

CHAPTER 3

Configuring System Message Logging

This chapter describes how to configure system message logging on Cisco MDS 9000 Family switches. It includes the following sections:

- [About System Message Logging, page 3-1](#)
- [System Message Logging Configuration, page 3-4](#)
- [Default Settings, page 3-14](#)

About System Message Logging

With the system message logging software, you can save messages in a log file or direct the messages to other devices. By default, the switch logs normal but significant system messages to a log file and sends these messages to the system console. This feature provides you with the following capabilities:

- Provides logging information for monitoring and troubleshooting
- Allows you to select the types of captured logging information
- Allows you to select the destination server to forward the captured logging information properly configured system message logging server.

You can monitor system messages by clicking the Events tab on Fabric Manager or by choosing **Logs > Events > Current** on Device Manager. You can also monitor system messages remotely by accessing the switch through Telnet, SSH, or the console port, or by viewing the logs on a system message logging server.



Note

When the switch first initializes, the network is not connected until initialization completes. Therefore, messages are not redirected to a system message logging server for a few seconds.

Log messages are not saved across system reboots. However, a maximum of 100 log messages with a severity level of critical and below (levels 0, 1, and 2) are saved in NVRAM.

[Table 3-1](#) describes some samples of the facilities supported by the system message logs.

Table 3-1 Internal Logging Facilities

Facility Keyword	Description	Standard or Cisco MDS Specific
acl	ACL manager	Cisco MDS 9000 Family specific
all	All facilities	Cisco MDS 9000 Family specific

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Table 3-1 Internal Logging Facilities (continued)

Facility Keyword	Description	Standard or Cisco MDS Specific
auth	Authorization system	Standard
authpriv	Authorization (private) system	Standard
bootvar	Bootvar	Cisco MDS 9000 Family specific
callhome	Call Home	Cisco MDS 9000 Family specific
cron	Cron or at facility	Standard
daemon	System daemons	Standard
fcc	FCC	Cisco MDS 9000 Family specific
fcdomain	fcdomain	Cisco MDS 9000 Family specific
fcns	Name server	Cisco MDS 9000 Family specific
fcs	FCS	Cisco MDS 9000 Family specific
flogi	FLOGI	Cisco MDS 9000 Family specific
fspf	FSPF	Cisco MDS 9000 Family specific
ftp	File Transfer Protocol	Standard
ipconf	IP configuration	Cisco MDS 9000 Family specific
ipfc	IPFC	Cisco MDS 9000 Family specific
kernel	Kernel	Standard
local0 to local7	Locally defined messages	Standard
lpr	Line printer system	Standard
mail	Mail system	Standard
mcast	Multicast	Cisco MDS 9000 Family specific
module	Switching module	Cisco MDS 9000 Family specific
news	USENET news	Standard
ntp	NTP	Cisco MDS 9000 Family specific
platform	Platform manager	Cisco MDS 9000 Family specific
port	Port	Cisco MDS 9000 Family specific
port-channel	PortChannel	Cisco MDS 9000 Family specific
qos	QoS	Cisco MDS 9000 Family specific
rdl	RDL	Cisco MDS 9000 Family specific
rib	RIB	Cisco MDS 9000 Family specific
rscn	RSCN	Cisco MDS 9000 Family specific
securityd	Security	Cisco MDS 9000 Family specific
syslog	Internal system messages	Standard
sysmgr	System manager	Cisco MDS 9000 Family specific
tlport	TL port	Cisco MDS 9000 Family specific
user	User process	Standard
uucp	UNIX-to-UNIX Copy Program	Standard

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Table 3-1 Internal Logging Facilities (continued)

Facility Keyword	Description	Standard or Cisco MDS Specific
vhbad	Virtual host base adapter daemon	Cisco MDS 9000 Family specific
vni	Virtual network interface	Cisco MDS 9000 Family specific
vrrp_cfg	VRRP configuration	Cisco MDS 9000 Family specific
vrrp_eng	VRRP engine	Cisco MDS 9000 Family specific
vsan	VSAN system messages	Cisco MDS 9000 Family specific
vshd	vshd	Cisco MDS 9000 Family specific
wwn	WWN manager	Cisco MDS 9000 Family specific
xbar	Xbar system messages	Cisco MDS 9000 Family specific
zone	Zone server	Cisco MDS 9000 Family specific

Table 3-2 describes the severity levels supported by the system message logs.

Table 3-2 Error Message Severity Levels

Level Keyword	Level	Description	System Message Definition
emergencies	0	System unusable	LOG_EMERG
alerts	1	Immediate action needed	LOG_ALERT
critical	2	Critical conditions	LOG_CRIT
errors	3	Error conditions	LOG_ERR
warnings	4	Warning conditions	LOG_WARNING
notifications	5	Normal but significant condition	LOG_NOTICE
informational	6	Informational messages only	LOG_INFO
debugging	7	Debugging messages	LOG_DEBUG



Note

Refer to the *Cisco MDS 9000 Family System Messages Reference* for details on the error log message format.

SFP Diagnostics

The error message related to SFP failures is written to the syslog. You can listen to the syslog for events related to SFP failures. The values, low or high alarm, and the warning are checked for the following parameters:

- TX Power
- RX Power
- Temperature
- Voltage
- Current

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The SFP notification trap indicates the current status of the alarm and warning monitoring parameters for all the sensors based on the digital diagnostic monitoring information. This notification is generated whenever there is a change in the status of atleast one of the monitoring parameters of the sensors on the transceiver in an interface.

The CISCO-INTERFACE-XCVR-MONITOR-MIB contains the SFP notification trap information. Refer to the Cisco MDS 9000 Family MIB Quick Reference for more information on this MIB.

System Message Logging Configuration

System logging messages are sent to the console based on the default (or configured) logging facility and severity values.

This sections includes the following topics:

- [Message Logging Initiation, page 3-4](#)
- [Console Severity Level, page 3-5](#)
- [Module Logging, page 3-6](#)
- [Log Files, page 3-7](#)
- [System Message Logging Servers, page 3-8](#)
- [Verifying Syslog Servers from Fabric Manager Web Server, page 3-10](#)
- [Viewing Logs from Fabric Manager Web Server, page 3-12](#)

Message Logging Initiation

You can disable logging to the console or enable logging to a specific Telnet or SSH session.

- When you disable or enable logging to a console session, that state is applied to all future console sessions. If you exit and log in again to a new session, the state is preserved.
- When you enable or disable logging to a Telnet or SSH session, that state is applied only to that session. If you exit and log in again to a new session, the state is not preserved.

To enable or disable the logging state for a Telnet or SSH session using Fabric Manager, follow these steps:

-
- Step 1** Select a switch in the Fabric pane.
- Step 2** Expand **Switches**, expand **Events** and select **SysLog** in the Physical Attributes pane.
You see the syslog information in the Information pane.
- Step 3** Click the **Switch Logging** tab.
You see the switch information (see [Figure 3-1](#)).

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Figure 3-1 Switch Logging Tab in Fabric Manager

Switch	Console Enable	Console Severity	Terminal Enable	Terminal Severity	Linecard Enable	Linecard Severity	LogFile Name	LogFile Severity
sw172-22-46-225	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-224	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-221	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-223	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-222	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-233	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-174	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-220	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)

- Step 4** Select a switch in the Information pane.
- Step 5** Check (enable) or uncheck (disable) the **Console Enable** check box.
- Step 6** Click the **Apply Changes** icon.

Console Severity Level

When logging is enabled for a console session (default), you can configure the severity levels of messages that appear on the console. The default severity for console logging is 2 (critical).



Tip

The current critical (default) logging level is maintained if the console baud speed is 9600 baud (default). All attempts to change the console logging level generates an error message. To increase the logging level (above critical), you must change the console baud speed to 38400 baud.

Monitor Severity Level

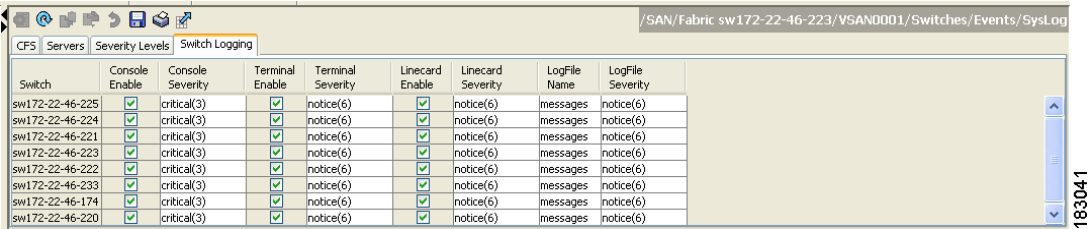
When logging is enabled for a monitor session (default), you can configure the severity levels of messages that appear on the monitor. The default severity for monitor logging is 5 (notifications).

To configure the severity level for a logging facility using Fabric Manager, follow these steps

- Step 1** Select a switch in the Fabric pane.
- Step 2** Expand **Switches**, expand **Events** and select **SysLog** in the Physical Attributes pane.
You see the syslog information in the Information pane.
- Step 3** Click the **Switch Logging** tab.
You see the switch information (see [Figure 3-2](#)).

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Figure 3-2 Switch Logging Tab in Fabric Manager



Switch	Console Enable	Console Severity	Terminal Enable	Terminal Severity	Linecard Enable	Linecard Severity	LogFile Name	LogFile Severity
sw172-22-46-225	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-224	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-221	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-223	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-222	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-233	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-174	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-220	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)

- Step 4

Select a switch in the Information pane.
- Step 5

Select a severity level from the Console Severity drop-down list in the row for that switch.
- Step 6

Click the **Apply Changes** icon.

Module Logging

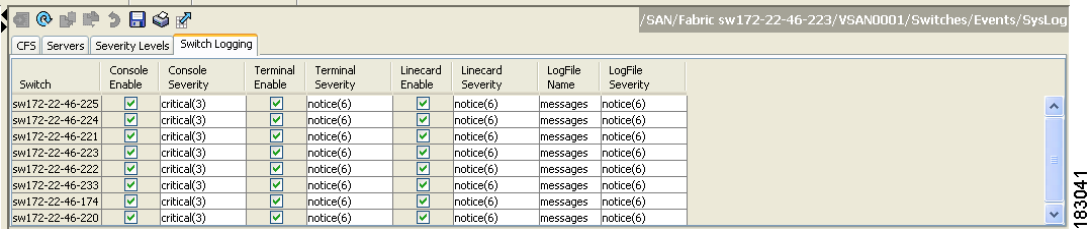
By default, logging is enabled at level 7 for all modules. You can enable or disable logging for each module at a specified level.

To the severity level for a logging facility, follow these steps:

- Step 1

In Fabric Manager, expand **Switches**, expand **Events** and select **SysLog** in the Physical Attributes pane. In Device Manager, choose **Logs > Syslog > Setup** and click the **Switch Logging** tab in the syslog dialog box.
- You see the switch information (see [Figure 3-3](#) or [Figure 3-4](#)).

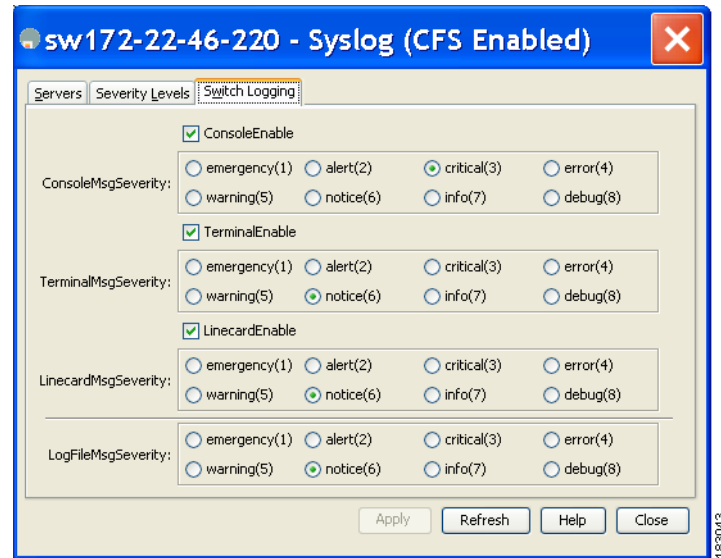
Figure 3-3 Switch Logging Tab in Fabric Manager



Switch	Console Enable	Console Severity	Terminal Enable	Terminal Severity	Linecard Enable	Linecard Severity	LogFile Name	LogFile Severity
sw172-22-46-225	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-224	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-221	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-223	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-222	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-233	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-174	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-220	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)

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Figure 3-4 Switch Logging Tab in Device Manager



- Step 2** Check the check boxes where you want message logging to occur (**ConsoleEnable**, **TerminalEnable**, **LineCardEnable**).
- Step 3** Choose the message severity threshold from the **Console Severity** drop-down box for each switch in Fabric Manager (see [Figure 3-3](#)) or click the appropriate message severity level radio button in Device Manager (see [Figure 3-4](#)).
- Step 4** Click the **Apply Changes** icon in Fabric Manager, or click **Apply** in Device Manager to save and apply your changes.

Log Files

By default, the switch logs normal but significant system messages to a log file and sends these messages to the system console. Log messages are not saved across system reboots. The logging messages that are generated may be saved to a log file. You can configure the name of this file and restrict its size as required. The default log file name is messages. The file name can have up to 80 characters and the file size ranges from 4096 bytes to 4194304 bytes.

To send log messages to a file using Fabric Manager, follow these steps

- Step 1** Select a switch in the Fabric pane.
- Step 2** Expand **Switches**, expand **Events** and select **SysLog** in the Physical Attributes pane.
You see the syslog information in the Information pane.
- Step 3** Select a switch in the Information pane.
- Step 4** Click the **Switch Logging** tab.
You see the information in [Figure 3-5](#).

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Figure 3-5 Switch Logging Tab in Fabric Manager

Switch	Console Enable	Console Severity	Terminal Enable	Terminal Severity	Linecard Enable	Linecard Severity	LogFile Name	LogFile Severity
sw172-22-46-225	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-224	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-221	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-223	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-222	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-233	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-174	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)
sw172-22-46-220	☒	critical(3)	☒	notice(6)	☒	notice(6)	messages	notice(6)

Step 5 Enter the name of the log file in the LogFile Name column in the row for that switch.

Step 6 Click the **Apply Changes** icon.



Note

The configured log file is saved in the `/var/log/external` directory. The location of the log file cannot be changed.

System Message Logging Servers

You can configure a maximum of three system message logging servers. One of these syslog servers should be Fabric Manager if you want to view system messages from the Event tab in Fabric Manager.

To send log messages to a UNIX system message logging server, you must configure the system message logging daemon on a UNIX server. Log in as root, and follow these steps:

Step 1 Add the following line to the `/etc/syslog.conf` file.

```
local1.debug                                /var/log/myfile.log
```



Note

Be sure to add five tab characters between **local1.debug** and **/var/log/myfile.log**. Refer to entries in the `/etc/syslog.conf` file for further examples.

The switch sends messages according to the specified facility types and severity levels. The **local1** keyword specifies the UNIX logging facility used. The messages from the switch are generated by user processes. The **debug** keyword specifies the severity level of the condition being logged. You can set UNIX systems to receive all messages from the switch.

Step 2 Create the log file by entering these commands at the UNIX shell prompt:

```
$ touch /var/log/myfile.log
$ chmod 666 /var/log/myfile.log
```

Step 3 Make sure the system message logging daemon reads the new changes by entering this command:

```
$ kill -HUP ~cat /etc/syslog.pid~
```

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Note

Most tabs in the Information pane for features using CFS are dimmed until you click the CFS tab. The CFS tab shows which switches have CFS enabled and shows the master switch for this feature. Once the CFS tab is click, the other tabs in the Information pane that use CFS are activated.

To configure system message logging servers, follow these steps:

- Step 1** In Fabric Manager, expand **Switches**, expand **Events** and select **SysLog** in the Physical Attributes pane, then click the **Servers** tab in the Information pane.

Figure 3-6 Servers Tab in Fabric Manager Syslog

Master	Id	IP Address Type	Name or IP Address	MsgSeverity	Facility
sw172-22-46-220	1	ipv4	171.71.55.32	info(7)	local7
sw172-22-46-220	2	ipv4	171.71.55.50	info(7)	local7
sw172-22-46-220	3	ipv4	171.71.55.1	info(7)	local7

In Device Manager, choose **Logs > Syslog > Setup** and click the **Servers** tab in the syslog dialog box.

Figure 3-7 Servers Tab in Device Manager Syslog

Id	IP Address Type	Name or IP Address	MsgSeverity	Facility
1	ipv4	171.71.55.32	info(7)	local7
2	ipv4	171.71.55.50	info(7)	local7
3	ipv4	171.71.55.1	info(7)	local7

Buttons: CFS (dropdown), Create..., Delete, Apply, Refresh, Help, Close

Data retrieved at 13:54:00

- Step 2** Click the **Create Row icon** in Fabric Manager, or click **Create** in Device Manager (see [Figure 3-7](#)) to add a new syslog server.
- Step 3** Enter the name or IP address in dotted decimal notation (for example, 192.168.2.12) of the syslog server in the Name or IP Address field.
- Step 4** Set the message severity threshold by clicking the **MsgSeverity** radio button and set the facility by clicking the **Facility** radio button.
- Step 5** Click the **Apply Changes** icon in Fabric Manager, or click **Create** in Device Manager to save and apply your changes.

Device Manager allows you to view event logs on your local PC as well as those on the switch. For a permanent record of all events that occur on the switch, you should store these messages off the switch. To do this the MDS switch must be configured to send syslog messages to your local PC and a syslog server must be running on that PC to receive those messages. These messages can be categorized into four classes:

- Hardware—Line card or power supply problems

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- Link Incidents—FICON port condition changes
- Accounting—User change events
- Events—All other events



Note

You should avoid using PCs that have IP addresses randomly assigned to them by DHCP. The switch continues to use the old IP address unless you manually change it; however, the Device Manager prompts you if it does detect this situation. UNIX workstations have a built-in syslog server. You must have root access (or run the Cisco syslog server as `setuid` to root) to stop the built-in syslog daemon and start the Cisco syslog server.

Verifying Syslog Servers from Fabric Manager Web Server

To verify the syslog servers remotely using Fabric Manager Web Server, follow these steps:

-
- Step 1** Point your browser at the Fabric Manager Web Server.
- Step 2** Choose **Events > Syslog** to view the syslog server information for each switch. The columns in the table are sortable.
-

Monitoring Syslog Server from Fabric Manager

Cisco Fabric Manager Server registers itself as a logging server and receives syslog messages and stores them in separate files for each switch.

With Cisco NX-OS Release 5.0(1a) and later, the Fabric Manager Server stores the syslog messages from all the switches in a fabric to a database, and displays only the aggregated syslog information from the web client. This feature can be enabled or disabled. The syslog stored in the database is filtered by a configurable severity level.

Once the Fabric Manager Server receives the syslog messages through the syslog receiver, the raw messages are parsed and the flag for persisting the message in the database is checked. The severity carried by this message is checked from the parsed fields, and the syslog messages are sent to the database.

The raw syslog messages are parsed into the following fields: switch time, facility, severity, event, and Vsan Id. The description is stored in the database and filtered by the severity level.

The following fields are added to `server.properties`:

- `syslog.dblog.enable = false`

This field is used to turn on the feature for storing the syslog messages into the database. By turning on this flag, the syslog messages are also written into the database.

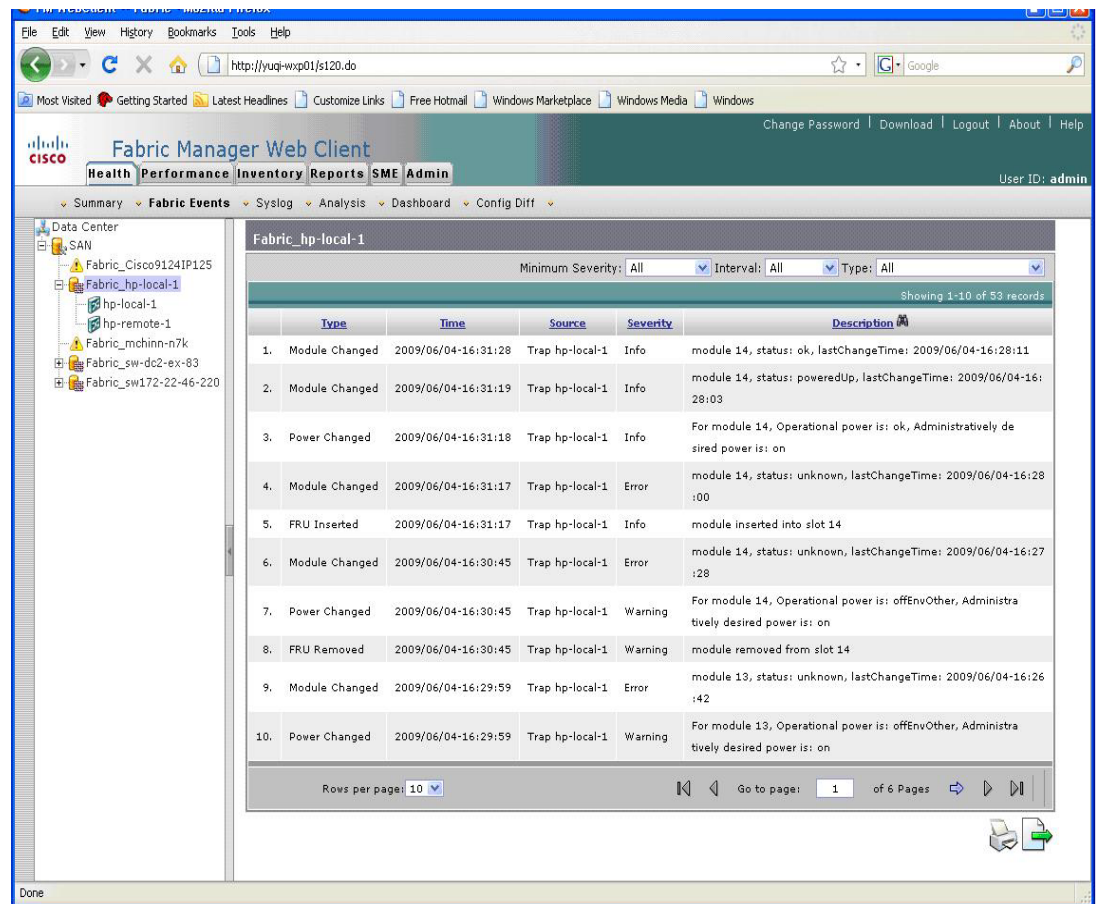
- `syslog.dblog.severity = warnings`

This field is used to filter the syslog messages based on the severity. By configuring this property, syslog messages are filtered on the severity level.

Figure 3-8 displays the syslog messages in Fabric Manager.

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Figure 3-8 Syslog Messages



System Message Logging

The system message logging software saves the messages in a log file or directs the messages to other devices. This feature has the following capabilities:

- Provides logging information for monitoring and troubleshooting.
- Allows the user to select the types of captured logging information.
- Allows the user to select the destination server to forward the captured logging information.

By default, the switch logs normal but significant system messages to a log file and sends these messages to the system console. You can specify which system messages should be saved based on the type of facility and the severity level. Messages are time-stamped to enhance real-time debugging and management.

You can access the logged system messages using the CLI or by saving them to a correctly configured system message logging server. The switch software saves system messages in a file that can save up to 1200 entries. You can monitor system messages remotely by accessing the switch through Telnet, SSH, the console port, or by viewing the logs on a system message logging server.

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Outgoing System Message Logging Server Facilities

All system messages have a logging facility and a level. The logging facility can be thought of as *where* and the level can be thought of as *what*.

The single system message logging daemon (syslogd) sends the information based on the configured **facility** option. If no facility is specified, local7 is the default outgoing facility.

The internal facilities are listed in [Table 3-1](#) and the outgoing logging facilities are listed in [Table 3-3](#).

Table 3-3 Outgoing Logging Facilities

Facility Keyword	Description	Standard or Cisco MDS Specific
auth	Authorization system	Standard
authpriv	Authorization (private) system	Standard
cron	Cron or at facility	Standard
daemon	System daemons	Standard
ftp	File Transfer Protocol	Standard
kernel	Kernel	Standard
local0 to local7	Locally defined messages	Standard (local7 is the default)
lpr	Line printer system	Standard
mail	Mail system	Standard
news	USENET news	Standard
syslog	Internal system messages	Standard
user	User process	Standard
uucp	UNIX-to-UNIX Copy Program	Standard

Viewing Logs from Fabric Manager Web Server

To view system messages remotely using Fabric Manager Web Server, follow these steps:

-
- Step 1** Point your browser at the Fabric Manager Web Server.
 - Step 2** Click the **Events** tab followed by the **Details** to view the system messages. The columns in the events table are sortable. In addition, you can use the Filter button to limit the scope of messages within the table.
-

Viewing Logs from Device Manager

You can view system messages from Device Manager if Device Manager is running from the same workstation as the Fabric Manager Server. Choose **Logs > Events > current** to view the system messages on Device Manager. The columns in the events table are sortable. In addition, you can use the Find button to locate text within the table.

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You can view switch-resident logs even if you have not set up your local syslog server or your local PC is not in the switch's syslog server list. Due to memory constraints, these logs will wrap when they reach a certain size. The switch syslog has two logs: an NVRAM log that holds a limited number of critical and greater messages and a nonpersistent log that contains notice or greater severity messages. Hardware messages are part of these logs.

System Message Logging Configuration Distribution

You can enable fabric distribution for all Cisco MDS switches in the fabric. When you perform system message logging configurations, and distribution is enabled, that configuration is distributed to all the switches in the fabric.

You automatically acquire a fabric-wide lock when you issue the first configuration command after you enabled distribution in a switch. The system message logging server uses the effective and pending database model to store or commit the commands based on your configuration. When you commit the configuration changes, the effective database is overwritten by the configuration changes in the pending database and all the switches in the fabric receive the same configuration. After making the configuration changes, you can choose to discard the changes by aborting the changes instead of committing them. In either case, the lock is released. See [Chapter 2, “Using the CFS Infrastructure”](#) for more information on the CFS application.

Fabric Lock Override

If you have performed a system message logging task and have forgotten to release the lock by either committing or discarding the changes, an administrator can release the lock from any switch in the fabric. If the administrator performs this task, your changes to the pending database are discarded and the fabric lock is released.



Tip

The changes are only available in the volatile directory and are subject to being discarded if the switch is restarted.

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Database Merge Guidelines

See the “CFS Merge Support” section on page 2-10 for detailed concepts.

When merging two system message logging databases, follow these guidelines:

- Be aware that the merged database is a union of the existing and received database for each switch in the fabric.
- Verify that the merged database will only have a maximum of three system message logging servers.



Caution

If the merged database contains more than three servers, the merge will fail.

Default Settings

Table 3-4 lists the default settings for system message logging.

Table 3-4 **Default System Message Log Settings**

Parameters	Default
System message logging to the console	Enabled for messages at the critical severity level.
System message logging to Telnet sessions	Disabled.
Logging file size	4194304.
Log file name	Message (change to a name with up to 200 characters).
Logging server	Disabled.
Syslog server IP address	Not configured.
Number of servers	Three servers.
Server facility	Local 7.