



# CHAPTER 1

## Managing Licenses

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This chapter describes how to manage licenses on a Cisco Nexus 5000 Series switch.

Licensing allows you to access specified premium features on the switch after you install the appropriate license for that feature. This chapter contains information related to licensing types, options, procedures, installation, and management for the Cisco NX-OS software.

This chapter includes the following sections:

- [Licensing Terminology, page 1-1](#)
- [Licensing Model, page 1-2](#)
- [License Installation, page 1-3](#)
- [Obtaining the License Key File, page 1-4](#)
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## Licensing Terminology

The following terms are used in this chapter:

- **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 switch.
- **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 switch using the switch's unique host ID.
- **Host IDs**—A unique chassis serial number that is specific to each switch.

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- Proof of purchase—A document entitling its rightful owner to use licensed features on one switch as described in that document. The proof of purchase document is also known as the claim certificate.
- Product Authorization Key (PAK)—The PAK allows you to obtain a license key from one of the sites listed in the proof of purchase document. After registering at the specified website, you will receive your license key file and installation instructions through e-mail.
- License key file—A switch-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—If the bootflash has been corrupted or a supervisor module replaced after you have installed a license, that license shows as “missing.” The feature still works, but the license count is inaccurate. You should reinstall the license as soon as possible.
- Incremental license—An additional licensed feature that was not in the initial license file. License keys are incremental. If you purchase some features now and others later, the license file and the software detect the sum of all features for the specified switch.
- Evaluation license—A temporary license. Evaluation licenses are time bound (valid for a specified number of days) and are not tied to a host ID (switch serial number).
- 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 Systems, contact Cisco Technical Support at this URL: <http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

## Licensing Model

The licensing model for the Cisco NX-OS software is feature-based. Feature-based licenses make features available to the entire physical switch. [Table 1-1](#) lists the feature-based license packages.



### Note

Any feature not included in the Storage Services license package is bundled with the Cisco NX-OS software and is provided with the switch hardware at no additional charge (See Base Services Package in [Table 1-1](#)).

**Table 1-1** Feature-Based Licenses

Feature License	Features
Base Services Package N5000-AS	This package is included with the switch hardware at no additional charge. It includes all available Ethernet and system features, except features explicitly listed in the Storage Services Package.

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**Table 1-1**      *Feature-Based Licenses (continued)*

Feature License	Features
Storage Services Package N5020-SS	<ul style="list-style-type: none"> <li>• N5020-SS includes the following services for one NX5020 system:</li> <li>• Native Fibre Channel</li> <li>• FCoE</li> <li>• NPV</li> <li>• FC Port Security</li> <li>• Fabric Binding</li> </ul>
Advanced Services Package N5000-AS	<ul style="list-style-type: none"> <li>• This package will be available in a future release.</li> </ul>

## License Installation

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

This section includes the following topics:

- [Obtaining a Factory-Installed License, page 1-3](#)
- [Performing a Manual Installation, page 1-4](#)

## Obtaining a Factory-Installed License

You can obtain factory-installed licenses for a new Cisco Nexus 5000 Series switch.

To obtain a factory-installed license, perform this task:

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**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 Systems, contact Cisco Technical Support at this URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

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Your switch is shipped with the required licenses installed in the system. The proof of purchase document is sent along with the switch.

**Step 2**      Obtain the host ID from the proof of purchase document for future use.

You can now start to use the switch and the licensed features.

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## Performing a Manual Installation

All Cisco Nexus 5000 Series licenses are factory-installed. Manual installation is not required.

## Obtaining the License Key File

To obtain new or updated license key files, perform this task:

- Step 1** Use the **show license host-id** command to obtain the serial number for your switch. The host ID is also referred to as the switch serial number.

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



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

- Step 2** Obtain either your claim certificate or your proof of purchase document. This document accompanies every Cisco Nexus 5000 Series switch.

- Step 3** Get the product authorization key (PAK) from either the claim certificate or the proof of purchase document.

- Step 4** Locate the website URL from either the claim certificate or the proof of purchase document.

- Step 5** Access the specified URL that applies to your switch and enter the switch serial number and the PAK. The license key file is sent to you by e-mail. The license key file is digitally signed to only authorize use on the requested switch. The requested features are also enabled once the Cisco NX-OS software on the specified switch accesses the license key file.



**Caution** Install the license key file in the specified Cisco Nexus 5000 Series switch without making any modifications.

A license is either permanent or it expires on a fixed date. If you do not have a license, the grace period for using that feature starts from the first time you start using a feature offered by that license (see the [“Grace Period Alerts”](#) section on page 1-8).

- Step 6** Use the **copy licenses** command in EXEC mode to save your license file to one of two locations; either the bootflash: or the volatile: directory (see the [“Backing Up License Files”](#) section on page 1-6).

## Installing the License Key File



**Tip** If you need to install multiple licenses in any switch, be sure to provide unique file names for each license key file.

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To install a license key file in any switch, perform this task:

- Step 1** Log into the switch through the console port of the active supervisor.
- Step 2** Perform the installation by entering the **install license** command on the active supervisor module from the switch 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** Back up the license file to a .tar file on bootflash: using the **copy licenses** command.

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

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

```
switch# show license
Enterprise.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT ENTERPRISE_PKG cisco 1.0 permanent uncounted \
  HOSTID=VDH=FOX0646S017 \
  NOTICE="<LicFileID></LicFileID><LicLineID>0</LicLineID> \
  <PAK>dummyPak</PAK>" SIGN=EE9F91EA4B64
```



**Note** If the license meets all guidelines when the **install license** command is entered, 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 switch.

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

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

```
switch# show license file Enterprise.lic
Enterprise.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT ENTERPRISE_PKG cisco 1.0 permanent uncounted \
  HOSTID=VDH=FOX0646S017 \
  NOTICE="<LicFileID></LicFileID><LicLineID>0</LicLineID> \
  <PAK>dummyPak</PAK>" SIGN=EE9F91EA4B64
```

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## Backing Up License Files

All installed license files can be backed up as a .tar file in the user specified location. Use the **copy licenses** command in EXEC mode to save your license file to one of two locations; bootflash: or volatile:. The following example saves all licenses to a file named Enterprise.tar:

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



### Tip

We recommend backing up your license files immediately after installing them and just before running a **write erase** command.



### Caution

If you erase any existing licenses, you can only install them using the **install license** command.

## Identifying License Features in Use

When a Cisco NX-OS software feature is enabled, it can activate a license grace period. To identify the features active for a specific license, use the **show license usage license-name** command.

```
switch# show license usage FC_FEATURES_PKG
Application
-----
PFM
-----
```

Use the **show license usage** command to identify all of the active features on your switch.

```
switch# show license usage
Feature                               Ins  Lic  Status Expiry Date Comments
                                   Count
-----
FM_SERVER_PKG                         No   -   Unused
ENTERPRISE_PKG                        No   -   In use  Grace 119D 23H
FC_FEATURES_PKG                       Yes  -   In use never
```

## 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 with an error message. Uninstalling an unused license initiates the grace period. The grace period is measured from the first use of the feature without a license and is reset when a valid license file is installed.



### Note

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

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### Tip

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



### Caution

Disable related features before uninstalling a license. The delete procedure fails if the license is in use.

To uninstall a license, perform this task:

- 
- Step 1** Save your running configuration to a remote server using the **copy** command (see [Chapter 1, “Configuring the Switch”](#)).
- Step 2** Enter the **show license brief** command in EXEC mode to view a list of all installed license key files and identify the file to be uninstalled. In this example, the file to be uninstalled is the FibreChannel.lic file.
- ```
switch# show license brief
Enterprise.lic
FibreChannel.lic
```
- Step 3** Disable the features provided by the license to be uninstalled. Enter the **show license usage package\_name** command to view the enabled features for a specified package.
- ```
switch# show license usage FC_FEATURES_PKG
Application
-----
PFM
-----
```
- Step 4** Uninstall the FibreChannel.lic file using the **clear license filename** command, where *filename* is the name of the installed license key file.
- ```
switch# clear license FibreChannel.lic
Clearing license FibreChannel.lic:
SERVER this_host ANY
VENDOR cisco
```
- Step 5** Enter **yes** (yes is the default) to continue with the license update.
- ```
Do you want to continue? (y/n) y
Clearing license ..done
```

The FibreChannel.lic license key file is now uninstalled.

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## Updating Licenses

If your license is time bound, you must obtain and install an updated license. Contact technical support to request an updated license.



### Note

If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco Systems, contact Cisco Technical Support at this URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

To update a license, perform this task:

**Step 1** Obtain the updated license file using the procedure described in the “[Obtaining the License Key File](#)” section on page 1-4.

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

**Step 3** Enter the **show license brief** command to verify the name of the file to be updated.

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

**Step 4** Update the license file using the **update license url** command, where *url* specifies the bootflash: or volatile: location of the updated license file.

```
switch# update license bootflash:Advanced2.lic Advanced1.lic
Updating Advanced1.lic:
SERVER this_host ANY
VENDOR cisco
# An example fports license
INCREMENT SAN_EXTN_OVER_IP cisco 1.000 permanent 1 HOSTID=VDH=ABCD \
  NOTICE=<LicFileID>Advanced1.lic</LicFileID><LicLineID>0</LicLineID> \
  SIGN=33088E76F668

with bootflash:/Advanced2.lic:
SERVER this_host ANY
VENDOR cisco
# An example fports license
INCREMENT SAN_EXTN_OVER_IP cisco 1.000 permanent 1 HOSTID=VDH=ABCD \
  NOTICE=<LicFileID>Advanced2.lic</LicFileID><LicLineID>1</LicLineID> \
  SIGN=67CB2A8CCAC2
```

**Step 5** Enter **yes** (yes is the default), to continue with the license update.

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

The Enterprise.lic license key file is now updated.

## Grace Period Alerts

Cisco NX-OS 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.

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The grace period stops if you disable a feature you are evaluating, but if you enable that feature again without a valid license, the grace period countdown continues from when it had stopped.

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. Use the **show license usage** *license-name* command to determine which applications to disable.

```
switch# show license usage FC_FEATURES_PKG
Application
-----
PFM
-----
```

The Cisco NX-OS license counter keeps track of all licenses on a switch. 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.



### 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 will enforce license requirements and the 120-day grace period.

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

```
switch# show license usage
Feature                Installed  License Status  ExpiryDate  Comments
                        Count
-----
FM_SERVER_PKG          Yes       -               Unused      never       license missing
MAINFRAME_PKG          No        -               Unused      never       Grace Period 57days15hrs
ENTERPRISE_PKG         Yes       -               InUse       never       -
SAN_EXTN_OVER_IP       No        0               Unused      never       -
SAN_EXTN_OVER_IP_IPS4 No        0               Unused      never       -
-----
```

## License Transfers Between Switches

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



### Note

If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco Systems, contact Cisco Technical Support at this URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

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## Verifying the License Configuration

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

Command	Purpose
switch# <b>show license [brief]</b>	Displays information for all installed license files.
switch# <b>show license file</b>	Displays information for a specific license file.
switch# <b>show license host-id</b>	Displays the host ID for the physical switch.
switch# <b>show license usage</b>	Displays the usage information for installed licenses.