Cisco MDS 9000 Family NX-OS Licensing Guide, Release 6.x

Revised: February 4, 2019, OL-29297-02

Licensing Cisco MDS 9000 Series NX-OS Software Features

Licenses are available for all switches in the Cisco MDS 9000 Series. Licensing allows you to access specified premium features on the switch after you install the appropriate license for that feature. You can also obtain licenses to activate ports on the Cisco MDS 9148S Multilayer Fabric switch, Cisco MDS 9250i Multiservice Fabric switch, and Cisco MDS 9396S Multilayer Fabric Switch.

Cisco MDS NX-OS Software Licenses

This section contains information related to licensing types, options, procedures, installation, and management for the Cisco MDS NX-OS software.

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
: 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. You should reinstall the license 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).

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 Model

The licensing model defined for the Cisco MDS product line has two options:

- Feature-based licenses allow features that are applicable to the entire switch.
- Module-based licenses allow features that require additional hardware modules. The cost varies based on a per-module usage. SAN Extension over IP license is an example of a module-based license.

Note Each module requires its own separate license. If you replace a module that requires a license with a module of the same type (such as replacing a Storage Services Module (SSM) with another SSM), the existing license will support the new module.

Note

- The SAN extension features, FCIP-related features, and an enterprise package (ENTERPRISE_PKG) license for IVR are included in the base license for the Cisco MDS 9250i switch.

  The Cisco MDS 9250i switch does not support SME.

- A SAN extension license is included in the base license for the Cisco MDS 9000 24/10-Port SAN Extension Module (DS-X9334-K9).

This table describes feature-based licenses.

Table 1: Feature-Based Licenses

Feature License	Features
Enterprise package (ENTERPRISE_PKG)	• FC Port security • VSAN-based access control • Fibre Channel Security Protocol (FC-SP) authentication • Advanced traffic engineering—quality of service (QoS) • IP security (IPsec) protocol for iSCSI and FCIP using the MPS-14/2 or SSN-16 modules or Cisco MDS 9222i or MDS 9250i switches • IPsec and IKE for IPv4 • IKE digital certificates • Enhanced VSAN routing inter-VSAN routing (IVR) over Fibre Channel • IVR Network Address Translation (NAT) over Fibre Channel • Zone-based traffic prioritizing • Zone-based FC QoS • Extended BB_Credits • Fibre Channel write acceleration • SCSI flow statistics • FCIP encryption • Fabric binding for Fibre Channel • SAN device virtualization • Cisco TrustSec Fibre Channel Link Encryption
Mainframe package (MAINFRAME_PKG)	• Switch cascading • IBM TotalStorage Virtual Tape Server (VTS) • IBM TotalStorage XRC application • FICON for the Cisco MDS 9250i Multiservice Fabric Switch • FICON for the Cisco MDS 9700 Series Switches • Port swap, block, prohibit
DCNM-SAN License packages	For DCNM related licensing information, see the Cisco DCNM Licensing Guide.

Feature License	Features
On-demand Port Activation Licensing package (PORT_ACTIVATION_PKG) (M9250IP20-16G=) (M9396S-PL12) (M9148S-PL12) (M9148T-PL8) (M9396T-PL16) **Note** The license manager does not prevent installing more port licenses than the available physical ports on the switch. The extra licenses if installed, will not affect the normal behavior of the licensed ports.	• On the Cisco MDS 9250i Fabric Switch, 20 Fibre Channel ports are active by default. Each M9250IP20-16G= enables additional 20 Fibre Channel ports. • On Cisco MDS 9396S 16G Multilayer Fabric Switch, 48 ports are enabled by default. Each M9396S-PL12 enables 12 ports. • On Cisco MDS 9148S 16G Multilayer Fabric Switch, 12 ports are enabled by default. Each M9148S-PL12 enables 12 ports.
Data Mobility Manager (DMM) (DMM_FOR_SSM_PKG) (M9250IDMMT6M)	• Online migration of heterogenous arrays • Simultaneous migration of multiple LUNs • Unequal size LUN migration • Rate adjusted migration • Verification of migrated data • Secure erasure of migrated data • Dual fabric support • Activates DMM on the Cisco MDS 9250i Fabric Switch.
Cisco I/O Acceleration (IOA) (M9250IIOA=)	Activates IOA for the Cisco MDS 9250i Fabric Switch.

Note License packages for Cisco DMM (Cisco Data Mobility Manager) and Cisco SME (Cisco Storage Media Encryption) are documented in the Cisco MDS 9000 Series Data Mobility Manager Configuration Guide, and the Cisco MDS 9000 Series Storage Media Encryption 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 Some licenses, for example, Cisco TrustSec, 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).

Obtaining a Factory-Installed License

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

Procedure

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.

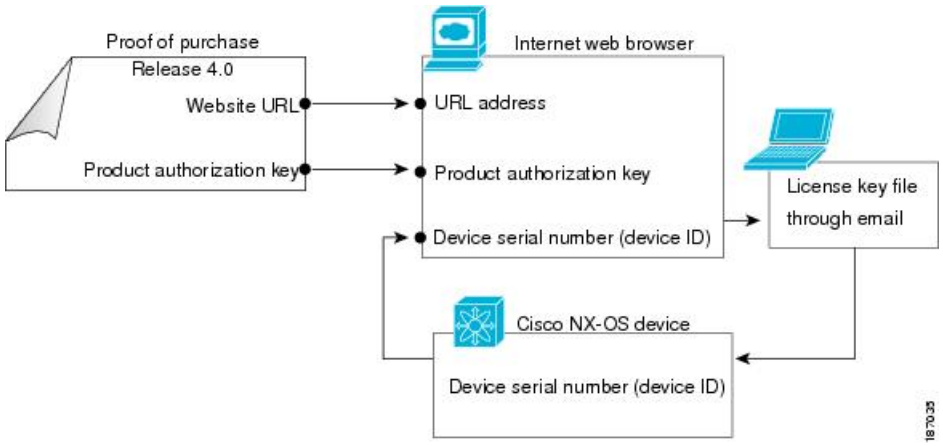
Step 2 Start using the device and the licensed features.

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.

Figure 1: Obtaining a License Key File

This figure shows how to obtain a license key file.



Note You can use the **show license host-id** command to find out which serial number to lock the license against.

For additional information about specific switches and modules and the feature licenses they support, refer to Table 1: Feature-Based Licenses.

Obtaining the License Key File

You can obtain new or updated license key files.

Procedure

Step 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.

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

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

Step 2 Obtain your claim software license certificate document. If you cannot locate your software license claim certificate, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html

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

Step 4 Locate the website URL from the software license claim certificate document. You can access the Product License Registration website from the Software Download website at this URL: http://www.cisco.com/cisco/web/download/index.html

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

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

Caution Do not make any modifications to the license key file. It will alter the digital signature and render the license invalid.

A license is permanent. If you do not have a license, the grace period for using a feature starts from the first time you start using a feature offered by a license.

Note Cisco TrustSec does not have a grace period. You must obtain an Advanced Services license to use Cisco TrustSec.

Step 6 Use the **copy licenses** command to save your license file to either the bootflash: directory or a slot0: device.

Step 7 You can use the file transfer service (tftp, ftp, sftp, sfp, or scp) or use the Cisco DCNM to copy a license to the switch.

For example,Copy tftp://a.b.c.d/<filename> bootflash:

Related Topics

Licensing Model, on page 3
Backing Up Licenses, on page 9
Configuring the Grace Period Feature, on page 13

Installing the License Key File

You can install the license to enable features on your device.

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

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 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.

Procedure

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

Step 2 You can use the file transfer service (tftp, ftp, sftp, sfp, or scp) or use the Cisco Data Center Network Manager (DCNM) to copy a license to the switch.

For example, copy tftp://a.b.c.d/<filename> bootflash:

On DCNM, copy the license file into INSTALL_DIR/dcnm/licenses directory or if using a Microsoft Windows system, the default INSTALL_DIR value is C:\Program Files\Cisco Systems.

Step 3 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 4 (Optional) Back up the license key file.

Step 5 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
Permanent.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT MAINFRAME_PKG cisco 1.0 permanent uncounted \
        HOSTID=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 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
Ficon.lic
FCIP.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 Permanent.lic
Permanent.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT MAINFRAME_PKG cisco 1.0 permanent uncounted \
        HOSTID=FOX0646S017 \
        NOTICE="<LicFileID></LicFileID><LicLineID>0</LicLineID> \
        <PAK>dummyPak</PAK>" SIGN=EE9F91EA4B64
```

Related Topics

Backing Up Licenses, on page 9

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 only reinstall them by using the **install license** command using the license key file.

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:lEnterprise.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
```

Identifying License Features in Use

When you enable a Cisco NX-OS software feature, it can activate a license grace period.

```
switch# show license usage ENTERPRISE_PKG
Application
-----------
ivr
qos_manager
-----------
```

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

```
switch# show license usage
Feature                      Ins  Lic   Status Expiry Date Comments
                                Count
--------------------------------------------------------------------------------
FM_SERVER_PKG                 No    -   Unused             Grace 79D 16H
MAINFRAME_PKG                 No    -   Unused             Grace expired
```

```
ENTERPRISE_PKG                Yes   -   Unused never       license missing
DMM_FOR_SSM_PKG               No    0   Unused             -
SAN_EXTN_OVER_IP              Yes  16   Unused never       -
PORT_ACTIVATION_PKG           No    0   Unused             -
SME_FOR_IPS_184_PKG           No    0   Unused             Grace 86D 5H
SAN_EXTN_OVER_IP_18_4         No    0   Unused             -
SAN_EXTN_OVER_IP_IPS2         Yes   1   Unused never       1 license(s) missing
SAN_EXTN_OVER_IP_IPS4         No    0   Unused             -
10G_PORT_ACTIVATION_PKG       No    0   Unused             -
SAN_EXTN_OVER_IP_18_4         No    0   Unused             -
STORAGE_SERVICES_ENABLER_PKG  Yes   1   Unused never       1 license(s) missing
--------------------------------------------------------------------------------
```

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. 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.

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

Caution You must disable the features that are related to the feature before uninstalling a license. The delete procedure fails if the license is in use.

Procedure

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
Ficon.lic
```

Step 3 Disable the features provided by the license to be uninstalled. Use the **show license usage** *package_name* command to view the enabled features for a specified package.

```
switch# show license usage ENTERPRISE_PKG
Application
-----------
ivr
qos_manager
```

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

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.

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

Procedure

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
Enterprise.lic
```

Step 4 Update the license file by using the **update license** *url* command, where *url* specifies the bootflash:, slot0:, usb1:, or usb2: location of the updated license file.

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

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

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

The Enterprise.lic license key file is now updated.

Related Topics

Licensing Model, on page 3
Obtaining the License Key File , on page 7

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.

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
```

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 Inter-VSAN Routing (IVR) feature as follows:

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

Related Topics

Licensing Model, on page 3

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.

Procedure

Step 1 Display the licenses using the grace period by using the **show license usage** command.

```
switch# show license usage

Feature                      Ins       Lic   Status     Expiry Date  Comments
                                       Count
--------------------------------------------------------------------------------
FM_SERVER_PKG                 Yes       -    Unused        never       -
ENTERPRISE_PKG                Yes       -    In use        never       -
PORT_ACTIVATION_PKG           No        8    In use        never       -
10G_PORT_ACTIVATION_PKG       No        0    Unused                    -
--------------------------------------------------------------------------------
```

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. .

```
switch# show license usage ENTERPRISE_PKG
Application
-----------
ivr
qos_manager
-----------
```

Step 3 Disable the grace period.

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

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.

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 When you install the permanent license, to avoid service disruptions, 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.

```
switch# show license usage MAINFRAME_PKG
Application
-----------
Ficon
-----------
```

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.

Beyond that, the frequency of these messages become hourly during the last seven days of the grace period. 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.
- Hourly alerts from May 22 to May 30.

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
                                Count
--------------------------------------------------------------------------------
FM_SERVER_PKG                 No    -   Unused             Grace 79D 16H
MAINFRAME_PKG                 No    -   Unused             Grace expired
ENTERPRISE_PKG                Yes   -   Unused never       license missing
DMM_FOR_SSM_PKG               No    0   Unused             -
SAN_EXTN_OVER_IP              Yes  16   Unused never       -
PORT_ACTIVATION_PKG           No    0   Unused             -
SME_FOR_IPS_184_PKG           No    0   Unused             Grace 86D 5H
SAN_EXTN_OVER_IP_18_4         No    0   Unused             -
SAN_EXTN_OVER_IP_IPS2         Yes   1   Unused never       1 license(s) missing
SAN_EXTN_OVER_IP_IPS4         No    0   Unused             -
10G_PORT_ACTIVATION_PKG       No    0   Unused             -
SAN_EXTN_OVER_IP_18_4         No    0   Unused             -
STORAGE_SERVICES_ENABLER_PKG  Yes   1   Unused never       1 license(s) missing
--------------------------------------------------------------------------------
```

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. The license cannot be transferred.

Note

- Cisco ONE Software license can be transferred from one device to another as a replacement.
- Return Material Authorization (RMA) certified devices need new license file and can be obtained from Technical Assistance Center (TAC) license team.
- 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 stand-by supervisor module.
- If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html

Verifying the License Configuration

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

Command	Purpose
show license [**brief**]	Displays information for all installed license files.
show license file	Displays information for a specific license file.
show license host-id	Displays the host ID for the physical device.
show license usage	Displays the usage information for installed licenses.

For detailed information about the fields in the output from these commands, see the for your platform.

On-Demand Port Activation Licensing

This section describes how to use the on-demand port activation licensing feature on the Cisco MDS 9148S Multilayer Fabric switch, Cisco MDS 9250i Multiservice Fabric switch, and Cisco MDS 9396S Multilayer Fabric Switch.

About On-Demand Port Activation Licensing

You can expand your SAN connectivity as needed by enabling users to purchase and install additional port licenses. By default, all ports are eligible for license activation.

Port-Naming Conventions

This table describes the port-naming conventions for the Cisco Fabric switches.

Table 2: Port-Naming Conventions for Cisco Fabric Switches

Cisco MDS 9148S Switch	fc1/1 through fc1/48
Cisco MDS 9250i Switch	fc1/1 through fc1/40 and IPS 1/1-2 ETH 1/1-8
Cisco MDS 9396S Switch	fc1/1 through fc1/96

Port Licensing

On the Cisco MDS 9250i Switch, 20 16-Gbps Fibre Channel ports are active by default. To enable the other 20 16-Gbps Fibre Channel ports, you must obtain a license. The 8 10-Gbps FCoE ports are active by default. The two fixed 10-Gbps IP storage services ports do not require additional license

Default Configuration

The following example shows the default port license configuration for the Cisco MDS 9148S Switch:

```
switch# show port-license
 Available port activation licenses are 36
-----------------------------------------------
  Interface   Cookie    Port Activation License
-----------------------------------------------
```

```
fc1/1       16777216        acquired
fc1/2       16781312        acquired
fc1/3       16785408        acquired
fc1/4       16789504        acquired
fc1/5       16793600        acquired
fc1/6       16797696        acquired
fc1/7       16801792        acquired
fc1/8       16805888        acquired
fc1/9       16809984        acquired
fc1/10      16814080        acquired
fc1/11      16818176        acquired
fc1/12      16822272        acquired
fc1/13      16826368        eligible
fc1/14      16830464        eligible
fc1/15      16834560        eligible
fc1/16      16838656        eligible
fc1/17      16842752        eligible
fc1/18      16846848        eligible
fc1/19      16850944        eligible
fc1/20      16855040        eligible
fc1/21      16859136        eligible
fc1/22      16863232        eligible
fc1/23      16867328        eligible
fc1/24      16871424        eligible
fc1/25      16875520        eligible
fc1/26      16879616        eligible
fc1/27      16883712        eligible
fc1/28      16887808        eligible
fc1/29      16891904        eligible
fc1/30      16896000        eligible
fc1/31      16900096        eligible
fc1/32      16904192        eligible
fc1/33      16908288        eligible
fc1/34      16912384        eligible
fc1/35      16916480        eligible
fc1/36      16920576        eligible
fc1/37      16924672        eligible
fc1/38      16928768        eligible
fc1/39      16932864        eligible
fc1/40      16936960        eligible
fc1/41      16941056        eligible
fc1/42      16945152        eligible
fc1/43      16949248        eligible
fc1/44      16953344        eligible
fc1/45      16957440        eligible
fc1/46      16961536        eligible
fc1/47      16965632        eligible
fc1/48      16969728        eligible
```

Note The cookie is used to acquire a license. Use the **show license usage PORT_ACTIV_9148S_PKG** command to show the cookies for acquired licenses.

```
switch# show license usage PORT_ACTIV_9148S_PKG
Application
--------------------------------------------------------------------------------
Port Manager (fc1/1)
Port Manager (fc1/2)
Port Manager (fc1/3)
Port Manager (fc1/4)
Port Manager (fc1/5)
```

```
Port Manager (fc1/6)
Port Manager (fc1/7)
Port Manager (fc1/8)
Port Manager (fc1/9)
Port Manager (fc1/10)
Port Manager (fc1/11)
Port Manager (fc1/12)
--------------------------------------------------------------------------------
```

The following example shows the default port license configuration for the Cisco MDS 9250i Switch:

```
switch# show port-license
Available port activation licenses are 20
-----------------------------------------------
  Interface   Cookie    Port Activation License
-----------------------------------------------
  fc1/1       16777216        acquired
  fc1/2       16781312        acquired
  fc1/3       16785408        acquired
  fc1/4       16789504        acquired
  fc1/5       16793600        acquired
  fc1/6       16797696        acquired
  fc1/7       16801792        acquired
  fc1/8       16805888        acquired
  fc1/9       16809984        acquired
  fc1/10      16814080        acquired
  fc1/11      16818176        acquired
  fc1/12      16822272        acquired
  fc1/13      16826368        acquired
  fc1/14      16830464        acquired
  fc1/15      16834560        acquired
  fc1/16      16838656        acquired
  fc1/17      16842752        acquired
  fc1/18      16846848        acquired
  fc1/19      16850944        acquired
  fc1/20      16855040        acquired
  fc1/21      16859136        eligible
  fc1/22      16863232        eligible
  fc1/23      16867328        eligible
  fc1/24      16871424        eligible
  fc1/25      16875520        eligible
  fc1/26      16879616        eligible
  fc1/27      16883712        eligible
  fc1/28      16887808        eligible
  fc1/29      16891904        eligible
  fc1/30      16896000        eligible
  fc1/31      16900096        eligible
  fc1/32      16904192        eligible
  fc1/33      16908288        eligible
  fc1/34      16912384        eligible
  fc1/35      16916480        eligible
  fc1/36      16920576        eligible
  fc1/37      16924672        eligible
  fc1/38      16928768        eligible
  fc1/39      16932864        eligible
  fc1/40      16936960        eligible
```

Note The cookie is used to acquire a license. Use the **show license usage PORT_ACTIV_20P** command to show the cookies for acquired licenses.

```
switch# show license usage PORT_ACTIV_20P
Application
--------------------------------------------------------------------------------
Port Manager (fc1/1)
Port Manager (fc1/2)
Port Manager (fc1/3)
Port Manager (fc1/4)
Port Manager (fc1/5)
Port Manager (fc1/6)
Port Manager (fc1/7)
Port Manager (fc1/8)
Port Manager (fc1/9)
Port Manager (fc1/10)
Port Manager (fc1/11)
Port Manager (fc1/12)
Port Manager (fc1/13)
Port Manager (fc1/14)
Port Manager (fc1/15)
Port Manager (fc1/16)
Port Manager (fc1/17)
Port Manager (fc1/18)
Port Manager (fc1/19)
Port Manager (fc1/20)
```

The following example shows the default port license configuration for the Cisco MDS 9396S Switch:

```
switch# show port-license
 Available port activation licenses are 0
-----------------------------------------------
  Interface   Cookie    Port Activation License
-----------------------------------------------
  fc1/1       16777216        acquired
  fc1/2       16781312        acquired
  fc1/3       16785408        acquired
  fc1/4       16789504        acquired
  fc1/5       16793600        acquired
  fc1/6       16797696        acquired
  fc1/7       16801792        acquired
  fc1/8       16805888        acquired
  fc1/9       16809984        acquired
  fc1/10      16814080        acquired
  fc1/11      16818176        acquired
  fc1/12      16822272        acquired
  fc1/13      16826368        acquired
  fc1/14      16830464        acquired
  fc1/15      16834560        acquired
  fc1/16      16838656        acquired
  fc1/17      16842752        acquired
  fc1/18      16846848        acquired
  fc1/19      16850944        acquired
  fc1/20      16855040        acquired
  fc1/21      16859136        acquired
  fc1/22      16863232        acquired
  fc1/23      16867328        acquired
  fc1/24      16871424        acquired
  fc1/25      16875520        acquired
  fc1/26      16879616        acquired
  fc1/27      16883712        acquired
  fc1/28      16887808        acquired
  fc1/29      16891904        acquired
  fc1/30      16896000        acquired
  fc1/31      16900096        acquired
```

fc1/32	16904192	**acquired**
fc1/33	16908288	**acquired**
fc1/34	16912384	**acquired**
fc1/35	16916480	**acquired**
fc1/36	16920576	**acquired**
fc1/37	16924672	**acquired**
fc1/38	16928768	**acquired**
fc1/39	16932864	**acquired**
fc1/40	16936960	**acquired**
fc1/41	16941056	**acquired**
fc1/42	16945152	**acquired**
fc1/43	16949248	**acquired**
fc1/44	16953344	**acquired**
fc1/45	16957440	**acquired**
fc1/46	16961536	**acquired**
fc1/47	16965632	**acquired**
fc1/48	16969728	**acquired**
fc1/49	16973824	eligible
fc1/50	16977920	eligible
fc1/51	16982016	eligible
fc1/52	16986112	eligible
fc1/53	16990208	eligible
fc1/54	16994304	eligible
fc1/55	16998400	eligible
fc1/56	17002496	eligible
fc1/57	17006592	eligible
fc1/58	17010688	eligible
fc1/59	17014784	eligible
fc1/60	17018880	eligible
fc1/61	17022976	eligible
fc1/62	17027072	eligible
fc1/63	17031168	eligible
fc1/64	17035264	eligible
fc1/65	17039360	eligible
fc1/66	17043456	eligible
fc1/67	17047552	eligible
fc1/68	17051648	eligible
fc1/69	17055744	eligible
fc1/70	17059840	eligible
fc1/71	17063936	eligible
fc1/72	17068032	eligible
fc1/73	17072128	eligible
fc1/74	17076224	eligible
fc1/75	17080320	eligible
fc1/76	17084416	eligible
fc1/77	17088512	eligible
fc1/78	17092608	eligible
fc1/79	17096704	eligible
fc1/80	17100800	eligible
fc1/81	17104896	eligible
fc1/82	17108992	eligible
fc1/83	17113088	eligible
fc1/84	17117184	eligible
fc1/85	17121280	eligible
fc1/86	17125376	eligible
fc1/87	17129472	eligible
fc1/88	17133568	eligible
fc1/89	17137664	eligible
fc1/90	17141760	eligible
fc1/91	17145856	eligible
fc1/92	17149952	eligible
fc1/93	17154048	eligible
fc1/94	17158144	eligible

```
fc1/95      17162240        eligible
fc1/96      17166336        eligible
```

Note The cookie is used to acquire a license. Use the **show license usage PORT_ACTIV_9396S_PKG** command to show the cookies for acquired licenses.

```
switch# show license usage PORT_ACTIV_9396S_PKG
Application
--------------------------------------------------------------------------------
Port Manager (fc1/1)
Port Manager (fc1/2)
Port Manager (fc1/3)
Port Manager (fc1/4)
Port Manager (fc1/5)
Port Manager (fc1/6)
Port Manager (fc1/7)
Port Manager (fc1/8)
Port Manager (fc1/9)
Port Manager (fc1/10)
Port Manager (fc1/11)
Port Manager (fc1/12)
Port Manager (fc1/13)
Port Manager (fc1/14)
Port Manager (fc1/15)
Port Manager (fc1/16)
Port Manager (fc1/17)
Port Manager (fc1/18)
Port Manager (fc1/19)
Port Manager (fc1/20)
Port Manager (fc1/21)
Port Manager (fc1/22)
Port Manager (fc1/23)
Port Manager (fc1/24)
Port Manager (fc1/25)
Port Manager (fc1/26)
Port Manager (fc1/27)
Port Manager (fc1/28)
Port Manager (fc1/29)
Port Manager (fc1/30)
Port Manager (fc1/31)
Port Manager (fc1/32)
Port Manager (fc1/33)
Port Manager (fc1/34)
Port Manager (fc1/35)
Port Manager (fc1/36)
Port Manager (fc1/37)
Port Manager (fc1/38)
Port Manager (fc1/39)
Port Manager (fc1/40)
Port Manager (fc1/41)
Port Manager (fc1/42)
Port Manager (fc1/43)
Port Manager (fc1/44)
Port Manager (fc1/45)
Port Manager (fc1/46)
Port Manager (fc1/47)
Port Manager (fc1/48)
--------------------------------------------------------------------------------
```

License Status Definitions

This table defines the port activation license status terms.

Table 3: Port Activation License Status Definitions

Port Activation License Status	Definition
acquired	The port is licensed and active.
eligible	The port is eligible to receive a license but does not yet have one.
ineligible	The port is not allowed to receive a license.

By default, when you install additional port license activation packages, the activation status of ports changes from "eligible" to "acquired." If you prefer to accept the default behavior, no further action is required.

Note You can uninstall licenses for ports not in use; however, you cannot uninstall default licenses.

This table describes the port license assignments for the Cisco MDS 9148S Switch.

Table 4: Default Port License Assignments for Cisco MDS 9148S Switch

License Package (PORT_ACTIV_9148S_PKG)	Assigned to Ports on the Cisco MDS 9148S Switch
Default	1–12
PORT_ACTIV_9148S_PKG	13–48

You can use the **show license usage** command to view any licenses assigned to a switch. If a license is in use, the status displayed is In use. If a license is installed but features or ports have acquired the license, then the status displayed is Unused.

The default license package for the Cisco MDS 9148S Switch is as follows:

```
switch# show license usage

Feature                      Ins  Lic   Status Expiry Date Comments
                                Count
--------------------------------------------------------------------------------
FM_SERVER_PKG                 Yes   -   Unused never       -
ENTERPRISE_PKG                No    -   Unused             Grace expired
PORT_ACTIV_9148S_PKG          No   12   In use never       -
--------------------------------------------------------------------------------
```

This example displays the output when you do not have port licenses and try to active a port license:

```
switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# interface fc1/50
switch(config-if)# shutdown
switch(config-if)# port-license acquire
fc1/50: (error) port activation license not available
switch(config-if)# no shutdown
```

```
switch(config-if)# end
switch# show interface fc1/50
fc1/50 is down (SFP not present)
    Hardware is Fibre Channel
    Port WWN is 20:32:8c:60:4f:0d:27:70
    Admin port mode is F, trunk mode is off
    snmp link state traps are enabled
    Port vsan is 1
    Receive data field Size is 2112
    Beacon is turned off
    Logical type is Unknown(0)
    5 minutes input rate 0 bits/sec,0 bytes/sec, 0 frames/sec
    5 minutes output rate 0 bits/sec,0 bytes/sec, 0 frames/sec
      0 frames input,0 bytes
        0 discards,0 errors
        0 invalid CRC/FCS,0 unknown class
        0 too long,0 too short
      0 frames output,0 bytes
        0 discards,0 errors
      0 input OLS,0  LRR,0 NOS,0 loop inits
      0 output OLS,0 LRR, 0 NOS, 0 loop inits
    Last clearing of "show interface" counters :  never

switch# show running-config interface fc1/50

!Command: show running-config interface fc1/50
!Time: Mon Apr 17 11:47:08 2017

version 8.1(1)

interface fc1/50
  switchport mode F
  no shutdown

switch# show port-license | i 1/50
  fc1/50      16977920        eligible
```

This table describes the port license assignments for the Cisco MDS 9250i Switch.

Table 5: Default Port License Assignments for Cisco MDS 9250i Switch

License Package (PORT_ACTIV_20P)	Assigned to Ports on the Cisco MDS 9250i Switch
Default	1–20
PORT_ACTIV_20P	21–40

You can use the **show license usage** command to view any licenses assigned to a switch. If a license is in use, the status displayed is In use. If a license is installed but no ports have acquired a license, then the status displayed is Unused.

The default license package for the Cisco MDS 9250i Switch is as follows:

```
switch# show license usage
Feature                      Ins  Lic   Status Expiry Date Comments
                                Count
--------------------------------------------------------------------------------
DMM_9250                      No    0   Unused             -
IOA_9250                      No    0   Unused             -
XRC_ACCL                      No    -   Unused             -
FM_SERVER_PKG                 Yes   -   Unused never       -
MAINFRAME_PKG                 No    -   Unused             -
ENTERPRISE_PKG                No    -   Unused             -
```

```
PORT_ACTIV_20P                No   20   In use never       -
--------------------------------------------------------------------------------
```

This table describes the port license assignments for the Cisco MDS 9396S Switch.

Table 6: Default Port License Assignments for Cisco MDS 9396S Switch

License Package (PORT_ACTIV_9396S_PKG)	Assigned to Ports on the Cisco MDS 9396S Switch
Default	1–48
First PORT_ACTIV_9396S_PKG	49-60
Second PORT_ACTIV_9396S_PKG	61-72
Third PORT_ACTIV_9396S_PKG	73-84
Fourth PORT_ACTIV_9396S_PKG	85-96

You can use the **show license usage** command to view any licenses assigned to a switch. If a license is in use, the status displayed is In use. If a license is installed but features or ports have acquired the license, then the status displayed is Unused.

The default license package for the Cisco MDS 9396S Switch is as follows:

```
switch# show license usage

Feature                      Ins  Lic   Status Expiry Date Comments
                                Count
--------------------------------------------------------------------------------
FM_SERVER_PKG                 No    -   Unused             -
ENTERPRISE_PKG                No    -   In use             Grace 24D 0H
PORT_ACTIV_9396S_PKG          No   48   In use never       -
--------------------------------------------------------------------------------
```

Configuring Port Activation Licenses

This section describes how to configure port activation licenses.

Making a Port Eligible for a License

By default, all ports are eligible to receive a license. However, if a port has already been made ineligible and you prefer to activate it, then you must make that port eligible by using the **port-license** command.

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters configuration mode.

Step 2	**interface fc** *slot/port* **Example:**	Specifies the port interface that you want to make eligible for a license.

	Command or Action	Purpose
	`switch(config)# interface fc1/1` `switch(config-if)#`	**Note** The name of the port depends on the switch you are using.
Step 3	[**no**] **port-license** **Example:** `switch(config-if)# port-license`	Makes the port eligible to acquire a license. Use the **no** form of the command to remove a license from a port if it already has been assigned, and also make the port ineligible to acquire a license. **Note** You can remove licenses only from ports that are not in an administrative shutdown state.

Step 4	**exit**
	Example:
	`switch(config-if)# exit`
	`switch(config)#`
		Exits interface configuration mode.

Step 5	(Optional) **show port-license** **Example:** `switch(config)# show port-license`	Displays the port license configuration.
Step 6	(Optional) **copy running-config startup-config** **Example:** `switch(config)# copy running-config startup-config`	Copies the running configuration to the startup configuration.

Acquiring a License for a Port

If you do not prefer to accept the default on-demand port license assignments, you will need to first acquire licenses for ports to which you want to move the license.

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters configuration mode.

Step 2	**interface fc** *slot*/*port*
	Example:
	`switch(config)# interface fc1/1`
	`switch(config-if)#`
		Specifies the port interface for which you want to acquire a license.
		Note The name of the port depends on the switch you are using.

Step 3	[**no**] **port-license acquire** **Example:** `switch(config-if)# port-license acquire`	Grants a license to a port or range of ports. Use the **no** form of the command to remove a license from a port or range of ports.

	Command or Action	Purpose

Step 4	**exit**
	Example:
	`switch(config-if)# exit`
	`switch(config)#`
		Exits interface configuration mode.

Step 5	(Optional) **show port-license** **Example:** `switch(config)# show port-license`	Displays the port license configuration.
Step 6	(Optional) **copy running-config startup-config** **Example:** `switch(config)# copy running-config startup-config`	Copies the running configuration to the startup configuration.

Moving Licenses Among Ports

You can move a license from a port (or range of ports) at any time. If you attempt to move a license to a port and no license is available, then the switch returns the message "port activation license not available."

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters configuration mode.

Step 2	**interface fc** *slot*/*port*
	Example:
	`switch(config)# interface fc1/1`
	`switch(config-if)#`
		Specifies the port interface from which you want to move a license.

Step 3	**shutdown** **Example:** `switch(config-if)# shutdown`	Disables the interface.
Step 4	**no port-license** **Example:** `switch(config-if)# no port-license`	Removes the license from port fc1/1 and makes the port ineligible to acquire a license.

Step 5	**exit**
	Example:
	`switch(config-if)# exit`
	`switch(config)#`
		Exits interface configuration mode.

	Command or Action	Purpose

Step 6	**interface fc** *slot/port*
	Example:
	`switch(config)# interface fc1/24`
	`switch(config-if)#`
		Specifies the port interface to which you want to move the license.
		Note The name of the port depends on the switch you are using.

Step 7	**shutdown** **Example:** `switch(config-if)# shutdown`	Disables the interface.
Step 8	**port-license acquire** **Example:** `switch(config-if)# port-license acquire`	Grants a license to port fc1/24.
Step 9	**no shutdown** **Example:** `switch(config-if)# shutdown`	Enables the interface.

Step 10	**exit**
	Example:
	`switch(config-if)# exit`
	`switch(config)#`
		Exits interface configuration mode.

Step 11	(Optional) **show port-license** **Example:** `switch(config)# show port-license`	Displays the port license configuration.
Step 12	(Optional) **copy running-config startup-config** **Example:** `switch(config)# copy running-config startup-config`	Copies the running configuration to the startup configuration.

On-Demand Port License Activation Example

The following example shows how to do the following tasks:

- Make a port ineligible
- Install port activation licenses
- Move licenses from one port to another

If you do not want to accept the default behavior, or you need flexibility in terms of which ports acquire a license, you may want to make a port ineligible. For example, if the first eight ports have a license, but you want to move a license from port 7 to port 9, then you would need to make a port ineligible. Or, if you have a port that should never acquire a license, you can make it ineligible and it will not be a candidate for a license when additional licenses are installed.

Procedure

Step 1 Display the default port license configuration.

```
switch# show port-license
Available port activation licenses are 0
--------------------------------------------------
  Interface    Cookie       Port Activation License
--------------------------------------------------
   fc1/1      16777216           acquired
   fc1/2      16781312           acquired
   fc1/3      16785408           acquired
   fc1/4      16789504           acquired
   fc1/5      16793600           acquired
   fc1/6      16797696           acquired
   fc1/7      16801792           acquired
   fc1/8      16805888           acquired
   fc1/9      16809984           eligible
   fc1/10     16814080           eligible
   fc1/11     16818176           eligible
   fc1/12     16822272           eligible
   fc1/13     16826368           eligible
   fc1/14     16830464           eligible
   fc1/15     16834560           eligible
   fc1/16     16838656           eligible
   fc1/17     16842752           eligible
   fc1/18     16846848           eligible
   fc1/19     16850944           eligible
   fc1/20     16855040           eligible
   fc1/21     16859136           eligible
   fc1/22     16863232           eligible
   fc1/23     16867328           eligible
   fc1/24     16871424           eligible
```

Step 2 Install an additional license package.

```
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.

(Optional) Release port license from a port.

```
switch(config)# interface fc 1/1
switch(config-if)# shutdown
switch(config-if)# no port-license acquire
switch(config-if)# show running-config interface fc 1/1

!Command: show running-config interface fc1/1
!Time: Tue Apr 18 15:35:03 2017

version 8.1(1)

interface fc1/1
  no port-license
```

Step 3 Make port fc1/8 ineligible to receive a license.

Note When you make a port ineligible, the license does not automatically transfer to another port.

```
switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# interface fc1/8
switch(config-if)# shutdown
switch(config-if)# no port-license
switch(config-if)# exit
switch(config)# show port-license
Available port activation licenses are 1
-----------------------------------------------------
  Interface    Cookie       Port Activation License
-----------------------------------------------------
   fc1/1      16777216           acquired
   fc1/2      16781312           acquired
   fc1/3      16785408           acquired
   fc1/4      16789504           acquired
   fc1/5      16793600           acquired
   fc1/6      16797696           acquired
   fc1/7      16801792           acquired
   fc1/8      16805888           ineligible
   fc1/9      16809984           eligible
   fc1/10     16814080           eligible
```

Step 4 Display the licensed features to confirm that you have successfully installed PORT_ACTIVATION_PKG.

```
switch(config)# show license default
Feature                              Default License Count
--------------------------------------------------------------------------------
FM_SERVER_PKG                                -
ENTERPRISE_PKG                               -
PORT_ACTIVATION_PKG                          8
10G_PORT_ACTIVATION_PKG                      0
switch# --------------------------------------------------------------------------
```

Step 5 Display the port license configuration to confirm that additional ports have acquired a license.

Note Port fc1/8 remains ineligible and one license remains available. Ports fc1/9 through fc1//16 have acquired an additional license.

```
switch(config)# show port-license
Available port activation licenses are 1
-----------------------------------------------------
  Interface    Cookie       Port Activation License
-----------------------------------------------------
   fc1/1      16777216           acquired
   fc1/2      16781312           acquired
   fc1/3      16785408           acquired
   fc1/4      16789504           acquired
   fc1/5      16793600           acquired
   fc1/6      16797696           acquired
   fc1/7      16801792           acquired
   fc1/8      16805888           ineligible
   fc1/9      16809984           acquired
```

```
   fc1/10     16814080           acquired
   fc1/11     16818176           acquired
   fc1/12     16822272           acquired
   fc1/13     16826368           acquired
   fc1/14     16830464           acquired
   fc1/15     16834560           acquired
   fc1/16     16838656           acquired
   fc1/17     16842752           eligible
   fc1/18     16846848           eligible
   fc1/19     16850944           eligible
   fc1/20     16855040           eligible
   fc1/21     16859136           eligible
   fc1/22     16863232           eligible
   fc1/23     16867328           eligible
   fc1/24     16871424           eligible
```

Step 6 Move the remaining license to port fc1/17.

```
switch(config)# interface fc1/17
switch(config-if)# shutdown
switch(config-if)# port-license acquire
switch(config-if)# no shutdown
switch(config-if)# exit
switch(config)#
```

Step 7 Display the port license configuration to confirm that port fc1/17 has acquired a license.

```
switch(config)# show port-license
Available port activation licenses are 0
--------------------------------------------------
  Interface    Cookie       Port Activation License
--------------------------------------------------
   fc1/1      16777216           acquired
   fc1/2      16781312           acquired
   fc1/3      16785408           acquired
   fc1/4      16789504           acquired
   fc1/5      16793600           acquired
   fc1/6      16797696           acquired
   fc1/7      16801792           acquired
   fc1/8      16805888           ineligible
   fc1/9      16809984           acquired
   fc1/10     16814080           acquired
   fc1/11     16818176           acquired
   fc1/12     16822272           acquired
   fc1/13     16826368           acquired
   fc1/14     16830464           acquired
   fc1/15     16834560           acquired
   fc1/16     16838656           acquired
   fc1/17     16842752           acquired
   fc1/18     16846848           eligible
   fc1/19     16850944           eligible
   fc1/20     16855040           eligible
   fc1/21     16859136           eligible
   fc1/22     16863232           eligible
   fc1/23     16867328           eligible
   fc1/24     16871424           eligible
```

Step 8 Make this configuration your startup configuration by saving the new port license configuration into nonvolatile storage. Once you complete this step, the running and the startup copies of the configuration are identical.

```
switch(config)# copy running-config startup-config
```

Step 9 Display and confirm the licenses in the running configuration by entering the **show running-config** command.

```
switch# show running-config
...
interface fc1/1
  switchport trunk mode auto
  port-license acquire
  channel-group 122 force
  no shutdown

interface fc1/2
  switchport trunk mode auto
  port-license acquire
  channel-group 122 force
  no shutdown

interface fc1/3
  switchport trunk mode auto
  port-license acquire
  no shutdown

interface fc1/4
  port-license acquire
  no shutdown

interface fc1/5
  switchport trunk mode auto
  port-license acquire
  port-track interface fc1/13
  port-track interface fc1/21
  port-track interface fc1/24
  port-track interface port-channel 122
  no shutdown

interface fc1/6
  switchport trunk mode off
  port-license acquire
  fcsp auto-active
  no shutdown
```

Related Documentation

The documentation set for the Cisco MDS 9000 Series includes the following documents. To find a document online, use the Cisco MDS NX-OS Documentation Locator at:

http://www.cisco.com/en/US/docs/storage/san_switches/mds9000/roadmaps/doclocater.htm

Cisco DCNM documentation is available at the following URL:

http://www.cisco.com/en/US/products/ps9369/tsd_products_support_series_home.html

Release Notes

- *Cisco MDS 9000 Series Release Notes for Cisco MDS NX-OS Releases*
- *Cisco MDS 9000 Series Release Notes for MDS SAN-OS Releases*
- *Cisco MDS 9000 Series Release Notes for Storage Services Interface Images*
- *Cisco MDS 9000 Series Release Notes for Cisco MDS 9000 EPLD Images*
- *Cisco Data Center Network Manager Release Notes*

Regulatory Compliance and Safety Information

Regulatory Compliance and Safety Information for the Cisco MDS 9000 Series

Compatibility Information

- *Cisco Data Center Interoperability Support Matrix*
- *Cisco MDS 9000 NX-OS Hardware and Software Compatibility Information and Feature Lists*
- *Cisco MDS NX-OS Release Compatibility Matrix for Storage Service Interface Images*
- *Cisco MDS 9000 Series Switch-to-Switch Interoperability Configuration Guide*
- *Cisco MDS NX-OS Release Compatibility Matrix for IBM SAN Volume Controller Software for Cisco MDS 9000*

Hardware Installation

- *Cisco MDS 9700 Director Hardware Installation Guide*
- *Cisco MDS 9500 Series Hardware Installation Guide*
- *Cisco MDS 9250i Multiservice Switch Hardware Installation Guide*
- *Cisco MDS 9200 Series Hardware Installation Guide*

Software Installation and Upgrade

- *Cisco MDS 9000 Series Storage Services Interface Image Install and Upgrade Guide*
- *Cisco MDS 9000 Series Storage Services Module Software Installation and Upgrade Guide*
- *Cisco MDS 9000 NX-OS Release 4.1(x) and SAN-OS 3(x) Software Upgrade and Downgrade Guide*

Cisco NX-OS

- *Cisco MDS 9000 Series NX-OS Fundamentals Configuration Guide*
- *Cisco MDS 9000 Series NX-OS Licensing Guide*
- *Cisco MDS 9000 Series NX-OS System Management Configuration Guide*
- *Cisco MDS 9000 Series NX-OS Interfaces Configuration Guide*
- *Cisco MDS 9000 Series NX-OS Fabric Configuration Guide*

- *Cisco MDS 9000 Series NX-OS Quality of Service Configuration Guide*
- *Cisco MDS 9000 Series NX-OS Security Configuration Guide*
- *Cisco MDS 9000 Series NX-OS IP Services Configuration Guide*
- *Cisco MDS 9000 Series NX-OS Intelligent Storage Services Configuration Guide*
- *Cisco MDS 9000 Series NX-OS High Availability and Redundancy Configuration Guide*
- *Cisco MDS 9000 Series NX-OS Inter-VSAN Routing Configuration Guide*

Command-Line Interface

Cisco MDS 9000 Series Command Reference

Intelligent Storage Networking Services Configuration Guides

- *Cisco MDS 9000 I/O Acceleration Configuration Guide*
- *Cisco MDS 9000 Series SANTap Deployment Guide*
- *Cisco MDS 9000 Series Data Mobility Manager Configuration Guide*
- *Cisco MDS 9000 Series Storage Media Encryption Configuration Guide*
- *Cisco MDS 9000 Series Secure Erase Configuration Guide*
- *Cisco MDS 9000 Series Cookbook for Cisco MDS SAN-OS*

Troubleshooting and Reference

- *Cisco NX-OS System Messages Reference*
- *Cisco MDS 9000 Series NX-OS Troubleshooting Guide*
- *Cisco MDS 9000 Series NX-OS MIB Quick Reference*
- *Cisco MDS 9000 Series NX-OS SMI-S Programming Reference*
- *Cisco DCNM for SAN Database Schema Reference*

Communications, Services, and Additional Information

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

Cisco Bug Search Tool

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

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA 95134-1706
USA

Asia Pacific Headquarters
CiscoSystems(USA)Pte.Ltd.
Singapore

Europe Headquarters
CiscoSystemsInternationalBV
Amsterdam,TheNetherlands

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