Cisco NX-OS Licensing Guide

First Published: 2011-11-23
Last Modified: 2019-10-03
THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE. IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.

All printed copies and duplicate soft copies of this document are considered uncontrolled. See the current online version for the latest version.

Cisco has more than 200 offices worldwide. Addresses and phone numbers are listed on the Cisco website at www.cisco.com/go/offices.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: www.cisco.com/go/trademarks. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1721R)

© 2011–2019 Cisco Systems, Inc. All rights reserved.
CONTENTS

PREFACE

Preface vii

Audience vii

Document Conventions vii

Communications, Services, and Additional Information viii

CHAPTER 1

Licensing Cisco NX-OS Software Features 1

Information About Licensing 1

Tier-Based Licenses 3

Cisco Nexus 9000 Series Tier-Based Licenses 4

Cisco Nexus 3000, 3400-S, and 3600 Series Tier-Based Licenses 7

Feature-Based Licenses 8

Module-based Licenses 23

Bundle/Chassis-based Licenses 24

Subscription-Based Licenses 26

Honor Mode Licensing 26

Licensing Terminology 27

Licensing Virtualization Support 28

Licensing High Availability 28

License Installation 29

Obtaining a Factory-Installed License 29

Performing a Manual Installation 29

Obtaining the License Key File 30

Installing the License Key File 32

Backing Up Licenses 34

Backing Up the License Key File 34

Backing Up an Installed License 34
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

Note

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>
</tbody>
</table>
### Convention

| [x {y | z}] | Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element. |
| --- | --- |
| variable | Indicates a variable for which you supply values, in context where italics cannot be used. |
| string | A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks. |

Examples use the following conventions:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>screen font</strong></td>
<td>Terminal sessions and information the switch displays are in screen font.</td>
</tr>
<tr>
<td><strong>boldface screen font</strong></td>
<td>Information you must enter is in boldface screen font.</td>
</tr>
<tr>
<td><strong>italic screen font</strong></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></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:

<table>
<thead>
<tr>
<th>Note</th>
<th>Means reader take note. Notes contain helpful suggestions or references to material not covered in the manual.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caution</td>
<td>Means reader be careful. In this situation, you might do something that could result in equipment damage or loss of data.</td>
</tr>
</tbody>
</table>

### Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at [Cisco Profile Manager](https://www.cisco.com/profilemanager).
- To get the business impact you’re looking for with the technologies that matter, visit [Cisco Services](https://www.cisco.com/services).
- To submit a service request, visit [Cisco Support](https://www.cisco.com/support).
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit [Cisco Marketplace](https://www.cisco.com/marketplace).
- To obtain general networking, training, and certification titles, visit [Cisco Press](https://www.cisco.com/products/education).
• 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.
This chapter contains information related to feature and module-based licensing for Cisco Nexus switches that run Cisco NX-OS software.

Note

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 27
- Licensing Virtualization Support, on page 28
- Licensing High Availability, on page 28
- License Installation, on page 29
- Obtaining the License Key File, on page 30
- Installing the License Key File, on page 32
- Backing Up Licenses, on page 34
- Enabling Licensed Features, on page 35
- Identifying License Features in Use, on page 35
- Uninstalling Licenses, on page 36
- Updating Licenses, on page 38
- Configuring the Grace Period Feature, on page 39
- Associating a License with a Module, on page 44
- License Transfers Between Devices, on page 44
- Verifying the License Configuration, on page 45
- Additional References, on page 45
- Feature History for Licensing, on page 46

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>
<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>Evaluation</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>
<tr>
<td></td>
<td></td>
<td>Supported, on Cisco NX-OS Release 8.2(3) and earlier 8.x releases. From Cisco NX-OS Release 8.2(4), Grace period is not supported on Cisco Nexus 7000 Series switches.</td>
<td></td>
</tr>
</tbody>
</table>
Tier-Based Licenses

Tier-based licensing is available for Cisco Nexus 3000 and 3600 Series switches and Cisco Nexus 9300, 9300-EX, 9300-FX/FX2/FXP, and 9500 platform switches. This licensing model applies to both Cisco Application Centric Infrastructure (ACI) and NX-OS standalone architectures where these switches can be deployed. For the remaining Cisco Nexus platforms, we offer only the NX-OS standalone feature-based licenses. For these switches, see Feature-Based Licenses, on page 8.

Tier-based licensing offers the following benefits:

- Consistency across ACI and NX-OS licensing (for Cisco Nexus 9000 Series switches)
- A choice between perpetual or subscription-based licenses

**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.

- The simplicity of being able to purchase a group of feature licenses in one of two packages: Essentials or Advantage

**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 and Cisco Tetration Analytics™) |

---

*Please refer to the Cisco NX-OS Licensing Guide for more details.*
Features Included*

## License Package

<table>
<thead>
<tr>
<th>Package</th>
<th>Features Included*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantage</td>
<td>All features included in the Essentials package plus the following features:</td>
</tr>
<tr>
<td></td>
<td>- ACI features (Multi-Site and physical remote leaf)</td>
</tr>
<tr>
<td></td>
<td>- Advanced fabric features (Pervasive Load Balancing and Tenant Routed Multicast)</td>
</tr>
<tr>
<td></td>
<td>- DCI overlay features (Inter AS option B, Layer 3 EVPN over segment routing, MPLS Layer 3 VPN, and VXLAN EVPN Multi-Site)</td>
</tr>
<tr>
<td>Premier</td>
<td>All features included in the Essentials and Advantage packages.</td>
</tr>
<tr>
<td>NDB add-on license</td>
<td>Nexus Data Broker</td>
</tr>
<tr>
<td>Security add-on license</td>
<td>MACsec</td>
</tr>
<tr>
<td>Storage add-on license</td>
<td>FCoE, FC support on all 48 ports, and DCNM SAN</td>
</tr>
</tbody>
</table>

*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 ACI+NX-OS for 3 or 5 years
  - Non-Cisco ONE perpetual license for ACI+NX-OS
  - Non-Cisco ONE perpetual license for NX-OS
  - NX-OS upgrade licenses

- Cisco Nexus 3000 and 3600 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 ACI+NX-OS Essentials, Advantage, and add-on licenses are supported for Cisco Nexus 9000 Series switches beginning with Cisco NX-OS Release 9.2(3). Beginning with Cisco NX-OS Release 7.0(3)I7(7),
the ACI Premier licenses are supported for Cisco Nexus 9000 Series 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 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.

**Table 3: PIDs for Cisco ONE Subscription Tier-Based Licenses for 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>4-Slot Modular Platforms</th>
<th>8- to 16-Slot Modular Platforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essentials package</td>
<td>C1E1TN9300GF-3Y</td>
<td>C1E1TN9300XF-3Y</td>
<td>C1E1TN9500M4-3Y</td>
<td>C1E1TN9500M816-3Y</td>
</tr>
<tr>
<td></td>
<td>C1E1TN9300GF-5Y</td>
<td>C1E1TN9300XF-5Y</td>
<td>C1E1TN9500M4-5Y</td>
<td>C1E1TN9500M816-5Y</td>
</tr>
<tr>
<td>Advantage package</td>
<td>C1A1TN9300GF-3Y</td>
<td>C1A1TN9300XF-3Y</td>
<td>C1A1TN9500M4-3Y</td>
<td>C1A1TN9500M816-3Y</td>
</tr>
<tr>
<td></td>
<td>C1A1TN9300GF-5Y</td>
<td>C1A1TN9300XF-5Y</td>
<td>C1A1TN9500M4-5Y</td>
<td>C1A1TN9500M816-5Y</td>
</tr>
<tr>
<td>Premier package</td>
<td>C1P1TN9300GF-3Y</td>
<td>C1P1TN9300XF-3Y</td>
<td>Unsupported</td>
<td>Unsupported</td>
</tr>
<tr>
<td></td>
<td>C1P1TN9300GF-5Y</td>
<td>C1P1TN9300XF-5Y</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Add-On Licenses

<table>
<thead>
<tr>
<th>License</th>
<th>1G Fixed Platforms (GF)</th>
<th>10G/25G/40G/100G Fixed Platforms (XF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDB</td>
<td>C1-N9K-NDB-3Y</td>
<td>C1-N9K-NDB-3Y</td>
</tr>
<tr>
<td></td>
<td>C1-N9K-NDB-5Y</td>
<td>C1-N9K-NDB-5Y</td>
</tr>
<tr>
<td>Security</td>
<td>Not supported</td>
<td>C1-N9K-SEC-M-3Y</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C1-N9K-SEC-M-5Y</td>
</tr>
<tr>
<td>Storage</td>
<td>Not supported</td>
<td>C1-N9K-STRG-M-3Y</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C1-N9K-STRG-M-5Y</td>
</tr>
</tbody>
</table>

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

**Table 4: PIDs for Non-Cisco ONE Perpetual Tier-Based Licenses for 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>
</tr>
</thead>
<tbody>
<tr>
<td>Essentials</td>
<td>ACI-ES-GF</td>
<td>ACI-ES-XF</td>
</tr>
<tr>
<td>Advantage</td>
<td>ACI-AD-GF</td>
<td>ACI-AD-XF</td>
</tr>
</tbody>
</table>

Add-On Licenses

<table>
<thead>
<tr>
<th>License</th>
<th>1G Fixed Platforms (GF)</th>
<th>10G/25G/40G/100G Fixed Platforms (XF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security</td>
<td>Not supported</td>
<td>ACI-SEC-XF</td>
</tr>
<tr>
<td>Storage</td>
<td>Not supported</td>
<td>ACI-STRG</td>
</tr>
</tbody>
</table>
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 Platform (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>
</tbody>
</table>

Add-On Licenses

<table>
<thead>
<tr>
<th>License</th>
<th>1G Fixed Platforms (GF)</th>
<th>10G/25G/40G/100G Fixed Platforms (XF)</th>
<th>Nexus 9364C Platform (XF2)</th>
<th>4-Slot Modular Platforms</th>
<th>8- to 16-Slot Modular Platforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDB</td>
<td>NXOS-NDB</td>
<td>NXOS-NDB</td>
<td>NXOS-NDB</td>
<td>NDB-M1M-SW9</td>
<td>NDB-M1M-SW9</td>
</tr>
<tr>
<td>Security</td>
<td>Not supported</td>
<td>Not supported</td>
<td>NDB-SEC-XF</td>
<td>NDB-SEC-XM</td>
<td>NDB-SEC-XM</td>
</tr>
<tr>
<td>Storage</td>
<td>Not supported</td>
<td>Not supported</td>
<td>NDB-STRG-XF</td>
<td>NDB-STRG-M</td>
<td>NDB-STRG-M</td>
</tr>
</tbody>
</table>

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>
</tbody>
</table>
Cisco Nexus 3000, 3400-S, and 3600 Series Tier-Based Licenses

The NX-OS Essentials, Advantage, and add-on licenses are supported for Cisco Nexus 3000, 3400-S, and 3600 Series switches beginning with Cisco NX-OS Release 9.3(1).

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>
<thead>
<tr>
<th>License</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essentials package</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>Advantage package</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>
</tbody>
</table>

Add-On Licenses
### 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.

**Note** 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><strong>Enterprise Services Package</strong></td>
<td>N95-LAN1K9 (for Cisco Nexus 9500 Series switches)</td>
<td>- Open Shortest Path First (OSPF) Protocol</td>
</tr>
<tr>
<td><strong>LAN_ENTERPRISE_SERVICES_PKG</strong></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>switches, except the Cisco Nexus N9K-C9348GC-FXP switch)</td>
<td>- Protocol Independent Multicast (PIM), which includes sparse mode, bidirectional mode, and Source Specific Multicast (SSM) mode</td>
</tr>
<tr>
<td></td>
<td>N93-LAN1K9-XF2 (for the Cisco Nexus 9364C switch)</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><strong>VPN Fabric License</strong></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>
</tbody>
</table>

**Note** For specific implementation of these features, see the Release Notes document and configuration guides for the Cisco Nexus 9000 Series switches.
## Feature-Based Licenses

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Feature Name</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Services Package</td>
<td>N95-SERVICES1K9</td>
<td>• Catena</td>
<td>The IP fabric for media solution also requires the N93-LAN1K9 or N95-LAN1K9 license for multicast.</td>
</tr>
<tr>
<td>Network Services Package</td>
<td>N93-SERVICES1K9</td>
<td>• iCAM</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Intelligent Traffic Director (ITD)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Non-blocking multicast (NBM)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- for the IP fabric for media solution.</td>
<td></td>
</tr>
<tr>
<td>FCoE NPV</td>
<td>N95-FNPV1K9</td>
<td>FCoE NPV</td>
<td></td>
</tr>
<tr>
<td>FCoE NPV (up to 16 ports)</td>
<td>N93-FNPV1K9</td>
<td>FC and FCoE NPV</td>
<td></td>
</tr>
<tr>
<td>FCoE NPV (up to 48 ports)</td>
<td>N93-16Y-SSK9 (up to 16 ports)</td>
<td>FC and FCoE NPV</td>
<td></td>
</tr>
<tr>
<td>FCoE NPV (up to 48 ports)</td>
<td>N93-48Y-SSK9 (all 48 ports)</td>
<td>FC and FCoE NPV</td>
<td></td>
</tr>
<tr>
<td>Security License</td>
<td>NXOS-SEC-XM or</td>
<td>MACsec</td>
<td>Cisco Nexus 9000 Series ToR switches that support this feature require the NXOS-SEC-XF license, and Cisco Nexus 9000 Series EoR switches that support this feature require the NXOS-SEC-XM license.</td>
</tr>
<tr>
<td></td>
<td>NXOS-SEC-XF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisco Tetration License</td>
<td>N93-TTR1K9</td>
<td>Cisco Tetration Analytics™</td>
<td></td>
</tr>
<tr>
<td>24 Port License Package*</td>
<td>N9K-LIC1-24P</td>
<td>24-port license for Cisco Nexus 93108TC-EX, 93108TC-FX, 93180YC-EX, and 93180YC-FX switches.</td>
<td></td>
</tr>
<tr>
<td>24 Port License Upgrade Package*</td>
<td>N9K-EX-24P-UPG=</td>
<td>24-port upgrade license for Cisco Nexus 93108TC-EX and 93180YC-EX switches.</td>
<td></td>
</tr>
<tr>
<td>24 Port License Upgrade Package*</td>
<td>N9K-FX-24P-UPG=</td>
<td>24-port upgrade license for Cisco Nexus 93108TC-FX and 93180YC-FX switches.</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.

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>LAN_ENTERPRISE_SERVICES_PKG</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, 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>LAN_ADVANCED_SERVICES_PKG</td>
<td></td>
<td></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>VDC Licenses</td>
<td>N7K-VDC1K9</td>
<td>• For Nexus 7000 Series, a single ADV license provides five non-admin VDCs and one admin VDC. If you require an additional VDC, buy another license (N7K-VDC1K9) which in turn, provides another four VDCs.</td>
</tr>
<tr>
<td>VDC_LICENSES</td>
<td>N77-VDC1K9</td>
<td></td>
</tr>
<tr>
<td>For Nexus 7700 Series, a single ADV license provides five non-admin VDCs and one admin VDC. If you require an additional VDC, buy another license (N77-VDC1K9) which in turn, provides another four VDCs.</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>LAN_TRANSPORT_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>
</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>Storage Enterprise Package</td>
<td>N7K-SAN1K9</td>
<td>Inter-VSAN routing (IVR) over Fibre Channel and FCoE</td>
</tr>
<tr>
<td></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>
<tr>
<td>VSAN-based Access Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fabric Binding for Open Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N7K-SAN1K9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N77-SAN1K9</td>
<td></td>
<td></td>
</tr>
<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>• 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</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VRRP</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>
<tr>
<td>Feature License</td>
<td>Product ID</td>
<td>Feature Name</td>
</tr>
<tr>
<td>-----------------------------------------------------------</td>
<td>------------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Layer 3 Enterprise Services Package</td>
<td>N6001-LAN1K9</td>
<td>N6001-LAN1K9 / N6000-LAN1K9 (includes the following features in addition to the ones under N6K-BAS1K9 license).</td>
</tr>
<tr>
<td><strong>LAN ENTERPRISE SERVICES_PKG</strong></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 11</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</td>
<td>Remote Integrated Services Engine (RISE )</td>
</tr>
<tr>
<td><strong>NETWORK SERVICES_PKG</strong></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><strong>FC FEATURES_PKG</strong></td>
<td>N6004-4Q-SSK9</td>
<td>• FCoE</td>
</tr>
<tr>
<td><strong>ENTERPRISE_PKG</strong></td>
<td>N6004-12Q-SSK9</td>
<td>• FC NPV</td>
</tr>
<tr>
<td></td>
<td>N6K-16P-SSK9</td>
<td>• FC Port Security</td>
</tr>
<tr>
<td></td>
<td>N6K-20P-SSK9</td>
<td>• Fabric Binding</td>
</tr>
<tr>
<td></td>
<td>N6001-64P-SSK9</td>
<td>• Fibre Channel Security Protocol (FC-SP) Authentication</td>
</tr>
<tr>
<td></td>
<td>N6004-96Q-SSK9</td>
<td></td>
</tr>
<tr>
<td>VM-FEX Package</td>
<td>N6K-VMFEXK9</td>
<td>VM-FEX</td>
</tr>
</tbody>
</table>

5 The LAN_BASE_SERVICES_PKG gives unlimited static routes and a maximum of 256 dynamic routes across all the protocols.
6 Routes above 256 for all protocols are included in the LAN_ENTERPRISE_SERVICES_PKG license.
7 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.
8 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).

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.

These licenses are applicable to Cisco Nexus 6004 20 UP LEM only.

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 15</td>
<td></td>
<td>Unlimited static routes and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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 16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VRRP17</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>
<tr>
<td>Feature License</td>
<td>Product ID</td>
<td>Feature Name</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>---------------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>Layer 3 Enterprise Services</td>
<td>N56-LAN1K9</td>
<td>Layer 3 Enterprise Services Package</td>
</tr>
<tr>
<td>Package</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-IS20</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 Learn21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VxLAN EVPN22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Intelligent Traffic Director (ITD)</td>
</tr>
<tr>
<td>Network Services Package</td>
<td>N56-SERVICES1K923</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</td>
<td>N56-16p-SSK9</td>
<td>• Native Fibre Channel</td>
</tr>
<tr>
<td>Package</td>
<td>N56-12P-SSK924</td>
<td>• FCoE</td>
</tr>
<tr>
<td></td>
<td>N5672-72P-SSK9</td>
<td>• NPV</td>
</tr>
<tr>
<td></td>
<td>N56128-128P-SSK9</td>
<td>• FC Port Security</td>
</tr>
<tr>
<td></td>
<td>N56-20P-SSK925</td>
<td>• Fabric Binding</td>
</tr>
<tr>
<td></td>
<td>N56-12Q-SSK9</td>
<td>• Fibre Channel Security Protocol (FC-SP)</td>
</tr>
<tr>
<td></td>
<td>N56-4Q-SSK9</td>
<td>Authentication</td>
</tr>
<tr>
<td></td>
<td>N56-48Q-SSK9</td>
<td></td>
</tr>
<tr>
<td>VM-FEX Package</td>
<td>N56-VMFEX9</td>
<td>VM-FEX</td>
</tr>
</tbody>
</table>

15 The LAN_BASE_SERVICES_PKG gives unlimited static routes and a maximum of 256 dynamic routes across all the protocols.
16 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>
<tr>
<td>Layer 3 Base Services Package</td>
<td>N55-BAS1K9</td>
<td>Layer 3 Base Services Package</td>
</tr>
<tr>
<td>LAN_BASE_SERVICES_PKG</td>
<td></td>
<td>Unlimited static routes and a 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 27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VRRP 28</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>Layer 3 Enterprise Services Package</td>
<td>N55-LAN1K9</td>
<td>Layer 3 Enterprise Services Package</td>
</tr>
<tr>
<td>LAN_ENTERPRISE_SERVICES_PKG</td>
<td></td>
<td>N55-LAN1K9 includes the following features in addition to the ones under the N55-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>• PIMv2 (all modes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Full EIGRP</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>• Intelligent Traffic Director (ITD)</td>
</tr>
<tr>
<td>Network Services Package</td>
<td>N55-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>
</tbody>
</table>
The LAN_BASE_SERVICES_PKG gives unlimited static routes and a maximum of 256 dynamic routes across all the protocols.

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 to use the LAN_ENTERPRISE_SERVICES_PKG license.

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

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.

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.

**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>Basic Storage Services Package</td>
<td>N4K-4005I-SSK9</td>
<td>FIP Snooping</td>
</tr>
<tr>
<td>BASIC_STORAGE_SERVICES_PKG</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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></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>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>Cisco Nexus 3500 Algo Boost License</td>
<td>N3548-ALGK9</td>
<td>Cisco Nexus 3500 Algo Boost License</td>
</tr>
<tr>
<td></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></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>
<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 Enterprise Services Package N3524-LAN1K9 | Layer 3 Enterprise Services Package for Cisco Nexus 3524 and 3548 Series switches  
• BGP  
• VRF-Lite (IP-VPN) | Note  
• Requires the Base Services Package.  
• For Cisco NX-OS Release 9.3(1) and later releases—The BGP feature is checked out from the LAN1K9_ENT_SERVICES_PKG and 24P_LIC_PKG. |

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Features</th>
</tr>
</thead>
</table>
| Layer 3 Enterprise Services Package N3548-LAN1K9 | Layer 3 Enterprise Services Package for Cisco Nexus 3524 and 3548 Series switches  
• BGP  
• PBR  
• VRF-Lite (IP-VPN) | Note  
• Requires the Base Services Package.  
• For Cisco NX-OS releases prior to 9.3(1)—The BGP feature is checked out from the LAN_ENTERPRISE_SERVICES_PKG. |

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 sprom` 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</td>
</tr>
<tr>
<td>16P_UPG_PKG</td>
<td></td>
<td>upgrade license to enable 16 ports, and it can only be applied to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N3K-C3172TQ-32T.</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>32P_LIC_PKG</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>16P_UPG_PKG</td>
<td></td>
<td></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>
<tr>
<td>32P_LIC_PKG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layer 3 Base Services Package</td>
<td>N3K-BAS1K9</td>
<td>• EIGRP stub</td>
</tr>
<tr>
<td>LAN_BASE_SERVICES_PKG</td>
<td></td>
<td>• OSPFv2 (limited routes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• PIMv2 (sparse mode)</td>
</tr>
<tr>
<td>Note</td>
<td></td>
<td>Only the Cisco Nexus 3016, 3048, 3064, 3132Q, 3132Q-XL, and 3172</td>
</tr>
<tr>
<td></td>
<td></td>
<td>switches require the Layer 3 Base Services Package. The Cisco Nexus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3132C-Z, 3164Q, 31128PQ, 3100-V, 32xx, and 34xx switches require the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Layer 3 Enterprise Services Package (rather than the Layer 3 Base</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Services Package) to support these routing protocols.</td>
</tr>
<tr>
<td>Layer 3 Enterprise Services Package</td>
<td>N3K-LAN1K9</td>
<td>• BGP</td>
</tr>
<tr>
<td>LAN_ENTERPRISE_SERVICES_PKG</td>
<td>N3K-LAN2K9</td>
<td>• Policy-Based Routing</td>
</tr>
<tr>
<td></td>
<td>(for Cisco Nexus 3264C-E, 3408-S, 3432D-S, and 3464C switches)</td>
<td>• Generic routing encapsulation (GRE) tunnels</td>
</tr>
</tbody>
</table>
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>
</tr>
</thead>
<tbody>
<tr>
<td>FCoE Services Package (FCOE_PKG)</td>
<td>N7K-FCOE-F132XP=</td>
<td>• Fibre Channel over Ethernet (FCoE)</td>
</tr>
</tbody>
</table>

*Note* You do not need the Advanced Services Package to enable the storage VDC required for FCoE.
<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></td>
<td>N77-FCOE-F248XP</td>
<td>Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7700 Enhanced F2E Series 48 Port 10G (SFP+)</td>
</tr>
<tr>
<td>FCoE F3-Series (FCoE_F3)</td>
<td>N7K-FCOE-F312FQ</td>
<td>Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7000 F3 Series 12-port 40-Gigabit Ethernet QSFP+ module</td>
</tr>
<tr>
<td></td>
<td>N7K-FCOE-F348XP</td>
<td>Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7000 F3 Series 48-port 10-Gigabit Ethernet SFP+ module</td>
</tr>
<tr>
<td></td>
<td>N77-FCOE-F324FQ</td>
<td>Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7700 F3 Series 24-port 40-Gigabit Ethernet QSFP+ module</td>
</tr>
<tr>
<td></td>
<td>N77-FCOE-F348XP</td>
<td>Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7700 F3 Series 48-port 10-Gigabit Ethernet SFP+ module</td>
</tr>
</tbody>
</table>

**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**

Associated a License with a Module, on page 44

**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>
</tr>
<tr>
<td></td>
<td>N77-FCOE-F348XP</td>
<td>Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7718 F3 Series 48-port 10-Gigabit Ethernet SFP+ Module (Maximum of 16 modules)</td>
</tr>
<tr>
<td>N7706-FCOE-40G=</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></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>
</tr>
<tr>
<td>N7710-FCOE-40G=</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></td>
<td>N77-FCOE-F324FQ</td>
<td>Fibre Channel over Ethernet (FCoE) for Cisco Nexus 7710 F3 Series 24-port 40-Gigabit Ethernet QSFP+ Module (Maximum of 8 modules)</td>
</tr>
</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.

The following table shows the subscription-based license package that is available for the Cisco Nexus 7000 Series switches.

**Table 20: Subscription-Based Licenses for the Cisco Nexus 7000 Series Switches**

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Feature Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>iCAM Services Package</td>
<td>?</td>
<td>Intelligent CAM Analytics and Machine-learning (iCAM)</td>
</tr>
<tr>
<td>ICAM_LICENSE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Starting from Cisco NX-OS Release 7.0(3)I7(7), subscription-based licensing is available for Cisco Nexus 9000 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.

The following table shows the subscription-based license packages that is available for the Cisco Nexus 9000 Series switches.

**Table 21: Subscription-Based Licenses for the Cisco Nexus 9000 Series Switches**

<table>
<thead>
<tr>
<th>Feature License</th>
<th>Product ID</th>
<th>Feature Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACI Premier License Package</td>
<td>C1P1TN9300XF-3Y</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>C1P1TN9300XF-5Y</td>
<td>?</td>
</tr>
</tbody>
</table>

### 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.
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
The Cisco 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.
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 usbl: device, or the usbl2: 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 usbl: device, or the usbl2: 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>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<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>
<td>The <code>switch# show license host-id</code> command shows the license host ID. License hostid: VDH=FOX064317SQ. <strong>Tip</strong> Use the entire ID that appears after the equal sign (=). In this example, the host ID is FOX064317SQ.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>Locate the product authorization key (PAK) from the software license claim certificate document.</td>
<td><strong>Note</strong> Locate the product authorization key (PAK) from the software license claim certificate document. You can access the Product License Registration website from this URL: <a href="https://tools.cisco.com/SWIFT/LicensingUI/Home">https://tools.cisco.com/SWIFT/LicensingUI/Home</a></td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>Locate the website URL from the software license claim certificate document. You can access the Product License Registration website from this URL: <a href="https://tools.cisco.com/SWIFT/LicensingUI/Home">https://tools.cisco.com/SWIFT/LicensingUI/Home</a></td>
<td><strong>Caution</strong> Do not make any modifications to the license key file. It will alter the digital signature and render the license invalid.</td>
</tr>
<tr>
<td><strong>Step 5</strong></td>
<td>Follow the instructions on the Product License Registration website to register the license for your device.</td>
<td>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. <strong>Note</strong> Cisco TrustSec for the Cisco Nexus 7000 Series and Layer 3 Enterprise for the Cisco Nexus 5000 Series do not have a grace period. You must obtain an Advanced Services license to use Cisco TrustSec.</td>
</tr>
<tr>
<td><strong>Step 6</strong></td>
<td>For the Cisco Nexus 9000 Series switches, Cisco Nexus 3164Q switches, and Cisco Nexus 31128PQ switches, use the <code>copy licenses</code> 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 <code>copy licenses</code> 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</td>
<td><strong>Note</strong> Only users with the network-admin role can copy licenses on Cisco NX-OS devices. For information on user accounts and roles, see the <em>Security Configuration Guide</em> for your platform.</td>
</tr>
</tbody>
</table>
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.

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.

```
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.

```
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>\ 
<PFA>/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>\ 
<PFA>/PAK" SIGN=0CC6E2245FBE
```

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 8
- Module-based Licenses, on page 23
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 reinstallation 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.

**Note**
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
PC_PORT_ACTIVATION_PKG No 0 Unused -
LAN_ENTERPRISE_SERVICES_PKG No - In use Honor Start 0M 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
Application
----------
bgp
ospf
bgp@2
ospf@2
----------
```

**Note**

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).
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.

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.

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.

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
----------
```

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](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
```

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
```

**Related Topics**
- Feature-Based Licenses, on page 8
- Module-based Licenses, on page 23
- Obtaining the License Key File, on page 30

## 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.

---

**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.

---

**Note**
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 switchto vdc command to reach the nondefault VDC where you can disable the feature.

---

Note

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: LAN_ENTERPRISE_SERVICES_PKG
Ins Lic: No - In use
Status: 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: LAN_ENTERPRISE_SERVICES_PKG
Ins Lic: No - In use
Status: 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.

**Note**

You cannot modify the frequency of the grace period messages.

**Caution**

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.

```
switch# show license usage
Feature            Ins Lic Status Expiry Date Comments
-----------------------------------------------
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 8
- Module-based Licenses, on page 23

### 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
--------------------------------- ------------------------------------------
LAN_ADVANCED_SERVICES_PKG       Yes  -                     Never  - 
LAN_ENTERPRISE_SERVICES_PKG     No   -                     Grace 119D 22H
```

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 `switchto 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>Step 1</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><code>license fcoe module module-number</code></td>
<td>Associates the module-based license with the module.</td>
</tr>
<tr>
<td>Example:</td>
<td><code>switch(config)# license fcoe module 2</code></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](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><code>show license [brief]</code></td>
<td>Displays information for all installed license files.</td>
</tr>
<tr>
<td><code>show license feature package mapping</code></td>
<td>Displays information about features available in installed license packages. Note: The Cisco Nexus 9000 Series and the Cisco Nexus 3164Q switches do not support this command.</td>
</tr>
<tr>
<td><code>show license file</code></td>
<td>Displays information for a specific license file.</td>
</tr>
<tr>
<td><code>show license host-id</code></td>
<td>Displays the host ID for the physical device.</td>
</tr>
<tr>
<td><code>show license usage [license-package]</code></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 22: 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>
<thead>
<tr>
<th>Feature Name</th>
<th>Release</th>
<th>Feature Information</th>
</tr>
</thead>
<tbody>
<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>Introduced for the Cisco Nexus 3000 and 3600 Series switches.</td>
</tr>
<tr>
<td>NX-OS Essentials and Advantage licenses</td>
<td>Cisco Nexus NX-OS Release 9.3(1)</td>
<td>The -XF2 licenses have priority over the -XF licenses for Cisco Nexus 3000 and 3600 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>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 9000 Series 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>Feature Name</td>
<td>Release</td>
<td>Feature Information</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
<td>---------------------</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>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>Feature Name</td>
<td>Release</td>
<td>Feature Information</td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
<td>---------------------</td>
</tr>
<tr>
<td>N3K-FAB1K9, N95-FAB1K9, and N93-FAB1K9 licenses</td>
<td>Cisco Nexus 3000 and 9000 Series NX-OS 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 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 7.0(3)i4(2)</td>
<td>Added support for the non-blocking multicast (NBM) 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 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 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 7.0(3)i3(1)</td>
<td>Added support for the Cisco Nexus 9200 Series switches.</td>
</tr>
<tr>
<td>N3K-LAN1K9 license</td>
<td>Cisco Nexus 3232C and 3264Q NX-OS 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 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 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 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 7.2(0)iN1(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>Feature Name</td>
<td>Release</td>
<td>Feature Information</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
<td>---------------------</td>
</tr>
<tr>
<td><strong>Feature Information</strong></td>
<td></td>
<td></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>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 N77-VDC1K9 license N77-EL21K9 license N77-SAN1K9 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>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>Feature Name</td>
<td>Release</td>
<td>Feature Information</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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

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 Cisco MDS 9000 Series Switches.

- Smart Software Licensing, on page 51
- Finding Feature Information, on page 52
- Information About Smart Software Licensing, on page 52
- Guidelines and Limitations for Smart Software Licensing, on page 54
- Smart Accounts and Virtual Accounts, on page 54
- Smart Software Manager Overview, on page 54
- Smart Call Home Overview, on page 55
- Smart Software Manager Satellite, on page 55
- Requesting a Smart Account, on page 55
- Adding a User to a Smart Account, on page 56
- Converting a Traditional License to a Smart License, on page 57
- Converting a Traditional License to a Smart License—CLI Version, on page 57
- Configuring Smart Software Licensing, on page 59
- Configuring Smart Call Home for Smart Software Licensing, on page 62
- Verifying Smart Software Licensing, on page 63
- Configuration Examples for Smart Software Licensing, on page 63
- Verification Examples for Smart Software Licensing, on page 64
- Use Cases for Smart Software Licensing, on page 71
- Additional References for Smart Software Licensing, on page 73
- Feature History for Smart Software Licensing, on page 73

Smart Software Licensing

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 Cisco MDS 9000 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 Release 8.2(1), subscription-based licensing is available on Cisco Nexus 7000 Series switches. This enables the customer to purchase licenses for any period of time.

Smart Software Licensing provides you an experience of 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 57
- Converting a Traditional License to a Smart License—CLI Version, on page 57

Comparing Licensing Models

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

Table 24: 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>

**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 Cisco MDS 9000 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 Traditional License to 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](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 accounts' 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](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/Cisco MDS 9000 Series Switches, Smart Software Licensing is not enabled by default.

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, 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:
  1. Enter Account Name, Company/Organization Name, Country, and State/Province/Region information.
  2. (Optional) Click Edit.
  3. 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.

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

- If you are not the approver, perform the following procedure:
  1. Enter the Account Name and an optional Message to the approver.
  2. (Optional) Click Edit.
  3. 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.

  4. Click Continue.

  5. 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.
       Note  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.
       Note  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**

```
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)

```
switch# license smart conversion stop
```

Stops the manual conversion.

**Step 3** (Optional)

```
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:

```
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:

```
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:

```
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: SUCCEED on Feb 24 23:30:12 2014 PST
Last Renewal Attempt: SUCCEED 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 a DNS Client

To avoid any issues during configuring a DNS client, ensure to check if the name server is reachable before you configure a DNS client.

**Step 1**
```
switch# configure terminal
```
Enters global configuration mode.

**Step 2**
```
switch(config)# ip domain-lookup
```
Enables DNS-based address translation.

**Step 3**
```
switch(config)# ip domain-name name
```
Defines the default domain name that Cisco NX-OS uses to resolve unqualified host names.

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.

**Step 4**
```
switch(config)# ip name-server address1 [address2... address6]
```
Defines up to six name servers. The address can be either an IPv4 address or an IPv6 address.

### Configuring a DNS Client

<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> switch(config)# ip domain-lookup</td>
<td>Enables DNS-based address translation.</td>
</tr>
<tr>
<td><strong>Step 3</strong> 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</td>
</tr>
</tbody>
</table>
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.

Defines up to six name 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.

Step 4

```
switch(config)# ip name-server address1 [address2... address6] [use-vrf vrf-name]
```

Step 5

```
switch(config)# vrf context vrf-name
```

Creates a VRF and enters VRF configuration mode.

Step 6

```
switch(config-vrf)# ip domain-name name [use-vrf vrf-name]
```

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.

Step 7

```
switch(config-vrf)# ip name-server address1 [address2... address6] [use-vrf vrf-name]
```

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> switch# 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>Step 1</td>
<td>switch# configure terminal.</td>
</tr>
<tr>
<td>Step 2</td>
<td>Use one of the following commands to enable Smart Software Licensing:</td>
</tr>
<tr>
<td></td>
<td>• switch(config)# license smart enable</td>
</tr>
<tr>
<td></td>
<td>• switch(config)# feature license smart</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>Step 1</td>
<td>switch# configure terminal.</td>
</tr>
<tr>
<td>Step 2</td>
<td>Use one of the following commands to disable Smart Software Licensing:</td>
</tr>
<tr>
<td></td>
<td>• switch(config)# no license smart enable</td>
</tr>
<tr>
<td></td>
<td>• switch(config)# no feature license smart</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</td>
<td>switch# license smart register idtoken token [force]</td>
</tr>
<tr>
<td></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 1D</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

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>
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</td>
<td>Displays the contents of all the license files.</td>
</tr>
<tr>
<td>show license all</td>
<td>Displays all smart license agent information.</td>
</tr>
<tr>
<td>show license brief</td>
<td>Displays a list of license files.</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:

```
Note
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
```

```
switch# configure terminal
switch(config)# ip domain-lookup
switch(config)# ip domain-name cisco.com
switch(config)# ip name-server 171.70.168.183
switch(config)# callhome
```

Cisco NX-OS Licensing Guide

63
switch(config-callhome)# dest xml trans http
switch(config-callhome)# dest xml email s1-sch-test@cisco.com
switch(config-callhome)# dest xml http
http://pteodc-alphastg.cloudapps.cisco.com/its/service/oddce/services/DDCEService
switch(config-callhome)# no dest xml http
https://tools.cisco.com/its/service/oddce/services/DDCEService
unknown configuration entry
switch(config-callhome)# enable
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:
callhome
  contract-id <contract-id >
customer-id <customer-id>
site-id <site-id>
email-contact <email>
phone-contact <phone>
streetaddress <street address>
destination-profile CiscoTAC-1 transport-method http
destination-profile CiscoTAC-1 index 1 http https://<CSSM Satellite
IP>/Transportgateway/services/DeviceRequestHandler
transport http use-vrf management
enable

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
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
switch# show license status

Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: MDS-9148S
  Virtual Account: Default
  Export-Controlled Functionality: Allowed
  Initial Registration: SUCCEEDED on Apr 18 08:20:47 2017 UTC
  Last Renewal Attempt: None
  Next Renewal Attempt: Oct 15 08:20:46 2017 UTC
  Registration Expires: Apr 18 08:17:43 2018 UTC

License Authorization:
  Status: AUTHORIZED on Apr 18 08:25:08 2017 UTC
  Communication Deadline: Apr 18 08:17:43 2018 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
  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 Certificates:

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: 9c172927d1806d05694c1f434b40ec0f93abb::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-74ea1bcb3991
Agent State: authorized
TS enable: True
Transport: Callhome
switch# show license tech support
Smart Licensing Status
--------------------------------------
Smart Licensing is ENABLED

Registration:
Status: REGISTERED
Smart Account: MDS-9148S
Virtual Account: Default
Export-Controlled Functionality: Allowed
Initial Registration: SUCCEEDED on Apr 18 08:20:47 2017 UTC
Last Renewal Attempt: None
Next Renewal Attempt: Oct 15 08:20:47 2017 UTC
Registration Expires: Apr 18 08:17:44 2018 UTC

License Authorization:
Status: AUTHORIZED on Apr 18 08:25:08 2017 UTC

License Usage:
--------------
Handle: 4
License: regid.2015-10.com.cisco.MDS_9100_ENT,1.0_9040c53f-c289-4a9a-a651-0990ec71739f
Entitlement Tag:
regid.2015-10.com.cisco.MDS_9100_ENT,1.0_9040c53f-c289-4a9a-a651-0990ec71739f
Description: This entitlement tag was created via Alpha Extension application
Count: 1
Version: 1.0
Status: AUTHORIZED
Status time: Apr 18 08:25:08 2017 UTC
Request time: Apr 18 08:19:37 2017 UTC
Handle: 5
License: regid.2015-10.com.cisco.MDS_9148S_12P,1.0_8a86344d-f531-4545-9926-9b925f7c775a
Entitlement Tag: regid.2015-10.com.cisco.MDS_9148S_12P,1.0_8a86344d-f531-4545-9926-9b925f7c775a
Description: This entitlement tag was created via Alpha Extension application
Count: 48
Version: 1.0
Status: AUTHORIZED
Status time: Apr 18 08:25:08 2017 UTC
Request time: Apr 18 08:19:37 2017 UTC

Product Information
---------------------
UDI: SN:JAF17524XX

Agent Version
-------------
Smart Agent for Licensing: 1.6.12_rel/119

Upcoming Scheduled Jobs
------------------------
Current time: Apr 18 08:33:28 2017 UTC
IdCert Expiration Warning: Feb 17 08:17:44 2018 UTC (304 days, 23 hours, 44 minutes, 16 seconds remaining)

License Certificates
---------------------
Production Cert: False
PIID: 2e1fd851-9cee-49a2-80b6-ee1943ac65e9

Licensing Certificated:
Id certificate Info:
  Start Date: Apr 18 08:17:45 2017 UTC
  Expiry Date: Apr 18 08:17:45 2018 UTC
  Version Number: 3
  Serial Number: 482602
  Common Name: 6f8e5e1cbff92d95abe34a1112c1686e907efe59::2

Signing certificate Info:
  Start Date: Jun 14 20:18:52 2013 UTC
  Expiry Date: Apr 24 21:55:42 2033 UTC
  Version Number: 3
  Serial Number: 3
  Common Name: MMI Signer

Sub CA Info:
  Start Date: Apr 24 22:19:15 2013 UTC
  Expiry Date: Apr 24 21:55:42 2033 UTC
  Version Number: 3
  Serial Number: 2
  Common Name: Smart Licensing CA - DEV

Root Cert Info:
  Start Date: Apr 24 21:55:43 2013 UTC
HA Info
--------
RP Role: Active
Chassis Role: Active
Behavior Role: Active
RMF: True
CF: True
CF State: Stateless

Other Info
---------
Software ID: regid.2015-10.com.cisco.MDS_9148S,1.0_1752a728-820f-4798-83ae-76a9975d54e3
Agent State: authorized
TS enable: True
Transport: Callhome
Locale: C
Debug flags: 0x0
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: Big
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: JAF1428DTAH

switch# show license usage

License Authorization:
  Status: AUTHORIZED on Dec 15 08:45:50 2016 UTC

(LAN_ENTERPRISE_SERVICES_PKG):
  Description: LAN license for Nexus 7000, 7700 Platforms
  Count: 1
  Version: 1.0
  Status: AUTHORIZED

switch# show license usage

License Authorization:
  Status: AUTHORIZED on Apr 18 08:25:08 2017 UTC
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).
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 25: Technical Assistance

<table>
<thead>
<tr>
<th>Description</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco Support website provides extensive online resources, including</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>
<tr>
<td>documentation and tools for troubleshooting and resolving technical</td>
<td></td>
</tr>
<tr>
<td>issues with Cisco products and technologies.</td>
<td></td>
</tr>
<tr>
<td>To receive security and technical information about your products, you</td>
<td></td>
</tr>
<tr>
<td>can subscribe to various services, such as the Product Alert Tool</td>
<td></td>
</tr>
<tr>
<td>(accessed from Field Notices), Cisco Technical Services Newsletter, and</td>
<td></td>
</tr>
<tr>
<td>Really Simple Syndication (RSS) Feeds.</td>
<td></td>
</tr>
<tr>
<td>Access to most tools on the Cisco Support website requires a Cisco.com</td>
<td></td>
</tr>
<tr>
<td>user ID and password.</td>
<td></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>Converting a Traditional License to a Smart License—CLI Version</td>
<td>8.2(1)</td>
<td>This feature was introduced. Converting a Traditional License to a Smart License—CLI Version, on page 57</td>
</tr>
<tr>
<td>Subscription-based Licensing</td>
<td>8.2(1)</td>
<td>This feature was introduced.</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>Smart Software Licensing</td>
<td>8.0(1)</td>
<td>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 SwitchesCisco MDS 9000 Series Switches. The following commands were introduced in this feature:</td>
</tr>
</tbody>
</table>
|                            | 8.(1)1   | • 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 |

8.0(1)  
8.(1)1  
Smart Software Licensing  
Cisco NX-OS Licensing Guide  
74