



Troubleshooting Licensing

Licensing functionality is available in all switches in the Cisco MDS 9000 Family. This functionality allows you to access specified premium features on the switch after you install the appropriate license for that feature. Licenses are supported, and enforced in Cisco MDS SAN-OS Release 1.3(1) and later.

This chapter includes the following topics:

- [License Overview, page 4-1](#)
- [Best Practices, page 4-3](#)
- [Initial Troubleshooting Checklist, page 4-4](#)
- [Licensing Installation Issues, page 4-6](#)

License Overview

Cisco SAN-OS requires licenses for advanced features. These licenses have two options:

- Feature-based licensing—Features that are applicable to the entire switch. You need to purchase and install a license for each switch that uses the features you are interested in. The Enterprise license is an example of a feature-based license.
- Module-based licensing—Features that require additional hardware modules. You need to purchase and install a license for each module that uses the features you are interested in. The SAN Extension over IP license is an example of a module-based license.



Note

The Cisco MDS 9216i switch enables SAN Extension features on the two fixed IP services ports only. The features enabled on these ports are identical to the features enabled by the SAN Extension over IP license on the 14/2-port Multiprotocol Services (MPS-14/2) module. If you install a module with IP ports in the empty slot on the Cisco MDS 9216i, a separate SAN Extension over IP license is required to enable related features on the IP ports of the additional module.

Chassis Serial Numbers

Licenses are created using the serial number of the chassis where the license file is to be installed. Once you order a license based on a chassis serial number, you cannot use this license on any other switch. If you use a license meant for another chassis, you may see the following system message:

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Error Message LICMGR-3-LOG_LIC_INVALID_HOSTID: Invalid license hostid VDH=[chars] for feature [chars].

Explanation The feature has a license with an invalid license Host ID. This can happen if a supervisor module with licensed features for one switch is installed on another switch.

Recommended Action Reinstall the correct license for the chassis where the supervisor module is installed.

Grace Period

If you use a feature that requires a license but have not installed a license for that feature, you are given a 120 day grace period to evaluate the feature. You must purchase and install the number of licenses required for that feature before the grace period ends or Cisco SAN-OS will disable the feature at the end of the grace period. If you try to use an unlicensed feature, you may see the following system messages:

Error Message LICMGR-2-LOG_LIC_GRACE_EXPIRED: Grace period expired for feature [chars].

Explanation The unlicensed feature has exceeded its grace time period. Applications using this license will be shut down immediately.

Recommended Action Please install the license file to continue using the feature.

Error Message LICMGR-3-LOG_LICAPP_NO_LIC: Application [chars] running without [chars] license, shutdown in [dec] days.

Explanation The Application [chars1] has not been licensed. The application will work for a grace period of [dec] days after which it will be shut down unless a license file for the feature is installed.

Recommended Action Install the license to continue using the feature.

Error Message LICMGR-3-LOG_LIC_LICENSE_EXPIRED: Evaluation license expired for feature [chars].

Explanation The feature has exceeded its evaluation time period. The feature will be shut down after a grace period.

Recommended Action Install the license to continue using the feature.

Error Message LICMGR-3-LOG_LIC_NO_LIC: No license(s) present for feature [chars]. Application(s) shutdown in [dec] days.

Explanation The feature has not been licensed. The feature will work for a grace period, after which the application(s) using the feature will be shutdown.

Recommended Action Install the license to continue using the feature.

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Error Message LICMGR-6-LOG_LICAPP_EXPIRY_WARNING: Application [chars] evaluation license [chars] expiry in [dec] days.

Explanation The application will exceed its evaluation time period in the listed number of days and will be shut down unless a permanent license for the feature is installed.

Recommended Action Install the license file to continue using the feature.

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 clock does not stop for that license package. To suspend the grace period countdown for a licensed feature, you must disable every feature in that license package. Choose **Switches > Licenses** and select the **Usage** tab in Fabric Manager or use the **show license usage** CLI command to determine which features are enabled for a license package.

Best Practices

This section provides the best practices when dealing with licenses for Cisco SAN-OS products.

- Do not ignore grace period expiration warnings. Allow 60 days before the grace period expires to allow time for ordering, shipping, and installation.
- Carefully determine the license(s) you require based on the features and modules that require a license. Remember that you need one license per chassis for feature-based licenses and one per module for module-based licenses.
- Order your license accurately:
 - Enter the Product Authorization Key that appears in the Proof of Purchase document that comes with your switch.
 - Enter the correct chassis serial number when ordering the license. The serial number must be for the same chassis that you plan to install the license on. Choose **Switches > Hardware** and check the SerialNo Primary for the switch chassis in Fabric Manager or use the **show license host-id** CLI command.
 - Enter serial numbers accurately. The serial number contains zeros, but no letter “O”.
 - Order the license specific to your chassis or module type. An MDS 9200 Series license will not work on an MDS 9500 Series switch. Similarly, the SAN_EXTENSION_OVER_IP2 license works for an MPS-14/2 module, but will not work for an IPS-4 module. See [Table 8-3 on page 8-7](#) for details on the SAN Extension over IP licenses available.
- Install licenses using the one-click method in Fabric Manager.
- Backup the license file to a remote, secure place. Archiving your license files ensures that you will not lose the licenses in the case of a failure on your switch.
- Install the correct licenses on each switch, using the licenses that were ordered using that switch’s serial number. Licenses are serial-number specific and platform or module type specific.
- Choose **Switches > Licenses** and select the **Usage** tab in Fabric Manager or use the **show license usage** CLI command to verify the license installation.
- Never modify a license file or attempt to use it on a switch that it was not ordered for. If you RMA a chassis, contact your customer support representative to order a replacement license for the new chassis.

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Initial Troubleshooting Checklist

Begin troubleshooting license issues by checking the following issues first:

Checklist	Checkoff
Verify the chassis serial number for all licenses ordered.	<input type="checkbox"/>
Verify the platform or module type for all licenses ordered.	<input type="checkbox"/>
Verify that the Product Authorization Key you used to order the licenses comes from the same chassis that you retrieved the chassis serial number on.	<input type="checkbox"/>
Verify that you have installed all licenses on all switches that require the licenses for the features you enable.	<input type="checkbox"/>

This section includes the following topics:

- [Displaying License Information Using Fabric Manager, page 4-4](#)
- [Displaying License Information Using Fabric Manager Web Services, page 4-4](#)
- [Displaying License Information Using the CLI, page 4-4](#)

Displaying License Information Using Fabric Manager

To view license information using Fabric Manager, follow these steps:

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- Step 1** Select **Switches > Licenses** from the Physical Attributes pane. You see the license information in the Information pane, one line per feature.
- Step 2** Click the **Feature Usage** tab to see the switch, name of the feature package, the type of license installed, the number of licenses used (Installed Count), the expiration date, the grace period (if you do not have a license for a particular feature), and any errors (for example, if you have a missing license). Click the **Keys** tab to display information about each of the License Key files installed on your switches.
- Step 3** Click the **Usage** tab to see the applications using the feature package on each switch. Use this tab to determine which applications depend on each license you have installed.
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Displaying License Information Using Fabric Manager Web Services

Fabric Manager Release 2.1(2) or later supports viewing license use across the fabric from Fabric Manager Web Services. This view summarizes the licenses used on all switches in the fabric.

To view licenses using Fabric Manager Web Services, choose **Inventory > Licenses**.

Displaying License Information Using the CLI

Use the **show license** commands to display all license information configured on this switch (see [Example 4-1](#) through [Example 4-3](#)).

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Example 4-1 Displays Information About Current License Usage

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

Example 4-2 Displays the List of Features in a Specified Package

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

Example 4-3 Displays the Host ID for the License

```
switch# show license host-id
License hostid: VDH=FOX0646S017
```



Note

Use the entire ID that appears after the colon (:). The VDH is the Vendor Host ID.

Example 4-4 Displays All Installed License Key Files and Contents

```
switch# show license
Permanent.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT MAINFRAME_PKG cisco 1.0 permanent uncounted \
  HOSTID=VDH=FOX0646S017 \
  NOTICE="<LicFileID>/<LicFileID><LicLineID>0</LicLineID> \
  <PAK>dummyPak</PAK>" SIGN=EE9F91EA4B64
Evaluation.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT MAINFRAME_PKG cisco 1.0 30-Dec-2003 uncounted \
  HOSTID=VDH=FOX0646S017 \
  NOTICE="<LicFileID>/<LicFileID><LicLineID>0</LicLineID> \
  <PAK>dummyPak</PAK>" SIGN=EE9F91EA4B64
```

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Example 4-5 *Displays a List of Installed License Key Files*

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

Example 4-6 *Displays the Contents of a Specified License Key File*

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

Licensing Installation Issues

Common problems with licenses usually stem from incorrectly ordering the license file, installing the license file on an incorrect switch, or not ordering the correct number of licenses for your fabric.

This section includes the following topics:

- [One-Click License Install Fails or Cannot Connect to Licensing Website, page 4-7](#)
- [Serial Number Issues, page 4-7](#)
- [RMA Chassis Errors or License Transfers Between Switches, page 4-8](#)
- [Receiving Grace Period Warnings After License Installation, page 4-8](#)
- [Incorrect Number of Licenses in Use for Multiple Modules, page 4-8](#)
- [Grace Period Alerts, page 4-9](#)
- [Checking in the Fabric Manager Server License From Device Manager, page 4-10](#)
- [Checking in the Fabric Manager Server License From Device Manager, page 4-10](#)
- [License Listed as Missing, page 4-11](#)

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One-Click License Install Fails or Cannot Connect to Licensing Website

The one-click license installation tries to open an HTTPS connection to the licensing website that matches the vendor you purchased your switch from.

Symptom One-click license install fails or cannot connect to the licensing website.

Table 4-1 One-Click License Install Fails or Cannot Connect to License Website

Symptom	Possible Cause	Solution
One-click license install fails or cannot connect to the licensing website.	License website uses HTTP, not HTTPS.	Edit <install directory>/bin/FabricManager.bat file to add the following lines to the JVMargs argument: -Dhttp.proxyHost=HOSTADDRESS -Dhttp.proxyPort=HOSTPORT.
	Fabric Manager communicating through a proxy server.	Edit <install directory>/bin/FabricManager.bat file to add the following lines to the JVMargs argument: -Dhttps.proxyHost=HOSTADDRESS -Dhttps.proxyPort=HOSTPORT.
	Java versions 1.4.2_01 and later do not have the right set of Certificate Authority (CA) certificates to validate the SSL certificates on the EMC server (HTTPS).	The license wizard cannot make an HTTPS connection to the EMC servers. If the License Wizard fails to fetch the license keys, saying the connection failed, the workaround is to install the latest 1.4(x) version of Java, preferably 1.4.2_04 or later.

Serial Number Issues

A common problem with licenses stems from not using the correct chassis serial number when ordering your license.

To obtain the correct chassis serial number using Fabric Manager, follow these steps:

-
- Step 1** Choose **Switches > Hardware** and select the **Inventory** tab.
 - Step 2** Copy down the SerialNo Primary field for the chassis that matches where you want to install a new license.



Note If you are ordering a module-based license, such as the SAN Extension over IP license package, you still use the chassis serial number for the chassis where the module resides, not the module serial number.

Use the **show license host-id** CLI command to obtain the correct chassis serial number for your switch using the CLI.

When entering the chassis serial number during the license ordering process, do not use the letter “O” in place of any zeros in the serial number.

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RMA Chassis Errors or 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>

Receiving Grace Period Warnings After License Installation

If the license installation does not proceed correctly, or if you are using a feature that exists in a license package that you have not installed, you will continue to get grace period warnings.

Symptom Receiving grace period warnings after a license installation.

Table 4-2 Receiving Grace Period Warnings After License Installation

Symptom	Possible Cause	Solution
Receiving grace period warnings after a license installation.	License file copied to switch but not installed.	Choose Tools > Other > License Install in Fabric Manager or use the license install CLI command to install the license.
	License installation failed.	Check your logs for any system messages for a failed license installation. Choose Switches > Licenses and select the Usage tab in Fabric Manager or use the show license usage CLI command to determine what feature is in use without a license.
	Not enough license files installed for a feature.	Some features require more than one license per chassis. Module-based licenses such as SAN Extension over IP for example requires one license per module that uses these features. Choose Switches > Licenses and select the Usage tab in Fabric Manager or use the show license usage CLI command to determine which feature is in use without a license.

Incorrect Number of Licenses in Use for Multiple Modules

Module-based licenses require one license installed per module that uses a licensed feature. SAN Extension over IP is an example of a module based license. Installing a SAN Extension over IP license while two FCIP instances from different modules are present, may cause the system to return the following error message:

```
Installing license failed: Number of License in use is more than the number being installed.
```

This error message is generated because the license grace period is only applicable when no licenses are installed. The installation of one license terminates the grace period and will arbitrarily cause the second module to shut down, because this is not allowed by licensing.

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The workaround for this scenario includes doing one of the following:

- Concatenate both licenses into one license file.
- Manually reduce the usage count by one.

To concatenate both licenses into one license file, follow these steps:

Step 1 Open both license files using WordPad.

Step 2 Copy both license files to one file:

```
Example
SERVER this_host ANY
VENDOR cisco
INCREMENT SAN_EXTN_OVER_IP_IPS2 cisco 1.0 permanent 1 \
VENDOR_STRING=<LIC_SOURCE>MDS_SWIFT</LIC_SOURCE><SKU>M9500EXT12EK9=</SKU> \
HOSTID=VDH=FOXYYYYYYY \
NOTICE="<LicFileID>2005082204514XXXX</LicFileID><LicLineID>1</LicLineID> \
<PAK>MDS-1X-JAB-0F1A81</PAK>" SIGN=F0652E02XXXX
INCREMENT SAN_EXTN_OVER_IP_IPS2 cisco 1.0 permanent 1 \
VENDOR_STRING=<LIC_SOURCE>MDS_SWIFT</LIC_SOURCE><SKU>M9500EXT12EK9=</SKU> \
HOSTID=VDH=FOXYYYYYYY \
NOTICE="<LicFileID>2005082204572XXXX</LicFileID><LicLineID>1</LicLineID> \
<PAK>MDS-1X-JAB-0F1AD1</PAK>" SIGN=D222AE4AXXXX
```

Step 3 Save the new concatenated license file.

Step 4 Upload and install the concatenated license file on the MDS switch.

To reduce the usage count to one, follow these steps:

Step 1 Bring down one of the modules manually to reduce the usage count by one.

Step 2 Reinsert the module after installing both licenses.

Grace Period Alerts

Cisco SAN-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.

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 where it left off.

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. To disable the grace period countdown for Fabric Manager Server, you must explicitly check in the license using Device Manager. See the [“Checking in the Fabric Manager Server License From Device Manager” section on page 4-10](#).

The Cisco SAN-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.

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Beyond that, the frequency of these messages become hourly during the last seven days of the grace period. The following example uses the FICON feature. On January 30th, you enabled the FICON feature, using the 120 day grace period. You will receive grace period ending messages as:

- Daily alerts from January 30th to May 21st.
- Hourly alerts from May 22nd to May 30th.

On May 31st, the grace period ends, and the FICON feature is automatically disabled. You will not be allowed to use FICON 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 will enforce license requirements and the 120-day grace period.

Checking in the Fabric Manager Server License From Device Manager

If you evaluated Fabric Manager Server without a license, you can stop the grace period countdown and disable all features using the Fabric Manager Server license package using Device Manager.

To stop the Fabric Manager Server license grace period using Device Manager, follow these steps:

Step 1 Choose **Admin > Licenses** and select the **Features** tab.

Step 2 Click **Check In FM**.



Note

This button appears only when FM_SERVER_PKG is unlicensed.



Note

Because of Caveat CSCeg23889, you might still receive Call Home or system messages for an unused FM_SERVER_PKG license. This caveat describes how extraneous messages are sent after a Fabric Manager Server license is checked in.

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License Listed as Missing

After a license is installed and operating properly, it may show up as missing if you modify your system hardware or encounter a bootflash: issue.

Symptom License listed as missing.

Table 4-3 License Listed as Missing

Symptom	Possible Causes	Solutions
License listed as missing.	Supervisor module was replaced after license was installed.	Reinstall the license.
	Supervisor bootflash: is corrupted.	See the “Corrupted Bootflash Recovery” section on page 2-13 to recover from corrupted bootflash:. Reinstall the license.

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