contains information related to feature and module-based licensing for Cisco Nexus switches that run Cisco NX-OS software.

Cisco Data Center Network Manager (DCNM) is a GUI that you can use to manage your data center infrastructure. See the Cisco DCNM Installation and Licensing Guide for details about installing and licensing Cisco DCNM.

- Information About Licensing, on page 1
- Licensing Terminology, on page 29
- Licensing Virtualization Support, on page 30
- Licensing High Availability, on page 30
- License Installation, on page 31
- Obtaining the License Key File, on page 32
- Installing the License Key File, on page 34
- Backing Up Licenses, on page 36
- Enabling Licensed Features, on page 37
- Identifying License Features in Use, on page 37
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- Configuring the Grace Period Feature, on page 42
- Associating a License with a Module, on page 46
- License Transfers Between Devices, on page 47
- Verifying the License Configuration, on page 47
- Additional References, on page 48
- Feature History for Licensing, on page 48

Information About Licensing

Licensing allows you to access specified premium features on your device after you install the appropriate license for that feature.

The following table compares licensing support between Cisco Nexus 5000/7000 Series switches and Cisco Nexus 3000/9000 Series switches.
Table 1: Licensing Support for Cisco NX-OS Switches

<table>
<thead>
<tr>
<th>Licensing Feature</th>
<th>Cisco Nexus 5000 Series Switches</th>
<th>Cisco Nexus 7000 Series Switches</th>
<th>Cisco Nexus 3000 and 9000 Series Switches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enforcement</td>
<td>Enforced</td>
<td>Enforced, on Cisco NX-OS Release 8.3(2) and earlier 8.3(x) releases. From Cisco NX-OS Release 8.4(1), Honor-based licensing is introduced on Cisco Nexus 7000 Series switches.</td>
<td>Honor-based</td>
</tr>
<tr>
<td>Perpetual</td>
<td>Supported</td>
<td>Supported</td>
<td>Supported</td>
</tr>
<tr>
<td>Term</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subscription</td>
<td>Not supported</td>
<td>Not supported</td>
<td>Supported</td>
</tr>
<tr>
<td>Evaluation¹</td>
<td>Supported</td>
<td>Supported</td>
<td>Not supported</td>
</tr>
<tr>
<td>Grace period</td>
<td>Supported</td>
<td>Supported, on Cisco NX-OS Release 8.3(2) and earlier 8.3(x) releases. From Cisco NX-OS Release 8.4(1), Grace period is not supported on Cisco Nexus 7000 Series switches.</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

¹ Temporary licenses with an expiry date are available for evaluation and lab use purposes. They are strictly not allowed to be used in production. Please use a permanent or subscription license that has been purchased through Cisco for production purposes.
Tier-Based Licenses

Tier-based licensing is available for some Cisco Nexus 3000 and 9000 Series switches. This licensing model applies to both Cisco Application Centric Infrastructure (ACI) and NX-OS standalone architectures where these switches can be deployed. For Cisco Nexus platforms that do not support tier-based licensing, we offer only the NX-OS standalone feature-based licenses. For these switches, see Feature-Based Licenses, on page 10.

Note

The Feature History for Licensing, on page 48 section lists the platforms that support tier-based licensing and the release in which support was introduced.

Tier-based licensing offers the following benefits:

• Consistency across ACI and NX-OS licensing (for Cisco Nexus 9000 Series switches)

• The simplicity of being able to purchase a group of feature licenses as packages: Essentials, Advantage, Premier

• Subscription-based or perpetual licenses

  • A subscription-based license enables you to purchase a license for a specific period of time based on your requirement. A subscription-based license is offered as an Essentials, Advantage, or Premiere license package.

    Purchasing a subscription-based license gives you the opportunity to adjust/upgrade the terms of the license (such as moving from Advantage to Premier) at the time of license renewal.

  • A perpetual license enables you to make a one-time purchase of a license that does not expire. A perpetual license is offered as an Essentials or Advantage license package.

Note

Several add-on licenses are also available, which can be added to either tier or purchased independently.
### Table 2: Features Included in Tier-Based Licenses

<table>
<thead>
<tr>
<th>License Package</th>
<th>Features Included*</th>
</tr>
</thead>
</table>
| Essentials      | • ACI base features (ecosystem security, fabric management, intent-based networking, multi-pod, and virtualization)  
                  
**Note** The ACI base features are included in the Essentials package (along with the NX-OS features). Having the NX-OS and ACI licenses in one package prevents you from having to order a separate ACI license if you start with an NX-OS deployment and later want to convert to ACI.  
• Fabric management features (DCNM LAN and PTP)  
• Fabric services features (Catena, iCAM, ITD, IP fabric for media non-blocking multicast, and smart channel)  
• Routing and switching features (BGP, EIGRP, GRE, IS-IS, MSDP, OSPF, PBR, PIM, SSM, VRF, and VXLAN BGP EVPN)  
• Telemetry features (NetFlow, FT, FTE, SSX) |
| Advantage       | All features included in the Essentials package plus the following features:  
                  • ACI features (Multi-Site and physical remote leaf)  
                  • Advanced fabric features (Pervasive Load Balancing and Tenant Routed Multicast)  
                  • DCI overlay features (Inter AS option B, Layer 3 EVPN over segment routing, MPLS Layer 3 VPN, and VXLAN EVPN Multi-Site) |
| Premier         | All features included in the Essentials and Advantage packages plus support for the Cisco Network Insights Advisor and Cisco Network Insights for Resources. |
| NDB add-on license | Nexus Data Broker |
| Security add-on license | MACsec |
| Storage add-on license | FCoE, FC support on all 48 ports, and DCNM SAN |

*Feature support varies by platform and release. See the release notes and configuration guides to determine which features are supported for your platform.

The following options are available when you order an Essentials or Advantage package:  
• Cisco Nexus 9000 Series switches  
  • Cisco ONE subscription license for DCN (ACI+NX-OS) for 3 or 5 years  
  • Non-Cisco ONE perpetual license for DCN (ACI+NX-OS)  
  • Non-Cisco ONE perpetual license for NX-OS
• NX-OS upgrade licenses

• Cisco Nexus 3000 Series switches
  • Cisco ONE subscription license for NX-OS for 1, 3, or 5 years
  • Non-Cisco ONE perpetual license for NX-OS

If you install a subscription-based license, you will be notified 90 days before your licensing contract expires.

Note

If the Essentials license expires after the Advantage license is installed, the following message appears: "LIC_LICENSE_EXPIRED: License expired for feature NXOS_ESSENTIALS_XF. Feature will run in honor mode." You can ignore this message because the license is no longer in use.

Cisco Nexus 9000 Series Tier-Based Licenses

The DCN (ACI+NX-OS) Essentials, Advantage, and add-on licenses are supported for Cisco Nexus 9300 platform switches beginning with Cisco NX-OS Release 9.2(3). Beginning with Cisco NX-OS Release 7.0(3)I7(7) and 9.3(2), the ACI Premier licenses are supported for Cisco Nexus 9300 platform switches. These licenses support license migration from Cisco NX-OS to ACI. Any attempt to install these licenses for a prior release will fail.

When you downgrade from Cisco NX-OS Release 9.2(3) to an earlier release, the features that use the DCN (ACI+NX-OS) Essentials, Advantage, and add-on licenses continue to work in honor mode in the downgraded version. In addition, the output of the `show license usage` command continues to include entries for these unsupported licenses.

The -XM licenses apply to modular switches; the -GF licenses apply to switches with less than 3.6 Tbps; the -XF licenses apply to switches with more than 3.6 Tbps and less than 6.4 Tbps; and the -XF2 licenses apply to switches with more than 6.4 Tbps.

Table 3: PIDs for Cisco ONE Subscription Tier-Based Licenses for DCN (ACI+NX-OS) (Cisco Nexus 9000 Series Switches)

<table>
<thead>
<tr>
<th>License</th>
<th>1G Fixed Platforms (GF)</th>
<th>10G/25G/40G/100G Fixed Platforms (XF)</th>
<th>Nexus 9364C and 9300-GX Platforms (XF2)</th>
<th>4-Slot Modular Platforms</th>
<th>8- to 16-Slot Modular Platforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essentials package</td>
<td>C1E1TN9800GF-3Y</td>
<td>C1E1TN9800XF-3Y</td>
<td>C1E1TN9800XF2-3Y</td>
<td>C1E1TN800M-43Y</td>
<td>C1E1TN800M863Y</td>
</tr>
<tr>
<td></td>
<td>C1E1TN9800GF-5Y</td>
<td>C1E1TN9800XF-5Y</td>
<td>C1E1TN9800XF2-5Y</td>
<td>C1E1TN800M-45Y</td>
<td>C1E1TN800M865Y</td>
</tr>
<tr>
<td>Advantage package</td>
<td>C1AT1N9800GF-3Y</td>
<td>C1AT1N9800XF-3Y</td>
<td>C1AT1N9800XF2-3Y</td>
<td>C1AT1N800M-43Y</td>
<td>C1AT1N800M863Y</td>
</tr>
<tr>
<td></td>
<td>C1AT1N9800GF-5Y</td>
<td>C1AT1N9800XF-5Y</td>
<td>C1AT1N9800XF2-5Y</td>
<td>C1AT1N800M-45Y</td>
<td>C1AT1N800M865Y</td>
</tr>
</tbody>
</table>
### Table 4: PIDs for Non-Cisco ONE Perpetual Tier-Based Licenses for DCN (ACI+NX-OS) (Cisco Nexus 9000 Series Switches)

<table>
<thead>
<tr>
<th>License</th>
<th>1G Fixed Platforms (GF)</th>
<th>10G/25G/40G/100G Fixed Platforms (XF)</th>
<th>Nexus 9364C and 9300-GX Platforms (XF2)</th>
</tr>
</thead>
</table>
| Premier package
2 | C1P1TN9500M816-3Y | C1P1TN9300XF2-3Y | C1P1TN9500M816-3Y |
| | C1P1TN9500M816-5Y | C1P1TN9300XF2-5Y | C1P1TN9500M816-5Y |
| Add-On Licenses | | | |
| NDB | C1-N9K-NDB-3Y | C1-N9K-NDB-3Y | C1N9K-SEC-M-3Y |
| | C1-N9K-NDB-5Y | C1-N9K-NDB-5Y | C1N9K-SEC-M-5Y |
| Storage | Not supported | Not supported | Not supported |
| | C1N9K-STRG-XF-3Y | C1N9K-STRG-XF-3Y | C1N9K-STRG-XF-3Y |
| | C1N9K-STRG-XF-5Y | C1N9K-STRG-XF-5Y | C1N9K-STRG-XF-5Y |

**Note:** This license is available for only Cisco Nexus 93180YC-FX platform switches.

---

2 The ACI Premier license package includes the ACI Essentials and ACI Advantage license packages.

3 The Cisco Nexus 9300-GX switches do not support NDB.
### Nexus 9364C and 9300-GX Platforms (XF2)

<table>
<thead>
<tr>
<th>License</th>
<th>1G Fixed Platforms (GF)</th>
<th>10G/25G/40G/100G Fixed Platforms (XF)</th>
<th>Nexus 9364C and 9300-GX Platforms (XF2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage (FC NPV, FCoE NPV, and SAN switching)</td>
<td>Not supported</td>
<td>ACI-STRG</td>
<td>Not supported</td>
</tr>
</tbody>
</table>

*Note: This license is available for only Cisco Nexus 93180YC-FX-F switch platforms.*

---

4 The licenses for the Cisco Nexus 9364C switch are supported beginning with Cisco NX-OS Release 7.0(3)I7(6). The licenses for the Cisco Nexus 9300-GX switches are supported beginning with Cisco NX-OS Release 9.3(3).

5 Beginning with Cisco NX-OS Releases 7.0(3)I7(6) and 9.3(1), the -XF2 Essentials and Advantage licenses have priority over the -XF licenses. If an -XF license is installed and features are checked out from this license and then you later install the -XF2 license, the -XF license shows as unused (in the output of the `show license usage` command), and the features become checked out from the -XF2 license. The Advantage licenses continue to have priority over the Essentials licenses.

---

### Note

Cisco NX-OS Release 9.2(3) does not support ACI licenses for the Cisco Nexus 9336C-FX2, 93108TC-FX, 93180YC-FX, and 93240YC-FX2 platform switches.

The NX-OS Essentials, Advantage, and add-on licenses are supported for Cisco Nexus 9000 Series switches beginning with Cisco NX-OS Release 7.0(3)I7(3).

#### Table 5: PIDs for Non-Cisco ONE Perpetual Tier-Based Licenses for NX-OS (Cisco Nexus 9000 Series Switches)

<table>
<thead>
<tr>
<th>License</th>
<th>1G Fixed Platforms (GF)</th>
<th>10G/25G/40G/100G Fixed Platforms (XF)</th>
<th>Nexus 9364C and 9300-GX Platforms (XF2)</th>
<th>4-Slot Modular Platforms</th>
<th>8- to 16-Slot Modular Platforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantage package</td>
<td>NXOS-AD-GF</td>
<td>NXOS-AD-XF</td>
<td>NXOS-AD-XF2</td>
<td>NXOS-AD-M4</td>
<td>NXOS-AD-M8-16</td>
</tr>
<tr>
<td><strong>Add-On Licenses</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NDB</td>
<td>NXOS-NDB</td>
<td>NXOS-NDB</td>
<td>NXOS-NDB</td>
<td>NBDM18SW1K9</td>
<td>NBDM18SW1K9</td>
</tr>
<tr>
<td>Storage</td>
<td>Not supported</td>
<td>ACI-STRG-XF</td>
<td>Not supported</td>
<td>NXOS-STRG-M</td>
<td>NXOS-STRG-M</td>
</tr>
</tbody>
</table>
The licenses for the Cisco Nexus 9364C switch are supported beginning with Cisco NX-OS Release 7.0(3)I7(6). The licenses for the Cisco Nexus 9300-GX switches are supported beginning with Cisco NX-OS Release 9.3(3).

Beginning with Cisco NX-OS Releases 7.0(3)I7(6) and 9.3(1), the -XF2 Essentials and Advantage licenses have priority over the -XF licenses. If an -XF license is installed and features are checked out from this license and then you later install the -XF2 license, the -XF license shows as unused (in the output of the `show license usage` command), and the features become checked out from the -XF2 license.

The Advantage licenses continue to have priority over the Essentials licenses.

The Cisco Nexus 9300-GX switches do not support NDB.

ACI-SEC-XF is required only for supporting the uplink ports on the 1G Fixed Platforms.

ACI-SEC-XF replaces NXOS-SEC-XF. NXOS-SEC-XF is no longer orderable.

You can use the following licenses to upgrade from an NX-OS LAN Enterprise Services license to an NX-OS Essentials or Advantage license.

Table 6: NX-OS Upgrade Licenses (Cisco Nexus 9000 Series Switches)

<table>
<thead>
<tr>
<th>Upgrade License</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NXOS-UPG-L-ES-GF=</td>
<td>NX-OS Upgrade License: LAN to Essentials (1G platforms)</td>
</tr>
<tr>
<td>NXOS-UPG-L-AD-GF=</td>
<td>NX-OS Upgrade License: LAN to Advantage (1G platforms)</td>
</tr>
<tr>
<td>NXOS-UPG-ES-AD-GF=</td>
<td>NX-OS Upgrade License: Essentials to Advantage (1G platforms)</td>
</tr>
<tr>
<td>NXOS-UPG-L-ES-XF=</td>
<td>NX-OS Upgrade License: LAN to Essentials (10G+ platforms)</td>
</tr>
<tr>
<td>NXOS-UPG-L-AD-XF=</td>
<td>NX-OS Upgrade License: LAN to Advantage (10G+ platforms)</td>
</tr>
<tr>
<td>NXOS-UPG-ES-AD-XF=</td>
<td>NX-OS Upgrade License: Essentials to Advantage (10G+ platforms)</td>
</tr>
<tr>
<td>NXOS-UPG-L-ES-M4=</td>
<td>NX-OS Upgrade License: LAN to Essentials (modular 4-slot)</td>
</tr>
<tr>
<td>NXOS-UPG-L-AD-M4=</td>
<td>NX-OS Upgrade License: LAN to Advantage (modular 4-slot)</td>
</tr>
<tr>
<td>NXOS-UPG-ES-AD-M4=</td>
<td>NX-OS Upgrade License: Essentials to Advantage (modular 4-slot)</td>
</tr>
<tr>
<td>NXOS-UPG-L-ES-M8=</td>
<td>NX-OS Upgrade License: LAN to Essentials (modular 8- to 16-slot)</td>
</tr>
<tr>
<td>NXOS-UPG-L-AD-M8=</td>
<td>NX-OS Upgrade License: LAN to Advantage (modular 8- to 16-slot)</td>
</tr>
<tr>
<td>NXOS-UPG-ES-AD-M8=</td>
<td>NX-OS Upgrade License: Essentials to Advantage (modular 8- to 16-slot)</td>
</tr>
</tbody>
</table>

Cisco Nexus 3000 Series Tier-Based Licenses

The NX-OS Essentials, Advantage, and add-on licenses are supported for some Cisco Nexus 3000 Series switches.

Note

The Feature History for Licensing, on page 48 section lists the platforms that support tier-based licensing and the release in which support was introduced.
The -XM licenses apply to modular switches, the -XF licenses apply to switches with less than 6.4 Tbps, and the -XF2 licenses apply to switches with more than 6.4 Tbps.

The -XF2 Essentials and Advantage licenses have priority over the -XF licenses. If an -XF license is installed and features are checked out from this license and then you later install the -XF2 license, the -XF license shows as unused (in the output of the `show license usage` command), and the features become checked out from the -XF2 license. The Advantage licenses to have priority over the Essentials licenses.

### Table 7: PIDs for Cisco ONE Subscription Tier-Based Licenses for NX-OS (Cisco Nexus 3000 Series Switches)

<table>
<thead>
<tr>
<th>License</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Essentials package</strong></td>
<td>N3K-ES-XF-1Y</td>
</tr>
<tr>
<td></td>
<td>N3K-ES-XF-3Y</td>
</tr>
<tr>
<td></td>
<td>N3K-ES-XF-5Y</td>
</tr>
<tr>
<td></td>
<td>N3K-ES-XF2-1Y</td>
</tr>
<tr>
<td></td>
<td>N3K-ES-XF2-3Y</td>
</tr>
<tr>
<td></td>
<td>N3K-ES-XF2-5Y</td>
</tr>
<tr>
<td></td>
<td>N3K-ES-XM-1Y</td>
</tr>
<tr>
<td></td>
<td>N3K-ES-XM-3Y</td>
</tr>
<tr>
<td></td>
<td>N3K-ES-XM-5Y</td>
</tr>
<tr>
<td><strong>Advantage package</strong></td>
<td>N3K-AD-XF-1Y</td>
</tr>
<tr>
<td></td>
<td>N3K-AD-XF-3Y</td>
</tr>
<tr>
<td></td>
<td>N3K-AD-XF-5Y</td>
</tr>
<tr>
<td><strong>Add-On Licenses</strong></td>
<td></td>
</tr>
<tr>
<td>NDB</td>
<td>N3K-NDB-1Y</td>
</tr>
<tr>
<td></td>
<td>N3K-NDB-3Y</td>
</tr>
<tr>
<td></td>
<td>N3K-NDB-5Y</td>
</tr>
<tr>
<td>Security</td>
<td>N3K-SEC-1Y</td>
</tr>
<tr>
<td></td>
<td>N3K-SEC-3Y</td>
</tr>
<tr>
<td></td>
<td>N3K-SEC-5Y</td>
</tr>
</tbody>
</table>

11 License support for Cisco Nexus 3400-S switches:

Feature-Based Licenses

Feature-based licenses make features available to the entire physical device. Therefore, you only require one copy of the license for a device. A license only supports the listed features. Licenses may be specific to a particular hardware platform.

Any feature that is not included in a license package is bundled with the Cisco NX-OS software and is provided at no extra charge to you.

Note

The Cisco Nexus 9000 Series switches support static routes, switch virtual interfaces (SVIs), Hot Standby Router Protocol (HSRP), and Routing Information Protocol (RIP) by default (without any license).

The licenses are independent of each other. If you want to use features that are covered by different licenses, you must install all the appropriate licenses.

The following table lists the feature-based license packages for the Cisco Nexus 9000 Series (which includes Cisco Nexus 9200, 9300, 9300-EX, 9300-FX/FX2/FXP, and 9500 switches) in Cisco NX-OS mode.
In the CCW tool, these licenses are described as legacy NX-OS software licenses.

Table 9: Feature-Based Licenses for the Cisco Nexus 9000 Series in Cisco NX-OS Mode

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Feature Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise Services Package</td>
<td>N95-LAN1K9 (for Cisco Nexus 9500 Series switches)</td>
<td>• Open Shortest Path First (OSPF) Protocol</td>
</tr>
<tr>
<td>LAN_ENTERPRISE_SERVICES_PKG</td>
<td>N93-1G-LAN1K9 (for the Cisco Nexus N9K-C9348GC-FXP switch)</td>
<td>• Border Gateway Protocol (BGP)</td>
</tr>
<tr>
<td></td>
<td>N93-LAN1K9-XF2 (for the Cisco Nexus 9364C and 9300-GX switches)</td>
<td>• Protocol Independent Multicast (PIM), which includes sparse mode, bidirectional mode, and Source Specific Multicast (SSM) mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Multicast Source Discovery Protocol (MSDP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Policy-Based Routing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Generic Routing Encapsulation (GRE) Tunnels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enhanced Interior Gateway Routing Protocol (EIGRP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VRF route leaking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VXLAN BGP EVPN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note For specific implementation of these features, see the Release Notes document and configuration guides for the Cisco Nexus 9000 Series switches.</td>
</tr>
<tr>
<td>VPN Fabric License</td>
<td>N95-FAB1K9</td>
<td>• InterAS option B</td>
</tr>
<tr>
<td></td>
<td>N93-FAB1K9</td>
<td>• Layer 3 EVPN over segment routing MPLS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• MPLS Layer 3 VPN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pervasive Load Balancing (PLB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tenant Routed Multicast</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VXLAN EVPN Multi-Site</td>
</tr>
<tr>
<td>Feature License</td>
<td>Product ID</td>
<td>Feature Name</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Network Services Package</td>
<td>N95-SERVICES1K9</td>
<td>• Catena</td>
</tr>
<tr>
<td></td>
<td>N93-SERVICES1K9</td>
<td>• iCAM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Intelligent Traffic Director (ITD)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Non-blocking multicast (NBM) - for the IP fabric for media solution.</td>
</tr>
<tr>
<td>Note</td>
<td></td>
<td>The IP fabric for media solution also requires the N93-LAN1K9 or N95-LAN1K9 license for multicast.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Smart channel</td>
</tr>
<tr>
<td>FCoE NPV Package</td>
<td>N95-FNPV1K9</td>
<td>FCoE NPV</td>
</tr>
<tr>
<td></td>
<td>N93-FNPV1K9</td>
<td>Note</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The N93-16Y-SSK9 and N93-48Y-SSK9 licenses also support FCoE NPV. If you install one of these licenses (rather than N95-FNPV1K9 or N93-FNPV1K9), the show license command does not show FCoE NPV in the output. For more information, see the <em>Cisco Nexus 9000 Series NX-OS FC-NPV and FCoE-NPV Configuration Guide</em>.</td>
</tr>
<tr>
<td>SAN Switching Package</td>
<td>N93-16Y-SSK9 (up to 16 ports)</td>
<td>SAN switching, FC NPV, or FCoE NPV</td>
</tr>
<tr>
<td></td>
<td>N93-48Y-SSK9 (all 48 ports)</td>
<td>Note</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SAN switching, FC NPV, and FCoE NPV require both the FC_PORT_ACTIVATION_PKG and SAN_ENTERPRISE_PKG licenses. For more information, see the <em>Cisco Nexus 9000 Series NX-OS SAN Switching Configuration Guide</em> and the <em>Cisco Nexus 9000 Series NX-OS FC-NPV and FCoE-NPV Configuration Guide</em>.</td>
</tr>
<tr>
<td>Feature License</td>
<td>Product ID</td>
<td>Feature Name</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Security License</td>
<td>ACI-SEC-XM*** or ACI-SEC-XF**</td>
<td>MACsec</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note</td>
<td>Cisco Nexus 9000 Series ToR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>switches that support this</td>
<td></td>
</tr>
<tr>
<td></td>
<td>feature require the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACI-SEC-XF** license, and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cisco Nexus 9000 Series EoR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>switches that support this</td>
<td></td>
</tr>
<tr>
<td></td>
<td>feature require the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACI-SEC-XM*** license.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Feature Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NEXUS_24PORTEX_UPGRADE</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Feature Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NEXUS_24PORTFX_UPGRADE</td>
<td></td>
</tr>
</tbody>
</table>

*The 24-port licenses are hardware licenses. They are independent of any Cisco NX-OS or ACI software feature sets or software licenses.

**ACI-SEC-XF replaces NXOS-SEC-XF. NXOS-SEC-XF is no longer orderable.

***ACI-SEC-XM replaces NXOS-SEC-XM. NXOS-SEC-XM is no longer orderable.
The following table lists the feature-based license packages for the Cisco Nexus 7000 Series, which includes Cisco Nexus 7000 switches and Cisco Nexus 7700 switches.

**Table 10: Feature-Based Licenses for the Cisco Nexus 7000 Series**

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Feature Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise Services Package</td>
<td>N7K-LAN1K9</td>
<td>• Open Shortest Path First (OSPF) Protocol</td>
</tr>
<tr>
<td></td>
<td>N77-LAN1K9</td>
<td>• Border Gateway Protocol (BGP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Intermediate System-to-Intermediate System (IS-IS) Protocol (Layer 3 only)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Protocol Independent Multicast (PIM), which includes sparse mode,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>bidirectional mode, and source-specific mode (SSM)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Multicast Source Discovery Protocol (MSDP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Policy-Based Routing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Generic routing encapsulation (GRE) Tunnels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enhanced Interior Gateway Routing Protocol (EIGRP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VXLAN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• BGP eVPN Control Plane over VXLAN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ACI WAN Interconnect</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Locator/ID Separation Protocol (LISP)</td>
</tr>
<tr>
<td>Advanced Services Package</td>
<td>N7K-ADV1K9</td>
<td>• Virtual Device Contexts (VDCs)</td>
</tr>
<tr>
<td></td>
<td>N77-VDC1K9</td>
<td>• For Nexus 7000 Series, a single ADV license provides five non-admin VDCs</td>
</tr>
<tr>
<td>VDC Licenses</td>
<td></td>
<td>and one admin VDC. If you require an additional VDC, buy another license</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(N7K-VDC1K9) which in turn, provides another four VDCs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For Nexus 7700 Series, a single ADV license provides five non-admin VDCs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and one admin VDC. If you require an additional VDC, buy another license</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(N77-VDC1K9) which in turn, provides another four VDCs.</td>
</tr>
<tr>
<td>Feature License</td>
<td>Product ID</td>
<td>Feature Name</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>---------------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Transport Services Package</td>
<td>N7K-TRS1K9</td>
<td>• Overlay Transport Virtualization (OTV)</td>
</tr>
<tr>
<td>SCALABLE_SERVICES_PKG</td>
<td>N77-TRS1K9</td>
<td></td>
</tr>
<tr>
<td>Scalable Services Package</td>
<td>N7K-C7004-XL</td>
<td>A single license per system enables all XL-capable I/O modules to operate in XL mode. The license increases the performance of the following features:</td>
</tr>
<tr>
<td>SCALABLE_SERVICES_PKG</td>
<td>N7K-C7009-XL</td>
<td>• IPv4 routes</td>
</tr>
<tr>
<td></td>
<td>N7K-C7010-XL</td>
<td>• IPv6 routes</td>
</tr>
<tr>
<td></td>
<td>N7K-C7018-XL</td>
<td>• ACL entries</td>
</tr>
<tr>
<td>Enhanced Layer 2 Package</td>
<td>N7K-EL21K9</td>
<td>• FabricPath support on the F Series module</td>
</tr>
<tr>
<td>ENHANCED_LAYER2_PKG</td>
<td>N77-EL21K9</td>
<td>• Remote Integrated Service Engine (RISE)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Intelligent Traffic Director (ITD)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Intelligent CAM Analytics and Machine Learning (iCAM)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Catena</td>
</tr>
<tr>
<td>MPLS Services Package</td>
<td>N7K-MPLS1K9</td>
<td>• Multiprotocol Label Switching (MPLS)</td>
</tr>
<tr>
<td>MPLS_PKG</td>
<td>N77-MPLS1K9</td>
<td>• Layer 3 Virtual Private Network (VPN)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Layer 2 Ethernet over MPLS (EoMPLS)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Layer 2 Virtual Private LAN Services (VPLS)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ACI WAN Interconnect</td>
</tr>
<tr>
<td>Storage Enterprise Package</td>
<td>N7K-SAN1K9</td>
<td>• Inter-VSAN routing (IVR) over Fibre Channel and FCoE</td>
</tr>
<tr>
<td>STORAGE-ENT</td>
<td>N77-SAN1K9</td>
<td>IVR Network Address Translation (NAT) over Fibre Channel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VSAN-based Access Control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fabric Binding for Open Systems</td>
</tr>
</tbody>
</table>

**Note**

From Cisco NX-OS Release 6.1, Cisco TrustSec (CTS) does not require a feature license. CTS is included with the Cisco NX-OS software.
The following table lists the feature-based license packages for the Cisco Nexus 6000 Series switches.

**Table 11: Feature-Based Licenses for the Cisco Nexus 6000 Series**

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Feature Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>FabricPath Services Package</td>
<td>N6001-EL2-SSK9</td>
<td>FabricPath</td>
</tr>
<tr>
<td>ENHANCED_LAYER2_PKG</td>
<td>N6004-EL2-SSK9</td>
<td></td>
</tr>
<tr>
<td>FCoE NPV Package</td>
<td>N6K-FNPV-SSK9</td>
<td>FCoE NPV</td>
</tr>
<tr>
<td>FCOE_NPV_PKG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layer 3 Base Services Package</td>
<td>N6K-BAS1K9</td>
<td>Unlimited static routes and a maximum of 256 dynamic routes.</td>
</tr>
<tr>
<td>LAN_BASE_SERVICES_PKG</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 13</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Static routes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• RIPv2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• OSPFv2 and OSPFv3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• EIGRP Stub</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• HSRP 14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VRRP 15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• IGMP v2/v3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• PIMv2 (sparse mode)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VRF Lite</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Routed ACL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• NAT</td>
</tr>
</tbody>
</table>
### Feature-Based Licenses

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Feature Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer 3 Enterprise Services Package</td>
<td>N6001-LAN1K9</td>
<td>N6001-LAN1K9 / N6004-LAN1K9 (includes the following features in addition to the ones under N6K-BAS1K9 license).</td>
</tr>
<tr>
<td>Layer 3 Enterprise Services Package (continued)</td>
<td>N6004-LAN1K9</td>
<td>• BGP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• PBR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Full EIGRP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• PIMv2 (all modes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• L3 IS-IS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• uRPF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• MSDP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Sampled NetFlow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Intelligent Traffic Director (ITD)</td>
</tr>
<tr>
<td>Network Services Package</td>
<td>N6K-SERVICES1K9(^{19})</td>
<td>Remote Integrated Services Engine (RISE )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intelligent Traffic Director (ITD)</td>
</tr>
<tr>
<td>Storage Protocols Services Package</td>
<td>N6001-16P-SSK9</td>
<td>• Native Fibre Channel</td>
</tr>
<tr>
<td>Storage Protocols Services Package (continued)</td>
<td>N6004-4Q-SSK9</td>
<td>• FCoE</td>
</tr>
<tr>
<td></td>
<td>N6004-12Q-SSK9</td>
<td>• FC NPV</td>
</tr>
<tr>
<td></td>
<td>N6K-16P-SSK9(^{20})</td>
<td>• FC Port Security</td>
</tr>
<tr>
<td></td>
<td>N6K-20P-SSK9(^{21})</td>
<td>• Fabric Binding</td>
</tr>
<tr>
<td></td>
<td>N6001-64P-SSK9</td>
<td>• Fibre Channel Security Protocol (FC-SP)</td>
</tr>
<tr>
<td></td>
<td>N6004-96Q-SSK9</td>
<td>Authentication</td>
</tr>
<tr>
<td>VM-FEX Package</td>
<td>N6K-VMFEXK9</td>
<td>VM-FEX</td>
</tr>
</tbody>
</table>

12 The LAN_BASE_SERVICES_PKG gives unlimited static routes and a maximum of 256 dynamic routes across all the protocols.
13 Routes above 256 for all protocols are included in the LAN_ENTERPRISE_SERVICES_PKG license.
14 Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed. When you configure HSRP in a virtual port channel (vPC) on the Cisco Nexus 6000 platform without installing the LAN_BASE_SERVICES_PKG license, it sends an HSRP hello message to the link-local multicast address and enables the Active-Active state.
15 Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed.
16 The LAN_BASE_SERVICES_PKG license should be installed in order to use the
LAN_ENTERPRISE_SERVICES_PKG license.
17 Routes above 256 for all the protocols included in the LAN_ENTERPRISE_SERVICES_PKG license.
18 L3 IS-IS will be available starting with the Cisco NX-OS Release 7.0(1)N1(1).
19 N6K-SERVICES1K9 is available from Cisco NX-OS Release 7.2(0)N1(1). To use RISE and ITD
   features with Cisco NX-OS Release 7.1(1)N1(1), use the ENHANCED_LAYER2_PKG license.
20 These licenses are applicable to Cisco Nexus 6004 20 UP LEM only.
21 These licenses are applicable to Cisco Nexus 6004 20 UP LEM only.

The following table lists the feature-based license packages for the Cisco Nexus 5600 Series switches.

Table 12: Feature-Based Licenses for the Cisco Nexus 5600 Series

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Feature Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>FabricPath Services Package</td>
<td>N5672-EL2-SSK9</td>
<td>FabricPath</td>
</tr>
<tr>
<td>ENHANCED_LAYER2_PKG</td>
<td>N56128-EL2-SSK9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N5696-EL2-SSK9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N5624Q-EL2-SSK9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N5648Q-EL2-SSK9</td>
<td></td>
</tr>
<tr>
<td>FCoE NPV Package</td>
<td>N56-FNPV-SSK9</td>
<td>FCoE NPV</td>
</tr>
<tr>
<td>FCOE_NPV_PKG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layer 3 Base Services Package</td>
<td>N56-BAS1K9</td>
<td>Layer 3 Base Services Package</td>
</tr>
<tr>
<td>LAN_BASE_SERVICES_PKG</td>
<td></td>
<td>Unlimited static routes and maximum of 256 dynamic routes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Static Routes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- RIPv2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- OSPFv2 and OSPFv3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- EIGRP Stub</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- HSRP 23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- VRRP24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- IGMP v2/v3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- PIMv2 (sparse mode)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- VRF Lite</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Routed ACL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- NAT</td>
</tr>
</tbody>
</table>
### Feature-Based Licenses

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Feature Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer 3 Enterprise Services Package</td>
<td>N56-LAN1K9</td>
<td>Layer 3 Enterprise Services Package</td>
</tr>
<tr>
<td>LAN ENTERPRISE SERVICES_PKG</td>
<td></td>
<td>The N56-LAN1K9 license includes the following features in addition to the ones under the N56-BAS1K9 license.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• BGP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• PBR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Full EIGRP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• PIMv2 (all modes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• L3 IS-IS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• uRPF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• MSDP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Sampled NetFlow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VxLAN Flood and Learn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VxLAN EVPN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Intelligent Traffic Director (ITD)</td>
</tr>
<tr>
<td>Network Services Package</td>
<td>N56-SERVICES1K9</td>
<td>Remote Integrated Services Engine (RISE )</td>
</tr>
<tr>
<td>NETWORK_SERVICES_PKG</td>
<td></td>
<td>Intelligent Traffic Director (ITD)</td>
</tr>
<tr>
<td>Storage Protocols Services Package</td>
<td>N56-16p-SSK9</td>
<td>• Native Fibre Channel</td>
</tr>
<tr>
<td>FC_FEATURES_PKG</td>
<td>N56-12P-SSK9</td>
<td>• FCoE</td>
</tr>
<tr>
<td>ENTERPRISE_PKG</td>
<td>N56-12Q-SSK9</td>
<td>• NPV</td>
</tr>
<tr>
<td></td>
<td>N56-20P-SSK9</td>
<td>• Fabric Binding</td>
</tr>
<tr>
<td></td>
<td>N56-48Q-SSK9</td>
<td>• Fibre Channel Security Protocol (FC-SP) Authentication</td>
</tr>
<tr>
<td>VM-FEX Package</td>
<td>N56-VMFEX9</td>
<td>VM-FEX</td>
</tr>
</tbody>
</table>

---

22 The LAN_BASE_SERVICES_PKG gives unlimited static routes and a maximum of 256 dynamic routes across all the protocols.

23 Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed.
Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed.

The LAN_BASE_SERVICES_PKG license should be installed in order to use the LAN_ENTERPRISE_SERVICES_PKG license.

Routes above 256 for all the protocols included in the LAN_ENTERPRISE_SERVICES_PKG license.

L3 IS-IS will be available starting with the Cisco NX-OS Release 7.0(1)N1(1).

VXLAN Flood and Learn is supported from Cisco NX-OS Release 7.1(0)N1(1) and requires the LAN_BASE_SERVICES_PKG license and the ENHANCED_LAYER2_PKG license. From Cisco NX-OS Release 7.2(1)N1(1), VXLAN Flood and Learn will require the LAN_BASE_SERVICES_PKG license and the LAN_ENTERPRISE_SERVICES_PKG license only.

VXLAN EVPN is supported from Cisco NX-OS Release 7.3(0)N1(1) and will require the LAN_BASE_SERVICES_PKG license and the LAN_ENTERPRISE_SERVICES_PKG license.

N56-SERVICES1K9 is available from Cisco NX-OS Release 7.2(0)N1(1). To use RISE and ITD features with Cisco NX-OS Release 7.1(1)N1(1), use the ENHANCED_LAYER2_PKG license.

This license is applicable to Cisco Nexus 5672UP-16G only.

This license is applicable to Cisco Nexus 5696 20 Port UP LEM only.

The prefix of the Product ID number indicates the platform for which the license applies. For example, N5548 indicates that the license is for the Cisco Nexus 5548 switch only, and N5K indicates that the license is for all Cisco Nexus 5000 Series switches.

The following table lists the feature-based license packages for the Cisco Nexus 5000 Series and Cisco 5500 Series Platform.

### Table 13: Feature-Based Licenses for the Cisco Nexus 5000 and Nexus 5500 Series

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>FabricPath Services Package</td>
<td>N5548-EL2-SSK9</td>
<td>FabricPath</td>
</tr>
<tr>
<td>ENHANCED_LAYER2_PKG</td>
<td>N5596-EL2-SSK9</td>
<td></td>
</tr>
<tr>
<td>FCoE NPV Package</td>
<td>N5010-FNPV-SSK9</td>
<td>FCoE NPV</td>
</tr>
<tr>
<td>FCOE_NPV_PKG</td>
<td>N5020-FNPV-SSK9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N5548-FNPV--SSK9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N5596-FNPV-SSK9</td>
<td></td>
</tr>
<tr>
<td>Feature License</td>
<td>Product ID</td>
<td>Features</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>---------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Layer 3 Base Services Package               | N55-BAS1K9          | Layer 3 Base Services Package  
Unlimited static routes and a maximum of 256 dynamic routes  
- Static Routes  
- RIPv2  
- OSPFv2 and OSPFv3  
- EIGRP Stub  
- HSRP  
- VRRP  
- IGMP v2/v3  
- PIMv2 (sparse mode)  
- VRF Lite  
- Routed ACL |
| Layer 3 Enterprise Services Package         | N55-LAN1K9          | Layer 3 Enterprise Services Package  
N55-LAN1K9 includes the following features in addition to the ones under the N55-BAS1K9 license  
- BGP  
- PBR  
- PIMv2 (all modes)  
- Full EIGRP  
- uRPF  
- MSDP  
- Intelligent Traffic Director (ITD) |
| Network Services Package                    | N55-SERVICES1K9³⁸   | Remote Integrated Services Engine (RISE)  
Intelligent Traffic Director (ITD)³⁹ |
Table 14: Feature-Based Licenses for the Cisco Nexus 4000 Series

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Protocols Services Package</td>
<td>N5010-SSK9</td>
<td>• Native Fibre Channel</td>
</tr>
<tr>
<td>FC_FEATURES_PKG</td>
<td>N5020-SSK9</td>
<td>• FCoE</td>
</tr>
<tr>
<td>ENTERPRISE_PKG</td>
<td>N55-8P-SSK9</td>
<td>• NPV</td>
</tr>
<tr>
<td></td>
<td>N55-48P-SSK9</td>
<td>• FC Port Security</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fabric Binding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fibre Channel Security Protocol (FC-SP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Authentication</td>
</tr>
<tr>
<td>VM-FEX Package</td>
<td>N55-VMFEXK9</td>
<td>VM-FEX</td>
</tr>
</tbody>
</table>

33 The LAN_BASE_SERVICES_PKG gives unlimited static routes and a maximum of 256 dynamic routes across all the protocols.
34 Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed.
35 Although this feature can be enabled and configured in the CLI without this license, it will not function until the license is installed.
36 The LAN_BASE_SERVICES_PKG license should be installed to use the LAN_ENTERPRISE_SERVICES_PKG license.
37 Routes above 256 for all the protocols are included in the LAN_ENTERPRISE_SERVICES_PKG license.
38 N55-SERVICES1K9 is available from Cisco NX-OS Release 7.2(0)N1(1). To use RISE and ITD features with the Cisco NX-OS Release 7.1(1)N1(1), use the LAN_ENTERPRISE_SERVICES_PKG license.
39 Starting NXOS 7.2(0)N1(1), LAN_ENTERPRISE_SERVICES_PKG package does not contain ITD license. You need to install NETWORK_SERVICES_PKG package for ITD.

The following table lists the feature-based license packages for the Cisco Nexus 4000 Series.
The following table lists the feature-based license packages for the Cisco Nexus 3600 platform switches.

Table 15: Feature-Based Licenses for the Cisco Nexus 3600 Platform Switches

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer 3 Enterprise Services Package</td>
<td>N3K-LAN1K9</td>
<td>• BGP</td>
</tr>
<tr>
<td>LAN_ENTERPRISE_SERVICES_PKG</td>
<td></td>
<td>• EIGRP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• IS-IS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• OSPFv2 and OSPFv3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• PIM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VRF-lite</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VXLAN</td>
</tr>
<tr>
<td>VPN Fabric License</td>
<td>N3K-FAB1K9</td>
<td>• InterAS option B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• MPLS Layer 3 VPN</td>
</tr>
</tbody>
</table>

The following table lists the feature-based license packages for the Cisco Nexus 3500 Series switches.

Table 16: Feature-Based Licenses for the Cisco Nexus 3500 Series Switches

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 Port License Package</td>
<td>N3548-24P-LIC</td>
<td>24-port license for the Cisco Nexus 3548 Series switch.</td>
</tr>
<tr>
<td>24P_LIC_PKG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 Port Upgrade License Package</td>
<td>N3548-24P-UPG</td>
<td>24-port upgrade license for the Cisco Nexus 3548 Series switch.</td>
</tr>
<tr>
<td>24P_UPG_PKG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisco Nexus 3500 Algo Boost License</td>
<td>N3548-ALGK9</td>
<td>Cisco Nexus 3500 Algo Boost License</td>
</tr>
<tr>
<td>ALGO_BOOST_SERVICES_PKG</td>
<td></td>
<td>• Warp Mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Warp SPAN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Static NAT</td>
</tr>
<tr>
<td>Layer 3 Base Services Package</td>
<td>N3548-BAS1K9</td>
<td>Layer 3 Base Services Package</td>
</tr>
<tr>
<td>LAN_BASE_SERVICES_PKG</td>
<td></td>
<td>• EIGRP stub</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• OSPFv2 (limited routes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• PIMv2 (sparse mode)</td>
</tr>
</tbody>
</table>
### Feature-Based Licenses

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer 3 Enterprise Services Package</td>
<td>N3524-LAN1K9</td>
<td>Layer 3 Enterprise Services Package for Cisco Nexus 3524 Series switches</td>
</tr>
<tr>
<td><strong>LAN1K9_ENT_SERVICES_PKG</strong></td>
<td></td>
<td>• BGP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• PBR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VRF-Lite (IP-VPN)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This license requires the Base Services Package.</td>
</tr>
</tbody>
</table>

40 For Cisco NX-OS releases prior to 9.3(3), the BGP feature is checked out from the `LAN1K9_ENT_SERVICES_PKG` for both Cisco Nexus 3524 and 3548 platform switches.

41 For Cisco NX-OS releases prior to 9.3(3), the PBR feature is checked out from the `LAN_ENTERPRISE_SERVICES_PKG` for both Cisco Nexus 3524 and 3548 platform switches.

---

**Note**

After upgrading to Cisco NX-OS Release 7.0(3)I7(7), the *show license usage* command might display license mismatches that do not apply to Cisco Nexus 3500 Series switches. A "License Missing" warning in the comments section may also be displayed. Issue the *clear license srom* command to recover from this state.

The following table lists the feature-based license packages for the Cisco Nexus 3000 Series.

### Table 17: Feature-Based Licenses for the Cisco Nexus 3000 Series

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 Port License Upgrade Package</td>
<td>N3K-16T-UPG</td>
<td>16-port upgrade license for Cisco Nexus 3172TQ switches. This is the upgrade license to enable 16 ports, and it can only be applied to <code>N3K-C3172TQ-32T</code>.</td>
</tr>
<tr>
<td><strong>16P_UPG_PKG</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32 Port License Package</td>
<td>N3K-32X-LIC</td>
<td>Default 32-port license for the Cisco Nexus 3172TQ switches.</td>
</tr>
<tr>
<td><strong>32P_LIC_PKG</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feature License</td>
<td>Product ID</td>
<td>Features</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------</td>
<td>----------</td>
</tr>
<tr>
<td>16 Port License Upgrade Package</td>
<td>N3064T-16T-UPG</td>
<td>16-port upgrade license for Cisco Nexus 3164T switch.</td>
</tr>
<tr>
<td>32 Port License Package</td>
<td>N3064T-32T-LIC</td>
<td>32-port license for Cisco Nexus 3164T switch.</td>
</tr>
</tbody>
</table>
| Layer 3 Base Services Package | N3K-BAS1K9 | • EIGRP stub  
• OSPFv2 (limited routes)  
• PIMv2 (sparse mode)  
**Note** Only the Cisco Nexus 3016, 3048, 3064, 3132Q, 3132Q-XL, and 3172 switches require the Layer 3 Base Services Package. The Cisco Nexus 3132C-Z, 3164Q, 31128PQ, 3100-V, 32xx, and 34xx switches require the Layer 3 Enterprise Services Package (rather than the Layer 3 Base Services Package) to support these routing protocols. |
| Layer 3 Enterprise Services Package | N3K-LAN1K9, N3K-LAN2K9 | • BGP  
• Policy-Based Routing  
• Generic routing encapsulation (GRE) tunnels |
Module-based Licenses

Module-based licenses make features available to one module on the physical device, so you need one copy of the license for each module that you want to enable the features on. Each license only supports the listed features. Licenses may be specific to a particular hardware platform or module.

Any feature not included in a license package is bundled with the Cisco NX-OS software and is provided at no extra charge to you.

This table lists the module license packages for the Cisco Nexus 7000 Series, which includes Cisco Nexus 7000 switches and Cisco Nexus 7700 switches.

### Table 18: Module-Based Licenses for the Cisco Nexus 7000 Series

<table>
<thead>
<tr>
<th>Module License</th>
<th>Product ID</th>
<th>Features</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCoE Services Package</td>
<td>N7K-FCOE-F132XP=</td>
<td>• Fibre Channel over Ethernet (FCoE)</td>
<td>You do not need the Advanced Services Package to enable the storage VDC required for FCoE.</td>
</tr>
</tbody>
</table>
### Module License

<table>
<thead>
<tr>
<th>Module License</th>
<th>Product ID</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCoE F2-Series (FCoE_F2)</td>
<td>N7K-FCOE-F248XP</td>
<td>Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7000 48-port 10G SFP+ (F2)</td>
</tr>
<tr>
<td>N77-FCOE-F248XP</td>
<td>Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7700 Enhanced F2E Series 48 Port 10G (SFP+)</td>
<td></td>
</tr>
</tbody>
</table>

| FCoE F3-Series (FCoE_F3) | N7K-FCOE-F312FQ | Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7000 F3 Series 12-port 40-Gigabit Ethernet QSFP+ module |
| N7K-FCOE-F348XP | Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7000 F3 Series 48-port 10-Gigabit Ethernet SFP+ module |
| N77-FCOE-F324FQ | Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7700 F3 Series 24-port 40-Gigabit Ethernet QSFP+ module |
| N77-FCOE-F348XP | Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7700 F3 Series 48-port 10-Gigabit Ethernet SFP+ module |

- **Note**: The licenses are independent of each other. If you want to use features that are covered by different licenses, you must install all appropriate licenses. For example, if you want to use EIGRP and VDCs on the Cisco Nexus 7000 Series, you must install both the Enterprise Services Package license and the Advanced Services Package license.

- **Related Topics**: [Associating a License with a Module](#), on page 46

### Bundle/Chassis-based Licenses

Bundle/Chassis-based licensing makes the Fibre Channel over Ethernet (FCoE) feature available for all supported line card modules such as F2 and F3 for that particular chassis, with max counts supported by that chassis.

- **Note**: Bundle/Chassis-based licensing is not supported for the Cisco Nexus 7000 series.
This table lists the bundle/chassis-based licenses for the Cisco Nexus 7700 Series.

**Table 19: Bundle/Chassis-Based Licenses for the Cisco Nexus 7700 Series**

<table>
<thead>
<tr>
<th>Bundle/Chassis</th>
<th>Product ID</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>N7706-FCOE-10G=</td>
<td>N77-FCOE-F248XP</td>
<td>Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7706 F2 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 4 modules)</td>
</tr>
<tr>
<td></td>
<td>N77-FCOE-F348XP</td>
<td>Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7706 F3 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 4 modules)</td>
</tr>
<tr>
<td>N7710-FCOE-10G=</td>
<td>N77-FCOE-F248XP</td>
<td>Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7710 F2 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 8 modules)</td>
</tr>
<tr>
<td></td>
<td>N77-FCOE-F348XP</td>
<td>Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7710 F3 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 8 modules)</td>
</tr>
<tr>
<td>N7718-FCOE-10G=</td>
<td>N77-FCOE-F248XP</td>
<td>Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7718 F2 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 16 modules)</td>
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<tr>
<td></td>
<td>N77-FCOE-F324FQ</td>
<td>Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7706 F3 Series 24-port 40-Gigabit Ethernet QSFP+ Module (Maximum of 4 modules)</td>
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<tr>
<td>N7710-FCOE-40G=</td>
<td>N77-FCOE-F248XP</td>
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</tbody>
</table>
Subscription-Based Licenses

Starting from Cisco NX-OS Release 8.2(1), subscription-based licensing is available for Cisco Nexus 7000 Series switches. Subscription-based licensing enables you to purchase a license for a period of 1 year, 3 years or 5 years based on your requirement.

Honor Mode Licensing

Starting from Cisco NX-OS Releases 8.2(4) and 8.4(1), Honor Mode Licensing is supported on Cisco Nexus 7000 Series switches. Honor mode licensing allows you to enable or continue using a feature without having a valid license for that feature. In such a scenario, a syslog is generated once every 7 days until you acquire the required license. An example of such a syslog is given below.

%LICMGR-2-LOG_LIC_MISSING_WARNING: A feature that requires LAN_ENTERPRISE_SERVICES_PKG license is not installed. System supports honor based licensing so feature will continue to be fully functional. Use 'show license usage <package-name>' to find features using missing license.

Licensing Terminology

The following terms are used in this document:

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.

Licensed application
A software feature that requires a license to be used.

License enforcement
A mechanism that prevents a feature from being used without first obtaining a license.

Node-locked license
A license that can only be used on a particular device using the device’s unique host ID.

Host IDs
A unique chassis serial number that is specific to each device.

Software license claim certificate
A document entitling its rightful owner to use licensed features on one device as described in that document.
Product Authorization Key (PAK)

The PAK allows you to obtain a license key from one of the sites listed in the software license claim certificate document. After registering at the specified website, you will receive your license key file and installation instructions through e-mail.

License key file

A device-specific unique file that specifies the licensed features. Each file contains digital signatures to prevent tampering and modification. License keys are required to use a licensed feature. License keys are enforced within a specified time span.

Missing license

Once a license is installed, the license file can be deleted from bootflash as the license is copied to the internal file system. If the internal file system becomes corrupted or a supervisor module is replaced after you have installed a license, the license shows as missing although the feature continues to work. In this case, copy the license file (.lic) into bootflash and reinstall it as soon as possible.

Evaluation license

A temporary license. Evaluation licenses are time bound (valid for a specified number of days) and are tied to a host ID (device serial number).

Note

Temporary licenses with an expiry date are available for evaluation and lab use purposes. They are strictly not allowed to be used in production. Please use a permanent or subscription license that has been purchased through Cisco for production purposes.

Permanent license

A license that is not time bound is called a permanent license.

Grace period

The amount of time the features in a license package can continue functioning without a license.

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 at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html

Licensing Virtualization Support

On the Cisco Nexus 7000 Series, you install and manage licenses on the physical device in the default virtual device context (VDC 1). Licenses apply to features in all VDCs and Virtual Routing and Forwarding instances (VRFs) on the physical device. You do not need to obtain a separate license for each VDC or VRF. For more information on VDCs, see the Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide.

Licensing High Availability

As with other Cisco NX-OS features, the licensing feature also maintains the following high-availability standards:

- Installing any license in the device is a nondisruptive process.
- Installing a license automatically saves a copy of permanent licenses to the chassis.
- If you have enabled the grace period feature, enabling a licensed feature that does not have a license key starts a counter on the grace period. You then have 120 days to install the appropriate license keys, disable
the use of that feature, or disable the grace period feature. If at the end of the 120-day grace period the device does not have a valid license key for the feature, the Cisco NX-OS software automatically disables the feature and removes the configuration from the device.

---

**Note**
TheCisco Nexus 9000 Series and Cisco Nexus 3000 Series do not support the grace period feature.

**Note**
The Cisco Nexus 7000 Series switches support grace period on Cisco NX-OS Release 8.2(3) and earlier 8.x releases. From Cisco NX-OS Releases 8.2(4) and 8.4(1), Grace period is not supported on Cisco Nexus 7000 Series switches.

**Note**
Some licenses, for example Cisco TrustSec for the Cisco Nexus 7000 Series or Layer 3 Enterprise Services for the Cisco Nexus 5000 Series, do not have a grace period.

Devices with dual supervisors have the following additional high-availability features:

- The license software runs on both supervisor modules and provides failover protection.
- The license key file is mirrored on both supervisor modules. Even if both supervisor modules fail, the license file continues to function from the version that is available on the chassis.

## License Installation

You can either obtain a factory-installed license (only applies to new device orders) or perform a manual license installation of the license (applies to existing devices in your network).

**Note**
Only users with the network-admin role can install licenses on Cisco NX-OS devices. For information on user accounts and roles, see the *Security Configuration Guide* for your platform.

## Obtaining a Factory-Installed License

You can obtain factory-installed licenses for a new Cisco NX-OS device.

**SUMMARY STEPS**

1. Contact your reseller or Cisco representative and request this service.
2. Start using the device and the licensed features.
DETAILED STEPS

Step 1  Contact your reseller or Cisco representative and request this service.

Note  If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html

Your device is shipped with the required licenses installed in the system.

Step 2  Start using the device and the licensed features.

Performing a Manual Installation

If you have existing devices or if you wish to install the licenses on your own, you must first obtain the license key file and then install that file in the device.

Note  All licenses for the Cisco Nexus 5000 Series and the Cisco Nexus 4000 Series are factory-installed. Manual installation is not required.

Figure 1: Obtaining a License Key File

This figure shows how to obtain a license key file.

Obtaining the License Key File

You can obtain new or updated license key files.
SUMMARY STEPS

1. Obtain the serial number for your device by entering the `show license host-id` command. The host ID is also referred to as the device serial number.


3. Locate the product authorization key (PAK) from the software license claim certificate document.

4. Locate the website URL from the software license claim certificate document. You can access the Product License Registration website from this URL: https://tools.cisco.com/SWIFT/LicensingUI/Home

5. Follow the instructions on the Product License Registration website to register the license for your device.

6. For the Cisco Nexus 9000 Series switches, Cisco Nexus 3164Q switches, and Cisco Nexus 31128PQ switches, use the `copy licenses` command to save your license file to one of three locations—the bootflash: directory, the usb1: device, or the usb2: device. For the Cisco Nexus 7000 Series, use the `copy licenses` command from the default VDC to save your license file to one of four locations—the bootflash: directory, the slot0: device, the usb1: device, or the usb2: device. For all other platforms, use the `copy licenses` command to save your license file to one of two locations—the bootflash: directory or the volatile: directory.

DETAILED STEPS

<table>
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<th>Purpose</th>
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<tr>
<td><strong>Step 1</strong></td>
<td>Obtain the serial number for your device by entering the <code>show license host-id</code> command. The host ID is also referred to as the device serial number.</td>
</tr>
</tbody>
</table>

```
switch# show license host-id
License hostid: VDH=FOX064317SQ
```

**Tip** Use the entire ID that appears after the equal sign (=). In this example, the host ID is FOX064317SQ.

| **Step 2** | Obtain your software license claim certificate document. If you cannot locate your software license claim certificate, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html |
| **Step 3** | Locate the product authorization key (PAK) from the software license claim certificate document. |
| **Step 4** | Locate the website URL from the software license claim certificate document. You can access the Product License Registration website from this URL: https://tools.cisco.com/SWIFT/LicensingUI/Home |
| **Step 5** | Follow the instructions on the Product License Registration website to register the license for your device. |

The license key file is sent to you by e-mail and is digitally signed to only authorize use on the requested device. The requested features are also enabled once the Cisco NX-OS software on the specified device accesses the license key file.
Installing the License Key File

You can install the license to enable features on your device. For the Cisco Nexus 7000 Series, the license must be installed in the default VDC or admin VDC. A license applies to features in all VDCs and VRFs on the physical device.

Tip
If you need to install multiple licenses in any device, be sure to provide unique filenames for each license key file.
If you have a single supervisor module on your Cisco NX-OS device and you replace the supervisor module, you must reinstall the license key file.

If you are currently running with a grace period license to avoid service disruptions when you install your permanent license, do not disable the grace period by using the `no license grace-period` command. Instead, just install your new license. The license manager will automatically transition from grace licensing to the installed license.

### SUMMARY STEPS

1. Log into the device through the console port of the active supervisor.
2. Perform the installation by using the `install license` command on the active supervisor module from the device console.
3. (Optional) Back up the license key file.
4. Exit the device console and open a new terminal session to view all license files installed on the device using the `show license` command.
5. (Optional) Enable licensed features, if necessary, by using the `feature feature-name` command in global configuration mode. For example, you can enable the BGP feature as follows:

### DETAILED STEPS

**Step 1**
Log into the device through the console port of the active supervisor.

**Note** Only users with the network-admin role can install licenses on Cisco NX-OS devices. For information on user accounts and roles, see the Security Configuration Guide for your platform.

**Step 2**
Perform the installation by using the `install license` command on the active supervisor module from the device console.

```bash
switch# install license bootflash:license_file.lic
Installing license ..done
```

**Note** If you provide a target name for the license key file, the file is installed with the specified name. Otherwise, the filename specified in the license key file is used to install the license.

**Step 3**
(Optional) Back up the license key file.

**Step 4**
Exit the device console and open a new terminal session to view all license files installed on the device using the `show license` command.

```bash
switch# show license
Enterprise.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT LAN_ENTERPRISE_SERVICES_PKG cisco 1.0 permanent uncounted
VENDOR_STRING=<LIC_SOURCE>MDS_SWIFT</LIC_SOURCE><SKU>N7K-LAN1K9=</SKU>
HOSTID=VDH=TBC10412106
NOTICE="<LicFileID>20071025133322456</LicFileID><LicLineID>1</LicLineID><PAK></PAK>" SIGN=0CC6E2245FBE
```
**Note**

If the license meets all guidelines when the `install license` command is used, all features and modules continue functioning as configured.

You can use the `show license brief` command to display a list of license files installed on the device.

```
switch# show license brief
Enterprise.lic
```

You can use the `show license file` command to display information about a specific license file installed on the device.

```
switch# show license file Enterprise.lic
Enterprise.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT LAN_ENTERPRISE_SERVICES_PKG cisco 1.0 permanent uncounted \ 
  VENDOR_STRING=<LIC_SOURCE>MDS_SWIFT</LIC_SOURCE><SKU>N7K-LAN1K9=-</SKU> \ 
  HOSTID=VDH=TBC10412106 \ 
  NOTICE="<LicFileID>20071025133322456</LicFileID><LicLineID>1</LicLineID>\ 
  <PAK></PAK>" SIGN=0CC6E2245FB
```

**Step 5**

(Optional) Enable licensed features, if necessary, by using the `feature feature-name` command in global configuration mode. For example, you can enable the BGP feature as follows:

```
switch# configure terminal
switch(config)# feature bgp
```

---

**Related Topics**
- Feature-Based Licenses, on page 10
- Module-based Licenses, on page 26
- Backing Up Licenses, on page 36

---

**Backing Up Licenses**

If the configuration or bootflash memory on your device becomes corrupted, you might need to reinstall your license. You can do a reinstalltion from a backed up copy of the license key file. If you do not have a license key file, you can create a copy of the license key file from your installed license.

**Note**

If you have a single supervisor module on your Cisco NX-OS device and you replace the supervisor module, you must reinstall the license key file. You cannot reinstall the license key file from the backed-up copy.

**Caution**

If you erase any existing licenses installed on your device, you can reinstall them only by using the `install license` command using the license key file.
Only users with the network-admin role can back up licenses on Cisco NX-OS devices. On the Cisco Nexus 7000 Series, licenses must be backed up from the default VDC (VDC 1). For information on user accounts and roles, see the Security Configuration Guide for your platform.

---

**Backing Up the License Key File**

You can back up your license key file to a remote server or to an external device by using the `copy` command.

This example shows how to save a license key file to a remote server:

```
switch# copy bootflash:license_file.lic tftp://10.10.1.1//license_file.lic
```

Some Cisco NX-OS platforms support external flash devices. This example shows how to save a license key file to an external Flash device:

```
switch# copy bootflash:license_file.lic slot0:license_file.lic
```

**Backing Up an Installed License**

You can back up your license key file to a remote server or to an external device by using the `copy` command.

This example saves all licenses installed on your device to a .tar file and copies it to a remote UNIX-based server:

```
switch# copy licenses bootflash:Enterprise.tar
Backing up license done
switch# copy bootflash:Enterprise.tar tftp://10.10.1.1//Enterprise.tar
```

You can uncompress the .tar file on the remote UNIX-based server to create one or more backup license key files, depending on how many licenses you have installed. You can also extract the license files on your Cisco NX-OS device by using the `tar extract` command.

This example shows how to extract license files from a .tar file:

```
switch# tar extract bootflash:Enterprise.tar
```

**Enabling Licensed Features**

You might have to enable a licensed feature to configure it. To enable a licensed feature, use the `feature feature-name` command in global configuration mode. For example, you can enable the BGP feature as follows:

```
switch# configure terminal
switch(config)# feature bgp
```

**Identifying License Features in Use**

Use the `show license usage [package-name]` command to identify all of the active features.
switch# show license usage
Feature          Ins  Lic  Status   Expiry Date Comments
Count
-----------------------------------------------
LAN_ENTERPRISE_SERVICES_PKG Yes - In use Never -
-----------------------------------------------

switch# show license usage LAN_ENTERPRISE_SERVICES_PKG
Application
----------
bgp
msdp
ospf
----------

Note
Licenses are disabled if the system clock is reset. The show license usage command shows that the licensed feature is not enabled. To work around this behavior, reboot the device.

For Cisco Nexus 3000, 3500, 3600, and 9000 Series switches, the Comments field displays the time elapsed (in minutes and seconds) from when honor mode is enabled for a license package. This field is populated when a feature is enabled but the corresponding license is not installed.

switch# show license usage
Feature          Ins  Lic  Status   Expiry Date Comments
Count
-----------------------------------------------
FC_PORT_ACTIVATION_PKG No 0 Unused -
LAN_ENTERPRISE_SERVICES_PKG No - In use Honor Start OM 33S
-----------------------------------------------

For Cisco Nexus 7000 or 9000 Series switches, if “license missing” appears in the output of the show license usage command, the license file for your device is either not installed on the internal directory of the device or contains incorrect information. Complete these steps to resolve the issue:

1. Validate that the license host ID and file match the chassis serial number.

Note
If these do not match and you see the log on two devices, the license files are most likely swapped between the chassis. Compare the host ID and serial numbers between each chassis and move the appropriate file to the correct chassis.

2. Update the license file (.lic) with the file from the bootflash.

3. If these steps do not work, clear the license SPROM with the clear license sprom command and reinstall the license.

For the Cisco Nexus 7000 Series, use the show license usage vdc-all license-name command to identify the features active in a VDC for a specific license.

switch# show license usage vdc-all LAN_ADVANCED_SERVICES_PKG
The "@2" after the feature name in the `show license usage vdc-all` command output indicates that the feature is enabled in VDC 2.

For the Cisco Nexus 7000 Series, use the `show license usage vdc-all` command from the default VDC to identify all of the active features in all VDCs.

```
switch# show license usage vdc-all
```

## Uninstalling Licenses

You can only uninstall a permanent license that is not in use. If you try to delete a permanent license that is currently being used, the software rejects the request and issues an error message.

When you enable a Cisco NX-OS software feature, it can activate a license grace period. Uninstalling an unused license causes the grace period to come into effect. The grace period is counted from the first use of the feature without a license and is reset when a valid license file is installed.

For the Cisco Nexus 7000 Series, you can uninstall a license only from the default VDC (VDC 1).

**Note**

Only users with the network-admin role can uninstall licenses on Cisco NX-OS devices. For information on user accounts and roles, see the *Security Configuration Guide* for your platform.

**Note**

Permanent licenses cannot be uninstalled if they are currently being used. Features turned on by permanent licenses must be disabled before that license is uninstalled.

**Tip**

If you are using an evaluation license and would like to install a new permanent license, you can do so without service disruption and before the evaluation license expires. Removing an evaluation license immediately triggers a grace period without service disruption.

**Caution**

You must disable the features that are related to the feature before uninstalling a license. The delete procedure fails if the license is in use.
Step 1  Save your running configuration to a remote server by using the `copy` command.

```
switch# copy running-config tftp://server/path/filename
```

Step 2  Display a list of all installed license key files and identify the file to be uninstalled by using the `show license brief` command. In this example, the file to be uninstalled is the `Enterprise.lic` file.

```
switch# show license brief
Enterprise.lic
```

Step 3  Disable the features provided by the license to be uninstalled. Use the `show license usage vdc-all package-name` command to view the enabled features for a specified package.

```
switch# show license usage vdc-all LAN_ENTERPRISE_SERVICES_PKG
Application
----------
bgp
ospf
bgp@2
ospf@2
----------
```

**Note**  For the Cisco Nexus 7000 Series, if the feature names in the `show license usage vdc-all` command output are followed by "@" and a number, that means that the feature is enabled in a nondefault VDC and must be disabled from that VDC. The number after the feature name is the nondefault VDC identifier number. Use the `show vdc` command and `switchto vdc` command to reach the nondefault VDC where you can disable the features.

Step 4  Uninstall the `Enterprise.lic` file by using the `clear license filename` command, where `filename` is the name of the installed license key file.

```
switch# clear license Enterprise.lic
Clearing license Enterprise.lic:
SERVER this_host ANY
VENDOR cisco
```

Step 5  Continue uninstalling the license by entering `y` for yes.

```
Do you want to continue? (y/n) y
Clearing license ..done
```

The `Enterprise.lic` license key file is now uninstalled.

### Updating Licenses

If your license is time bound, you must obtain and install an updated license. Contact technical support to request an updated license.
For the Cisco Nexus 7000 Series, you can update the license only from the default VDC (VDC 1).

**Note**
If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html

**Note**
Only users with the network-admin role can update licenses on Cisco NX-OS devices. For information on user accounts and roles, see the *Security Configuration Guide* for your platform.

**SUMMARY STEPS**

1. Obtain the updated license file.
2. Save your running configuration to a remote server by using the `copy` command.
3. Verify the name of the file to be updated by using the `show license brief` command.
4. Update the license file by using the `update license {bootflash: | slot0: | usb0: | usb1:} new-license-filename old-license-filename` command.
5. Continue with the license update by entering `y` (yes is the default).
6. (Optional) Enable licensed features, if necessary, by using the `feature feature-name` command in global configuration mode. For example, you can enable the BGP feature as follows:

**DETAILED STEPS**

**Step 1**
Obtain the updated license file.

**Step 2**
Save your running configuration to a remote server by using the `copy` command.

**Step 3**
Verify the name of the file to be updated by using the `show license brief` command.

```
switch# show license brief
Enterprise1.lic
```

**Step 4**
Update the license file by using the `update license {bootflash: | slot0: | usb0: | usb1:} new-license-filename old-license-filename` command.

```
switch# update license bootflash:Enterprise2.lic Enterprise1.lic
```

**Note**
Make sure to use the `install` command to install a new license and the `update` command to update a license.

**Step 5**
Continue with the license update by entering `y` (yes is the default).

```
Do you want to continue? (y/n)  y
Updating license ..done
switch#
```

The Enterprise1.lic license key file is now updated.
Step 6 (Optional) Enable licensed features, if necessary, by using the `feature feature-name` command in global configuration mode. For example, you can enable the BGP feature as follows:

```
switch# configure terminal
switch(config)# feature bgp
switch#
```

---

**Related Topics**

- Feature-Based Licenses, on page 10
- Module-based Licenses, on page 26
- Obtaining the License Key File, on page 32

---

**Configuring the Grace Period Feature**

The grace period feature allows you to use licensed features that do not have a license key. By default, the license period feature is disabled. While the grace period feature is disabled, users cannot accidentally enable licensed features.

---

**Note**

The Cisco Nexus 9000 Series and Cisco Nexus 3000 Series do not support the grace period feature.

For the Cisco Nexus 7000 Series, you can enable and disable the grace period only from the default VDC (VDC 1).

On a Cisco Nexus 7000 Series switch, the grace period gets automatically started for features that do not have a license key installed (even when the `no license grace-period` command is enabled).

---

**Note**

Starting from Cisco NX-OS Releases 8.2(4) and 8.4(1), Grace period is not supported on Cisco Nexus 7000 Series switches.

For the Cisco Nexus 5000 Series, the `license grace-period` command is enabled by default.

---

**Note**

Only users with the network-admin role can enable the grace period on Cisco NX-OS devices. For information on user accounts and roles, see the Security Configuration Guide for your platform.

---

**Grace Period Alerts**

The Cisco NX-OS software gives you a 120-day grace period. This grace period starts or continues when you are evaluating a feature for which you have not installed a license. For the Cisco Nexus 7000 Series, the grace period applies to all VDCs on the physical device. If you start the grace period by enabling a licensed feature in one VDC, the grace period starts for all VDCs.

The grace period stops if you disable a feature that you are evaluating, but if you enable that feature again without a valid license, the grace period countdown continues where it left off.
Starting from Cisco NX-OS Releases 8.2(4) and 8.4(1), Grace period is not supported on Cisco Nexus 7000 Series switches.

To avoid service disruptions when you install the permanent license, do not disable the grace period by using the `no license grace-period` command. Instead, just install your new license. The license manager will automatically transition from grace licensing to the installed license.

Once the license manager is using your installed license, the grace period alerts will cease.

The grace period operates across all features in a license package. License packages can contain several features. If you disable a feature during the grace period and there are other features in that license package that are still enabled, the countdown does not stop for that license package. To suspend the grace period countdown for a license package, you must disable every feature in that license package. For the Cisco Nexus 7000 Series, you must disable the licensed features in all VDCs on the physical device. Use the `show license usage vdc-all license-name` command in the default VDC to determine which features to disable.

```
switch# show license usage vdc-all LAN_ENTERPRISE_SERVICES_PKG
Application
--------
bgp
ospf
bgp@2
ospf@2
--------
```

For the Cisco Nexus 7000 Series, if a feature name in the `show license usage vdc-all` command output is followed by "@" and a number, that means that the feature is enabled in a nondefault VDC and you must disable it from that VDC. The number after the feature name is the nondefault VDC identifier number. Use the `show vdc` command and `switch to vdc` command to reach the nondefault VDC where you can disable the feature.

When you disable a feature or when the license grace period expires, the Cisco NX-OS software generates a checkpoint containing the feature configuration that you can use to reconfigure the feature when you reenable the license after you install the license or resume the grace period countdown. For more information on checkpoints, see the System Management Configuration Guide for your platform.

The Cisco NX-OS license counter keeps track of all licenses on a device. If you are evaluating a feature and the grace period has started, you will receive console messages, SNMP traps, system messages, and Call Home messages on a daily basis. The frequency of these messages become hourly during the last seven days of the grace period.

In addition to the grace period alerts, Cisco NX-OS will display a banner at login in the last 15 days of the grace period.
NOTICE: NX-OS LICENSED FEATURES NEED ATTENTION

-----------------------------------------------------------------------------
Feature Ins Lic Status Expiry Date Comments
Count
-----------------------------------------------------------------------------
LAN_ENTERPRISE_SERVICES_PKG No - In use Grace 14D 6H
-----------------------------------------------------------------------------
**** WARNING: License(s) about to expire. When license(s) expire, all licensed conditional features will be disabled ****

During the last seven days of the grace period, the banner will include a prompt which you must dismiss before you can complete login:

NOTICE: NX-OS LICENSED FEATURES NEED ATTENTION

-----------------------------------------------------------------------------
Feature Ins Lic Status Expiry Date Comments
Count
-----------------------------------------------------------------------------
LAN_ENTERPRISE_SERVICES_PKG No - In use Grace 3D 23H
-----------------------------------------------------------------------------
**** WARNING: License(s) about to expire. When license(s) expire, all licensed conditional features will be disabled ****

CISCO TAC must be contacted asap for required licenses to prevent imminent downtime/service disruption.
Please press Enter to confirm you understand this risk and wish to continue: [ENTER]

For example, if you enabled a licensed feature on January 30, you will receive grace period ending messages as follows:

• Daily alerts from January 30 to May 21. Starting from May 15, Cisco NX-OS would display the banner at login.

• Hourly alerts from May 22 to May 30. The login banner would require you to dismiss its prompt before you can complete login.

On May 31, the grace period ends, and the licensed feature is automatically disabled. You will not be allowed to use the licensed feature until you purchase a valid license.

You cannot modify the frequency of the grace period messages.

After the final seven days of the grace period, the feature is turned off and your network traffic may be disrupted. Any future upgrade to Cisco NX-OS will enforce license requirements and the 120-day grace period.

Use the show license usage command to display grace period information for a device.

```bash
switch# show license usage
Feature Ins Lic Status Expiry Date Comments
Count
LAN_ADVANCED_SERVICES_PKG Yes - In use Never -
LAN_ENTERPRISE_SERVICES_PKG No - In use Grace 119D 22H
```
Enabling the License Grace Period

Enable the grace period feature by using the `license grace-period` command:

```
switch# configure terminal
switch(config)# license grace-period
```

For the Cisco Nexus 7000 Series, you can only enable the grace period feature from the default VDC.

Related Topics
- Feature-Based Licenses, on page 10
- Module-based Licenses, on page 26

Disabling the License Grace Period

To disable the grace period, you must disable all features that use the license grace period. Otherwise, the Cisco NX-OS software rejects the request and issues an error message.

- **Note**
  
  To avoid service disruptions, you should not disable the grace period before you install a permanent license.

**SUMMARY STEPS**

1. Display the licenses using the grace period by using the `show license usage` command. For the Cisco Nexus 7000 Series, you must work in the default VDC.

2. Disable the features provided by the license using the grace period. Display the enabled features for a specified package by using the `show license usage package-name` command. For the Cisco Nexus 7000 Series, use the `show license usage vdc-all package_name` in the default VDC to view the enabled features in all VDCs.

3. Disable the grace period.

**DETAILED STEPS**

**Step 1**

Display the licenses using the grace period by using the `show license usage` command. For the Cisco Nexus 7000 Series, you must work in the default VDC.

```
switch# show license usage
Feature                  Ins Lic Status Expiry Date Comments
                          Count
LAN_ADVANCED_SERVICES_PKG Yes - In use Never -
LAN_ENTERPRISE_SERVICES_PKG No - In use Grace 119D 22H
```

---

**Licensing Cisco NX-OS Software Features**

**Enabling the License Grace Period**

---

45
Step 2  Disable the features provided by the license using the grace period. Display the enabled features for a specified package by using the `show license usage package-name` command. For the Cisco Nexus 7000 Series, use the `show license usage vdc-all package_name` in the default VDC to view the enabled features in all VDCs.

```
switch# show license usage vdc-all LAN_ENTERPRISE_SERVICES_PKG
Application
--------
bgp
ospf
bgp@2
ospf@2
--------
```

**Note**  For the Cisco Nexus 7000 Series, if a feature name in the `show license usage vdc-all` command output is followed by "@" and a number, that means that the feature is enabled in a nondefault VDC and you must disable it from that VDC. The number after the feature name is the nondefault VDC identifier number. Use the `show vdc` command and `switch to vdc` command to reach the nondefault VDC where you can disable the feature.

When you disable a feature or when the license grace period expires, the Cisco NX-OS software generates a checkpoint containing the feature configuration that you can use to reconfigure the feature when you reenable the license after you install the license or reenable the grace period. For more information on checkpoints, see the *System Management Configuration Guide* for your platform.

Step 3  Disable the grace period.

```
switch# configure terminal
switch(config)# no license grace-period
```

### Associating a License with a Module

You must associate a module-based license with a module to enable the licensed features on that module.

**Before you begin**

- Ensure you have installed the correct license.
- Ensure you are in the correct VDC.
- Ensure you have met all required prerequisites for the feature. See the appropriate feature documentation for details.

**SUMMARY STEPS**

1. `license fcoe module module-number`
DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Associates the module-based license with the module.</td>
</tr>
<tr>
<td>license fcoe module <em>module-number</em></td>
<td></td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>switch(config)# license fcoe module 2</td>
<td></td>
</tr>
</tbody>
</table>

License Transfers Between Devices

A license is specific to the physical device for which it is issued and is not valid on any other physical device. If you need to transfer a license from one physical device to another, contact your customer service representative.

Note

If you have a single supervisor module on your Cisco NX-OS device and you replace the supervisor module, you must reinstall the license key file.

If you are evaluating a license when you replace the supervisor module, the grace period of the license is usually set to 120 days. On a dual supervisor system, the grace period of the license will be overwritten from the existing active supervisor module to the new standby supervisor module.

Note

If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html

Verifying the License Configuration

To display the license configuration information, perform one of the following tasks:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>show license [brief]</td>
<td>Displays information for all installed license files.</td>
</tr>
<tr>
<td>show license feature package mapping</td>
<td>Displays information about features available in installed license packages.</td>
</tr>
</tbody>
</table>

Note

The Cisco Nexus 9000 Series and the Cisco Nexus 3164Q switches do not support this command.
### Command

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>show license file</td>
<td>Displays information for a specific license file.</td>
</tr>
<tr>
<td>show license host-id</td>
<td>Displays the host ID for the physical device.</td>
</tr>
<tr>
<td>show license usage [license-package]</td>
<td>Displays the usage information for installed licenses.</td>
</tr>
</tbody>
</table>

### Additional References

This section includes additional information related to licensing the Cisco NX-OS software.

#### Table 20: Applicable MIBs

<table>
<thead>
<tr>
<th>MIBs</th>
<th>MIBs Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>• CISCO-LICENSE_MGR-MIB</td>
<td>To locate and download MIBs, go to the following URL: ftp://ftp.cisco.com/pub/mibs/supportlists/</td>
</tr>
</tbody>
</table>

### Feature History for Licensing

This table lists the release history for this feature.

#### Table 21: Feature History for Licensing

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Release</th>
<th>Feature Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>N3K-STR2K9 license</td>
<td>Cisco Nexus NX-OS Release 9.3(3)</td>
<td>Added support for the Cisco Nexus 3408-S and 3432D-S switches.</td>
</tr>
<tr>
<td>N93-LAN1K9-XF2 license</td>
<td>Cisco Nexus NX-OS Release 9.3(3)</td>
<td>Introduced for the Cisco Nexus 9300-GX switches.</td>
</tr>
<tr>
<td>Feature Name</td>
<td>Release</td>
<td>Feature Information</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
<td>---------------------</td>
</tr>
<tr>
<td>NX-OS Advantage license</td>
<td>Cisco Nexus NX-OS Release 9.3(3)</td>
<td>Added support for the Cisco Nexus 3132Q (excluding the 3132Q-40GE), 3172, 3172PQ, 3172TQ, 31128PQ, 3100-V, 3232C, 3264Q, and 3500 switches. <strong>Note</strong> The Cisco Nexus 3132Q, 3172, 3172PQ, and 3172TQ platform switches support the NX-OS Advantage license only when running in N9K mode. You can view the switch mode using the <code>show system switch-mode</code> command.</td>
</tr>
<tr>
<td>NXOS-ES-XF2 and NXOS-AD-XF2 licenses</td>
<td>Cisco Nexus NX-OS Release 9.3(3)</td>
<td>Introduced for the Cisco Nexus 9300-GX switches.</td>
</tr>
<tr>
<td>NXOS-SEC-XF license</td>
<td>Cisco Nexus NX-OS Release 9.3(3)</td>
<td>Added support for the Cisco Nexus 93216TC-FX2 and 93360YC-FX2 platform switches.</td>
</tr>
<tr>
<td>ACI Premier license packages</td>
<td>Cisco Nexus NX-OS Release 9.3(2)</td>
<td>Introduced for the Cisco Nexus 9000 Series switches.</td>
</tr>
<tr>
<td>Honor mode syslog in the output of the <code>show license usage</code> command</td>
<td>Cisco Nexus NX-OS Release 9.3(1)</td>
<td>Introduced for the Cisco Nexus 3000, 3500, 3600, and 9000 Series switches.</td>
</tr>
<tr>
<td>NX-OS Essentials and Advantage licenses</td>
<td>Cisco Nexus NX-OS Release 9.3(1)</td>
<td>Recommended that the -XF2 licenses be purchased for Cisco Nexus 3000 Series switches and Cisco Nexus 9364C switches.</td>
</tr>
<tr>
<td>NXOS-SEC-XF license</td>
<td>Cisco Nexus NX-OS Release 9.3(1)</td>
<td>Added support for the Cisco Nexus 9332C, 9348C-FXP, and 9364C platform switches.</td>
</tr>
<tr>
<td>Feature Name</td>
<td>Release</td>
<td>Feature Information</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>--------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>DCN (ACI+NX-OS) Essentials and Advantage license packages and add-on licenses</td>
<td>Cisco Nexus NX-OS Release 9.2(3)</td>
<td>Introduced for the Cisco Nexus 9300 platform switches.</td>
</tr>
<tr>
<td>N3K-LAN2K9 license</td>
<td>Cisco Nexus NX-OS Release 9.2(3)</td>
<td>Added support for the Cisco Nexus 3264C-E and 3464C switches.</td>
</tr>
<tr>
<td>N3K-STR1K9 license</td>
<td>Cisco Nexus NX-OS Release 9.2(3)</td>
<td>Added support for the Cisco Nexus 34180YC switch.</td>
</tr>
<tr>
<td>NXOS-SEC-XF license</td>
<td>Cisco Nexus NX-OS Release 9.2(1)</td>
<td>Added this license for Cisco Nexus 9000 Series ToR switches that support MACsec.</td>
</tr>
<tr>
<td>Honor Mode Licensing</td>
<td>Cisco Nexus NX-OS Release 8.4(1)</td>
<td>Introduced for the Cisco Nexus 7000 Series switches.</td>
</tr>
<tr>
<td></td>
<td>Cisco Nexus NX-OS Release 8.2(4)</td>
<td>iCAM feature is available under the ENHANCED_LAYER2_PKG license on Cisco Nexus 7000 Series switches.</td>
</tr>
<tr>
<td>ENHANCED_LAYER2_PKG license</td>
<td>Cisco NX-OS Release 8.2(1)</td>
<td>iCAM feature is available under the ENHANCED_LAYER2_PKG license on Cisco Nexus 7000 Series switches.</td>
</tr>
<tr>
<td>N95-FAB1K9 and N3K-FAB1K9 licenses</td>
<td>Cisco NX-OS Release 7.0(3)F3(3)</td>
<td>Added support for the InterAS option B and MPLS Layer 3 VPN features.</td>
</tr>
<tr>
<td>N3K-LAN1K9 license</td>
<td>Cisco NX-OS Release 7.0(3)F3(1)</td>
<td>Added support for the Cisco Nexus 3600 platform switches.</td>
</tr>
<tr>
<td>ACI Premier license packages</td>
<td>Cisco Nexus NX-OS Release 7.0(3)I7(7)</td>
<td>Introduced for the Cisco Nexus 9300 Series switches.</td>
</tr>
<tr>
<td>NX-OS Essentials and Advantage licenses</td>
<td>Cisco Nexus NX-OS Release 7.0(3)I7(7)</td>
<td>The -XF2 licenses now have priority over the -XF licenses for Cisco Nexus 3000 and 3600 Series switches and Cisco Nexus 9364C switches.</td>
</tr>
<tr>
<td>Feature Name</td>
<td>Release</td>
<td>Feature Information</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>----------------------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>NXOS-ES-XF2, NXOS-AD-XF2, and NXOS-NDB licenses</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(6)</td>
<td>Introduced for the Cisco Nexus 9364C switch.</td>
</tr>
<tr>
<td>N93-LAN1K9-XF2 license</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(6)</td>
<td>Introduced for the Cisco Nexus 9364C switch.</td>
</tr>
<tr>
<td>NX-OS Essentials and Advantage license packages and NX-OS upgrade licenses</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(3)</td>
<td>Introduced for the Cisco Nexus 9000 Series switches.</td>
</tr>
<tr>
<td>NXOS-SEC-XM license</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(2)</td>
<td>Added support for the MACsec feature for Cisco EoR switches.</td>
</tr>
<tr>
<td>FC NPV and FCoE NPV licenses</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(2)</td>
<td>Added support for FC and FCoE NPV.</td>
</tr>
<tr>
<td>N95-FAB1K9 and N93-FAB1K9 licenses</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(1)</td>
<td>Added support for the Pervasive Load Balancing, Tenant Routed Multicast, and VXLAN EVPN Multi-Site features.</td>
</tr>
<tr>
<td>N93-1G-LAN1K9 license</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(1)</td>
<td>Introduced this license for the Cisco Nexus N9K-C9348GC-FXP switch.</td>
</tr>
<tr>
<td>N95-SERVICES1K9 and N93-SERVICES1K9</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I7(1)</td>
<td>Added support for the iCAM feature.</td>
</tr>
<tr>
<td>N3K-FAB1K9, N95-FAB1K9, and N93-FAB1K9 licenses</td>
<td>Cisco Nexus 3000 and 9000 Series NX-OS Release 7.0(3)I6(1)</td>
<td>Added support for the Layer 3 EVPN over segment routing MPLS feature.</td>
</tr>
<tr>
<td>N95-SERVICES1K9 and N93-SERVICES1K9 licenses</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I6(1)</td>
<td>Added support for the catena and smart channel features.</td>
</tr>
<tr>
<td>N93-LAN1K9 license</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I4(2)</td>
<td>Added support for the non-blocking multicast (NMB) feature on Cisco Nexus 9236C, 9272Q, and 92160YC-X switches.</td>
</tr>
<tr>
<td>N3K-LAN1K9 license</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I4(1)</td>
<td>Added support for the Cisco Nexus 3100-V switches.</td>
</tr>
<tr>
<td>N95-FNPV1K9 license and N93-FNPV1K9 license</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I3(1)</td>
<td>Added these licenses to support FCoE NPV on Cisco Nexus 9500 and 9300 Series switches.</td>
</tr>
<tr>
<td>N93-LAN1K9 license</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I3(1)</td>
<td>Added support for the Cisco Nexus 9200 Series switches.</td>
</tr>
<tr>
<td>Feature Name</td>
<td>Release</td>
<td>Feature Information</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
<td>---------------------</td>
</tr>
<tr>
<td>N3K-LAN1K9 license</td>
<td>Cisco Nexus 3232C and 3264Q NX-OS Release 7.0(3)IX1(2)</td>
<td>Added support for the Cisco Nexus 3232C and 3264Q switches.</td>
</tr>
<tr>
<td>N3172T-32T-LIC, N3172T-16T-UPG</td>
<td>Cisco Nexus 3000 Series NX-OS Release 7.0(3)I2(1)</td>
<td>N3172T-32T-LIC is the default 32-port license for Cisco Nexus 3172TQ switches. N3172T-16T-UPG is the 16-port upgrade license for Cisco Nexus 3172TQ switches. This is the upgrade license to enable 16 ports and it can only be applied to N3K-C3172TQ-32T.</td>
</tr>
<tr>
<td>N3K-LAN1K9 license</td>
<td>Cisco Nexus 3000 Series NX-OS Release 7.0(3)I2(1)</td>
<td>Added support for the Cisco Nexus 31128PQ switch and the Cisco Nexus 3100 Series switches in N9K mode.</td>
</tr>
<tr>
<td>N95-LAN1K9 and N93-LAN1K9 licenses</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I2(1)</td>
<td>Added support for PIM bidirectional mode and Source-Specific Multicast (SSM) mode.</td>
</tr>
<tr>
<td>N6K-SERVICES1K9, N56-SERVICES1K9, and N55-SERVICES1K9</td>
<td>Cisco Nexus 5500, 5600, and 6000 Series NX-OS Release 7.2(0)N1(1)</td>
<td>Added these licenses to support the Intelligent Traffic Director (ITD) and Remote Integrated Services Engine (RISE) on the Cisco Nexus 5500, 5600 and 6000 Series switches.</td>
</tr>
<tr>
<td>N95-SERVICES1K9 license and N93-SERVICES1K9 license</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I1(2)</td>
<td>Added these licenses to support the Intelligent Traffic Director (ITD) on the Cisco Nexus 9500 and 9300 Series switches.</td>
</tr>
<tr>
<td>N95-LAN1K9 license</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I1(2)</td>
<td>Added VXLAN and BGP eVPN control plane support for the Cisco Nexus 9500 Series switches.</td>
</tr>
<tr>
<td>FCoE F3 Series</td>
<td>Cisco Nexus 7000 Series NX-OS Release 7.2(0)D1(1)</td>
<td>Added licenses for FCoE on F3 Series modules.</td>
</tr>
<tr>
<td>MPLS</td>
<td>Cisco Nexus 7000 Series NX-OS Release 7.2(0)D1(1)</td>
<td>Added license for MPLS on Cisco Nexus 7700 switches.</td>
</tr>
<tr>
<td>N93-LAN1K9 license and N3K-LAN1K9 license</td>
<td>Cisco Nexus 9000 Series NX-OS Release 7.0(3)I1(1)</td>
<td>Added support for the BGP eVPN control plane for the Cisco Nexus 9300 Series switches and the Cisco Nexus 3164Q switch.</td>
</tr>
<tr>
<td>N95-LAN1K9 license, N93-LAN1K9 license, and N3K-LAN1K9 license</td>
<td>Cisco Nexus 9000 Series NX-OS Release 6.1(2)I3(1)</td>
<td>Added support for policy-based routing.</td>
</tr>
<tr>
<td>Feature Name</td>
<td>Release</td>
<td>Feature Information</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>N3K-LAN1K9 license</td>
<td>Cisco Nexus 9000 Series NX-OS Release 6.1(2)I2(2a)</td>
<td>Added support for the Cisco Nexus 3164Q switch.</td>
</tr>
<tr>
<td>N93-LAN1K9 license</td>
<td>Cisco Nexus 9000 Series NX-OS Release 6.1(2)I2(1)</td>
<td>Added the license for the Cisco Nexus 9300 Series switches.</td>
</tr>
<tr>
<td>N95-LAN1K9 license</td>
<td>Cisco Nexus 9000 Series NX-OS Release 6.1(2)I1(1)</td>
<td>Added the license for the Cisco Nexus 9500 Series switches.</td>
</tr>
<tr>
<td>N77-LAN1K9 license</td>
<td>Cisco Nexus 7000 Series NX-OS Release 6.2(2)</td>
<td>Added licenses for the Cisco Nexus 7718 switch and the Cisco Nexus 7710 switch.</td>
</tr>
<tr>
<td>N77-VDC1K9 license</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N77-EL21K9 license</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N77-SAN1K9 license</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layer 3 Base Services Package</td>
<td>Cisco Nexus 3548 Switch NX-OS Release 5.0(3)A1(1)</td>
<td>Added the Cisco Nexus 3548 Layer 3 Base License.</td>
</tr>
<tr>
<td>Layer 3 Enterprise Services Package</td>
<td>Cisco Nexus 3548 Switch NX-OS Release 5.0(3)A1(1)</td>
<td>Added the Cisco Nexus 3548 Layer 3 Enterprise License.</td>
</tr>
<tr>
<td>Static NAT, Warp Mode, Warp SPAN</td>
<td>Cisco Nexus 3548 Switch NX-OS Release 5.0(3)A1(1)</td>
<td>Added the new 3500 Algo Boost License.</td>
</tr>
<tr>
<td>N7K-C7004-XL license</td>
<td>Cisco Nexus 7000 Series NX-OS Release 6.1(2)</td>
<td>Added the Cisco Nexus 7004 Scalable Feature License.</td>
</tr>
<tr>
<td>VDC and FCoE F2 Series</td>
<td>Cisco Nexus 7000 Series NX-OS Release 6.1(1)</td>
<td>Added licenses for VDCs and FCoE on F2 Series modules. Removed Cisco TrustSec from the Advanced Services Package.</td>
</tr>
<tr>
<td>MPLS, LISP, and FCoE</td>
<td>Cisco Nexus 7000 Series NX-OS Release 5.2(1)</td>
<td>Added licenses for the MPLS, LISP, and FCoE features.</td>
</tr>
<tr>
<td>Grace period</td>
<td>Cisco Nexus 7000 Series NX-OS Release 4.2(1)</td>
<td>Automatic checkpoints are created for configured licensed features when the grace period expires.</td>
</tr>
</tbody>
</table>
CHAPTER 2

Smart Software Licensing for Cisco Nexus 7000 Series Switches

Smart Software Licensing is a standardized licensing platform that simplifies the Cisco software experience and helps you understand how the Cisco software is used across your network. Smart Software Licensing is the next-generation licensing platform for all Cisco software products.

This chapter provides an overview of the Smart Software Licensing feature and describes the tools and processes required to complete the registration and authorization for Cisco Nexus 7000 Series Switches.

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- Information About Smart Software Licensing, on page 56
- Guidelines and Limitations for Smart Software Licensing, on page 58
- Smart Accounts and Virtual Accounts, on page 58
- Smart Software Manager Overview, on page 58
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- Requesting a Smart Account, on page 59
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- Converting a Traditional License to a Smart License, on page 61
- Converting a Traditional License to a Smart License—CLI Version, on page 61
- Configuring Smart Software Licensing, on page 63
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- Verification Examples for Smart Software Licensing, on page 67
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Smart Software Licensing for Cisco Nexus 7000 Series Switches

Smart Software Licensing is a standardized licensing platform that simplifies the Cisco software experience and helps you understand how the Cisco software is used across your network. Smart Software Licensing is the next-generation licensing platform for all Cisco software products.
This chapter provides an overview of the Smart Software Licensing feature and describes the tools and processes required to complete the registration and authorization for Cisco Nexus 7000 Series Switches.

Finding Feature Information

Your software release might not support all the features documented in this module. For the latest caveats and feature information, see the Bug Search Tool at https://tools.cisco.com/bugsearch/ and the release notes for your software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the Feature History for Smart Software Licensing table.

Information About Smart Software Licensing

Smart Software Licensing Overview

Smart Software Licensing is a new software-based licensing model based on a single technology that provides capabilities that are similar to the Enterprise-Level Agreement for all Cisco products.

Smart Software Licensing is a cloud-based licensing end-to-end model that consists of tools and processes to authorize you the usage and reporting of your Cisco products. This feature captures your order and communicates with the Cisco Cloud License Service through the Smart Call Home transport media to complete product registration and authorization at the corresponding performance and technology levels.

In the Smart Software Licensing model, you can activate licensed products without the use of a special software key or upgrade license file. You can activate the new functionalities using the appropriate product commands or configurations. Note that a software reboot may or may not be required depending on the product capabilities and requirements.

Similarly, downgrading or removing an advanced feature, performance, or functionality requires the removal of configurations or commands. After either of these actions is taken, the change in license state is noted by the Smart Software Manager during the next synchronization and an appropriate action is taken.

Starting from Cisco NX-OS 8.2(1), subscription-based licensing is available on Cisco Nexus 7000 Series switches. This enables the customer to purchase licenses for a period of time.

Smart Software Licensing provides a single, standardized licensing solution for your Cisco products.
Traditional Licensing Overview

Traditional licensing at Cisco is a legacy licensing model based on Product Activation Keys (PAK) and Unique Device Identifiers (UDI). On most Cisco NX-OS 7000 Series Switches, bandwidth needs are assessed prior to obtaining and installing a `.tar` file on switches to retrieve the UDI. Customers place an order for a PAK, and the PAK is emailed to the user. A combination of them, UDI and PAK is used to receive a license file that is installed in the boot directory of the switch to complete the installation of the Cisco NX-OS software.

The License Registration Portal (LRP) is available to help migrate traditional licenses to smart licenses. To access the LRP, obtain training, and manage licenses, go to http://tools.cisco.com/SWIFT/LicensingUI/Home.

You can convert the traditional license to a smart license in the following ways:

- Converting a Traditional License to a Smart License, on page 61
- Converting a Traditional License to a Smart License—CLI Version, on page 61

Comparing Licensing Models

Two types of licensing models are used for the Cisco Nexus 7000 Series Switches—traditional licensing and Smart Software Licensing.

Table 22: Comparison Between Traditional Licensing and Smart Software Licensing

<table>
<thead>
<tr>
<th>Description</th>
<th>Traditional Licensing</th>
<th>Smart Software Licensing</th>
</tr>
</thead>
<tbody>
<tr>
<td>License instance node locked to the product instance</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Product registration upon configuration</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Guidelines and Limitations for Smart Software Licensing

- You cannot use both traditional licensing and Smart Software Licensing at the same time on the Cisco Nexus 7000 Series Switches.

- Smart Software Licensing is not supported on Cisco N-Port Virtualizer (Cisco NPV) devices.

- Port licenses will be in out-of-compliance state when you move from a traditional license to a Smart Software License.

Smart Accounts and Virtual Accounts

- A Smart account provides you with a single location for all smart-account enabled products and licenses. It assists you in speedy procurement, deployment, and maintenance of your Cisco software.

  If you are requesting a Smart account on behalf of an organization, you must have the authority to represent the requesting organization when creating a Smart account. After submitting the request, the request goes through an approval process before you are provided with access to your Smart account.

  Go to http://software.cisco.com to learn about, set up, and manage a Smart account.

- A virtual account is a subaccount within a Smart account. You can define the virtual account's structure based on organizational layout, business function, geography, or any defined hierarchy. Virtual accounts can be created and maintained only by Smart account administrators.

Smart Software Manager Overview

Smart Software Manager enables the management of software licenses and Smart accounts from a single portal. The interface allows you to activate your product, manage entitlements, renew, and upgrade software. An active Smart account is required to complete the registration process. To access the Smart Software Manager, go to http://www.cisco.com/web/ordering/smart-software-manager/index.html.

You must add the following information in the Smart Software Manager:

- Trusted Unique Identifier—This is the device ID (Secure Unique Device Identifier (SUDI)).

- Organizational Identifier—This is a numerical format to associate a product with a Smart account or Virtual account.

- Licenses consumed—Allows the Smart Software Manager to understand the license type and the level of consumption.
Smart Call Home Overview

You must configure the DNS client and virtual routing and forwarding (VRF) before using Smart Call Home. For more information, see Configuring a DNS Client and Configuring a VRF To Send a Message Using HTTP.

Use the Smart Call Home feature to communicate with the Smart Software Manager. Smart Call Home is enabled automatically when you configure Smart Software Licensing. On Cisco Nexus 7000 Series Switches, Smart Software Licensing is not enabled by default.

The Smart Call Home (SCH) server runs on the Cisco Smart Software Manager (CSSM) satellite by default. You can access this service using the following URL:

https://<CSSM satellite IP>/Transportgateway/services/DeviceRequestHandler

Provide this URL as part of Smart Call Home configuration so that the device registration works with the CSSM satellite. For a sample configuration, see Configuration Examples for Smart Software Licensing.

Smart Call Home creates a CiscoTAC-1 profile. The associated Smart Call Home messages are sent to the Smart Software Manager only after enabling Smart Call Home. For switches in which Smart Software Licensing is enabled by default, Smart Call Home is also enabled by default, along with the associated messages.

To disable Smart Software Licensing, see Disabling Smart Software Licensing.

Smart Software Manager Satellite

Smart Software Manager satellite is a component of Smart Software Licensing and works in conjunction with the Smart Software Manager to manage software licenses. You can intelligently manage product licenses and get near real-time visibility and reports pertaining to the Cisco licenses you purchased and consumed.

If you do not want to manage your installed base using a direct Internet connection, the Smart Software Manager satellite will be installed on your premises to provide a subset of the Smart Software Manager functionality. You can download the satellite application, deploy it, and register it with the Smart Software Manager.

You can perform the following functions using the satellite application on your premises:

• Activate or register a license
• Get visibility to your company's licenses
• Transfer licenses between company entities

To learn more about the Smart Software Manager satellite, go to http://www.cisco.com/go/smartsatellite.

Requesting a Smart Account

Requesting a Smart account is a one-time process. Subsequent management of users is a capability provided through the tool.
**Before you begin**

Ensure that you have a Cisco Employee Connection (CEC) ID.

---

**Step 1**
Go to [http://software.cisco.com](http://software.cisco.com), and log in to your account.

**Step 2**
Click the **Request a Smart Account** link in the **Administration** section.

**Step 3**
Perform one of the following tasks to select the Account Approver:

- To select yourself as the approver, click **Yes, I will be the Approver for the account** option.
- To select a different person as the approver, click **No, the person specified below will be the Approver for the account** option and specify the person's email ID.

**Note**
The specified approver must have the authority to enter legal agreements. The approver serves as the primary owner and nominates account administrators.

**Step 4**
Depending on the approver type, perform one of the following procedures:

- If you are the approver, perform the following tasks:
  a. Enter **Account Name**, **Company/Organization Name**, **Country**, and **State/Province/Region** information.
  b. (Optional) Click **Edit**.
  c. In the **Edit Account Identifier** window, enter a valid **Proposed Domain Identifier** and **Contact Phone Number**, and click **OK**.

  **Note**
The default domain identifier is the approver's email domain. If you edit the domain identifier, the change goes through a manual approval process.

  d. Click **Continue** to select the legal address to be linked to your Smart account.

- If you are not the approver, perform the following procedure:
  a. Enter the **Account Name** and an optional **Message** to the approver.
  b. (Optional) Click **Edit**.
  c. In the **Edit Account Identifier** window, enter a valid **Proposed Domain Identifier**, and click **OK**.

  **Note**
The default domain identifier is the approver's email domain. If you edit the domain identifier, the change goes through a manual approval process.

  d. Click **Continue**.
  e. Follow the instructions in the email that is sent to you to complete the request.

---

**Adding a User to a Smart Account**

Smart account user management is available in the **Administration** section of Cisco Software Central.
Converting a Traditional License to a Smart License

Traditional licenses associated with Product Activation Keys (PAK) can be converted to Smart Licenses. Access Traditional licenses through the License Registration Portal by clicking the PAKs/Tokens tab, and then use the information provided in this section to convert PAKs to smart licenses.

Step 1  Go to http://software.cisco.com, and log in to your account.
Step 2  Click the Traditional Licensing link in the License section. You will be redirected to the LRP window.
Step 3  Click the PAKs/Tokens tab under Manage, if it is not already selected.
Step 4  Check the PAK/Token ID check box.
Step 5  Select Convert to Smart Entitlements from the Actions drop-down menu.
Step 6  Select a smart account from the Smart Account drop-down list. You can view only the smart accounts that are assigned to you.
Step 7  Select a virtual account from the Virtual Account drop-down list. You can view only the virtual accounts that are assigned to you.
Step 8  Click Assign. The selected PAK will be converted to a smart license.

Converting a Traditional License to a Smart License—CLI Version

Traditional licenses associated with Product Activation Keys (PAK) can be converted to smart licenses using CLI.
Before you begin

- Ensure that Smart Software Licensing is enabled.
- Ensure that you have a valid smart account.
- Ensure that you have valid user rights for the smart account.

---

Step 1

```bash
switch# license smart conversion start
```

Starts a manual conversion of a traditional license to a smart license. The conversion takes place in the background. After the conversion succeeds or fails, a system log message is displayed on the switch console.

Step 2

(Optional) ```bash
switch# license smart conversion stop
```

Stops the manual conversion.

Step 3

(Optional) ```bash
switch# show license status
```

Displays the license conversion status. If you run this command from an active device in an high availability (HA) configuration, this will display the status of all the devices in the HA configuration.

---

Converting a Traditional License to a Smart License—CLI Version

The following example shows how to convert a traditional license to a smart license using the CLI:

```bash
switch# license smart conversion start
```

Smart License Conversion process is in progress. Use the 'show license status' command to check the progress and result.

The following example shows how to stop the process of converting a traditional license to smart license using the CLI:

```bash
switch# license smart conversion stop
stop manual conversion failed:
Some Smart Licensing Conversion jobs stopped successfully.
```

The following example shows the status of the license conversion for a standalone device:

```bash
switch# show license status
```

Smart Licensing is ENABLED.
Registration:
Status: REGISTERED
Smart Account: Big-U University
Virtual Account: Physics
Export-Controlled Functionality: Not Allowed
Initial Registration: SUCCEEDED on Feb 24 23:30:12 2014 PST
Last Renewal Attempt: SUCCEEDED on Feb 24 23:30:12 2014 PST
Next Renewal Attempt: Aug 24 23:30:12 2014 PST
Registration Expires: Feb 24 23:30:12 2015 PST

---

The following show output is applicable from Cisco NX-OS Release 8.2(1) onwards!

Smart License Conversion:
Automatic Conversion Enabled: False
Configuring Smart Software Licensing

Configuring a DNS Client

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>switch# configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>switch(config)# ip domain-lookup</td>
<td>Enables DNS-based address translation.</td>
</tr>
<tr>
<td>Step 3</td>
<td>switch(config)# ip domain-name name [use-vrf vrf-name]</td>
<td>Defines the default domain name that Cisco NX-OS uses to resolve unqualified host names. You can also define a virtual routing and forwarding (VRF) that Cisco NX-OS uses to resolve this domain name if it cannot be resolved in the VRF that you configured this domain name under. Cisco NX-OS appends the default domain name to any hostname that does not contain a complete domain name before starting a domain-name lookup.</td>
</tr>
<tr>
<td>Step 4</td>
<td>switch(config)# ip name-server address1 [address2... address6] [use-vrf vrf-name]</td>
<td>Defines up to six servers. The address can be either an IPv4 address or an IPv6 address. You can optionally define a VRF that Cisco NX-OS uses to reach this name server if it cannot be reached in the VRF that you configured this name server under.</td>
</tr>
<tr>
<td>Step 5</td>
<td>switch(config)# vrf context vrf-name</td>
<td>Creates a VRF and enters VRF configuration mode.</td>
</tr>
<tr>
<td>Step 6</td>
<td>switch(config-vrf)# ip domain-name name [use-vrf vrf-name]</td>
<td>Defines the default domain name that Cisco NX-OS uses to complete unqualified host names. You can optionally define a VRF that Cisco NX-OS uses to resolve this domain name if it cannot be resolved in the VRF that you configured this domain name under. Cisco NX-OS appends the default domain name to any hostname that does not contain a complete domain name before starting a domain-name lookup.</td>
</tr>
<tr>
<td>Step 7</td>
<td>switch(config-vrf)# ip name-server address1 [address2... address6] [use-vrf vrf-name]</td>
<td>Defines up to six name servers. The address can be either an IPv4 address or an IPv6 address.</td>
</tr>
</tbody>
</table>
### Configuring a VRF To Send a Message Using HTTP

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> switc# configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> switch(config)# callhome</td>
<td>Enters Call Home configuration mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> switch(config-callhome)# transport http use-vrf vrf-name</td>
<td>Configures the VRF used to send email and other Smart Call Home messages over HTTP.</td>
</tr>
</tbody>
</table>

### Enabling Smart Software Licensing

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> switch# configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> Use one of the following commands to enable Smart Software Licensing:</td>
<td>Enables Smart Software Licensing.</td>
</tr>
<tr>
<td>• switch(config)# license smart enable</td>
<td></td>
</tr>
<tr>
<td>• switch(config)# feature license smart</td>
<td></td>
</tr>
</tbody>
</table>

### Disabling Smart Software Licensing

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> switch# configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> Use one of the following commands to disable Smart Software Licensing:</td>
<td>Disables Smart Software Licensing.</td>
</tr>
<tr>
<td>• switch(config)# no license smart enable</td>
<td></td>
</tr>
<tr>
<td>• switch(config)# no feature license smart</td>
<td></td>
</tr>
</tbody>
</table>
Registering a Device

Before you begin

• Ensure that Smart Software Licensing is enabled.
• Ensure that you have the token to be used to register your device to the smart account.

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 switch# license smart register idtoken token [force]</td>
<td>Registers your device to the smart account using the token.</td>
</tr>
</tbody>
</table>

Renewing Device Registration

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 switch# license smart renew ID</td>
<td>Renews the device registration.</td>
</tr>
</tbody>
</table>

Renewing Device Authorization

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 switch# license smart renew auth</td>
<td>Renews the device authorization.</td>
</tr>
</tbody>
</table>

Unregistering a Device

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 switch# license smart deregister</td>
<td>Unregisters a device.</td>
</tr>
</tbody>
</table>
Configuring Smart Call Home for Smart Software Licensing

Viewing a Smart Call Home Profile

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>switch# show callhome smart-licensing</td>
<td>Displays the Smart Call Home profile.</td>
</tr>
</tbody>
</table>

Enabling Smart Call Home Data Privacy

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>switch# configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>switch(config)# callhome</td>
<td>Enters Call Home configuration mode.</td>
</tr>
<tr>
<td>switch(config-callhome)# data-privacy hostname</td>
<td>Enables Call Home data privacy.</td>
</tr>
</tbody>
</table>

Verifying Smart Software Licensing

Verify Smart Software Licensing using the following commands:

<table>
<thead>
<tr>
<th>Commands</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>show license all</td>
<td>Displays all smart license agent information.</td>
</tr>
<tr>
<td>show license status</td>
<td>Displays the smart license agent status.</td>
</tr>
<tr>
<td>show license summary</td>
<td>Displays a summary of the smart license agent status.</td>
</tr>
<tr>
<td>show license tech support</td>
<td>Gathers information for troubleshooting.</td>
</tr>
<tr>
<td>show license udi</td>
<td>Displays device UDI information.</td>
</tr>
<tr>
<td>show license usage</td>
<td>Displays show license usage table information.</td>
</tr>
<tr>
<td>show tech-support license</td>
<td>Displays licensing technical support information.</td>
</tr>
</tbody>
</table>

Configuration Examples for Smart Software Licensing

This example shows how to register your device with the Cisco portal and enable Smart Software Licensing:
To avoid any issues during registering your device, ensure to check if the name server is reachable before registering your device.

```
switch# configure terminal
switch(config)# ip domain-lookup
switch(config)# ip domain-name cisco.com
switch(config)# ip name-server 171.70.168.183 use-vrf management
switch(config)# vrf context management
switch(config-vrf)# ip domain-name cisco.com
switch(config-vrf)# ip name-server 171.70.168.183
switch(config-vrf)# exit
switch(config)# callhome
switch(config-callhome)# transport http use-vrf management
switch(config-callhome)# exit
switch(config)# feature license smart
```

This example shows how to disable Smart Software Licensing:

```
switch# configure terminal
switch(config)# no feature license smart
```

This example shows how to register a device:

```
switch# configure terminal
switch(config)# license smart register idtoken sampletokenID
register status: Registration process is in progress. Use the 'show license status' command to check the progress and result
```

This example shows how to unregister a device:

```
switch# license smart deregister
```

This example shows how to provide the URL for CSSM satellite as part of smart call home configuration:

```
switch(config-callhome)# destination-profile CiscoTAC-1 http https://10.83.111.51/Transportgateway/services/DeviceRequestHandler
```

* The IP address should have the format: https://<CSSM satellite IP>/Transportgateway/services/DeviceRequestHandler

---

**Verification Examples for Smart Software Licensing**

These examples show how to verify Smart Software Licensing:

```
switch# show license status

Smart Licensing is ENABLED
Registration:
  Status: REGISTERED
```

---

**Note**

These examples show how to verify Smart Software Licensing:
Smart Account: Cisco Systems, Inc.
Virtual Account: NexusSmartLicensing_Test
Export-Controlled Functionality: Allowed
Initial Registration: SUCCEEDED on Dec 14 10:43:33 2016 UTC
Last Renewal Attempt: None
Next Renewal Attempt: Jun 12 10:43:32 2017 UTC
Registration Expires: Dec 14 08:07:20 2017 UTC

License Authorization:
Status: AUTHORIZED on Dec 14 10:43:48 2016 UTC
Last Communication Attempt: SUCCEEDED on Dec 14 10:43:48 2016 UTC
Next Communication Attempt: Jan 13 10:43:47 2017 UTC
Communication Deadline: Dec 14 08:07:20 2017 UTC

switch# show callhome smart-licensing

Current smart-licensing transport settings:
Smart-license messages: enabled
Profile: CiscoTAC-1 (status: ACTIVE)

switch# show license summary

Smart Licensing is ENABLED

Registration:
Status: REGISTERED
Smart Account: Cisco Systems, Inc.
Virtual Account: NexusSmartLicensing_Test
Export-Controlled Functionality: Allowed

License Authorization:
Status: AUTHORIZED on Dec 14 10:43:48 2016 UTC
Last Communication Attempt: SUCCEEDED
Next Communication Attempt: Jan 13 10:43:47 2017 UTC
Communication Deadline: Dec 14 08:07:20 2017 UTC

switch# show license all

Smart Licensing Status
----------------------
Smart Licensing is ENABLED

Registration:
Status: REGISTERED
Smart Account: Cisco Systems, Inc.
Virtual Account: NexusSmartLicensing_Test
Export-Controlled Functionality: Allowed
Initial Registration: SUCCEEDED on Dec 14 10:43:33 2016 UTC
Last Renewal Attempt: None
Next Renewal Attempt: Jun 12 10:43:32 2017 UTC
Registration Expires: Dec 14 08:07:20 2017 UTC

License Authorization:
Status: AUTHORIZED
Last Communication Attempt: SUCCEEDED on Dec 14 10:43:48 2016 UTC
Next Communication Attempt: Jan 13 10:43:48 2017 UTC
Communication Deadline: Dec 14 08:07:21 2017 UTC

License Usage
----------
Product Information
---------------------
UDI: SN:JAF1428DTAH

Agent Version
-------------
Smart Agent for Licensing: 1.6.6_rel/88

switch# show license tech support

Smart Licensing Status
-----------------------
Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: Cisco Systems, Inc.
  Virtual Account: NexusSmartLicensing_Test
  Export-Controlled Functionality: Allowed
  Initial Registration: SUCCEEDED on Dec 14 10:43:33 2016 UTC
  Last Renewal Attempt: None
  Next Renewal Attempt: Jun 12 10:43:32 2017 UTC
  Registration Expires: Dec 14 08:07:20 2017 UTC

License Authorization:
  Status: AUTHORIZED on Dec 14 10:43:48 2016 UTC
  Last Communication Attempt: SUCCEEDED on Dec 14 10:43:48 2016 UTC
  Next Communication Attempt: Jan 13 10:43:47 2017 UTC
  Communication Deadline: Dec 14 08:07:20 2017 UTC

Evaluation Period:
  Evaluation Mode: Not In Use
  Evaluation Period Remaining: 89 days, 23 hours, 59 minutes, 7 seconds

License Usage
-------------

Product Information
---------------------
UDI: SN:JAF1428DTAH

Agent Version
-------------
Smart Agent for Licensing: 1.6.6_rel/88

Upcoming Scheduled Jobs
-----------------------
Current time: Dec 15 08:44:44 2016 UTC
  IdCert Expiration Warning: Oct 15 08:07:20 2017 UTC (303 days, 23 hours, 22 minutes, 36 seconds remaining)
  Daily: Dec 15 10:26:50 2016 UTC (1 hours, 42 minutes, 6 seconds remaining)
  Certificate Renewal: Jun 12 10:43:32 2017 UTC (179 days, 1 hours, 58 minutes, 48 seconds remaining)
  Reservation configuration mismatch between nodes in HA mode: Not Available
  Certificate Expiration Check: Dec 14 08:07:20 2017 UTC (363 days, 23 hours, 22 minutes, 36 seconds remaining)
  Authorization Renewal: Jan 13 10:43:47 2017 UTC (29 days, 1 hours, 59 minutes, 3 seconds remaining)
  Authorization Expiration Check: Dec 14 08:07:20 2017 UTC (363 days, 23 hours, 22 minutes, 36 seconds remaining)
  Init Flag Check: Not Available
  Register Period Expiration Check: Not Available
Ack Expiration Check: Not Available

License Certificates
---------------------
Production Cert: True
PIID: 27dc6a49-9745-4c7c-86de-d1dbd31e58ac

Licensing Certificate:

Id certificate Info:
  Start Date: Dec 14 08:07:22 2016 UTC
  Expiry Date: Dec 14 08:07:22 2017 UTC
  Version Number: 3
  Serial Number: 727430
  Common Name: 9c172927d1806d05694c1f434b40ec0f0b93abb::2

Signing certificate Info:
  Start Date: Sep 11 19:05:34 2013 UTC
  Expiry Date: Dec 7 07:00:15 2069 UTC
  Version Number: 3
  Serial Number: 3
  Common Name: MMI Signer

Sub CA Info:
  Start Date: Sep 11 19:06:30 2013 UTC
  Expiry Date: Dec 7 07:00:15 2069 UTC
  Version Number: 3
  Serial Number: 2
  Common Name: Smart Licensing CA

Root Cert Info:
  Start Date: May 30 19:48:47 2013 UTC
  Expiry Date: Dec 7 07:00:15 2069 UTC
  Version Number: 3
  Serial Number: 1
  Common Name: Cisco Licensing Root CA

HA Info
=======
RP Role: Active
Chassis Role: Active
Behavior Role: Active
RMF: True
CF: True
CF State: Stateless

Other Info
---------
Software ID: regid.2015-09.com.cisco.Nexus_7000,1.0_6e2b6ed8-fe9b-48e0-a71f-74ea
flbcc991
Agent State: authorized
TS enable: True
Transport: Callhome
Locale: C
Debug flags: 0x7
Privacy Send Hostname: True
Privacy Send IP: True
Build type:: Production
sizeof(char) : 1
sizeof(int) : 4
sizeof(long) : 4
sizeof(char *) : 4
sizeof(time_t) : 4
sizeof(size_t) : 4
Use Cases for Smart Software Licensing

Scenario 1

1. Configure and order a Cisco Nexus 7000 Series Switch with licenses and select the Cisco NX-OS release that will be preinstalled on the hardware prior to shipment.

   Note: To convert the preinstalled licenses on the hardware to smart licenses, you must have a Smart Account set up, and then convert the licenses by going to the License Registration Portal.

2. Click the Devices tab under the Manage section. Click the corresponding Device ID, and choose Convert to Smart Entitlements from the Device ID drop-down list. This will convert all the licenses that are
preinstalled on the switch to smart licenses. Note that this task must be performed for each switch that you want to convert to smart license.

3. The service will validate if license Stock Keeping Units (SKUs) on the switch have been mapped to smart licenses before proceeding with the conversion.

4. Enable smart mode on the switch and start using the smart licenses.

**Scenario 2**

1. Configure and order a Cisco Nexus 7000 Series Switch with licenses and select the Cisco NX-OS release that will be preinstalled in the hardware prior to shipment.

2. Upgrade the switch to Cisco NX-OS Release 8.0(1).

**Note**

To convert the preinstalled licenses on the hardware to smart licenses, you must have a Smart account set up and then perform the conversion by going to the **License Registration Portal**.

3. Click the Devices tab under the Manage section. Click the corresponding Device ID, and choose **Convert to Smart Entitlements** from the Device ID drop-down list. This will convert all the licenses that are preinstalled on the switch to smart licenses. Note that this task must be performed for each switch that you want to convert to smart license.

4. The service will validate if license SKUs on the switch are mapped to smart licenses before proceeding with the conversion.

5. You enable smart mode on the switch and start using the smart licenses.

**Scenario 3**

1. Order a spare license SKU and do not associate a Smart account to the order in Cisco Commerce Workspace (CCW).

**Note**

You must have a Smart account set up before using Smart Software Licensing.

2. Get a PAK delivered to yourself and load it to your Smart account.

3. License Registration Portal service will validate if a spare license SKU is mapped to a smart license.

4. The Smart Software Manager (SSM) will notify you via email that your Smart Account has licenses that can be fulfilled as traditional licenses or smart licenses.

5. Specify the PAKs as smart licenses in SSM.

6. Ensure that Cisco NX-OS Release 8.0(1) is installed on the switch, enable smart mode, and start using the smart entitlements.

**Scenario 4**

1. Order a spare license SKU and assign a Smart account to the order in CCW.
2. The existing License Registration Portal service will auto deposit the PAK to the LRP Smart account.

3. License Registration Portal service will validate if the spare license SKU has been mapped to smart entitlements. If the spare license SKU are mapped to smart entitlements, the service sends out a confirmation notification to CSSM.

4. The Smart Software Manager will notify you via email that your Smart Account has licenses that can be fulfilled as traditional licenses or smart licenses.

5. Specify the PAKs as Smart Software Licenses in SSM.

6. Ensure that Cisco NX-OS Release 8.0(1) is installed on the switch, enable smart mode, and start using the smart licenses.

### Additional References for Smart Software Licensing

<table>
<thead>
<tr>
<th>Description</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</td>
<td><a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a></td>
</tr>
</tbody>
</table>

### Feature History for Smart Software Licensing

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Release</th>
<th>Feature Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart Software Licensing with Satellite</td>
<td>8.4(2)</td>
<td>This feature was introduced.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smart Software Manager Satellite, on page 59</td>
</tr>
<tr>
<td>Feature Name</td>
<td>Release</td>
<td>Feature Information</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>---------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Converting a Traditional License to a Smart License—CLI Version</td>
<td>8.2(1)</td>
<td>This feature was introduced. <em>Converting a Traditional License to a Smart License—CLI Version</em>, on page 61</td>
</tr>
<tr>
<td>Subscription-based Licensing</td>
<td>8.2(1)</td>
<td>This feature was introduced.</td>
</tr>
</tbody>
</table>
| Smart Software Licensing                             | 8.0(1)  | Smart Software Licensing is a standardized licensing platform that simplifies the Cisco software experience and helps you understand how Cisco software is used across your network. Smart Software Licensing is the next generation licensing platform for Cisco Nexus 7000 Series Switches. The following commands were introduced in this feature:  
  - `feature license smart`
  - `license smart deregister`
  - `license smart enable`
  - `license smart register`
  - `license smart renew`
  - `show license all`
  - `show license status`
  - `show license summary`
  - `show license tech support`
  - `show license udi`
  - `show license usage` |
Smart Software Licensing for Cisco Nexus 3000 and 9000 Series Switches

This chapter provides an overview of Smart Software Licensing and describes the tools and processes required to complete the registration and authorization for Cisco Nexus 3000 and 9000 Series Switches.

- Smart Software Licensing Overview, on page 75
- Traditional Licensing Overview, on page 79
- Comparing Licensing Models, on page 79
- Guidelines and Limitations for Smart Software Licensing, on page 80
- Setting Up Smart Accounts, on page 80
- Converting a Traditional License to a Smart License, on page 82
- Configuring Smart Call Home for Smart Software Licensing, on page 82
- Configuring Smart Software Licensing, on page 84
- Verifying Smart Software Licensing, on page 85
- Verification Examples for Smart Software Licensing, on page 86
- Configuration Examples for Smart Software Licensing, on page 90
- Use Cases for Smart Software Licensing, on page 91
- Additional References for Smart Software Licensing, on page 92
- Feature History for Smart Software Licensing, on page 93

Smart Software Licensing Overview

Smart Software Licensing provides a single, standardized licensing solution for all of your Cisco products. It is a cloud-based licensing end-to-end platform that consists of tools and processes to authorize the usage and reporting of your Cisco products. It is designed to run on a product instance and communicate with the Cisco Cloud License Service through the Smart Call Home transport medium to complete product registration and authorization.

In the Smart Software Licensing model, you can activate licensed products with CLI commands and without the use of a special software key or upgrade license file. A software reboot may or may not be required depending on product capabilities and requirements. Similarly, downgrading or removing an advanced feature requires the removal of configurations or commands. After either of these actions is taken, the change in license state is noted by the Smart Software Manager during the next synchronization, and the appropriate action is taken.
Subscription-based licensing is available for Cisco Nexus 3000 and 9000 Series switches. This model enables you to purchase licenses for 1 year, 3 years, or 5 years based on your licensing requirements.

**Smart Software Manager**

The Cisco Smart Software Manager (CSSM) enables the management of software licenses and Smart accounts from a single portal. The interface allows you to activate your product and manage entitlements and prevent license violations, expiry of subscription-based licenses, and out-of-compliance licenses. An active Smart account is required to complete the registration process. To access the Smart Software Manager, go to http://www.cisco.com/web/ordering/smart-software-manager/index.html.

You must add the following information in the Smart Software Manager:

- **Trusted Unique Identifier**—This is the device ID [Secure Unique Device Identifier (SUDI)].
- **Organizational Identifier**—This is a numerical format to associate a product with a Smart account or Virtual account.
- **Licenses consumed**—Allows the Smart Software Manager to understand the license type and the level of consumption.

**Smart Software Manager On-Prem**

Smart Software Manager On-Prem is a component of Smart Software Licensing and works in conjunction with the Smart Software Manager to manage software licenses. You can intelligently manage product licenses and get near real-time visibility and reports pertaining to the Cisco licenses you purchased and consumed.

If you do not want to manage your installed base using a direct Internet connection, Smart Software Manager On-Prem will be installed on your premises to provide a subset of the Smart Software Manager functionality. You can download the application, deploy it, and register it with the Smart Software Manager.

You can perform the following functions using the application on your premises:

- **Activate or register a license**
- **Get visibility to your company’s licenses**
- **Transfer licenses between company entities**

To learn more about Smart Software Manager On-Prem, go to https://www.cisco.com/c/en/us/buy/smart-accounts/software-manager.html.

**Smart Accounts and Virtual Accounts**

A Smart account provides you with a single location for all smart-account enabled products and licenses. It assists you in speedy procurement, deployment, and maintenance of your Cisco software.

If you are requesting a Smart account on behalf of an organization, you must have the authority to represent the requesting organization when creating a Smart account. After submitting the request, the request goes through an approval process before you are provided with access to your Smart account.

Go to http://software.cisco.com to learn about, set up, and manage a Smart account.
A virtual account is a subaccount within a Smart account. You can define the virtual account's structure based on organizational layout, business function, geography, or any defined hierarchy. Virtual accounts can be created and maintained only by Smart account administrators.

**Smart License Workflow and States**

The following illustration shows the workflow for Smart licenses:

*Figure 3: Smart Licensing Workflow*

Smart Software Licensing supports the following license states:

*Table 24: Smart License States*

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unregistered</td>
<td>The Smart license is enabled but not connected to the Cisco Smart Software Manager (CSSM). Before you register the switch with the CSSM, Smart Software Licensing automatically enters the evaluation period. The switch remains in evaluation mode for 90 days.</td>
</tr>
<tr>
<td>Registered</td>
<td>The Smart license is enabled and connected to the CSSM.</td>
</tr>
<tr>
<td>Authorized</td>
<td>The switch has the required license. The CSSM has verified that the reported number of licenses in use do not exceed the total number of licenses purchased for an entitlement. The authorization is valid for 90 days. The switch sends the entitlement request again every 30 days to renew the authorization.</td>
</tr>
</tbody>
</table>
### Smart License Consumption

Cisco Nexus 3000, 3500, and 9000 Series switches might consume double licenses as follows:

- Double consumption of licenses applies to all Cisco Nexus 9000 Series switch license families: GF/XF/XF2/Mod4/Mod8-16. For example:
  - Only ACI-AD-XF is available for consumption. When all features that consume the `LAN_ENTERPRISE_SERVICES_PKG`, `NETWORK_SERVICES_PKG`, and `VPN_FABRIC` packages are enabled, two counts of ACI-AD-XF is consumed instead of one.
  - Only ACI-PR-XF is available for consumption. When all features that consume the `LAN_ENTERPRISE_SERVICES_PKG`, `NETWORK_SERVICES_PKG`, and `VPN_FABRIC` packages are enabled, two counts of ACI-PR-XF are consumed instead of one.
  - Both NXOS-ES-M4 and NXOS-AD-M4 are available for consumption. When all features that consume the `LAN_ENTERPRISE_SERVICES_PKG`, `NETWORK_SERVICES_PKG`, and `VPN_FABRIC` packages are enabled, both NXOS-ES-M4 and NXOS-AD-M4 are consumed instead of the higher one in the hierarchy.
  - Both ACI-ES-XF and ACI-AD-XF are available for consumption. When all features that consume the `LAN_ENTERPRISE_SERVICES_PKG`, `NETWORK_SERVICES_PKG`, and `VPN_FABRIC` packages are enabled, both ACI-ES-XF and ACI-AD-XF are consumed instead of the higher one in the hierarchy.

- Double consumption of licenses applies to all Cisco Nexus 3500 Series switch license families. For example:
  - Only N35-AD-XF is available for consumption. When all features that consume the `LAN_ENTERPRISE_SERVICES_PKG` and N3548-ALGK9 packages are enabled, two counts of N35-AD-XF are consumed instead of one.
• Double consumption of licenses applies to all Cisco Nexus 3000 Series switch license families: XF/XF2/XM. For example:
  • Only N3K-AD-XF2 is available for consumption. When all features that consume the LAN_ENTERPRISE_SERVICES_PKG and VPN_FABRIC packages are enabled, two counts of N3K-AD-XF2 are consumed instead of one.
  • Only N3K-AD-XF is available for consumption. When all features that consume the LAN_ENTERPRISE_SERVICES_PKG and VPN_FABRIC packages are enabled, two counts of N3K-AD-XF are consumed instead of one.

Smart Call Home Overview

Use the Smart Call Home feature to communicate with the Smart Software Manager. On Cisco Nexus 3000 and 9000 Series switches, Smart Software Licensing and Smart Call Home are not enabled by default.

The Smart Call Home (SCH) server runs on Cisco Smart Software Manager On-Prem by default. You can access this service using the following URL:

https://CSSM-On-Prem-IP/Transportgateway/services/DeviceRequestHandler

Provide this URL as part of the Smart Call Home configuration so that the device registration works with CSSM On-Prem. For a sample configuration, see the Configuration Examples for Smart Software Licensing. Smart Call Home creates a CiscoTAC-1 profile. The associated Smart Call Home messages are sent to the Smart Software Manager only after enabling Smart Call Home.

Note

You must configure the DNS client and virtual routing and forwarding (VRF) before using Smart Call Home. For more information, see Configuring a DNS Client and Configuring a VRF To Send a Message Using HTTP.

Traditional Licensing Overview

Traditional licensing at Cisco is a legacy licensing model based on Product Activation Keys (PAKs) and Unique Device Identifiers (UDIs). On most Cisco NX-OS switches, bandwidth needs are assessed prior to obtaining and installing a .tar file on switches to retrieve the UDI. Customers place an order for a PAK, and the PAK is emailed to the user. The UDI and PAK are used to receive a license file that is installed in the boot directory of the switch to complete the installation of the Cisco NX-OS software.

The License Registration Portal (LRP) is available to help migrate traditional licenses to smart licenses. To access the LRP, obtain training, and manage licenses, go to http://tools.cisco.com/SWIFT/LicensingUI/Home.

Comparing Licensing Models

Two types of licensing models are used for the Cisco Nexus 3000 and 9000 Series Switches: traditional licensing and Smart Software Licensing.
Table 25: Comparison Between Traditional Licensing and Smart Software Licensing

<table>
<thead>
<tr>
<th>Description</th>
<th>Traditional Licensing</th>
<th>Smart Software Licensing</th>
</tr>
</thead>
<tbody>
<tr>
<td>License instance node locked to the product instance</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Product registration upon configuration</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Offers tools to report, monitor, own, and consume</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Requires Smart Call Home</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

The licensing mode changes based on the configuration provided. If Smart Software Licensing is enabled, all license requests are passed to the CSSM. If Smart Software Licensing is disabled, all license requests are fulfilled based on the license files installed on the device.

Guidelines and Limitations for Smart Software Licensing

- Beginning with Cisco NX-OS Release 9.3(3), all Cisco Nexus 3000 and 9000 Series switches (except the Cisco Nexus 3016 and 3064 platform switches) support Smart Software Licensing.
- You cannot use both traditional licensing and Smart Software Licensing at the same time.
- The FC_PORT_ACTIVATION_PKG license consumes the FC 48 ports entitlement tag regardless of the number of FC ports acquired.

Setting Up Smart Accounts

This section provides information on requesting a Smart account and adding users to the account.

Requesting a Smart Account

Requesting a Smart account is a one-time process. Subsequent management of users is a capability provided through the tool.

Before you begin

Ensure that you have a Cisco login.

Step 1  Go to http://software.cisco.com, and log in to your account.
Step 2  Click the Request a Smart Account link in the Administration section.
Step 3  Perform one of the following tasks to select the Account Approver:
Step 4 Depending on the approver type, perform one of the following procedures:

- If you are the approver, perform the following tasks:
  a. Enter **Account Name**, **Company/Organization Name**, **Country**, and **State/Province/Region** information.
  b. (Optional) Click **Edit**.
  c. In the **Edit Account Identifier** window, enter a valid **Proposed Domain Identifier** and **Contact Phone Number**, and click **OK**.
    - **Note** The default domain identifier is the approver's email domain. If you edit the domain identifier, the change goes through a manual approval process.
  d. Click **Continue** to select the legal address to be linked to your Smart account.

- If you are not the approver, perform the following procedure:
  a. Enter the **Account Name** and an optional **Message** to the approver.
  b. (Optional) Click **Edit**.
  c. In the **Edit Account Identifier** window, enter a valid **Proposed Domain Identifier**, and click **OK**.
    - **Note** The default domain identifier is the approver's email domain. If you edit the domain identifier, the change goes through a manual approval process.
  d. Click **Continue**.
  e. Follow the instructions in the email that is sent to you to complete the request.

---

**Adding a User to a Smart Account**

Smart account user management is available in the **Administration** section of Cisco Software Central.

**Step 1** Go to [http://software.cisco.com](http://software.cisco.com), and log in to your account.
**Step 2** Click the **Manage Smart Account** link in the **Administration** section.
**Step 3** Click the **Users** tab.
**Step 4** Click **New User**.
**Step 5** Provide the required information in the **New User** section.

(Define roles to manage the entire Smart account or specific virtual accounts.)
Converting a Traditional License to a Smart License

Traditional licenses associated with Product Activation Keys (PAKs) can be converted to smart licenses using the License Registration Portal (LRP). Access traditional licenses by clicking the PAKs/Tokens tab. Then use the information in this section to convert PAKs to smart licenses.

Alternatively, you can convert traditional licenses to smart licenses using one of the following methods:

• Access the Smart Software Manager and follow the instructions in the "Convert to Smart Licensing" section.

• Contact Cisco Global Licensing Operations (GLO) or TAC. You need to provide your PAK and device details as well as the smart account where you want the licenses to be deposited.

Configuring Smart Call Home for Smart Software Licensing

Make sure that Smart Call Home is enabled on the switch before configuring Smart Software Licensing. For more information, see the "Configuring Smart Call Home" chapter of the System Management Configuration Guide, Release 9.3(x) for your specific Cisco Nexus 3000 or 9000 Series switch.
# Configuring a DNS Client

## Before you begin

Make sure that the name server is reachable before you configure a DNS client.

## Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>switch# configure terminal</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>switch(config)# ip domain-lookup</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>switch(config)# ip domain-name name [use-vrf vrf-name]</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>switch(config)# ip name-server address1 [address2... address6] [use-vrf vrf-name]</td>
</tr>
<tr>
<td><strong>Step 5</strong></td>
<td>switch(config)# vrf context vrf-name</td>
</tr>
<tr>
<td><strong>Step 6</strong></td>
<td>switch(config-vrf)# ip domain-name name [use-vrf vrf-name]</td>
</tr>
<tr>
<td><strong>Step 7</strong></td>
<td>switch(config-vrf)# ip name-server address1 [address2... address6] [use-vrf vrf-name]</td>
</tr>
</tbody>
</table>

### Purpose:
- Enters global configuration mode.
- Enables DNS-based address translation.
- Defines the default domain name that Cisco NX-OS uses to resolve unqualified host names. You can also define a virtual routing and forwarding (VRF) that Cisco NX-OS uses to resolve this domain name if it cannot be resolved in the VRF under which you configured this domain name. Cisco NX-OS appends the default domain name to any hostname that does not contain a complete domain name before starting a domain-name lookup.
- Defines up to six name servers. The address can be either an IPv4 or IPv6 address. You can optionally define a VRF that Cisco NX-OS uses to reach this name server if it cannot be reached in the VRF under which you configured this name server.
- Creates a VRF and enters VRF configuration mode.
- Defines the default domain name that Cisco NX-OS uses to complete unqualified host names. You can optionally define a VRF that Cisco NX-OS uses to resolve this domain name if it cannot be resolved in the VRF under which you configured this domain name. Cisco NX-OS appends the default domain name to any hostname that does not contain a complete domain name before starting a domain-name lookup.
- Defines up to six name servers. The address can be either an IPv4 or IPv6 address. You can also define a VRF that Cisco NX-OS uses to reach this name server if it cannot be reached in the VRF under which you configured this name server.
Configuring a VRF To Send a Message Using HTTP

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 switch# configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Step 2 switch(config)# callhome</td>
<td>Enters Call Home configuration mode.</td>
</tr>
<tr>
<td>Step 3 switch(config-callhome)# transport http use-vrf vrf-name</td>
<td>Configures the VRF used to send email and other Smart Call Home messages over HTTP.</td>
</tr>
</tbody>
</table>

Viewing a Smart Call Home Profile

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 switch# show callhome smart-licensing</td>
<td>Displays the Smart Call Home profile.</td>
</tr>
</tbody>
</table>

Enabling Smart Call Home Data Privacy

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 switch# configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Step 2 switch(config)# callhome</td>
<td>Enters Call Home configuration mode.</td>
</tr>
<tr>
<td>Step 3 switch(config-callhome)# data-privacy hostname</td>
<td>Enables Call Home data privacy.</td>
</tr>
</tbody>
</table>

Configuring Smart Software Licensing

Follow the instructions in this section to enable Smart Software Licensing, register your device to use a Smart account, and renew device registration and authorization.

Enabling or Disabling Smart Software Licensing

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 switch# configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
</tbody>
</table>
### Registering a Device

You can register your device to use a Smart account. You need to register each device only once.

**Before you begin**
- Make sure that Smart Software Licensing is enabled.
- Make sure that you have the token to register your device to the Smart account.

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Registers your device to the Smart account using the token. The CSSM automatically renew the registration information with Cisco every 30 days.</td>
</tr>
<tr>
<td><code>switch# license smart register idtoken token [force]</code></td>
<td></td>
</tr>
</tbody>
</table>

**Note**
To unregister a device, use the `license smart deregister` command.

### Renewing Device Registration and Authorization

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Renews the device registration.</td>
</tr>
<tr>
<td><code>switch# license smart renew id</code></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Renews the device authorization.</td>
</tr>
<tr>
<td><code>switch# license smart renew auth</code></td>
<td></td>
</tr>
</tbody>
</table>

### Verifying Smart Software Licensing

Verify Smart Software Licensing using the following commands:

<table>
<thead>
<tr>
<th>Commands</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show license all</code></td>
<td>Displays all smart licensing information.</td>
</tr>
<tr>
<td><code>show license status</code></td>
<td>Displays the smart licensing status.</td>
</tr>
</tbody>
</table>
### Verification Examples for Smart Software Licensing

These examples show how to verify Smart Software Licensing:

```bash
switch# show license status

Smart Licensing is ENABLED

Registration:
Status: REGISTERED
Smart Account: Cisco Systems, Inc.
Virtual Account: NexusSmartLicensing_Test
Export-Controlled Functionality: Allowed
Initial Registration: SUCCEEDED on Nov 12 10:43:33 2019 UTC
Last Renewal Attempt: None
Next Renewal Attempt: Jun 16 10:43:32 2019 UTC
Registration Expires: Nov 12 08:07:20 2019 UTC

License Authorization:
Status: AUTHORIZED on Nov 12 10:43:48 2019 UTC

Last Communication Attempt: SUCCEEDED on Nov 12 10:43:48 2019 UTC
Next Communication Attempt: Jun 16 10:43:47 2019 UTC
Communication Deadline: Nov 12 08:07:20 2019 UTC

switch# show callhome smart-licensing

Current smart-licensing transport settings:
Smart-license messages: enabled
Profile: CiscoTAC-1 (status: ACTIVE)

switch# show license summary

Smart Licensing is ENABLED

Registration:
Status: REGISTERED
Smart Account: Cisco Systems, Inc.
Virtual Account: NexusSmartLicensing_Test
```
Export-Controlled Functionality: Allowed

License Authorization:
Status: AUTHORIZED on Dec 14 10:43:48 2019 UTC

Last Communication Attempt: SUCCEEDED
Next Communication Attempt: Jun 16 10:43:47 2019 UTC
Communication Deadline: Nov 12 08:07:20 2019 UTC

switch# show license all

Smart Licensing Status
----------------------
Smart Licensing is ENABLED

Registration:
Status: REGISTERED
Smart Account: Cisco Systems, Inc.
Virtual Account: NexusSmartLicensing_Test
Export-Controlled Functionality: Allowed
Initial Registration: SUCCEEDED on Nov 12 10:43:33 2019 UTC
Last Renewal Attempt: None
Next Renewal Attempt: Jun 16 10:43:32 2019 UTC
Registration Expires: Nov 12 08:07:20 2019 UTC

License Authorization:
Status: AUTHORIZED
Last Communication Attempt: SUCCEEDED on Nov 12 10:43:48 2019 UTC
Next Communication Attempt: Jun 16 10:43:48 2019 UTC
Communication Deadline: Nov 12 08:07:21 2019 UTC

License Usage
-------------

Product Information
--------------------
UDI: SN:AB123456789

Agent Version
------------
Smart Agent for Licensing: 1.6.6_rel/88

switch# show license tech support

Smart Licensing Status
----------------------
Smart Licensing is ENABLED

Registration:
Status: REGISTERED
Smart Account: Cisco Systems, Inc.
Virtual Account: NexusSmartLicensing_Test
Export-Controlled Functionality: Allowed
Initial Registration: SUCCEEDED on Nov 12 10:43:33 2019 UTC
Last Renewal Attempt: None
Next Renewal Attempt: Jun 16 10:43:32 2019 UTC
Registration Expires: Nov 12 08:07:20 2019 UTC

License Authorization:
Status: AUTHORIZED on Nov 12 10:43:48 2019 UTC

Last Communication Attempt: SUCCEEDED on Nov 12 10:43:48 2019 UTC
Next Communication Attempt: Jun 16 10:43:47 2019 UTC
Communication Deadline: Nov 12 08:07:20 2019 UTC

Evaluation Period:
- Evaluation Mode: Not In Use
- Evaluation Period Remaining: 89 days, 23 hours, 59 minutes, 7 seconds

License Usage

Product Information
- UDI: SN:AB123456789

Agent Version
- Smart Agent for Licensing: 1.6.6_rel/88

Upcoming Scheduled Jobs
- Current time: Nov 12 08:44:44 2019 UTC
  - IdCert Expiration Warning: Oct 15 08:07:20 2019 UTC (303 days, 23 hours, 22 minutes, 36 seconds remaining)
  - Daily: Oct 15 10:26:50 2019 UTC (1 hours, 42 minutes, 6 seconds remaining)
  - Certificate Renewal: Jun 16 10:43:32 2019 UTC (179 days, 1 hours, 58 minutes, 48 seconds remaining)
  - Reservation configuration mismatch between nodes in HA mode: Not Available
  - Certificate Expiration Check: Nov 12 08:07:20 2019 UTC (363 days, 23 hours, 22 minutes, 36 seconds remaining)
  - Authorization Renewal: Jun 16 10:43:47 2019 UTC (29 days, 1 hours, 59 minutes, 3 seconds remaining)
  - Authorization Expiration Check: Nov 12 08:07:20 2019 UTC (363 days, 23 hours, 22 minutes, 36 seconds remaining)
  - Init Flag Check: Not Available
  - Register Period Expiration Check: Not Available
  - Ack Expiration Check: Not Available

License Certificates
- Production Cert: True
- PIID:

Licensing Certificated:
- Id certificate Info:
  - Start Date: Nov 12 08:07:22 2019 UTC
  - Expiry Date: Nov 12 08:07:22 2019 UTC
  - Version Number: 3
  - Serial Number: 123456
  - Common Name: 9c172927d1806d05694c1f434b40ec0fbeb93abb::2

Signing certificate Info:
- Start Date: Aug 11 19:05:34 2019 UTC
- Expiry Date: Nov 12 07:00:15 2069 UTC
- Version Number: 3
- Serial Number: 3
- Common Name: MMI Signer

Sub CA Info:
- Start Date: Sep 11 19:06:30 2019 UTC
- Expiry Date: Dec 7 07:00:15 2069 UTC
- Version Number: 3
- Serial Number: 2
- Common Name: Smart Licensing CA
Root Cert Info:
  Start Date: Jun 30 19:48:47 2019 UTC
  Expiry Date: Dec 7 07:00:15 2069 UTC
  Version Number: 3
  Serial Number: 1
  Common Name: Cisco Licensing Root CA

HA Info
-------
RP Role: Active
Chassis Role: Active
Behavior Role: Active
RMF: True
CF: True
CF State: Stateless

Other Info
----------
Software ID: regid.2015-09.com.cisco.Nexus_9000,1.0_6e2b6ed8-fe9b-48e0-a71f-74ea
  f1bcc991
Agent State: authorized
TS enable: True
Transport: Calihome
Locale: C
Debug flags: 0x7
Privacy Send Hostname: True
Privacy Send IP: True
Build type:: Production
sizeof(char) : 1
sizeof(int) : 4
sizeof(long) : 4
sizeof(char *) : 4
sizeof(time_t): 4
sizeof(size_t): 4
Endian: Little
Write Erase Occurred: False
XOS version: 0.11.0.0
Reservation enable: False
Reservation in progress: False
Reservation type: None
Reservation request code: <empty>
Reservation authorization code: <empty>
Reservation return code: <empty>
Config Persist Received: True
Message Version: 1.1

switch# show license udi

UDI: SN:AB123456789

switch# show license usage

License Authorization:
  Status: AUTHORIZED on Nov 12 08:45:50 2019 UTC

(LAN_ENTERPRISE_SERVICES_PKG):
  Description: LAN license for Nexus 9000 Platforms
  Count: 1
  Version: 1.0
  Status: AUTHORIZED
Configuration Examples for Smart Software Licensing

This example shows how to register your device with the Cisco portal and enable Smart Software Licensing:

```
switch# configure terminal
switch(config)# ip domain-lookup
switch(config)# ip domain-name cisco.com
switch(config)# ip name-server 171.70.168.183 use-vrf management
switch(config)# vrf context management
switch(config-vrf)# ip domain-name cisco.com
switch(config-vrf)# ip name-server 171.70.168.183
switch(config-vrf)# exit
switch(config)# callhome
switch(config-callhome)# transport http use-vrf management
switch(config-callhome)# exit
switch(config)# feature license smart
```

This example shows how to disable Smart Software Licensing:

```
switch# configure terminal
switch(config)# no feature license smart
```

This example shows how to register a device:

```
switch# configure terminal
switch(config)# license smart register idtoken sampletokenID
register status: Registration process is in progress. Use the 'show license status' command to check the progress and result
```

This example shows how to unregister a device:

```
switch# license smart deregister
```

This example shows how to provide the URL for CSSM On-Prem as part of the Smart Call Home configuration:

```
callhome
  contract-id <contract-id>
  customer-id <customer-id>
```
Use Cases for Smart Software Licensing

Scenario 1

1. Configure and order a Cisco Nexus 3000 or 9000 Series switch with licenses and select the Cisco NX-OS release that will be preinstalled on the hardware prior to shipment.

Note

To convert the preinstalled licenses on the hardware to smart licenses, you must have a Smart Account set up and then convert the licenses by going to the License Registration Portal.

2. Click the Devices tab under the Manage section. Click the corresponding Device ID, and choose Convert to Smart Entitlements from the Device ID drop-down list. Doing so converts all the licenses that are preinstalled on the switch to smart licenses. This task must be performed for each switch that you want to convert to smart licensing.

3. The service validates if license Stock Keeping Units (SKUs) on the switch have been mapped to smart licenses before proceeding with the conversion.

4. Enable smart mode on the switch and start using the smart licenses.

Scenario 2

1. Configure and order a Cisco Nexus 3000 or 9000 Series switch with licenses and select the Cisco NX-OS release that will be preinstalled in the hardware prior to shipment.

2. Upgrade the switch to Cisco NX-OS Release 9.3(3) or a later release.

Note

To convert the preinstalled licenses on the hardware to smart licenses, you must have a Smart account set up and then perform the conversion by going to the License Registration Portal.

3. Click the Devices tab under the Manage section. Click the corresponding Device ID, and choose Convert to Smart Entitlements from the Device ID drop-down list. Doing so converts all the licenses that are preinstalled on the switch to smart licenses. This task must be performed for each switch that you want to convert to smart licensing.

4. The service validates if license SKUs on the switch are mapped to smart licenses before proceeding with the conversion.

5. Enable smart mode on the switch and start using the smart licenses.
Scenario 3

1. Order a spare license SKU and do not associate a Smart account to the order in Cisco Commerce Workspace (CCW).

Note
You must have a Smart account set up before using Smart Software Licensing.

2. Order a PAK and load it to your Smart account.
3. The License Registration Portal service validates if the spare license SKU is mapped to a smart license.
4. The Smart Software Manager (SSM) notifies you through email when your Smart Account has licenses that can be fulfilled as traditional licenses or smart licenses.
5. Specify the PAKs as smart licenses in SSM.
6. Ensure that Cisco NX-OS Release 9.3(3) or a later release is installed on the switch, enable smart mode, and start using the smart entitlements.

Scenario 4

1. Order a spare license SKU and assign a Smart account to the order in CCW.
2. The existing License Registration Portal service deposits the PAK to the LRP Smart account.
3. The License Registration Portal service validates if the spare license SKU has been mapped to smart entitlements. If the spare license SKUs are mapped to smart entitlements, the service sends out a confirmation notification to CSSM.
4. The Smart Software Manager notifies you through email when your Smart Account has licenses that can be fulfilled as traditional licenses or smart licenses.
5. Specify the PAKs as Smart Software Licenses in SSM.
6. Ensure that Cisco NX-OS Release 9.3(3) or a later release is installed on the switch, enable smart mode, and start using the smart licenses.

Additional References for Smart Software Licensing

Table 26: Technical Assistance

<table>
<thead>
<tr>
<th>Description</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>documentation</td>
<td></td>
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<tr>
<td>Smart accounts and smart licensing</td>
<td><a href="https://forums.cisco.com/OperationsExchange/s/Training-Details?L1Category=Training&amp;L2Category=CSE_End_Customer&amp;L1CategoryPath=training">https://forums.cisco.com/OperationsExchange/s/Training-Details?L1Category=Training&amp;L2Category=CSE_End_Customer&amp;L1CategoryPath=training</a></td>
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### Feature History for Smart Software Licensing

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<th>Feature Name</th>
<th>Release</th>
<th>Feature Information</th>
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<tr>
<td>Smart Software Licensing</td>
<td>9.3(3)</td>
<td>Introduced this feature for Cisco Nexus 3000 and 9000 Series switches.</td>
</tr>
</tbody>
</table>

**Training and resources**

https://community.cisco.com/t5/smart-licensing-enterprise/software-on-demand-training-resources-for-customers/ta-p/3639797