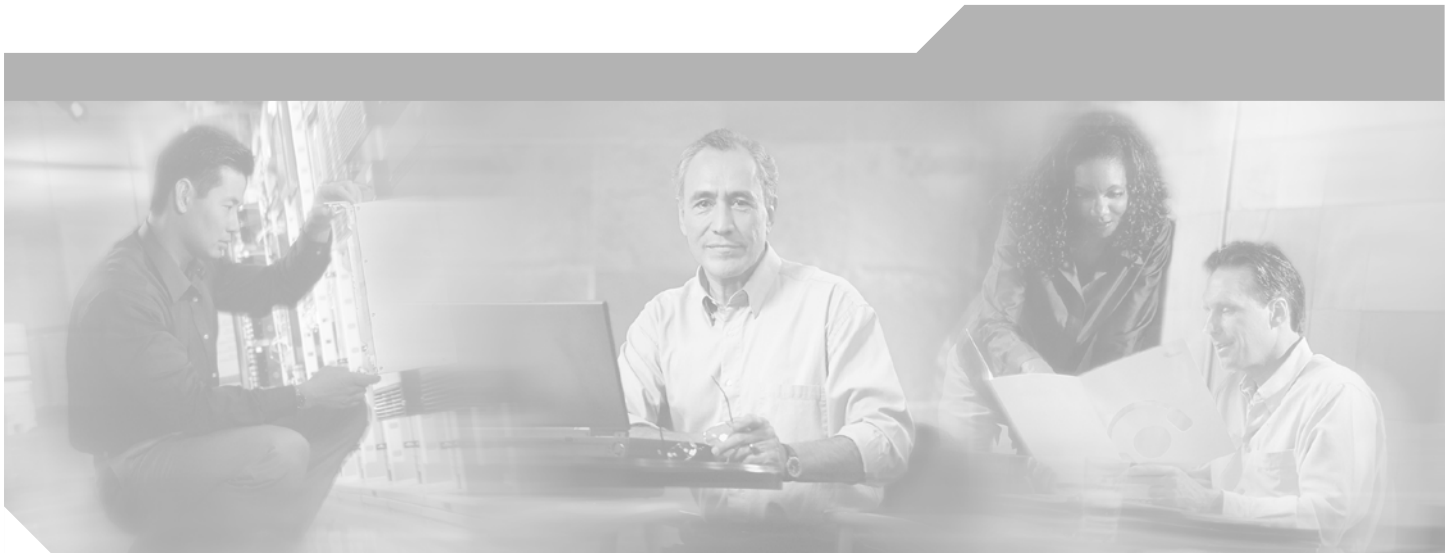


Cisco MDS 9000 Family Command Reference

Cisco MDS SAN-OS Release 1.3
February 2004

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

Customer Order Number: DOC-7816088=
Text Part Number: 78-16088-01

New and Changed Information

Table 1 summarizes the new and changed features for the *Cisco MDS 9000 Family Command Reference*, and tells you where they are documented. If a feature has changed in Release 1.3, a brief description of the change appears in the "Description" column, and that release is shown in the "Changed in Release" column.

Table 1 Documented Features for the Cisco MDS 9000 Family Command Reference

Feature	Description	Changed in Release	Where Documented
Licensing	The **install license** command	1.3(1)	I Commands
	The **show license** command		Show Commands
PortChannel quiesce	The **quiesce** command	1.3(1)	Q Commands
Zone	The **member domain-id** *domain-id* **port-number** *port-number*, **member ipaddress** *ip-address subnet-mask,* **member interface fc** *slot-port,* **member interface fc** *slot-port* **swwn** *switch-wwn*, and the **member interface fc** *slot-port* **domain-id** *domain-id* commands	1.3(1)	Z Commands
	The EXEC **zone copy** command		
	The **show zone statistics lun-zoning** and the **show zone statistics read-only-zoning** commands		Show Commands
Inter-VSAN routing (IVR)	The **ivr enable**, **ivr vsan-topology**, **ivr zone**, and the **ivr zoneset** commands	1.3(1)	I Commands
	The **show ivr** command		Show Commands
	The **clear ivr zone database** command		C Commands
	The **logging level ivr** command		L Commands

Table 1 Documented Features for the Cisco MDS 9000 Family Command Reference

Feature	Description	Changed in Release	Where Documented
AAA server groups	The **aaa accounting logsize, aaa accounting default, aaa authentication login, aaa authentication iscsi, aaa authentication dhchap**, and the **aaa group server** commands	1.3(1)	A Commands
	The **show aaa authentication**, **show aaa groups**, and the **show aaa accounting** commands		Show Commands
RADIUS enhancements	The **radius-server host, radius-server key, radius-server retransmit**, and the **radius-server timeout** commands	1.3(1)	R Commands
	The **show radius-server** command		Show Commands
TACACS+ authentication	The **tacacs+ enable, tacacs-server host, tacacs-server key**, and the **tacacs-server timeout** commands	1.3(1)	T Commands
	The **show tacacs-server** command		Show Commands
FC-SP DHCHAP	The **fcsp dhchap, fcsp enable**, and the **fcsp timeout** commands	1.3(1)	F Commands
	The **interface fcsp** command		I Commands
	The **show fcsp** command		Show Commands
FI-bre CON-nection (FICON)	The **setup ficon** and the he **snmp port** commands	1.3(1)	S Commands
	The **ficon swap**, the **ficon vsan** *vsan-id* (EXEC mode), **ficon vsan** *vsan-id* (configuration mode), **file** *file-name*, and the **fcid-last-byte** commands		F Commands
	The **ficon portnumber** *portnumber* command		I Commands
	The **code-page** and the **clear ficon** commands		C Commands
	The **host** command		H Commands
	The **active equals saved** command		A Commands
	The **portaddress** command		P Commands
	The **show ficon** command		Show Commands
Fabric binding	The **fabric-binding activate, fabric-binding database copy, fabric-binding database diff, fabric-binding database vsan,** and the **fabric-binding enable** commands	1.3(1)	F Commands
	The **show fabric-binding enable** command		Show Commands
	The **clear fabric-binding statistics** command		C Commands
Registered Link Incident Report (RLIR)	The **show rlir** command	1.3(1)	Show Commands
	The **clear rlir** command		C Commands

Table 1 Documented Features for the Cisco MDS 9000 Family Command Reference

Feature	Description	Changed in Release	Where Documented
Trespass support	The **trespass** command	1.3(1)	I Commands
Internet Storage Name Service (iSNS)	The **isns profile** and the **isns register** commands		
	The **interface gigabitethernet** *slot_number* **isns** *profile-name* command		
	The **show isns** command	1.3(1)	Show Commands
Proxy initiator	The **switchport proxy-initiator** command	1.3(1)	S Commands
FCIP write accelerator	The **write-accelerator** command	1.3(1)	W Commands
FCIP compression	The **ip-compression** command	1.3(1)	I Commands
Call Home enhancements	The **destination-profile** *profile-name* command	1.3(1)	C Commands
	The **show callhome destination-profile** command		Show Commands
FC Domain ID changes	The **fcdomain allowed** *range* **vsan** *vsan-id*	1.3(1)	F Commands
	The **show fcdomain** command		Show Commands
Port rate limiting	The **switchport ingress-rate** command	1.3(1)	S Commands
Quality of Service (QoS)	The **qos enable, qos class-map, qos dwrr-q, qos policy-map**, and the **qos service** commands	1.3(1)	Q Commands
	The **show qos statistics** command		Show Commands
SPAN source	The **source interface** command	1.3(1)	S Commands
Per VSAN Time Out Values (TOV)	The **fctimer** command.	1.3(1)	F Commands
Running configuration information	The **show running diff, show running interface,** and the **show running vsan** commands	1.3(1)	Show Commands
Transceiver and calibration information	The **show interface** *interface-type slot/port* **transceiver** command	1.3(1)	
Buffer-to-Buffer Credit (BB_credit) display	The **show interface bbcredit** command	1.3(1)	
Fabric-Device Management Interface (FDMI)	The **show fdmi** command	1.3(1)	
Auto-discovery of SCSI targets	The **show scsi-target auto-poll** command.	1.3(1)	
Zones	The **zoneset import** command	1.3(2a)	Z Commands
	The **zoneset export** command	1.3(2a)	

Table 1 Documented Features for the Cisco MDS 9000 Family Command Reference

Feature	Description	Changed in Release	Where Documented
NVRAM	The **clear system reset-reason** command	1.3(2a)	C Commands
Licensing	The **update license** *url* command	1.3(2a)	U Commands
SCSI targets	The **show scsi-target pwwn** command	1.3(2a)	Show Commands
	The **discover scsi-target local** command	1.3(2a)	D Commands
iSCSI SACK Default	The TCP SACK parameter is enabled by default for iSCSI configurations.	1.3(3)	T Commands
Deleting directories	The **delete** command	All	D Commands

Table 2 contains the history of the changes to the *Cisco MDS 9000 Family Command Reference*, Release 1.3. When the document is updated for the next release, these changes are incorporated into the new revision and will no longer appear in this table.

Table 2 Documentation Changes for Cisco MDS 9000 Family Command Reference, Release 1.3

Date	Description of Change	Where Changed
11/21/2003	Document created	See Table 1.
12/19/2003	New 1.3(2a) features documented	See Table 1.
01/13/2004	New 1.3(3) features documented	See Table 1.
02/04/2004	The **boot** command was modified to include the **auto-copy** option was added.	*See B Commands and Show Commands*

Preface

This preface describes the audience, organization, and conventions of the *Cisco MDS 9000 Family Command Reference*. It also provides information on how to obtain related documentation.

Audience

This guide is for experienced network operators and administrators who are responsible for configuring and maintaining the Cisco MDS 9000 family of multilayer directors and fabric switches.

Organization

This guide is organized as follows:

Chapter	Title	Description
Chapter 1	CLI Overview	Describes the CLI (command-line interface).
Chapter 2	A Commands	Describes all commands beginning with the letter “a.”
Chapter 3	B Commands	Describes all commands beginning with the letter “b.”
Chapter 4	C Commands	Describes all commands beginning with the letter “c.”
Chapter 5	D Commands	Describes all commands beginning with the letter “d.”
Chapter 6	Debug Commands	Describes all the **debug** commands.
Chapter 7	E Commands	Describes all commands beginning with the letter “e.”
Chapter 8	F Commands	Describes all commands beginning with the letter “f.”
Chapter 9	G Commands	Describes all commands beginning with the letter “g.”
Chapter 10	H Commands	Describes all commands beginning with the letter “h.”
Chapter 11	I Commands	Describes all commands beginning with the letter “i.”
Chapter 12	K Commands	Describes all commands beginning with the letter “k.”
Chapter 13	L Commands	Describes all commands beginning with the letter “l.”
Chapter 14	M Commands	Describes all commands beginning with the letter “m.”
Chapter 15	N Commands	Describes all commands beginning with the letter “n.”
Chapter 16	P Commands	Describes all commands beginning with the letter “p.”

Chapter	Title	Description
Chapter 17	Q Commands	Describes all commands beginning with the letter “q.”
Chapter 18	R Commands	Describes all commands beginning with the letter “r.”
Chapter 19	S Commands	Describes all commands beginning with the letter “s” except for the **show** commands.
Chapter 20	Show Commands	Describes all the **show** commands.
Chapter 21	T Commands	Describes all commands beginning with the letter “t.”
Chapter 22	U Commands	Describes all commands beginning with the letter “u.”
Chapter 23	V Commands	Describes all commands beginning with the letter “v.”
Chapter 24	W Commands	Describes all commands beginning with the letter “w.”
Chapter 25	Z Commands	Describes all commands beginning with the letter “z.”
Chapter 26	Advanced Services Module Commands	Describes all commands pertaining to the Advanced Services Module (ASM)
Chapter 27	Caching Services Module Commands	Describes all commands pertaining to the Caching Services Module (CSM) .

Document Conventions

Command descriptions use these conventions:

Convention	Indication
boldface font	Commands and keywords are in boldface.
italic font	Arguments for which you supply values are in italics.
[ ]	Elements in square brackets are optional.
{x | y | z }	Required alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Screen examples use these conventions:

Convention	Indication
`screen` font	Terminal sessions and information the switch displays are in `screen` font.
`boldface screen` font	Information you must enter is in **`boldface screen`** font.
`italic screen` font	Arguments for which you supply values are in *`italic screen`* font.
< >	Nonprinting characters, such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

This document uses the following conventions:

Note Means reader *take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Caution Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Related Documentation

The documentation set for the Cisco MDS 9000 Family includes the following documents:

- *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family*
- *Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 1.3(1)*
- *Cisco MDS 9100 Series Quick Start Guide*
- *Cisco MDS 9500 Series and Cisco MDS 9216 Switch Quick Start Guide*
- *Cisco MDS 9100 Series Hardware Installation Guide*
- *Cisco MDS 9216 Switch Hardware Installation Guide*
- *Cisco MDS 9500 Series Hardware Installation Guide*
- *Cisco MDS 9000 Family Configuration Guide*
- *Cisco MDS 9000 Family SAN Volume Controller Configuration Guide*
- *Cisco MDS 9000 Family Command Reference*
- *Cisco MDS 9000 Family Fabric and Device Manager User Guide*
- *Cisco MDS 9000 Family Troubleshooting Guide*
- *Cisco MDS 9000 Family System Messages Guide*
- *Cisco MDS 9000 Family MIB Reference Guide*
- *Cisco MDS 9000 Family CIM Programming Reference Guide*

For information on VERITAS Storage Foundation™ for Networks 1.0, Cisco, refer to the following VERITAS documents available at http://support.veritas.com/

- *VERITAS Storage Foundation for Networks Overview*
- *VERITAS Storage Foundation for Networks Installation and Configuration Guide*
- *VERITAS Storage Foundation for Networks Obtaining and Installing Licenses*
- *VERITAS Storage Foundation for Networks GUI Administrator's Guide*
- *VERITAS Storage Foundation for Networks CLI Administrator's Guide*
- *VERITAS Storage Foundation for Networks README*

For information on IBM TotalStorage SAN Volume Controller Storage Software for Cisco MDS 9000, refer to the following IBM documents available on the IBM TotalStorage Support web site: http://www.ibm.com/storage/support/2062-2300/

- Getting Started—*IBM TotalStorage SAN Volume Controller Storage Software for Cisco MDS 9000*
- Configuration Guide—*IBM TotalStorage SAN Volume Controller Storage Software for Cisco MDS 9000*
- Supported Hardware List—*IBM TotalStorage SAN Volume Controller Storage Software for Cisco MDS 9000*
- Supported Software Levels—*IBM TotalStorage SAN Volume Controller Storage Software for Cisco MDS 9000*
- Command Line Interface User's Guide—*IBM TotalStorage SAN Volume Controller Storage Software for Cisco MDS 9000*
- Host Attachment Guide—*IBM TotalStorage SAN Volume Controller Storage Software*

User Guide—*Subsystem Device Driver User's Guide*

Obtaining Documentation

Cisco provides several ways to obtain documentation, technical assistance, and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation on the World Wide Web at this URL:

http://www.cisco.com/univercd/home/home.htm

You can access the Cisco website at this URL:

http://www.cisco.com

International Cisco websites can be accessed from this URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which may have shipped with your product. The Documentation CD-ROM is updated regularly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual or quarterly subscription.

Registered Cisco.com users can order a single Documentation CD-ROM (product number DOC-CONDOCCD=) through the Cisco Ordering tool:

http://www.cisco.com/en/US/partner/ordering/ordering_place_order_ordering_tool_launch.html

All users can order annual or quarterly subscriptions through the online Subscription Store:

http://www.cisco.com/go/subscription

Ordering Documentation

You can find instructions for ordering documentation at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpck/pdi.htm

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Networking Products MarketPlace:

  http://www.cisco.com/en/US/partner/ordering/index.shtml

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA.) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

Documentation Feedback

You can submit comments electronically on Cisco.com. On the Cisco Documentation home page, click **Feedback** at the top of the page.

You can send your comments in e-mail to mdsfeedback-doc@cisco.com.

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

Note If you purchased this product through a Cisco reseller, contact the reseller directly for technical support. If you purchased this product directly from Cisco, contact Cisco Technical Support at this URL: http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml

For all customers, partners, resellers, and distributors who hold valid Cisco service contracts, the Cisco technical support center provides 24-hour, award-winning technical support services, online and over the phone. Cisco.com features the Cisco Technical Support Website as an online starting point for technical assistance.

Cisco Technical Support Website

The Cisco Technical Support Website (http://www.cisco.com/techsupport) provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The Cisco Technical Support Website is available 24 hours a day, 365 days a year.

Accessing all the tools on the Cisco Technical Support Website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a login ID or password, register at this URL:

http://tools.cisco.com/RPF/register/register.do

Opening a Technical Support Case

The online Case Open Tool (http://www.cisco.com/techsupport/caseopen) is the fastest way to open P3 and P4 cases. (Your network is minimally impaired or you require product information). After you describe your situation, the Case Open Tool automatically recommends resources for an immediate solution. If your issue is not resolved using these recommendations, your case will be assigned to a Cisco technical support engineer.

For P1 or P2 cases (your production network is down or severely degraded) or if you do not have Internet access, contact Cisco technical support by telephone. Cisco technical support engineers are assigned immediately to P1 and P2 cases to help keep your business operations running smoothly.

To open a case by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)
EMEA: +32 2 704 55 55
USA: 1 800 553-2447

For a complete listing of Cisco technical support contacts, go to this URL:

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

Technical Support Case Priority Definitions

To ensure that all cases are reported in a standard format, Cisco has established case priority definitions.

Priority 1 (P1)—Your network is “down” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Priority 2 (P2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Priority 3 (P3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Priority 4 (P4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The *Cisco Product Catalog* describes the networking products offered by Cisco Systems, as well as ordering and customer support services. Access the *Cisco Product Catalog* at this URL:

  http://www.cisco.com/en/US/products/products_catalog_links_launch.html

- Cisco Press publishes a wide range of networking publications. Cisco suggests these titles for new and experienced users: Internetworking Terms and Acronyms Dictionary, Internetworking Technology Handbook, Internetworking Troubleshooting Guide, and the Internetworking Design Guide. For current Cisco Press titles and other information, go to Cisco Press online at this URL:

  http://www.ciscopress.com

- Packet magazine is the Cisco quarterly publication that provides the latest networking trends, technology breakthroughs, and Cisco products and solutions to help industry professionals get the most from their networking investment. Included are networking deployment and troubleshooting tips, configuration examples, customer case studies, tutorials and training, certification information, and links to numerous in-depth online resources. You can access Packet magazine at this URL:

  http://www.cisco.com/go/packet

- iQ Magazine is the Cisco bimonthly publication that delivers the latest information about Internet business strategies for executives. You can access iQ Magazine at this URL:

  http://www.cisco.com/go/iqmagazine

- Internet Protocol Journal is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

  http://www.cisco.com/en/US/about/ac123/ac147/about_cisco_the_internet_protocol_journal.html

- Training—Cisco offers world-class networking training. Current offerings in network training are listed at this URL:

  http://www.cisco.com/en/US/learning/index.html

CLI Overview

This chapter prepares you to configure switches from the CLI (command-line interface). It also lists the information you need to have before you begin, and it describes the CLI command modes.

This chapter includes the following sections:

About the Switch Prompt

If you are connected to the console port when the switch boots up, you see the output show in Figure 1-1:

Note Refer to the *Cisco MDS 9200 Series Hardware Installation Guide* or the *Cisco MDS 9500 Series Hardware Installation Guide* for installation and connection instructions.

Once the switch is powered on successfully, you see the default switch prompt (`switch#`). You can perform embedded CLI operations, access command history, and use command parsing functions at this prompt. The switch gathers the command string upon detecting an **Enter** (CR) and accepts commands from a terminal.

Figure 1-1 Output When a Switch Boots Up

```
Auto booting bootflash:/boot-279 bootflash:/system_image;...
Booting kickstart image:bootflash:/boot-279....
.........................................Image verification OK

Starting kernel...
INIT: version 2.78 booting
Checking all filesystems..... done.
Loading system software
Uncompressing system image: bootflash:/system_image
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
INIT: Entering runlevel: 3

<<<<<<SAN OS bootup log messages>>>>>>

         ---- Basic System Configuration Dialog ----

This setup utility will guide you through the basic configuration of
the system. Use ctrl-c to abort configuration dialog at any prompt.

Basic management setup configures only enough connectivity for
management of the system.

Would you like to enter the basic configuration dialog (yes/no): yes

<<<<<<after configuration>>>>>>

switch login:
```

About the CLI Command Modes

Switches in the Cisco MDS 9000 Family have two main command modes—user EXEC mode and configuration mode. The commands available to you depend on the mode you are in. To obtain a list of available commands in either mode, type a question mark (?) at the system prompt.

Table 1-1 lists and describes the two commonly used modes, how to enter the modes, and the resulting system prompts. The system prompt helps you identify which mode you are in and hence, which commands are available to you.

Table 1-1 Frequently Used Switch Command Modes

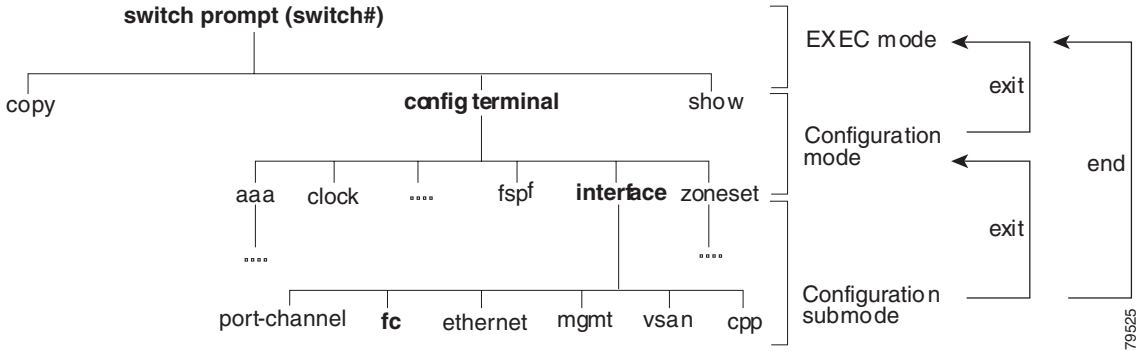
Mode	Description of Use	How to Access	Prompt
EXEC	Enables you to temporarily change terminal settings, perform basic tests, and display system information. **Note** Changes made in this mode are generally not saved across system resets.	At the switch prompt, enter the required EXEC mode command.	`switch#`
Configuration mode	Enables you to configure features that affect the system as a whole. **Note** Changes made in this mode are saved across system resets if you save your configuration. See the "Saving a Configuration" section on page 1-12.	From EXEC mode, enter the **config terminal** command.	`switch(config)#`

You can abbreviate commands and keywords by entering just enough characters to make the command unique from other commands. For example, you can abbreviate the **config terminal** command to **conf t**.

Understanding CLI Command Hierarchy

The CLI commands are organized hierarchically, with commands that perform similar functions grouped under the same level. For example, all commands that display information about the system, configuration, or hardware are grouped under the **show** command, and all commands that allow you to configure the switch are grouped under the **config terminal** command. Figure 1-2 illustrates a portion of the **config terminal** command hierarchy.

Figure 1-2 CLI Command Hierarchy Example



To execute a command, you enter the command by starting at the top level of the hierarchy. For example, to configure a Fibre Channel interface, use the **config terminal** command. Once you are in configuration mode, issue the **interface** command. When you are in the interface submode, you can query the available commands there.

The following example shows how to query the available commands in the interface submode:

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# interface fc1/1
switch(config-if)# ?
Interface configuration commands:
  channel-group  Add to/remove from a port-channel
  exit           Exit from this submode
  fcdomain       Enter the interface submode
  fspf           To configure FSPF related parameters
  no             Negate a command or set its defaults
  shutdown       Enable/disable an interface
  switchport     Configure switchport parameters
```

EXEC Mode Options

When you start a session on the switch, you begin in EXEC mode. Based on the role or group to which you belong, you have access to limited commands or to all commands (refer to the *Cisco MDS 9000 Family Configuration Guide* for further information). From the EXEC mode, you can enter configuration mode. Most of the EXEC commands are one-time commands, such as **show** commands, which display the current configuration status. Here is a list of EXEC mode commands:

```
switch# ?
Exec Commands:
  attach      Connect to a specific linecard
  callhome    Callhome commands
  cd          Change current directory
  clear       Reset functions
  clock       Manage the system clock
  config      Enter configuration mode
  copy        Copy from one file to another
  debug       Debugging functions
  delete      Remove files
  dir         Directory listing for files
  discover    Discover information
  exit        Exit from the EXEC
  fcping      Ping an N-Port
  fctrace     Trace the route for an N-Port.
  find        Find a file below the current directory
  format      Format disks
  install     Upgrade software
  load        Load system image
  mkdir       Create new directory
  move        Move files
  no          Disable debugging functions
  ping        Send echo messages
  purge       Deletes unused data
  pwd         View current directory
  reload      Reboot the entire box
  rmdir       Remove existing directory
  run-script  Run shell scripts
  send        Send message to all the open sessions
  setup       Run the basic SETUP command facility
  show        Show running system information
  sleep       Sleep for the specified number of seconds
  system      System management commands
  tail        Display the last part of a file
  telnet      Telnet to another system
  terminal    Set terminal line parameters
  test        Test command
  traceroute  Trace route to destination
  undebug     Disable Debugging functions (See also debug)
  write       Write current configuration
  zone        Execute Zone Server commands
```

Configuration Mode

Configuration mode allows you to make changes to the existing configuration. When you save the configuration, these commands are preserved across switch reboots. Once you are in configuration mode, you can enter interface configuration mode, zone configuration mode, and a variety of protocol-specific modes. Configuration mode is the starting point for all configuration commands. When you are in configuration mode, the switch expects configuration commands from the user.

The following example shows output from the **config terminal** command:

```
switch# config terminal
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)#
```

Configuration Mode Commands and Submodes

The following is a list of configuration mode commands:

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# ?
Configure commands:
  aaa                 Configure AAA
  arp                 [no] remove an entry from the ARP cache
  boot                Configure boot variables
  callhome            Enter the callhome configuration mode
  clock               Configure time-of-day clock
  end                 Exit from configure mode
  exit                Exit from configure mode
  fcalias             Fcalias configuration commands
  fcanalyzer          Configure cisco fabric analyzer
  fcc                 Configure FC Congestion Control
  fcdomain            Enter the fcdomain configuration mode
  fcdroplatency       Configure switch or network latency
  fcflow              Configure  fcflow
  fcinterop           Interop commands.
  fcns                Name server configuration
  fcroute             Configure FC routes
  fcs                 Configure Fabric Config Server
  fctimer             Configure fibre channel timers
  fspf                Configure fspf
  in-order-guarantee  Set in-order delivery guarantee
  interface           Select an interface to configure
  ip                  Configure IP features
  line                Configure a terminal line
  logging             Modify message logging facilities
  no                  Negate a command or set its defaults
  ntp                 NTP Configuration
  power               Configure power supply
  poweroff            Poweroff a module in the switch
  qos                 Configure priority of FC control frames
  radius-server       Configure RADIUS related parameters
  role                Configure roles
  rscn                Config commands for RSCN
  snmp-server         Configure snmp server
  span                Enter SPAN configuration mode
  ssh                 Configure SSH parameters
  switchname          Configure system's network name
  system              System config command
  telnet              Enable telnet
  trunk               Configure Switch wide trunk protocol
```

```
username            Configure user information.
vsan                Enter the vsan configuration mode
wwn                 Set secondary base MAC addr and range for additional WWNs
zone                Zone configuration commands
zoneset             Zoneset configuration commands
```

Configuration mode, also known as terminal configuration mode, has several submodes. Each of these submodes places you deeper in the prompt hierarchy. When you type **exit**, the switch backs out one level and returns you to the previous level. When you type **end**, the switch backs out to the user EXEC level. You can also type **Ctrl-Z** in configuration mode as an alternative to typing **end**.

Note When in configuration mode, you can alternatively enter
— **Ctrl-Z** instead of the **end** command, and
— **Ctrl-G** instead of the **exit** command

You can execute an EXEC mode command from a configuration mode or submode prompt. You can issue this command from any submode within the configuration mode. When in configuration mode (or in any submode), enter the **do** command along with the required EXEC mode command. The entered command is executed at the EXEC level and the prompt resumes its current mode level.

```
switch(config)# do terminal session-timeout 0
switch(config)#
```

In this example, **terminal session-timeout** is an EXEC mode command—you are issuing an EXEC mode command using the configuration mode **do** command.

The **do** command applies to all EXEC mode commands other than the **end** and **exit** commands. You can also use the help (?) and command completion (tab) features for EXEC commands when issuing a **do** command along with the EXEC command.

Table 1-2 lists some useful command keys that can be used in both EXEC and configuration modes:

Table 1-2 Useful Command Key Description

Command	Description
Ctrl-P	Up history
Ctrl-N	Down history
Ctrl-X-H	List history
Alt-P	History search backwards **Note** The difference between **Tab** completion and **Alt- P** or **Alt-N** is that TAB completes the current word while **Alt- P** and **Alt-N** completes a previously-entered command.
Alt-N	History search forwards
Ctrl-G	Exit
Ctrl-Z	End
Ctrl-L	Clear screen

Table 1-3 displays the commonly used configuration submodes.

Table 1-3 Submodes Within the Configuration Mode

Submode Name	From Configuration Mode Enter	Submode Prompt	Configured Information
Call Home	**callhome**	`switch(config-callhome)#`	Contact, destination, and e-mail
FCS Registration	**fcs register**	`switch(config-fcs-register)#`	FCS attribute registration
	From FCS registration submode: **platform name** *name* **vsan** *vsan-id*	`switch(config-fcs-register-attrib)#`	Platform name and VSAN ID association
Fibre Channel alias	**fcalias name** *name* **vsan** *vsan-id*	`switch(config-fcalias)#`	Alias member
FSPF	**fspf config vsan** *vsan-id*	`switch(config-(fspf-config))#`	Static SPF computation, hold time, and autonomous region
Interface configuration	**interface** *type slot/port*	`switch(config-if)#`	Channel groups, Fibre Channel domains, FSPF parameters, switch port trunk and beacon information, and IP address
	From the VSAN or mgmt0 (management) interface configuration submode: **vrrp** *number*	`switch(config-if-vrrp)#`	Virtual router (see "Creating or Removing a Virtual Router" section on page 20-19)
Line console	**line console**	`switch(config-console)#`	Primary terminal console
VTY	**line vty**	`switch(config-line)#`	Virtual terminal line
Role	**role name**	`switch(config-role)#`	Rule
SPAN	**span session** *number*	`switch(config-span)#`	SPAN source, destination, and suspend session information
VSAN database	**vsan database**	`switch(config-vsan-db)#`	VSAN database
Zone	**zone name** *string* **vsan** *vsan-id*	`switch(config-zone)#`	Zone member
Zone set	**zoneset name** *name* **vsan** *vsan-id*	`switch(config-zoneset)#`	Zone set member

Navigating Through CLI Commands

To redisplay a command you previously entered, press the **Up Arrow** key. You can continue to press the **Up Arrow** key to see more previously issued commands. Similarly, you can press the **Down Arrow**, **Right Arrow**, **Left Arrow**, and **Delete** keys to navigate through the command history and to modify an existing command string.

Getting Help

In any command mode, you can get a list of available commands by entering a question mark (?).

```
switch# ?
```

To obtain a list of commands that begin with a particular character sequence, type in those characters followed immediately by the question mark (?). Do not include a space.

```
switch# co?
configure copy
```

To list keywords or arguments, enter a question mark in place of a keyword or argument. Include a space before the question mark. This form of help is called command syntax help, because it reminds you which keywords or arguments are applicable based on the commands, keywords, and arguments you have already entered.

```
switch# config ?
 terminal Configure the system from the terminal
```

Tip If you are having trouble entering a command, check the system prompt and enter the question mark (?) for a list of available commands. You might be in the wrong command mode or using incorrect syntax.

Command Completion

In any command mode, you can begin a particular command sequence and immediately press the **Tab** key to complete the rest of the command.

```
switch (config)# ro<Tab>
switch (config)# role <Tab>
switch (config)# role name
```

This form of help is called command completion, because it completes a word for you. If several options are available for the typed letters, all options that match those letters are presented:

```
switch(config)# fc<Tab>
fcalias        fcdomain       fcs
fcanalyzer     fcdroplatency  fcns           fctimer
fcc            fcinterop      fcroute
switch(config)# fcd<Tab>
fcdomain       fcdroplatency
switch(config)# fcdo<Tab>
switch(config)# fcdomain
```

Using the no and Default Forms of Commands

You can issue the **no** form of any command to perform the following actions:

- Undo a wrongly issued command.

  If you issue the **zone member** command, you can undo the results:

```
switch(config)# zone name test vsan 1
switch(config-zone)# member pwwn 12:12:12:12:12:12:12:12
switch(config-zone)# no member pwwn 12:12:12:12:12:12:12:12
WARNING: Zone is empty. Deleting zone test. Exit the submode.
switch(config-zone)#
```

- Delete a created facility

  If you want to delete a zone that you created:

```
switch(config)# zone name test vsan 1
switch(config-zone)# exit
switch(config)# no zone name test vsan 1
switch(config)#
```

  You cannot delete a zone facility called test while residing in it. You must first exit the zone submode and return to configuration mode.

Entering CLI Commands

You can configure the software in one of two ways:

- You can create the configuration for the switch interactively by issuing commands at the CLI prompt.
- You can create an ASCII file containing a switch configuration and then load this file on the required system. You can then use the CLI to edit and activate the file (see the "Working with Configuration Files" section on page 4-23).

Viewing a Configuration

You can view the ASCII form of the configuration file when required. To view the current configuration tree from the EXEC prompt, issue the **show running-config** command. If the running configuration is different from the startup configuration, issue the **show startup-config** command to view the ASCII version of the current startup configuration that was used to boot the switch.

You can gather specific information on the entire switch configuration by issuing the relevant **show** commands. Available **show** commands for each feature are listed at the end of each chapter. Examples 1-1 to 1-3 display a few **show** command examples.

Example 1-1 Displays the Specified Interface

```
switch# show interface fc1/1
fc1/1 is up
    Hardware is Fibre Channel, 20:01:ac:16:5e:4a:00:00
    vsan is 1
    Port mode is E
    Speed is 1 Gbps
    Beacon is turned off
    FCID is 0x0b0100
```

```
      0 frames input, 0 bytes, 0 discards
      0 runts, 0 jabber, 0 too long, 0 too short
      0 input errors, 0 CRC, 0 invalid transmission words
      0 address id, 0 delimiter
      0 EOF abort, 0 fragmented, 0 unknown class
      0 frames output, 0 bytes, 0 discards
      Received 0 OLS, 0 LRR, 0 NOS, 0 loop inits
      Transmitted 0 OLS, 0 LRR, 0 NOS, 0 loop inits
```

Example 1-2 Displays the Software and Hardware Version

```
switch# show version
Cisco Storage Area Networking Operating System (SAN-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2003 by Cisco Systems, Inc. All rights reserved.
The copyright for certain works contained herein are owned by
Andiamo Systems, Inc. and/or other third parties and are used and
distributed under license.

Software
  BIOS:      version 1.0.3
  loader:    version error  [last  1.0(1)]
  kickstart: version 1.1(1) [build 1.1(0.94)] [gdb]
  system:    version 1.1(1) [build 1.1(0.94)] [gdb]

  BIOS compile time:       11/18/02
  kickstart image file is: bootflash:/bootimage
  kickstart compile time:  2/12/2003 11:00:00
  system image file is:    isanimage
  system compile time:     2/12/2003 12:00:00

Hardware
  RAM 1027628 kB

  bootflash: 1000944 blocks (block size 512b)
  slot0:           0 blocks (block size 512b)

  172.22.90.171 uptime is 0 days 2 hours 48 minute(s) 26 second(s)

  Last reset at 669882 usecs after Thu Feb 13 07:20:41 2003
    Reason: Reset Requested by CLI command reload
    System version: 1.0(1)
```

Example 1-3 Displays the Running Configuration

```
switch# show running-config
Building Configuration ...
 interface fc1/1
 interface fc1/2
 interface fc1/3
 interface fc1/4
 interface mgmt0
ip address 172.22.95.112 255.255.255.0
no shutdown
vsan database
boot system bootflash:system-237; sup-1
boot kickstart bootflash:boot-237 sup-1
callhome
ip default-gateway 172.22.95.1
switchname switch
trunk protocol enable
username admin password 5 /AFDAMD4B2xK2  role network-admin
```

Saving a Configuration

To save the configuration, enter the **copy running-config startup-config** command from the EXEC mode prompt to save the new configuration into nonvolatile storage. Once this command is issued, the running and the startup copies of the configuration are identical.

See the "Copying Files" section on page 4-27.

Clearing a Configuration

To clear a startup configuration, enter the **write erase** command from the EXEC mode prompt. Once this command is issued, the switch's startup configuration reverts to factory defaults. The running configuration is not affected. The **write erase** command erases the entire startup configuration with the exception of any configuration that affects the loader functionality.

The **write erase boot** command only erases the configuration that affects the loader functionality. The loader functionality configuration includes the boot variables and the mgmt0 IP configuration information (IP address, netmask and default gateway).

```
switch# write erase boot
This command will erase the boot variables and the ip configuration of interface mgmt 0
```

Displaying Users

The **show users** command displays all users currently accessing the switch.

```
switch# show users
admin    pts/7        Jan 12 20:56 (10.77.202.149)
admin    pts/9        Jan 12 23:29 (modena.cisco.com)
admin    pts/11       Jan 13 01:53 (dhcp-171-71-49-49.cisco.com)
```

Sending Messages to Users

The **send** command sends a message to all active CLI users currently using the switch. This message is restricted to 80 alphanumeric characters with spaces.

This example sends a warning message to all active users about the switch being shut down.

```
switch# send Shutting down the system in 2 minutes. Please log off.

Broadcast Message from admin@excal-112
        (/dev/pts/3) at 16:50 ...

Shutting down the system in 2 minutes. Please log off.
```

Using the ping Command

The **ping** command verifies the connectivity of a remote host or server by sending echo messages.

The syntax for this command is **ping** <*host or ip address*>

```
switch# ping 171.71.181.19
PING 171.71.181.19 (171.71.181.19): 56 data bytes
64 bytes from 171.71.181.19: icmp_seq=0 ttl=121 time=0.8 ms
64 bytes from 171.71.181.19: icmp_seq=1 ttl=121 time=0.8 ms

--- 171.71.181.19 ping statistics ---
2 packets transmitted, 2 packets received, 0% packet loss
round-trip min/avg/max = 0.8/0.8/0.8 ms
```

To abnormally terminate a ping session, type the **Ctrl-C** escape sequence

Using traceroute

The **traceroute** command prints the routes taken by a specified host or IP address.

The syntax for this command is **traceroute** <*host or ip address*>

```
switch# traceroute www.cisco.com
traceroute to www.cisco.com (171.71.181.19), 30 hops max, 38 byte packets
 1  kingfisher1-92.cisco.com (172.22.92.2)  0.598 ms  0.470 ms  0.484 ms
 2  nubulab-gw1-bldg6.cisco.com (171.71.20.130)  0.698 ms  0.452 ms  0.481 ms
 3  172.24.109.185 (172.24.109.185)  0.478 ms  0.459 ms  0.484 ms
 4  sjc12-lab4-gw2.cisco.com (172.24.111.213)  0.529 ms  0.577 ms  0.480 ms
 5  sjc5-sbb4-gw1.cisco.com (171.71.241.174)  0.521 ms  0.495 ms  0.604 ms
 6  sjc12-dc2-gw2.cisco.com (171.71.241.230)  0.521 ms  0.614 ms  0.479 ms
 7  sjc12-dc2-cec-css1.cisco.com (171.71.181.5)  2.612 ms  2.093 ms  2.118 ms
 8  www.cisco.com (171.71.181.19)  2.496 ms *  2.135 ms
```

To abnormally terminate a traceroute session, enter **Ctrl-C**.

Setting the Switch's Shell Timeout

Use the **exec-timeout** command in configuration mode to configure the lifetime of all terminal sessions on that switch. When the time limit configured by this command is exceeded, the shell exits and closes that session.

The syntax for this command from is **exec-timeout** *minutes*

The default is 30 minutes. You can configure different timeout values for a console or a virtual terminal line (VTY) session. You can set the **exec-timeout** value to 0 to disable this feature so the session remains active until you exit the switch. This change is saved in the configuration file.

- From the console:

  ```
  switch(config)# line console
  switch(config-console)# exec-timeout 60
  ```

  Specifies the current console shell timeout to be 60 minutes.

- From a VTY session (Telnet or SSH):

  ```
  switch(config)# line vty
  switch(config-line)# exec-timeout 60
  ```

Specifies the current console shell timeout to be 60 minutes.

Displaying VTY Sessions

Use the **show line** command to display all configured VTY sessions:

```
switch# show line
line Console:
    Speed:        38400 bauds
    Databits:     8 bits per byte
    Stopbits:     1 bit(s)
    Parity:       none
line Aux:
    Speed:        9600 bauds
    Databits:     8 bits per byte
    Stopbits:     1 bit(s)
    Parity:       none
```

Clearing VTY Sessions

Use the **clear line** command to close a specified VTY session:

```
switch# clear line Aux
```

Setting the Switch's Terminal Timeout

Use the **terminal session-timeout** command in EXEC mode to configure the automatic logout time for the current terminal session on that switch. When the time limit configured by this command is exceeded, the switch closes that session and exits.

The syntax for this command from is **terminal session-timeout** *minutes*

The default is 30 minutes. You can set the **terminal session-timeout** value to 0 to disable this feature so the terminal remains active until you choose to exit the switch. This change is not saved in the configuration file.

```
switch# terminal session-timeout 600
```

Specifies the terminal timeout to be 600 minutes for the current session.

Setting the Switch's Terminal Type

Use the **terminal terminal-type** command in EXEC mode to specify the terminal type for a switch:

The syntax for this command is **terminal terminal-type** *terminal-type*

```
switch# terminal terminal-type vt100
```

Specifies the terminal type. The *terminal-type* string is restricted to 80 characters and must be a valid type (for example vt100 or xterm). If a Telnet or SSH session specifies an unknown terminal type, the switch uses the vt100 terminal by default.

Setting the Switch's Terminal Length

To set the terminal screen length for the current session, use the **terminal length** command in EXEC mode. This command is specific to only the console port. Telnet and SSH sessions set the length automatically.

The syntax for this command is **terminal length** *lines*

```
switch# terminal length 20
```

Sets the screen length for the current session to 20 lines for the current terminal session. The default is 24 lines.

Setting the Switch's Terminal Width

To set the terminal screen width for the current session, use the **terminal width** command in EXEC mode. This command is specific to only the console port. Telnet and SSH sessions set the width automatically.

The syntax for this command is **terminal width** *columns*

```
switch# terminal width 86
```

Sets the screen length for the current session to 86 columns for the current terminal session. The default is 80 columns.

Displaying Terminal Settings

The show terminal command displays the terminal settings for the current session:

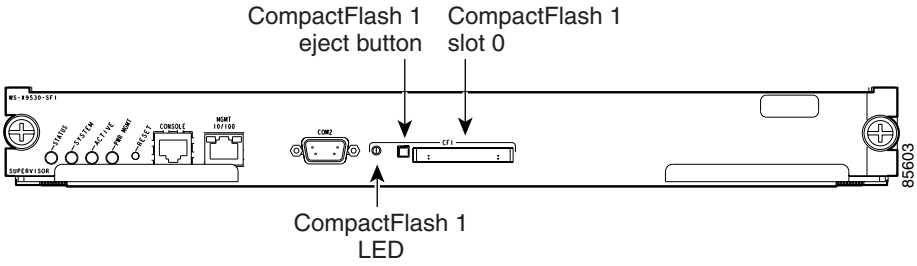
```
switch# show terminal
TTY: Type: "vt100"
Length: 24 lines, Width: 80 columns
Session Timeout: 525600 minutes
```

About Flash Devices

Every switch in the Cisco MDS 9000 Family contains one internal bootflash (see Figure 1-3). The Cisco MDS 9500 Series additionally contains one external CompactFlash called slot0 (see Figure 1-3 and Figure 1-4).

Figure 1-3 Flash Devices in the Cisco MDS 9000 Supervisor Module

Figure 1-4 External CompactFlash in the Cisco MDS 9000 Supervisor Module



Internal bootflash:

All switches in the Cisco MDS 9000 Family have one internal bootflash: that resides in the supervisor or switching module.You have access to two directories within the internal bootflash: file system.

- The volatile: directory which provides temporary storage, and is also the default. Files in temporary storage (volatile:) are erased when the switch reboots.
- The bootflash (nonvolatile storage): directory which provides permanent storage. The files in bootflash are preserved through reboots and power outages.

External CompactFlash (Slot0)

Cisco MDS 9500 Series directors contain an additional external CompactFlash called slot0:

The external CompactFlash, an optional device for MDS 9500 Series directors, can be used for storing software images, logs, and core dumps.

Formatting Flash Disks and File Systems

By formatting a flash disk or a file system, you are essentially clearing out the contents of the disk or the file system and restoring it to its factory-shipped state (see the "About Flash Devices" section on page 1-16 and "Using the File System" section on page 1-18 for additional information).

Initializing bootflash:

When a switch is shipped, the **init system** command is already performed and you do not need to issue it again. Initializing the switch resets the entire internal disk and erases all data in the bootflash: partition. The internal disk is composed of several file systems with bootflash: being one of them. All files in bootflash: are erased and you must download the system and kickstart images again. If you issue an **init system** command at any time, you don't have to format the bootflash: again since bootflash: is automatically formatted.

Note The **init system** command also installs a new loader from the existing (running) kickstart image. You can access this command from the `switch(boot)#` prompt (see Chapter 6, "Software Images").

If bootflash: is found corrupted during a boot sequence, you will see the following message:

```
ERROR:bootflash: has unrecoverable error; please do "format bootflash:"
```

Use the **format bootflash:** command to only format the bootflash: file system. You can access the format bootflash: command from either the `switch#` or the `switch(boot)#` prompts.

If you issue the **format bootflash:** command, you need to download the kickstart and system images again.

Formatting Slot0:

Be sure to format an external CompactFlash device before using it to save files or images.

You can verify if the external CompactFlash device is formatted by inserting it into slot0: and issuing the **dir slot0:** command.

- If the external CompactFlash device is already formatted, you can see file system usage information (along with any existing files).
- If the external CompactFlash device is unformatted (corrupted), you will see the following message:

  ```
  Device unavailable
  ```

  In this case, you need to format the CompactFlash device using the **format slot0:** command.

Note The slot0: file system cannot be accessed from the standby the `loader>` prompt or the `switch(boot)#` prompt, if the disk is inserted after booting the switch.

Using the File System

The switch provides the following useful commands to help you manage software image files and configuration files:

Setting the Current Directory

The **cd** command changes the current directory level to a specified directory level. CLI defaults to the volatile: files system. This command expects a directory name input.

Tip Any file saved in the volatile: file system will be erased when the switch reboots.

The syntax for this command is **cd** *directory name*

This example changes the current directory to the mystorage directory that resides in the slot0 directory:

```
switch# cd slot0:mystorage
```

This example changes the current directory to the mystorage directory that resides in the current directory.

```
switch# cd mystorage
```

If the current directory is slot0:mydir, this command changes the current directory to slot0:mydir/mystorage.

Displaying the Current Directory

The **pwd** command displays the current directory location. This example changes the directory and displays the current directory.

```
switch# cd bootflash:
switch# pwd
bootflash:
```

Listing the Files in a Directory

The **dir** command displays the contents of the current directory or the specified directory. The syntax for this command is **dir** *directory or file name*

This example shows how to list the files on the default volatile: file system:

```
switch# dir
          Usage for volatile: filesystem
                        0 bytes total used
                 20971520 bytes free
                 20971520 bytes available
```

Creating a New Directory

The **mkdir** command creates a directory at the current directory level or at a specified directory level.

The syntax for this command is **mkdir** *directory name*

This example creates a directory called test in the slot0 directory.

```
switch# mkdir slot0:test
```

This example creates a directory called test at the current directory level.

```
switch# mkdir test
```

If the current directory is slot0:mydir, this command creates a directory called slot0:mydir/test.

Deleting an Existing Directory

The **rmdir** command deletes an existing directory at the current directory level or at a specified directory level. The directory must be empty to be deleted.

The syntax for this command is **rmdir** *directory name*

This example deletes the directory called test in the slot0 directory.

```
switch# rmdir slot0:test
```

This example deletes the directory called test at the current directory level.

```
switch# rmdir test
```

If the current directory is slot0:mydir, this command deletes the slot0:mydir/test directory.

Moving Files

The **move** command removes a file from the source directory and places it in the destination directory. If a file with the same name already exists in the destination directory, that file is overwritten by the moved file.

This example moves the file called samplefile from the slot0 directory to the mystorage directory.

```
switch# move slot0:samplefile slot0:mystorage/samplefile
```

This example moves a file from the current directory level.

```
switch# move samplefile mystorage/samplefile
```

If the current directory is slot0:mydir, this command moves slot0:mydir/samplefile to slot0:mydir/mystorage/samplefile.

Copying Files

The **copy** command copies a file.

This example copies the file called samplefile from the slot0 directory to the mystorage directory.

```
switch# copy slot0:samplefile slot0:mystorage/samplefile
```

This example copies a file from the current directory level.

```
switch# copy samplefile mystorage/samplefile
```

If the current directory is slot0:mydir, this command copies slot0:mydir/samplefile to slot0:mydir/mystorage/samplefile.
You can also use the **copy** command to upload and download files from the slot0: or bootflash: file system to or from a FTP, TFTP, SFTP, or SCP server (see the "Copying Files" section on page 4-27).

Displaying File Contents

The **show file** command displays the contents of a specified file in the file system.

The syntax for this command is **show file** *file_name*

This example displays the contents of the test file that resides in the slot0 directory.

```
switch# show file slot0:test
config t
Int fc1/1
no shut
end
show int
```

This example displays the contents of a file residing in the current directory.

```
switch# show file myfile
```

Saving Command Output to a File

You can force all screen output to go to a file by appending **>** *filename* to any command. For example, enter **show interface > samplefile** at the EXEC mode switch prompt to save the interface configuration to *samplefile*—a file created at the same directory level. At the EXEC mode switch prompt, issue a **dir** command to view all files in this directory, including the recently saved *samplefile*.See Chapter 4, "Initial Configuration," for information on saving and copying configuration files, and Chapter 6, "Software Images," for information on saving and copying software images.

Note Redirection is allowed only if the current directory is on the `volatile:` (default) or `slot0:` file systems. Redirection is not allowed if the current directory is on the `bootflash:` file system. The current directory can be viewed using the **pwd** command and changed using the **cd** command.

Compressing and Uncompressing Files

The **gzip** command compresses (zips) the specified file using LZ77 coding.

This example directs the output of the show tech-support command to a file (Samplefile) and then zips the file and displays the difference in the space used up in the volatile: directory:

```
switch# show tech-support > Samplefile
Building Configuration ...
switch# dir
    1525859     Jul 04 00:51:03 2003 Samplefile
Usage for volatile://
    1527808 bytes used
   19443712 bytes free
   20971520 bytes total
switch# gzip volatile:Samplefile
switch# dir
     266069     Jul 04 00:51:03 2003 Samplefile.gz
Usage for volatile://
     266240 bytes used
   20705280 bytes free
   20971520 bytes total
```

The **gunzip** command uncompresses (unzips) LZ77 coded files.

This example unzips the file that was compressed in the previous example:

```
switch# gunzip samplefile
/volatile/samplefile.gz: No such file or directory
switch# gunzip Samplefile
switch# dir
    1525859     Jul 04 00:51:03 2003 Samplefile
Usage for volatile://
    1527808 bytes used
   19443712 bytes free
   20971520 bytes total
```

Displaying the Last Line in a File

The **tail** command displays the last lines (tail end) of a specified file.

The syntax for this command is **tail** <*file name*> *[<number of lines>]*

```
switch# tail mylog 10
```

You see the last 10 lines of the mylog file.

Executing Commands Specified in a Script

The **run-script** command executes the commands specified in a file. To use this command, be sure to create the file and specify commands in the required order.

Note You cannot create the script files at the switch prompt. You can create the script file on an external machine and copy it the bootflash: directory. This section assumes that the script file resides in the bootflash: directory.

The syntax for this command is **run-script** *file_name*

This example displays the CLI commands specified in the testfile that resides in the slot0 directory.

```
switch# show file slot0:testfile
conf t
interface fc 1/1
no shutdown
end
sh interface fc1/1
```

This file output is in response to the **run-script** command executing the contents in the testfile file:

```
switch# run-script slot0:testfile
'conf t'
Enter configuration commands, one per line. End with CNTL/Z.

'interface fc1/1'

'no shutdown'

'end'

'sh interface fc1/1'
fc1/1 is down (Fcot not present)
    Hardware is Fibre Channel
    Port WWN is 20:01:00:05:30:00:48:9e
    Admin port mode is auto, trunk mode is on
    vsan is 1
    Beacon is turned off
    Counter Values (current):
      0 frames input, 0 bytes, 0 discards
      0 runts, 0 jabber, 0 too long, 0 too short
      0 input errors, 0 CRC, 0 invalid transmission words
      0 address id, 0 delimiter
      0 EOF abort, 0 fragmented, 0 unknown class
      0 frames output, 0 bytes, 0 discards
      Received 0 OLS, 0 LRR, 0 NOS, 0 loop inits
      Transmitted 0 OLS, 0 LRR, 0 NOS, 0 loop inits
    Counter Values (5 minute averages):
      0 frames input, 0 bytes, 0 discards
      0 runts, 0 jabber, 0 too long, 0 too short
      0 input errors, 0 CRC, 0 invalid transmission words
      0 address id, 0 delimiter
      0 EOF abort, 0 fragmented, 0 unknown class
      0 frames output, 0 bytes, 0 discards
      Received 0 OLS, 0 LRR, 0 NOS, 0 loop inits
      Transmitted 0 OLS, 0 LRR, 0 NOS, 0 loop inits
```

Setting the Delay Time

The **sleep** command delays an action by a specified number of seconds.

The syntax for this command is **sleep** <*seconds*>

```
switch# sleep 30
```

You will see the switch prompt return after 30 seconds.

This command is useful within scripts. For example, if you create a script called test-script:

```
switch# show file slot0:test-script
discover scsi-target remote
sleep 10
show scsi-target disk

switch# run-script slot0:test-script
```

When you execute the slot0:test-script, the switch software executes the **discover scsi-target remote** command, and then waits for 10 seconds before executing the **show scsi-target disk command**.

Role-Based CLI

By default, two roles exist in all switches:

- Network operator—Has permission to view the configuration.
- Network administrator—Has permission to execute all commands and to set up to 64 permission levels based on user roles and groups (see Chapter 16, "Configuring Switch Security").

When you execute a command, perform command completion, or obtain context sensitive help, the switch software allows the operation to progress if you have the correct permission as specified in the description of the command.

Using Valid Formats and Ranges

Note Do not enter ellipsis (...), vertical bar (|), less or great (< >), bracket ([ ]), or braces ({ }) in command lines. These characters have special meaning in SAN-OS text strings.

Some commands require a MAC address, IP address, or IDs that must be designated in a standard format or given a range. See Table 1-4.

Table 1-4 Valid Formats and Ranges

Address	Description	Valid Format Example	Range
MAC address	6 bytes in hexadecimal format separated by colons (not case-sensitive)	00:00:0c:24:d2:Fe	—
IP address	32 bytes, written as 4 octets separated by periods (dotted decimal format) that are made up of a network section, an optional netmask section, and a host section.	126.2.54.1	—
VSAN	Integer that specifies the VSAN.	7	1 to 4093
VLAN	Integer that specifies the VLAN	11	1 to 4093
Port WWN (pWWN)	Eight hexadecimal numbers separated by colons (not case-sensitive).	12:34:56:78:9A:BC:dE:F1	—
Node WWN (nWWN)	Eight hexadecimal numbers separated by colons (not case-sensitive).	12:34:56:78:9A:BC:dE:F1	—
LUN	8 bytes in hexadecimal format separated by colons. A minimum of two hex characters are acceptable. The valid format is hhhh[:hhhh[:hhhh[:hhhh]]]	64 (100d = 64h)	—
FC ID	Six character hexadecimal value prepended by 0x.	0xabc123	—
Domain ID	Integer that specifies the domain.	7	1 to 239
Timers	Integer that specifies timers in milliseconds for latency, FC time out values (TOV).	100	0 to 2147483647
Switching module	Slot in which the applicable switching module resides.	1	1 to 15
Switch priority	Integer specifying switch priority.	5	1 to 254
Channel group	Integer that specifies a PortChannel group addition.	1	1 to 100
Fabric Shortest Path First (FSPF)	Integer that specifies the hold time (in milliseconds) before making FSPF computations.	1000	0 to 65535
Fabric Analyzer	The allowed range for the frame size limit in bytes.	64	64 to 65536
Fabric Analyzer captures	An example of 10 frames, limits the number of frames captured to 10.	10	0 to 2147483647
FCIP profile	Integer that specifies the FCIP profile	101	1 to 255
TCP retransmit time	Integer that specifies the minimum retransmit time for the TCP connection in milliseconds	300	250 to 5000

Table 1-4 Valid Formats and Ranges (continued)

Address	Description	Valid Format Example	Range
Keepalive timeout	Integer that specifies the TCP connection's keepalive timeout in seconds.	60	1 to 7200
TCP retransmissions	Integer that specifies the maximum number of TCP transmissions.	6	1 to 8
PMTU	Integer that specifies the path MTU reset time in seconds	90	60 to 3600
TCP buffer size	Integer that specifies the advertised TCP buffer size in KB.	5000	0 to 8192
Traffic burst size	Integer that specifies the maximum burst size in KB.	30	10 to 100
Peer TCP port	Integer that specifies the TCP port number	3000	0 to 65535
Acceptable time difference	Integer that specifies the acceptable time difference in milliseconds for a packet being accepted.	4000	1 to 60,000
iSCSI pWWN allocation	Integer that specifies the number of pWWNs that must be allocated to an iSCSI initiator.	2	1 to 64
CDP refresh and hold time	Integer that specifies the refresh time interval and the hold time in seconds for the CDP protocol.	60	5 to 255

A Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

aaa accounting logsize

Use the **aaa accounting logsize** command to set the size of the local accounting log file. Use the no form of the command to revert to the default logsize 35000 bytes.

aaa accounting logsize *integer*]

no aaa accounting logsize *integer*

Syntax Description

aaa accounting	Configures accounting methods
logsize	Configures local accounting log file size (in bytes).
integer	Sets the size limit of the local accounting log file in bytes from 0-35000K.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example shows the log file size configured at 29000 bytes.

```
switch# config t
switch(config)# aaa accounting logsize 29000
```

Related Commands

Command	Description
show accounting logsize	Displays the configured log size.
show accounting log	Displays the entire log file.

aaa accounting default

Use the **aaa accounting default** command to configure the accounting method. Use the **no** form of the command to revert to the default local accounting.

aaa accounting default [group *group-name* **| local | none]**

no aaa accounting default [group *group-name* **| local | none]**

Syntax Description

aaa accounting	Configures accounting methods
default	Configures the default accounting method.
group *group-name*	Specifies the group authentication method.
local	Specifies the local authentication method.
none	No authentication, everyone permitted.

Defaults

Enabled.

Command Modes

Configuration mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Specify the currently configured command preceded by a **no** in order to revert to the factory default.

Examples

The following example enables accounting to be performed using remote TACACS+ servers which are member of the group called TacServers, followed by the local accounting method.

```
switch# config t
switch(config)# aaa accounting default group TacServer local
```

The following example turns off accounting.

```
switch(config)# aaa accounting default none
```

The following example reverts to the local accounting (default).

```
switch(config)# no aaa accounting default group TacServer local
```

Related Commands

Command	Description
show aaa accounting	Displays the configured accounting methods.

aaa authentication login

To configure the authentication method for a login, use the **aaa authentication login** command in configuration mode. Use the **no** form of this command to revert to local authentication.

aaa authentication login default (group *group-name* **| local | none) |**
console (group *group-name* **| local | none)**

no aaa authentication login default (group *group-name* **| local | none) |**
console (group *group-name* **| local | none)**

Syntax Description

aaa authentication	Configures the authentication method.
login	Configures the authentication login method.
default	Configures the default authentication login method
console	Configures the console authentication login method.
group *group-name*	Specifies the group authentication method.
local	Specifies the local authentication method.
none	No authentication, everyone permitted.

Defaults

Enabled.

Command Modes

Configuration mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Use the **console** option to override the console login method.

Specify the currently configured command preceded by a **no** in order to revert to the factory default.

Examples

The following example enables all login authentication to be performed using remote TACACS+ servers which are member of the group called TacServers, followed by the local login method.

```
switch# config t
switch(config)# aaa authentication login default group TacServer local
```

The following example enables console authentication to use the group called TacServers, followed by the local login method.

```
switch(config)# aaa authentication login console group TacServer local
```

The following example turns off password validation.

```
switch(config)# aaa authentication login default none
```

The following example reverts to the local authentication method (default).

```
switch(config)# no aaa authentication login default group TacServer local
```

Related Commands

Command	Description
show aaa authentication	Displays the configured authentication methods.

aaa authentication dhchap

To configure DHCHAP authentication method, use the **aaa authentication dhchap** command in configuration mode. Use the **no** form of this command to revert to factory defaults.

aaa authentication dhchap default (group *group-name* **| local | none)**

no aaa authentication dhchap default (group *group-name* **| local | none)**

Syntax Description

aaa authentication	Configures the authentication method.
dhchap	Configures methods for DHCAP authentication.
default	Configures default authentication methods.
group	Specifies server groups.
local	Specifies local user name authentication (default).
none	Specifies no authentication.

Defaults

Enabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The **local** option disables other authentication methods and configures local authentication to be used exclusively.

Specify the currently configured command preceded by a **no** in order to revert to the factory default.

Examples

The following example enables all DHCHAP authentication to be performed using remote TACACS+ servers which are member of the group called TacServers, followed by the local authentication.

```
switch# config t
switch(config)# aaa authentication dhchap default group TacServer local
```

The following example reverts to the local authentication method (default).

```
switch(config)# no aaa authentication dhcahp default group TacServer local
```

Related Commands

Command	Description
show aaa authentication	Displays the configured authentication methods.

aaa authentication iscsi

To configure iSCSI authentication method, use the **aaa authentication iscsi** command in configuration mode. Use the **no** form of this command to negate the command or revert to factory defaults.

aaa authentication iscsi default (group *group-name* **| local | none)**

no aaa authentication iscsi default (group *group-name* **| local | none)**

Syntax Description

aaa authentication	Configures the authentication method.
iscsi	Configures methods for iSCSI authentication.
default	Configures default authentication methods.
group	Specifies server groups.
local	Specifies local user name authentication (default).
none	Specifies no authentication.

Defaults

Enabled.

Command Modes

Configuration mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The **local** option disables other authentication methods and configures local authentication to be used exclusively.

Specify the currently configured command preceded by a **no** in order to revert to the factory default.

Examples

The following example enables all iSCSI authentication to be performed using remote TACACS+ servers which are member of the group called TacServers, followed by the local authentication.

```
switch# config t
switch(config)# aaa authentication iscsi default group TacServer local
```

The following example reverts to the local authentication method (default).

```
switch(config)# no aaa authentication iscsi default group TacServer local
```

Related Commands

Command	Description
show aaa authentication	Displays the configured authentication methods.

aaa group server

To configure one or more independent server groups, use the **aaa group** command in configuration mode. Use the **no** form of this command to remove the server group.

aaa group server [radius | tacacs+] *group-name*
server *server-name*

no aaa group server [radius | tacacs+] *group-name*

Syntax Description

aaa group server	Configures the AAA server group.
radius	Specifies the RADIUS server group.
tacacs+	Specifies the TACACS+ server group.
group-name	Identifies the specified group of servers with a user-defined name. The name is limited to 64 alphanumeric characters.

Defaults

None.

Command Modes

Available in all command modes.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

You can configure these server groups at any time but they only take effect when you apply them to a AAA service using the **aaa authentication login** or the **aaa accounting** commands.

Examples

You can configure these server groups at any time but they only take effect when you apply them to a AAA service using the **aaa authentication** or the **aaa accounting** commands.

```
switch# config t
switch(config)# aaa group server tacacs+ TacacsServer1
switch(config-tacacs+)#
switch(config)# aaa group server tacacs+ TacacsServer19
switch(config-tacacs+)# server ServerA
switch(config-radius)# server ServerB
switch(config-radius)# no server ServerZ
```

Related Commands

Command	Description
show aaa groups	Displays all configured server groups.
show radius-server groups	Displays configured RADIUS server groups
show tacacs-server groups	Displays configured TACACS server groups

active equals saved

Enable the **active equals saved** command to automatically write any changes to the block, prohibit or port address name to the IPL file. To disable the configuration or to revert to factory defaults, use the **no** form of the command.

active equals saved

Syntax Description

active equals saved	Enables FICON configuration changes to be automatically written to the IPL file.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

If **active equals saved** is enabled, the SAN-OS software ensures that you do not have to perform the **copy running startup** command for the FICON configuration as well. If your switch or fabric consists of multiple FICON -enabled VSANs, and one of these VSANs have **active equals saved** enabled, changes made to the non-FICON configuration results in all configurations being saved to the startup configuration.

Refer to the *Cisco MDS 9000 Family Configuration Guide* for further information.

Examples

The following example enables the automatic save feature for all VSANs in the switch or fabric.

```
switch(config)# ficon vsan 2
switch(config-ficon)# active equals saved
```

The following example disables the automatic save feature for this VSAN.

```
switch(config-ficon)# no ficon vsan 2
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.
ficon vsan *vsan-id*	Enables FICON on the specified VSAN.

arp

To disable the Address Resolution Protocol (ARP) for the switch, use the **no arp** command.

no arp *hostname*

Syntax Description

hostname	Name of the host. Maximum length is 20 characters.

Defaults

Enabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example disables the Address Resolution Protocol configured for the host with the IP address 10.1.1.1.

```
switch(config)# no arp 10.1.1.1
switch(config)#
```

Related Commands

Command	Description
show arp	Displays the ARP table.
no arp	Removes an ARP entry from the ARP table.
clear arp	Deletes a specific entry or all entries from the ARP table.

attach module

To connect to a specific module, use the **attach module** command in EXEC mode. To disconnect, use the **exit** command at the module-number# prompt, or type **$.** to forcibly abort the attach session.

attach module *slot-number*

Syntax Description

slot-number	Specifies slot number of the module you want to connect to.

Command Modes

EXEC.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

You can use the **attach module** command to view the standby supervisor module information, but you cannot configure the standby supervisor module using this command.

You can also use the **attach module** command on the switching module portion of the Cisco MDS 9216 supervisor module, which resides in slot 1 of this two-slot switch.

Examples

The following example connects to the module in slot 2. Note that after you connect to the image on the module using the **attach module** command, the prompt changes to module-number#.

```
switch# attach module 1
Attaching to module 1 ...
To exit type 'exit', to abort type '$.'
module-1# exit
switch#
```

Related Commands

Command	Description
show module	Displays the status of a module.

B Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

boot

To perform operations on the system, use the **boot** command in configuration mode.

boot [asm-sfn | auto-copy | kickstart | system] [bootflash: | slot0: | tftp:] [sup-1 | sup-2]

Syntax Description

asm-sfn	Configures the virtualization image.
module *slot-number*	Specifies the slot number of the ASM.
auto-copy	Configures auto-copying of boot variable images.
kickstart	Configures the kickstart image.
system	Configures the system image.
bootflash:	Specifies system image URI for bootflash.
slot0:	Specifies system image URI for slot 0.
tftp:	Specifies system image URI for TFTP.
sup-1	The upper supervisor.
sup-2	The lower supervisor.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

The **boot kickstart slot0:image** command is currently not allowed. For kickstart, only bootflash: is allowed.

The **boot auto-copy** command is disabled by default. When issued, this command copies the boot variable images which are local (present) in the active supervisor module (but not in the standby supervisor module) to the standby supervisor module. For kickstart and system boot variables, only those images that are set for the standby supervisor module may be copied. For modules (line card) images, all modules present in standby's corresponding locations (bootflash or slot0) will be copied.

Examples

The following example adds the new system image file to the SYSTEM environment variable.

```
switch(config)# boot system bootflash:system.img
```

The following example boots from the CompactFlash device (slot0:). The switch updates the SYSTEM environment variable to reflect the new image file in the specified Flash device.

```
switch(config)# boot system slot0:system.img
```

The following example overwrites the old Kickstart environment variable in the configuration file:

```
switch(config)# boot kickstart kickstart.img
```

The following example specifies the ASM image to be used:

```
switch(config)# boot asm-sfn bootflash:m9000-ek9-asm-sfn-mz.1.2.2.bin
```

The following example enables automatic copying of boot variables from the active supervisor module to the standby supervisor module.

```
switch(config)# boot auto-copy
```

The following example disables the automatic copy feature (default).

```
switch(config)# no boot auto-copy
```

bport

To configure a B port FCIP interface, use the **bport** option. To disable a bport FCIP interface, use the **no** form of the option.

bport

no bport

Syntax Description

bport	Sets the B port mode.

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

Examples

```
switch# config t
switch(config)# interface fcip 1
switch(config-if)# bport
```

Related Commands

Command	Description
show interface fcip	Displays an interface configuration for a specified FCIP interface.
bport-keepalive	Configures B port keepalive responses.

bport-keepalive

To configure keepalive responses for B port FCIP interfaces, use the **bport-keepalive** option. To disable bport-keepalive for an FCIP interface, use the **no** form of the option.

bport-keepalive

no bport-keepalive

Syntax Description

bport-keepalive	Configures the keepalive responses for the B port FCIP interface.

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

Examples

```
switch# config t
switch(config)# interface fcip 1
switch(config-if)# bport-keepalives
```

Related Commands

Command	Description
show interface fcip	Displays an interface configuration for a specified FCIP interface.
bport	Configure a B port FCIP interface.

C Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "About the CLI Command Modes" section on page 1-3 to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

callhome

To configure the callhome function, use the **callhome** command in configuration mode. To set a command back to its factory defaults or negate the command, use the **no** form of the command.

callhome -->
contract-id *contract-id* | **customer-id** *customer-id* |
destination-profile *profile-name* [(**alert-group all** | **Cisco-TAC** | **environmental** | **inventory** | **linecard-hardware** | **supervisor-hardware** | **system** | **test**) | **email-addr** *email-address* | (**format full-txt** | **short-txt** | **XML**) | **message-level** *level* | **message-size** *size*] |
destination-profile full-txt-destination | **short-txt-destination** | **XML-destination** [(**alert-group all** | **Cisco-TAC** | **environmental** | **inventory** | **linecard-hardware** | **supervisor-hardware** | **system** | **test**) | **email-addr** *email-address* | **message-level** *level* | **message-size** *size*]**email-addr** *email-address* | **message-size** *size*] |
disable | **enable** | **email-contact** *email-address* | **phone-contact** *number* |
site-id *site number* | **streetaddress** *street number, city, state, zip* |
switch-priority *priority value* |
[transport email from *email-address* **|reply-to** *email-address* | **smtp-server** *ip address* **port** *port-number***]**

no callhome -->
no {contract-id *contract-id* | **customer-id** *customer-id* |
destination-profile *profile-name* [(**alert-group all** | **Cisco-TAC** | **environmental** | **inventory** | **linecard-hardware** | **supervisor-hardware** | **system** | **test**) | **email-addr** *email-address* | (**format full-txt** | **short-txt** | **XML**) | **message-level** *level* | **message-size** *size*] |
destination-profile full-txt-destination | **short-txt-destination** | **XML-destination** [(**alert-group all** | **Cisco-TAC** | **environmental** | **inventory** | **linecard-hardware** | **supervisor-hardware** | **system** | **test**) | **email-addr** *email-address* | **message-level** *level* | **message-size** *size*]**email-addr** *email-address* | **message-size** *size*] |
disable | **enable** | **email-contact** *email-address* | **phone-contact** *number* |
site-id *site number* | **streetaddress** *street number, city, state, zip* |
switch-priority *priority value* |
[transport email from *email-address* **|reply-to** *email-address* | **smtp-server** *ip address* **port** *port-number***] }**

Syntax Description

contract-id *contract-id*	(Optional). Configures service contract ID of the customer. Allows up to 64 characters for contract number.
customer-id *customer-id*	(Optional). Configures the customer ID for the switch. Allows customer ID up to 64 alphanumeric characters in free format.
destination-profile	(Optional) Configures a destination e-mail address for a message sent in full text format. This text provides the complete, detailed explanation of the failure.
profile-name	Configures a user-defined user profile with a maximum of 32 alphanumeric characters.
alert-group	Specifies one or all of the following groups: **all, Cisco-TAC, environmental, inventory, linecard-hardware, supervisor-hardware, system**, or **test**
all	Specifies an alert group consisting of all Callhome messages.

Cisco-TAC	Specifies an alert group consisting of events which are meant only for Cisco TAC.
environmental	Specifies an alert group consisting of power, fan, temperature-related events
inventory	Specifies an alert group consisting of inventory status events.
linecard-hardware	Specifies an alert group consisting of module-related events.
supervisor-hardware	Specifies an alert group consisting of supervisor related events.
system	Specifies an alert group consisting of software related events.
test	Specifies an alert group consisting of user-generated test events.
email-addr *email-address*	Configures email address. Uses a standard e-mail address that does not have any text size restrictions.
format	Configures a format for the user-defined profile. The options are **full-txt**, **short-txt**, or **XML** (default).
message-level *level*	Configures a message urgency level. Allows from 0 (lowest level of urgency) to 9 (highest level of urgency), and the default is 0 (all Call Home message are sent).
message-size *size*	Configures a destination message size for a message sent in full text format. Allows from 0 to 1,000,000 bytes for the message size and the default is 500,000. A value of 0 implies that a message of any size can be sent
full-txt-destination	Configures destination profile for plain text message.
short-txt-destination	(Optional). Configures a destination for a short text message.
XML-destination	(Optional). Configures destination profile for XML message.
disable	Disables callhome.
email-contact *email-address*	(Optional). Configures the customer's e-mail address. Allows up to 128 alphanumeric characters in e-mail address format.
enable	Enables callhome.
phone-contact *number*	(Optional). Configures the customer's phone number. Allows up to 20 alphanumeric characters international phone format. Do not use spaces. Use the **+** prefix before the number.
site-id *site number*	(Optional). Identifies the unit to the outsourced throughput. Allows up to 256 alphanumeric characters in free format.
streetaddress *street number, city, state, zip*	(Optional). Configures the customer's street address where the equipment is located. Allows up to 256 alphanumeric characters in free format for the street number, city, state, and zip (combined).
switch-priority *priority value*	(Optional). Configures the switch priority. Specifies a priority value. 0 is the highest priority and 7 the lowest.
transport	Optional. Configure the e-mail address from the user.
email	Configure the e-mail address from the user.
from *email-address*	Configure from email address. Provide from email address, example: SJ-9500-1@xyz.com (Max Size - 255).
reply-to *email-address*	Configure reply to email address. Provide reply-to email address, example: admin@xyz.com (Max Size - 255).
smtp-server *ip address*	Configure SMTP server address. The SMTP server (DNS name or IP address) (Max Size - 255).
port *port-number*	(Optional). Changes depending on the server location. The port usage defaults to 25 if no port number is specified.

Defaults None.

Command Modes Configuration mode.

Command History This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines The CallHome configuration commands available in the `(config-callhome)` submode.

A CallHome message is used to contact a support person or organization in case an urgent alarm is raised.

Once you have configured the contact information, you must enable the Call Home function. The **enable** command is required for the Call Home function to start operating. When you disable the Call Home function, all input events are ignored.

Note Even if Call Home is disabled, basic information for each Call Home event is sent to syslog.

Examples The following examples assign contact informations:

```
switch# config t
switch# snmp-server contact personname@companyname.com
switch(config)# callhome
switch(config-callhome)# email-contact username@company.com
switch(config-callhome)# phone-contact +1-800-123-4567
switch(config-callhome)# streetaddress 1234 Picaboo Street, Any city, Any state, 12345
switch(config-callhome)# switch-priority 0
switch(config-callhome)# customer-id Customer1234
switch(config-callhome)# site-id Site1ManhattanNY
switch(config-callhome)# contract-id Company1234
```

The following example configures full-text destination profiles:

```
switch(config-callhome)# destination-profile full-txt-destination email-addr
person@place.com
switch(config-callhome)# destination-profile full-txt-destination message-size 1000000
```

The following example configures short-text destination profiles:

```
switch(config-callhome)# destination-profile short-txt-destination email-addr
person@place.com
switch(config-callhome)# destination-profile short-txt-destination message-size 100000
```

The following example configures the from and reply-to e-mail addresses:

```
switch(config-callhome)# transport email from user@company1.com
switch(config-callhome)# transport email reply-to person@place.com
```

The following example configures the SMTP server and ports:

```
switch(config-callhome)# transport email smtp-server 192.168.1.1
switch(config-callhome)# transport email smtp-server 192.168.1.1 port 30
```

The following example enables and disables the CallHome function:

```
switch(config-callhome)# enable
switch(config-callhome)# disable
```

The following example configures a user-defined destination profile called *test*.

```
switch(config-callhome)# destination-profile test
switch(config-callhome)# destination-profile test alert-group all
switch(config-callhome)# destination-profile test alert-group Cisco-TAC
switch(config-callhome)# destination-profile test alert-group Environmental
switch(config-callhome)# destination-profile test alert-group Inventory
switch(config-callhome)# destination-profile test alert-group Linecard-Hardware
switch(config-callhome)# destination-profile test alert-group Supervisor-Hardware
switch(config-callhome)# destination-profile test alert-group test
switch(config-callhome)# destination-profile test email-addr
switch(config-callhome)# destination-profile test email-addr user@company.com
switch(config-callhome)# destination-profile test format full-txt
switch(config-callhome)# destination-profile test message-level 5
switch(config-callhome)# destination-profile test message-size 100000
```

Related Commands

Command	Description
callhome test	Sends a dummy test message to the configured destination(s).
callhome test inventory	Sends a dummy test inventory message to the configured destination(s).
show callhome	Displays configured Call Home information.

callhome test

To simulate a CallHome message generation, use the **callhome test** command.

callhome test [inventory]

Syntax Description

inventory	Sends a dummy CallHome inventory.

Defaults

none.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

You can simulate a message generation by issuing a **test** command.

Examples

The following example sends a test message to the configured destination(s):

```
switch# callhome test
trying to send test callhome message
successfully sent test callhome message
```

The following example sends a test inventory message to the configured destination(s)

```
switch# callhome test inventory
trying to send test callhome message
successfully sent test callhome message
```

Related Commands

Command	Description
callhome	Configures CallHome functions.
show callhome	Displays configured Call Home information.

cd

To change the default directory or file system, use the **cd** command.

cd {*directory* | **bootflash:**[*directory*] | **slot0:**[*directory*] | **volatile:**[*directory*]}

Syntax Description

directory	Name of the directory on the file system.
bootflash:	URI or alias of the bootflash or file system.
slot0:	URI or alias of the slot0 file system.
volatile:	URI or alias of the volatile file system.

Defaults

The initial default file system is flash:. For platforms that do not have a physical device named flash:, the keyword flash: is aliased to the default Flash device.

If you do not specify a directory on a file system, the default is the root directory on that file system.

Command Modes

EXEC mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

For all EXEC commands that have an optional file system argument, the system uses the file system specified by the **cd** command when you omit the optional file system argument. For example, the **dir** command, which displays a list of files on a file system, contains an optional file system argument. When you omit this argument, the system lists the files on the file system specified by the **cd** command.

Examples

The following example sets the default file system to the Flash memory card inserted in slot 0:

```
switch# pwd
bootflash:/
switch# cd slot0:
switch# pwd
slot0:/
```

Related Commands

Command	Description
copy	Copies any file from a source to a destination.
delete	Deletes a file on a Flash memory device.
dir	Displays a list of files on a file system.
pwd	Displays the current setting of the cd command.
show file systems	Lists available file systems and their alias prefix names.
undelete	Recovers a file marked deleted on a Class A or Class B Flash file system.

cdp

Use the **cdp** command to globally configure the Cisco Discovery Protocol parameters. Use the **no** form of this command to revert to factory defaults.

cdp enable | advertise *version* **| holdtime** *holdtime-seconds* **| timer** *timer-seconds*

no cdp enable | advertise *version* **| holdtime** *holdtime-seconds* **| timer** *timer-seconds*

Syntax Description

enable	Enables CDP on globally or on a per-interfaces basis.
advertise	Specifies the EXEC command to be executed.
version	Specifies one of two available versions: version 1 (v1) or version 2 (v2—default).
holdtime	Sets the hold time advertised in CDP packets.
holdtime-seconds	Specifies the holdtime in seconds. The default is 180 seconds and the valid range is from 10 to 255 seconds.
timer	Sets the refresh time interval.
timer-seconds	Specifies the time interval in seconds. The default is 60 seconds and the valid range is from 5 to 255 seconds.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Use the **cdp enable** command to enable the Cisco Discovery Protocol (CDP) feature at the switch level or at the interface level. Use the **no** form of this command to disable this feature. When the interface link is established, CDP is enabled by default

CDP version 1 (v1) and version 2 (v2) are supported in Cisco MDS 9000 Family switches. CDP packets with any other version number are silently discarded when received.

Examples

The following example disables the CDP protocol on the switch. When CDP is disabled on an interface, one packet is sent to clear out the switch state with each of the receiving devices.

```
switch(config)# no cdp enable
Operation in progress. Please check global parameters
switch(config-console)#
```

The following example enables (default) the CDP protocol on the switch. When CDP is enabled on an interface, one packet is sent immediately. Subsequent packets are sent at the configured refresh time

```
switch(config)# cdp enable
Operation in progress. Please check global parameters
switch(config)#
```

The following example configures the Gigabit Ethernet interface 8/8 and disables the CDP protocol on this interface. When CDP is disabled on an interface, one packet is sent to clear out the switch state with each of the receiving devices.

```
switch(config)# interface gigbitethernet 8/8
switch(config-if)# no cdp enable
Operation in progress. Please check interface parameters
switch(config-console)#
```

The following example enables (default) the CDP protocol on the selected interface. When CDP is enabled on this interface, one packet is sent immediately. Subsequent packets are sent at the configured refresh time.

```
switch(config-if)# cdp enable
Operation in progress. Please check interface parameters
switch(config)#
```

The following example globally configures the refresh time interval for the CDP protocol in seconds. The default is 60 seconds and the valid range is from 5 to 255 seconds.

```
switch# config terminal
switch(config)# cdp timer 100
switch(config)#
```

The following example globally configures the hold time advertised in CDP packet in seconds. The default is 180 seconds and the valid range is from 10 to 255 seconds.

```
switch# config terminal
switch(config)# cdp holdtime 200
switch(config)#
```

The following example globally configures the CDP version. The default is version 2 (v2). The valid options are v1 and v2

```
switch# config terminal
switch(config)# cdp advertise v1
switch(config)#
```

Related Commands

Command	Description
clear cdp	Clears global or interface-specific CDP configurations.
show cdp	Displays configured CDP settings and parameters.

clear arp-cache

To clear the arp-cache table entries, use the **clear arp-cache** command in EXEC mode.

clear arp-cache

Syntax Description

This command has no arguments or keywords.

Defaults

The ARP table is empty by default.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Examples

The following example shows how to clear the arp-cache table entries.

```
switch# clear arp-cache
```

Related Commands

Command	Description
show arp	Displays Address Resolution Protocol (ARP) entries.

clear cdp

Use the **clear cdp** command to delete global or interface-specific CDP configurations.

clear cdp counters [interface (gigabitethernet *slot-port* **| mgmt 0)] | table [interface (gigabitethernet** *slot-port* **| mgmt 0)]**

Syntax Description

counters	Enables CDP on globally or on a per-interfaces basis.
table	Specifies the EXEC command to be executed.
interface	Displays CDP parameters for an interface.
gigabitethernet	Specifies the Gigabit Ethernet interface.
slot-port	Specifies the slot number and port number separated by a slash (/).
mgmt 0	Specifies the Ethernet management interface.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

You can issue this command for a specified interface or for all interfaces (management and Gigabit Ethernet interfaces)

Examples

The following example clears CDP traffic counters for all interfaces.

```
switch# clear cdp counters
switch#
```

The following example clears CDP entries for the specified Gigabit Ethernet interface.

```
switch# clear cdp table interface gigabitethernet 4/1
switch#
```

Related Commands

Command	Description
cdp	Configures global or interface-specific CDP settings and parameters.
show cdp	Displays configured CDP settings and parameters.

clear cores

To clear all core dumps for the switch, use the **clear cores** command in EXEC mode.

clear cores

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

The system software keeps the last few cores per service and per slot and clears all other cores present on the active supervisor module.

Examples

The following example shows how to clear all core dumps for the switch.

```
switch# clear cores
```

Related Commands

Command	Description
show cores	Displays core dumps that have been made.

clear counters

To clear the counters, use the **clear counters** command in EXEC mode.

clear counters {statistics vrrp | interface {fc | mgmt | port-channel | sup-fc | vsan} *number***}**

Syntax Description

statistics vrrp	Clears global virtual router statistics.
interface	Clears interface counters for the specified interface.
type	Specifies the interface type. See the Keywords table in the "Usage Guidelines" section.
number	Specifies the number of the slot or interface being cleared.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

The following table lists the keywords and number ranges for the **clear counters** interface types:

Keyword	Interface Type	Number
fc	Fibre Channel	1- 2 or 1 - 9 (slot)
mgmt	Management	0-0 (management interface)
port-channel	PortChannel	1-128 (PortChannel)
sup-fc	Inband	0-0 (Inband interface)
vsan	VSAN	1- 4093 (VSAN ID)

Examples

The following example shows how to clear global virtual router statistics.

```
switch# clear counters statistics vrrp

switch# clear counters interface vsan 13
```

clear debug-logfile

To clear the debug logfile, use the **clear debug-logfile** command in EXEC mode.

clear debug-logfile *filename*

Syntax Description

filename	The name of the log file to be cleared. Maximum size is 1024 bytes.

Command Modes

EXEC.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Examples

The following example shows how to clear the debug logfile.

```
switch# clear debug-logfile
```

clear fabric-binding statistics

To clear fabric binding statistics in a FICON enabled VSAN, use the **clear fabric-binding statistics** command in EXEC mode.

clear fabric-binding statistics vsan *vsan-id*

Syntax Description

clear fabric-binding statistics	Clears all existing fabric binding statistics information.
vsan *vsan-id*	Specifies the FICON-enabled VSAN. The ID of the VSAN is from 1 to 4093.

Defaults

None

Command Modes

EXEC mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example clears existing fabric binding statistics in VSAN 1.

```
switch# clear fabric-binding statistics vsan 1
```

Related Commands

Command	Description
`show fabric-binding efmd statistics`	Displays existing fabric binding statistics information.

clear fcanalyzer

To clear the entire list of configured hosts for remote capture, use the **clear fcanalyzer** command in EXEC mode.

clear fcanalyzer

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

This command clears only the list of configured hosts. Existing connections are not terminated.

Examples

The following example shows how to clear the entire list of configured hosts for remote capture.

```
switch# clear fcanalyzer
```

Related Commands

Command	Description
show fcanalyzer	Displays the list of hosts configured for a remote capture.

clear fcflow stats

To clear Fibre Channel flow counters, use the **clear fcflow stats** command in EXEC mode.

clear fcflow stats {aggregated | module *module-number* **| index** *flow-number***}**

Syntax Description

aggregated	Clears fcflow aggregated statistics.
module	Clears statistics for a specified module.
index	Clears fcflow counters for a specified flow index.
flow-number	Specifies flow index number.

Command Modes

EXEC.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Examples

The following example shows how to clear aggregated Fibre Channel flow statistics for flow index 1 of module 2.

```
switch(config)# # clear fcflow stats aggregated module 2 index 1
```

Related Commands

Command	Description
show fcflow	Displays the fcflow statistics.

clear fcns statistics

To clear the name server statistics, use the **clear fcns statistics** command in EXEC mode.

clear fcns statistics [vsan *vsan-id*]

Syntax Description

vsan *vsan-id*	FCS statistics are to be cleared for a specified VSAN ranging from 1 to 4093.

Command Modes

EXEC.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Examples

The following example shows how to clear the name server statistics.

```
switch# show fcns statistics

Name server statistics for vsan 1
=================================
registration requests received = 0
deregistration requests received = 0
queries received = 23
queries sent = 27
reject responses sent = 23
RSCNs received = 0
RSCNs sent = 0

switch# clear fcns statistics

switch# show fcns statistics

Name server statistics for vsan 1
=================================
registration requests received = 0
deregistration requests received = 0
queries received = 0
queries sent = 0
reject responses sent = 0
RSCNs received = 0
RSCNs sent = 0
switch#
```

Related Commands

Command	Description
show fcns statistics	Displays the name server statistics.

clear fcs statistics

To clear the fabric configuration server statistics, use the **clear fcs statistics** command in EXEC mode.

clear fcs statistics [vsan *vsan-id***]**

Syntax Description

vsan *vsan-id*	FCS statistics are to be cleared for a specified VSAN ranging from 1 to 4093.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Examples

The following example shows how to clear the fabric configuration server statistics.

```
switch# clear fcs statistics
```

Related Commands

Command	Description
show fcs	Displays the fabric configuration server information.

clear ficon

Use the **clear ficon vsan** *vsan-id* **timestamp** command in EXEC mode to clear the VSAN-clock for a specified VSAN.

clear ficon vsan *vsan-id* **allegiance | timestamp**

Syntax Description

host	Enables host control of the FICON configurations
ficon	Specifies the FICON parameter.
vsan *vsan-id*	Specifies the FICON-enabled VSAN. The ID of the VSAN is from 1 to 4093.
allegiance	Clears FICON device allegiance.
timestamp	Allows the host to set the director clock

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The **clear ficon vsan** *vsan-id* **allegiance** command aborts the currently-executing session.

Examples

The following example clears the current device allegiance for VSAN 1.

```
switch# clear ficon vsan 1 allegiance
```

The following example clears the VSAN clock for VSAN 20.

```
switch# clear ficon vsan 20 timestamp
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.

clear fspf counters

To clear the Fabric Shortest Path First statistics, use the **clear fspf counters** command in EXEC mode.

clear fspf counters vsan *vsan-id* **[interface** ***type*****]**

Syntax Description

vsan	Indicates that the counters are to be cleared for a VSAN.
vsan-id	The ID of the VSAN is from 1 to 4093.
interface ***type***	(Optional). The counters are to be cleared for an interface. The interface types are fc for Fibre Channel, and port-channel for PortChannel.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

If the interface is not specified, then all of the counters of a VSAN are cleared. If the interface is specified, then the counters of the specific interface are cleared.

Examples

The following example clears the FSPF t statistics on VSAN 1.

```
switch# clear fspf counters vsan 1
```

The following example clears FSPF statistics specific to the Fibre Channel interface in VSAN 1, Slot 9 Port 32.

```
switch#  clear fspf counters vsan 1 interface fc 9/32
```

Related Commands

Command	Description
show fspf	Displays global FSPF information for a specific VSAN.

clear ips arp

To clear ARP caches, use the **clear ips arp** command in EXEC mode.

clear ips arp {address *ip-address*| **interface gigabitethernet** *module-number*}

Syntax Description

address	Clears fcflow aggregated statistics.
ip-address	Enters the peer IP address.
interface gigabitethernet	Specifies the Gigabit Ethernet interface.
module-number	Specifies slot and port of the Gigabit Ethernet interface.

Command Modes

EXEC.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Examples

The ARP cache can be cleared in two ways: clearing just one entry or clearing all entries in the ARP cache.

The following example clears one ARP cache entry:

```
switch# clear ips arp address 10.2.2.2 interface gigabitethernet 8/7
arp clear successful
```

The following example clears all ARP cache entries

```
switch# clear ips arp interface gigabitethernet 8/7
arp clear successful
```

clear ivr zone database

To clear the inter-VSAN routing (IVR) zone database, use the **clear ivr zone database** command in EXEC mode.

clear ivr zone database

Syntax Description

ivr	Specifies the IVR feature.
zone	Specifies the inter-VSAN zone (IVZ).
database	Empties the IVZ database

Command Modes

EXEC.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Examples

The following example clears all configured IVZ information.

```
switch# clear ivr zone database
```

clear license

To uninstall a license, use the **clear license** command in EXEC mode.

clear license *filename*

Syntax Description

clear license	Uninstalls configured licenses.
filename	Specifies the license file to be uninstalled.

Command Modes

EXEC.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(2).

Examples

The following example clears a specific license.

```
switch# clear license Ficon.lic
Clearing license Ficon.lic:
SERVER this_host ANY
VENDOR cisco
# An example fcports license
INCREMENT SAN_EXTN_OVER_IP cisco 1.000 permanent 1 HOSTID=VDH=ABCD \
        NOTICE=<LicFileID>san_extn2.lic</LicFileID><LicLineID>1</LicLineID> \
        SIGN=67CB2A8CCAC2

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

clear line

To clear VTY sessions, use the **clear line** command in EXEC mode.

clear line *vty_name*

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Examples

The following example clears one ARP cache entry:

```
switch# clear line Aux
arp clear successful
```

clear ntp statistics

To clear Network Time Protocol statistics, use the **clear ntp statistics** command in EXEC mode.

clear ntp statistics {all-peers | io | local | memory}

Syntax Description

all-peers	Clears I/O statistics for all peers.
io	Clears I/O statistics for I/O devices.
local	Clears I/O statistics for local devices.
memory	Clears I/O statistics for memory.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None mode.

Examples

The following example shows how to clear NTP statistics for all peers.

```
switch# clear ntp statistics all-peers
```

The following example shows how to clear NTP statistics for I/O devices.

```
switch# clear ntp statistics io
```

The following example shows how to clear NTP statistics for local devices.

```
switch# clear ntp statistics local
```

The following example shows how to clear NTP statistics for memory.

```
switch# clear ntp statistics memory
```

Related Commands

Command	Description
show ntp	Displays the configured server and peer associations.

clear port-security

To clear the log files on the switch, use the **clear processes log** command in EXEC mode.

clear
database auto-learn (interface fc *slot/port* **| port-channel** *number* **vsan** *vsan-id* **|**
statistics vsan *vsan-id*

Syntax Description

database	Clears the port security active configuration database.
statistics	Clears the port security counters.
auto-learnt	Clears the auto-learnt entries for a specified interface or VSAN.
interface fc *slot/port*	Clears entries for a specified interface.
port-channel number	Clears entries for a specified PortChannel.
vsan *vsan-id*	Clears entries for a specified VSAN.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

The active database is read-only and **clear port-security database** command can be used when resolving conflicts.

Examples

The following example clears all existing statistics from the port security database for a specified VSAN.

```
switch# clear port-security statistics vsan 1
```

The following example clears learnt entries in the active database for a specified interface within a VSAN.

```
switch# clear port-security database auto-learn interface fc1/1 vsan 1
```

The following example clears learnt entries in the active database up to for the entire VSAN.

```
switch# clear port-security database auto-learn vsan 1
```

Related Commands

Command	Description
show port-security	Displays the configured port security information.

clear processes log

To clear the log files on the switch, use the **clear processes log** command in EXEC mode.

clear processes log {all | pid *pid-number*}

Syntax Description

all	Deletes all of the log files.
pid	Deletes the log files of a specific process.
pid-number	Specifies the process ID, which must be from 0 to 2147483647.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following examples show how to clear all of the log files on the switch.

```
switch# clear processes log all
```

Related Commands

Command	Description
show processes	Displays the detailed running or log information of processes or high availability applications.

clear qos statistics

To clear the quality of services statistics counters, use the **clear qos statistics** command in EXEC mode.

clear qos statistics

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following examples shows how to clear the quality of service counters.

```
switch# clear qos statistics
```

Related Commands

Command	Description
show qos statistics	Displays the current QoS settings, along with a number of frames marked high priority.

clear rlir

To clear the Registered Link Incident Report (RLIR), use the **clear rlir** command in EXEC mode.

clear rlir history |
recent interface fc *slot/port* **|**
recent portnumber *port-number* **|**
statistics vsan *vsan-id*

Syntax Description

history	Clears RLIR link incident history.
recent	Clears recent link incidents.
interface fc *slot/port*	Clears entries for a specified interface.
portnumber *port-number*	Displays the port number for the link incidents.
statistics	Clears RLIR statistics.
vsan *vsan-id*	Specifies the VSNA ID for which the RLIR statistics are to be cleared.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example clears all existing statistics for a specified VSAN.

```
switch# clear rlir statistics vsan 1
```

The following example clears the link incident history.

```
switch# clear rlir history
```

The following example clears recent RLIR information for a specified interface.

```
switch# clear rlir recent interface fc 1/2
```

The following example clears recent RLIR information for a specified port number.

```
switch# clear rlir recent portnumber 16
```

Related Commands

Command	Description
show rscn	Displays RSCN information.

clear rscn statistics

To clear the registered state change notification statistics for a specified VSAN, use the **clear rscn statistics** command in EXEC mode.

clear rscn statistics vsan *vsan-id*

Syntax Description

vsan	The RSCN statistics are to be cleared for a VSAN.
vsan-id	The ID for the VSAN for which you want to clear RSCN statistics.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example shows how to clear rcsn statistics for VSAN 1.

```
switch# clear rscn statistics 1
```

Related Commands

Command	Description
show rscn	Displays RSCN information.

clear screen

To clear the terminal screen, use the **clear screen** command in EXEC mode.

clear screen

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example shows how to clear the terminal screen.

```
switch# clear screen
```

clear ssh hosts

To clear trusted SSH hosts, use the **clear ssh hosts** command in EXEC mode.

clear ssh hosts

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

None.

Examples

The following example shows how to clear reset-reason information from NVRAM and volatile storage.

```
switch# clear ssh hosts
```

clear system reset-reason

To nvlog reset-reason command clears the reset-reason information stored in NVRAM and volatile persistent storage, use the **clear system reset-reason** command in EXEC mode.

clear system reset-reason

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(2a).

Usage Guidelines

Use this command as listed below:

- In a Cisco MDS 9500 Series switch, this command clears the reset-reason information stored in NVRAM and volatile persistent storage in the active and standby supervisor modules.
- In a Cisco MDS 9200 Series switch, this command clears the reset-reason information stored in NVRAM and volatile persistent storage in the active supervisor module.

Examples

The following example shows how to clear trusted SSH hosts.

```
switch# clear system reset-reason
```

clear user

To clear trusted SSH hosts, use the **clear user** command in EXEC mode.

clear user *username*

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

None.

Examples

The following example shows how to log out a specified user.

```
switch# clear user vsam
switch#
```

clear vrrp

To clear all the software counters for the specified virtual router, use the **clear vrrp** command in EXEC mode.

clear vrrp *number* **interface** *type* [*vsan-id* | *mgmt-int*]

Syntax Description

number	A number from 1-255.
interface	The counters are cleared for an interface.
type	The interface types are **mgmt** for the management interface, and **vsan** for the IPFC VSAN interface.
vsan-id	The ID of the VSAN is from 1 to 4093.
mgmt-int	(Optional). The management interface number is 0.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following examples shows how to clear all the software counters for virtual router 7 on VSAN 2.

```
switch# clear vrrp 7 interface vsan2
```

Related Commands

Command	Description
show vrrp	Displays VRRP configuration information.

clear zone

To clear all configured information in the zone server for a specified VSAN, use the **clear zone** command in EXEC mode.

clear zone {database | statistics} vsan *vsan-id*

Syntax Description

database	Indicates that zone server database information is to be cleared.
statistics	Indicates that zone server statistics are to be cleared.
vsan	Indicates that zone information is to be cleared for a VSAN.
vsan-id	The ID of the VSAN is from 1 to 4093.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

After issuing a **clear zone database** command, you need to explicitly issue the **copy running-config startup-config** to ensure that the running configuration is used when you next start the switch.

Examples

The following examples shows how to clear all configured information in the zone server for VSAN 1.

```
switch# clear zone database vsan 1
```

Related Commands

Command	Description
show zone	Displays zone information for any configured interface.

clock

To configure the time zone and the summer time of day, use the **clock** command in configuration mode. To disable the daylight saving time adjustment, use the **no** form of this command.

clock {summer-time | time-zone *daylight-timezone-name start-week start-day start-month start-time end-week end-day end-month end-time daylight-offset-to-be-added-in-minutes***}**

no clock {summer-time | time-zone *daylight-timezone-name start-week start-day start-month start-time end-week end-day end-month end-time daylight-offset-to-be-added-in-minutes***}**

Syntax Description

summer-time	Adjusts the daylight savings time for the Pacific time zone by 60 minutes starting the first sunday in April at 2 a.m. and ending the last Sunday in October at 2 a.m.
time-zone	Sets the time zone for a specified time zone name.
daylight-timezone-name	The 8-character name of the time zone
start-week *end-week*	The week ranging from 1 through 5
start-day *end-day*	The day ranging from Sunday through Saturday
start-month *end-month*	The month ranging from January through December
start-time *end-time*	The time ranging from
daylight-offset-to-be-added-in-minutes	The daylight offset ranges from1 through 1440 minutes that will be added to the start time and deleted from the end time

Defaults

Coordinated Universal Time (UTC), which is the same as Greenwich Mean Time (GMT).

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Use this command if you need to change the UTC or GMT time or time zone.

Examples

The following example shows how to configure the time zone and summer time of day.

```
switch# config t
switch(config)# clock timezone <daylight timezone name> <start week> <start day> <start
month> <start time> <end week> <end day> <end month> <end time> <daylight offset to be
added in minutes>
switch(config)# clock summer-time Pacific 1 Sun Apr 02:00 5 Sun Oct 02:00 60
switch(config)# no clock summer-time
switch(config)# exit
switch#
```

Related Commands

Command	Description
clock set	Changes the default time on the switch.
show clock	Displays the current date and time.
show run	Displays changes made to the time zone configuration along with other configuration information.

code-page

Use the **code-page** command to configure the EBCDIC format. To disable the configuration or to revert to factory defaults, use the **no** form of the command.

code-page brazil |france | france | international-5 | italy | japan | spain-latinamerica | uk | us-canada

Syntax Description

code-page	Configures code page on a FICON-enabled VSAN
brazil	Configures the **brazil** EBCDIC format.
france	Configures the **france** EBCDIC format.
international-5	Configures the **international-5** EBCDIC format.
italy	Configures the **italy** EBCDIC format.
japan	Configures the **japan** EBCDIC format.
spain-latinamerica	Configures the **spain-latinamerica** *EBCDIC format.*
uk	Configures the **uk** EBCDIC format.
us-canada	Configures the **us-canada** EBCDIC format.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

This is an optional configuration. If you are not sure of the EBCDIC format to be used, we recommend retaining the **us-canada** (default) option.

Examples

The following example configures the **italy** EBCDIC format.

```
switch(config)# ficon vsan 2
switch(config-ficon)# code-page italy
```

The following example reverts to the factory default of using the **us-canada** EBCDIC format.

```
switch(config-ficon)# no code-page
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.
ficon vsan *vsan-id*	Enables FICON on the specified VSAN.

clock set

To change the default time on a Cisco MDS 9000 Family switch, use the **clock set** command in EXEC mode.

clock set *HH:MM:SS DD Month YYYY*

Syntax Description

HH	The two-digit time in hours in military format (15 for 3 p.m.).
MM	The two-digit time in minutes (58).
SS	The two-digit time in seconds(15).
DD	The two-digit date (12).
Month	The month in words (August).
YYYY	The four-digit year (2002).

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Generally, if the system is synchronized by a valid outside timing mechanism, such as an NTP clock source, or if you have a switch with calendar capability, you do not need to set the system clock. Use this command if no other time sources are available. The time specified in this command is relative to the configured time zone.

The **clock set** command changes are saved across system resets.

Examples

The following example displays the **clock set** command:

```
switch# clock set 15:58:15 12 August 2002
Mon Aug 12 15:58:00 PDT 2002
```

configure terminal

To enter the configuration mode, use the **configure terminal** command in EXEC mode.

configure terminal

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example enters the configuration mode:

```
switch# conf t
switch(config)#
```

copy

To save a backup of the system software, use the **copy** command in EXEC mode.

copy *source-URL destination-URL*

Syntax Description

source-URL	The location URL or alias of the source file or directory to be copied.
destination-URL	The destination URL or alias of the copied file or directory.

The following table lists the aliases for source and destination URLs.

running-config	Specifies the configuration currently running on the switch. The **system:running-config** keyword represents the current running configuration file.
startup-config	Specifies the configuration used during initialization (startup). You can copy the startup configuration into or from NVRAM. The **nvram:startup-config** keyword represents the configuration file used during initialization.
bootflash:	Specifies the location for internal bootflash memory.
slot0:	Specifies the location for the CompactFlash memory or PCMCIA card.
volatile:	Specifies the location for the volatile file system.
system	Specifies the location for system memory, which includes the running configuration.
tftp:	Specifies the location for a Trivial File Transfer Protocol (TFTP) network server. The syntax for this alias is **tftp:[[//location]/directory]/filename**.
ftp:	Specifies the location for a File Transfer Protocol (FTP) network server. The syntax for this alias is **ftp:[[//location]/directory]/filename**.
scp:	Specifies the location for a secure copy (scp) network server. The syntax for this alias is **scp:[[//location]/directory]/filename**.
sftp:	Specifies the location for a Secure Trivial File Transfer Protocol (SFTP) network server. The syntax for this alias is **sftp:[[//location]/directory]/filename**.
log:	Specifies the location for log files stored in the same directory.
nvram:	Specifies the switches NVRAM.
core:	Specifies the location of the cores from any switching or supervisor module to an external flash (slot 0) or a TFTP server.
filename	The name of the Flash file.
sup-#	The number of the supervisor module, where sup-1 is the slot 5 supervisor (active) and sup-2 is the slot 6 supervisor (standby).

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

This command makes the running and the backup copy of the software identical.

A file can only be copied from an active supervisor to a standby supervisor, not from standby to active.

This command does not allow 127.x.x.x IP addresses.

The copy function will not be completed if the required space is not available in the directory. First change to the required directory (for example, **cd bootflash:**) and verify the available space (for example, **dir bootflash:**).

The entire copying process may take several minutes.

Do not copy a file from an external source directly to the standby supervisor. You must copy from the external source to the active supervisor, and then copy the saved file to the standby supervisor.

You can save cores (from the active supervisor module, the standby supervisor module, or any switching module) to an external flash (slot 0) or to a TFTP server in one of two ways:

- On demand—to copy a single file based on the provided process ID.
- Periodically—to copy core files periodically as configured by the user.

You copy the logfile to a different location using the **copy log:messages** command

Examples

The following example saves your configuration to the startup configuration.

```
switch# copy system:running-config nvram:startup-config
```

The following example copies the file called samplefile from the slot0 directory to the mystorage directory.

```
switch# copy slot0:samplefile slot0:mystorage/samplefile
```

The following example copies a file from the current directory level.

```
switch# copy samplefile mystorage/samplefile
```

If the current directory is slot0:mydir, this command copies slot0:mydir/samplefile to slot0:mydir/mystorage/samplefile.

The following command downloads a configuration file from an external CompactFlash to the running configuration.

```
switch copy slot0:dns-config.cfg system:running-config
```

The following command downloads a configuration file from an external CompactFlash to the startup configuration.

```
switch# copy slot0:dns-config.cfg nvram:startup-config
```

The following command saves a running configuration file to an external CompactFlash.

```
switch# copy system:running-config slot0:dns-config.cfg
```

The following command saves a startup configuration file to an external CompactFlash.

```
switch# copy system:startup-config slot0:dns-config.cfg
```

The following example creates a copy of the binary configuration in NVRAM.

```
switch# copy system:running-config nvram:startup-config
```

The following example creates a backup copy of the binary configuration.

```
switch# copy nvram:startup-config nvram:snapshot-config
```

The following example overwrites the contents of an existing configuration in NVRAM.

```
switch# copy nvram:snapshot-config nvram:startup-config
Warning: Snapshot file is going to override the current startup-config.
Do you wish to proceed anyway? {y/n} [y] y
```

The following example copies an image in bootflash on the active supervisor to the bootflash on the standby supervisor.

```
switch# copy bootflash:myimage bootflash://sup-2/myimage
```

The following example creates a running configuration copy in bootflash.

```
switch# copy system:running-config bootflash:my-config
```

The following examples creates a startup configuration copy in bootflash.

```
switch# copy nvram:startup-config bootflash:my-config
```

Related Commands

Command	Description
cd	Changes the default directory or file system.
dir	Displays a list of files on a file system.
reload	Reloads the operating system.
show version	Displays the version of the running configuration file.

D Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

delete

To delete a specified file or directory on a Flash memory device, use the **delete** command in EXEC mode.

delete {**bootflash:***filename* | **slot0:***filename* | **volatile:***filename*}

Syntax Description

bootflash:	Flash image that resides on the supervisor module.
slot0:	Flash image that resides on another module.
volatile:	Flash image that resides on the volatile file system.
filename	The name of the file to be deleted.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

When you delete a file, the software erases the file.

If you attempt to delete the configuration file or image specified by the CONFIG_FILE or BOOTLDR environment variable, the system prompts you to confirm the deletion. Also, if you attempt to delete the last valid system image specified in the BOOT environment variable, the system prompts you to confirm the deletion.

Caution If you specify a directory, the **delete** command deletes the entire directory and all its contents.

Examples

The following example deletes the file named test from the Flash card inserted in slot 0.

```
switch# delete slot0:test
Delete slot0:test? [confirm]
```

The following example deletes a file from a directory.

```
switch# delete dns_config.cfg
```

The following example deletes a file from an external CompactFlash (slot0).

```
switch# delete slot0:dns_config.cfg
```

The following example deletes the entire `my-dir` directory and all its contents:

```
switch# delete bootflash:my-dir
```

Related Commands

Command	Description
cd	Changes the default directory or file system.
dir	Displays a list of files on a file system.
show boot	Displays the contents of the BOOT environment variable, the name of the configuration file pointed to by the CONFIG_FILE environment variable, the contents of the BOOTLDR environment variable, and the configuration register setting.

dir

To display the contents of the current directory or the specified directory, use the **dir** command in EXEC mode.

dir [bootflash:*directory or filename* | **slot0:***directory or filename* | **volatile:***directory or filename*]

Syntax Description

bootflash:	(Optional) Flash image that resides on the supervisor module.
slot0:	(Optional) Flash image that resides on another module.
filename *directory*	(Optional) Name of the files or directories to display on a specified device. The files can be of any type. You can use wildcards in the filename. A wildcard character (*) matches all patterns. Strings after a wildcard are ignored.
volatile:	Flash image on the volatile file system.

Defaults

The default file system is specified by the **cd** command.

Command Modes

EXEC mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

None.

Examples

The following example shows how to list the files on the bootflash directory.

```
switch# dir bootflash:
40295206     Aug 05 15:23:51 1980  ilc1.bin
12456448     Jul 30 23:05:28 1980  kickstart-image1
12288       Jun 23 14:58:44 1980  lost+found/
27602159     Jul 30 23:05:16 1980  system-image1
12447232     Aug 05 15:08:30 1980  kickstart-image2
28364853     Aug 05 15:11:57 1980  system-image2

Usage for bootflash://sup-local
  135404544 bytes used
   49155072 bytes free
  184559616 bytes total
```

Related Commands

Command	Description
cd	Changes the default directory or file system.
delete	Deletes a file on a Flash memory device.

discover scsi-target

To discover SCSI targets on local storage to the switch or remote storage across the fabric, use the **discover scsi-target** command in EXEC mode.

discover scsi-target [**custom-list | local | partial | remote**] **os [aix | all | hpux | linux | solaris | windows] | vsan** *vsan-id* **domain** *domain-id*}

Syntax Description

custom-list	Discovers SCSI targets from the customized list.
local	Discovers local SCSI targets.
remote	Discovers remote SCSI targets.
os	Discovers the specified operating system.
aix	Discovers the AIX operating system
all	Discovers all operating systems
hpux	Discovers the HPUX operating system
linux	Discovers the Linux operating system
solaris	Discovers the Solaris operating system
windows	Discovers the Windows operating system
vsan *vsan-id*	Discovers SCSI targets for the specified VSAN ID.
domain *domain-id*	Discovers SCSI targets for the specified domain ID. The domain ID is a number from 0 to 255 in decimal or a number from 0x0 to 0xFF in hex.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(2a).

Usage Guidelines

On-demand discovery only discovers Nx ports present in the name server database that have registered a FC4 Type = SCSI_FCP.

Examples

The following example shows how to discover local targets assigned to all OSs.

```
switch# discover scsi-target local os all
discovery started
```

The following example shows how to discover remote targets assigned to the Windows OS.

```
switch# discover scsi-target remote os windows
discovery started
```

The following example shows how to discover SCSI targets for the specified VSAN (1) and FC ID (0x9c03d6).

```
switch# discover scsi-target vsan 1 fcid 0x9c03d6
discover scsi-target vsan 1 fcid 0x9c03d6
VSAN:    1 FCID: 0x9c03d6 PWWN: 00:00:00:00:00:00:00:00
  PRLI RSP: 0x01 SPARM: 0x0012...
```

The following example begins discovering targets from a customized list assigned to the Linux operating system.

```
switch# discover scsi-target custom-list os linux
discovery started
```

discover custom-list

To selectively initiate discovery for specified domain IDs in a VSAN, use the **discover custom-list** command in EXEC mode.

discover custom-list [**add** | **delete**] **vsan** *vsan-id* **domain** *fc-id*}

Syntax Description

add	Add a targets to the customized list.
delete	Deletes a target from the customized list.
vsan *vsan-id*	Discovers SCSI targets for the specified VSAN ID.
domain *fc-id*	Discovers SCSI targets for the specified FC ID.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

None.

Examples

The following example selectively initiates discovery for the specified VSAN and domain ID.

```
switch# discover custom-list add vsan 1 domain 0X123456
```

The following example deletes the specified VSAN and domain ID from the customized list.

```
switch# discover custom-list delete vsan 1 domain 0X123456
```

do

Use the **do** command to execute an EXEC-level command from any configuration mode or submode.

do *command*

Syntax Description

command	Specifies the EXEC command to be executed.

Defaults

None.

Command Modes

All configuration modes.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Use this command to execute EXEC commands while configuring your switch. After the EXEC command is executed, the system returns to the mode from which you issued the do command.

Examples

The following example disables the **terminal session-timeout** command using the **do** command in configuration mode.

```
switch(config)# do terminal session-timeout 0
switch(config)#
```

The following example create, enables, and displays the interface from configuration mode.

```
switch(config)# int fc 3/1
switch(config-if)# no shut
switch(config-if)# do show interface fc 3/1
fc3/1 is trunking
    Hardware is Fibre Channel
    Port WWN is 20:81:00:05:32:00:4a:9e
    Peer port WWN is 20:43:00:0c:88:00:4a:e2
    Admin port mode is auto, trunk mode is on
    Port mode is TE
    Port vsan is 1
    Speed is 2 Gbps
    Transmit B2B Credit is 0
    Receive B2B Credit is 255
    Receive data field Size is 2112
    Beacon is turned off
    Trunk vsans (admin allowed and active) (1-10)
    Trunk vsans (up)                       (1-10)
    Trunk vsans (isolated)                 ()
    Trunk vsans (initializing)             ()
    5 minutes input rate 504 bits/sec, 63 bytes/sec, 0 frames/sec
    5 minutes output rate 344 bits/sec, 43 bytes/sec, 0 frames/sec
      69390 frames input, 4458680 bytes
        0 discards, 0 errors
        0 CRC,  0 unknown class
        0 too long, 0 too short
      69458 frames output, 3086812 bytes
        0 discards, 0 errors
      2 input OLS, 1 LRR, 0 NOS, 2 loop inits
      1 output OLS, 1 LRR, 1 NOS, 1 loop inits
```

Debug Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All debug commands are issued in EXEC mode and are shown here in alphabetical order. For more information, refer to the *Cisco MDS 9000 Family Troubleshooting Guide* and the *Cisco MDS 9000 Family System Messages Guide*.

Using the CLI, you can enable debugging modes for each switch feature and view a real-time updated activity log of the control protocol exchanges. Each log entry is time-stamped and listed in chronological order. Access to the debug feature can be limited through the CLI roles mechanism and can be partitioned on a per-role basis.

debug aaa

To enable debugging for boot variables, use the **debug aaa** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug aaa all | conf-events | errors |events |mts

Syntax Description

all	Enables all AAA debug options.
conf-events	Enables AAA configuration events.
errors	Enables debugging for AAA errors.
events	Enables debugging for AAA events.
mts	Enables AAA transmit and receive MTS packers.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug aaa all** command is issued:

```
switch# debug aaa conf-events
Nov 20 06:29:52 aaa: aaa_cleanup_session
Nov 20 06:29:52 aaa: mts_drop of request msg
Nov 20 06:29:52 aaa: Configured method local Succeeded
Nov 20 06:29:58 aaa: Src: 0x00000101/10886  Dst: 0x00000101/0  ID: 0x003
ize: 197 [REQ] Opc: 8402 (MTS_OPC_AAA_REQ) RR: 0x003A48F7  HA_SEQNO: 0x0
 TS: 0x9FC1C1234E7C  REJ:0  SYNC:0
Nov 20 06:29:58 aaa: 01 01 0C 00 00 00 00 00 00 00 00 00 00 00 02 01
Nov 20 06:29:58 aaa: 00 00 00 00 00 00 00 06 08 00 03 05 00 00 00 00
Nov 20 06:29:58 aaa: 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Nov 20 06:29:58 aaa: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Nov 20 06:29:58 aaa: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Nov 20 06:29:58 aaa: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Nov 20 06:29:58 aaa: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Nov 20 06:29:58 aaa: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Nov 20 06:29:58 aaa: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Nov 20 06:29:58 aaa: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

debug radius

To enable debugging for boot variables, use the **debug radius** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug radius aaa-request | aaa-request-lowlevel | all | config | config-lowlevel

Syntax Description

aaa-request	Enables RADIUS AAA request debug.
aaa-request-lowlevel	Enables RADIUS AAA request low-level debugging.
all	Enables Enable all the debug flags.
config	Enables RADIUS configuration debugging.
config-lowlevel	Enables RADIUS configuring low-level debugging.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug radius config-lowlevel** command is issued:

```
switch# debug radius config-lowlevel
Nov 20 06:36:42 radius: radius_new_debug_conf_open: entering...
Nov 20 06:36:42 radius: radius_new_conf_close: entering...
Nov 20 06:36:42 radius: radius_new_conf_close: returning 0
Nov 20 06:36:42 radius: radius_new_enable_info_config: entering for Radius Daemon debug
Nov 20 06:36:42 radius: radius_new_debug_conf_open: entering...
Nov 20 06:36:42 radius: radius_new_debug_conf_open: exiting
Nov 20 06:36:42 radius: radius_new_enable_info_config: SET_REQ for Radius Daemon debug
with 1
Nov 20 06:36:42 radius: radius_new_enable_info_config: SET_REQ done for Radius Daemon
debug with 1
Nov 20 06:36:42 radius: radius_new_enable_info_config: got back the return value of
configuration operation:success
Nov 20 06:36:42 radius: radius_new_debug_conf_close: entering...
Nov 20 06:36:42 radius: radius_new_debug_conf_close: returning 0
Nov 20 06:36:42 radius: radius_new_enable_info_config: exiting for Radius Daemon debug
```

debug tacacs+

To enable debugging for boot variables, use the **debug tacacs+** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug tacacs+ aaa-request | aaa-request-lowlevel | all | config | config-lowlevel

Syntax Description

aaa-request	Enables TACACS+ AAA request debug.
aaa-request-lowlevel	Enables TACACS+ AAA request low-level debugging.
all	Enables Enable all the debug flags.
config	Enables TACACS+ configuration debugging.
config-lowlevel	Enables TACACS+ configuring low-level debugging.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug tacacs+ config-lowlevel** command is issued:

```
switch# debug tacacs+ config-lowlevel
Nov 20 06:39:44 tacacs: tacacs_debug_conf_open: entering...
172.22.94.252# Nov 20 06:39:44 tacacs: tacacs_debug_conf_open: exiting
Nov 20 06:39:44 tacacs: tacacs_conf_close: entering...
Nov 20 06:39:44 tacacs: tacacs_conf_close: returning 0
Nov 20 06:39:44 tacacs: tacacs_enable_info_config: entering for TACACS+ Daemon debug
Nov 20 06:39:44 tacacs: tacacs_debug_conf_open: entering...
Nov 20 06:39:44 tacacs: tacacs_debug_conf_open: exiting
Nov 20 06:39:44 tacacs: tacacs_enable_info_config: SET_REQ for TACACS+ Daemon debug with 1
Nov 20 06:39:44 tacacs: tacacs_enable_info_config: SET_REQ done for TACACS+ Daemon debug
with 1
Nov 20 06:39:44 tacacs: tacacs_enable_info_config: got back the return value of
configuration operation:success
Nov 20 06:39:44 tacacs: tacacs_debug_conf_close: entering...
Nov 20 06:39:44 tacacs: tacacs_debug_conf_close: returning 0
Nov 20 06:39:44 tacacs: tacacs_enable_info_config: exiting for TACACS+ Daemon debug
```

debug all

To enable debugging for all features on the switch, use the **debug all** command in EXEC mode. You can disable this command and turn off all debugging by using the **no** form of this command.

debug all

no debug all

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug all** command is issued:

```
switch# debug all
```

debug bootvar

To enable debugging for boot variables, use the **debug bootvar** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug bootvar all | errors | events | info | pss

Syntax Description

all	Enables all boot variable debug options.
errors	Enables debugging for boot variable errors.
events	Enables debugging for boot variable events.
info	Enables debugging for boot variable information.
pss	Enables debugging for boot variable PSS operations.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug bootvar all** command is issued:

```
switch# debug bootvar all
```

debug callhome

To enable debugging for the Call Home function, use the **debug callhome** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug callhome all | events | mts

Syntax Description

all	Enables debugging for all Call Home features.
events	Enables debugging for all Call Home events.
mts	Enables debugging for all Call Home tx/rx packets of MTS

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug callhome events** command is issued:

```
switch# debug callhome events
Apr  8 13:09:37 callhome: Src: 0x00000501/4065  Dst: 0x00000501/66  ID: 0x0004FA
05  Size: 252 [REQ] Opc: 182 (MTS_OPC_DEBUG_WRAP_MSG) RR: 0x0004FA05  HA_SEQNO:
0x00000000  TS: 0x8657D581CAE  REJ:0
Apr  8 13:09:37 callhome: 00 00 00 00 64 00 00 00 00 00 00 00 00 00 00 00
Apr  8 13:09:37 callhome: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr  8 13:09:37 callhome: 00 00 00 00 00 00 00 00 00 00 00 00 FF FF FF FF
...
```

The following example displays the system output when the **debug callhome mts** command is issued:

```
switch# debug callhome mts
Apr  8 13:09:42 callhome: Src: 0x00000501/4067  Dst: 0x00000501/66  ID: 0x0004FA
0D  Size: 252 [REQ] Opc: 182 (MTS_OPC_DEBUG_WRAP_MSG) RR: 0x0004FA0D  HA_SEQNO:
0x00000000  TS: 0x86708AFE37B  REJ:0
Apr  8 13:09:42 callhome: 00 00 00 00 06 00 00 00 00 00 00 00 00 00 00 00
Apr  8 13:09:42 callhome: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr  8 13:09:42 callhome: 00 00 00 00 00 00 00 00 00 00 00 00 FF FF FF FF
...
Apr  8 13:09:42 callhome: Src: 0x00000501/4067  Dst: 0x00000501/66  ID: 0x0004FA
10  Size: 252 [REQ] Opc: 182 (MTS_OPC_DEBUG_WRAP_MSG) RR: 0x0004FA10  HA_SEQNO:
0x00000000  TS: 0x86708D6A974  REJ:0
Apr  8 13:09:42 callhome: 00 00 00 00 05 00 00 00 00 00 00 00 00 00 00 00
Apr  8 13:09:42 callhome: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr  8 13:09:42 callhome: 00 00 00 00 00 00 00 00 00 00 00 00 FF FF FF FF
...
```

debug cdp

To enable debugging for the CDP function, use the **debug cdp** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug cdp
[all] |
[errors] |
[events (mts | packets | pss) (interface gigabitethernet *slot-port* **| mgmt 0)]**

Syntax Description

all	Enables debugging for all CDP features.
errors	Enables debugging for CDP error conditions.
events	Enables debugging for CDP events.
mts	Enables debugging for CDP tx/rx MTS packets.
packets	Enables debugging for CDP tx/rx CDP packets.
pss	Enables debugging for all PSS related CDP events.
interface	Specifies debugging for the specified interface.
gigbitethernet *slot-port*	Specifies the Gigabit Ethernet interface slot and port.
mgmt 0	Specifies the management interface.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug cdp events packets** command is issued:

```
switch# debug cdp events packets
Apr  8 21:22:34 cdp: Sent CDP packet, interface 0x2380000
Apr  8 21:22:34 cdp: Sent CDP packet, interface 0x2381000
Apr  8 21:22:35 cdp: Sent CDP packet, interface 0x2382000
Apr  8 21:22:35 cdp: Sent CDP packet, interface 0x2383000
Apr  8 21:22:51 cdp: Received CDP packet, interface 0x5000000
Apr  8 21:23:01 cdp: Sent CDP packet, interface 0x5000000
Apr  8 21:23:34 cdp: Sent CDP packet, interface 0x2380000
Apr  8 21:23:34 cdp: Sent CDP packet, interface 0x2381000
Apr  8 21:23:35 cdp: Sent CDP packet, interface 0x2382000
...
```

debug core

To enable core demon debugging, use the **debug core** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug core error | flow

Syntax Description

errors	Enables debugging for core demon error conditions.
flow	Enables debugging for the core demon flow.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug core flow** command is issued:

```
switch# debug core flow
```

debug ethport

To enable Ethernet port debugging, use the **debug ethport** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug ethport
[all] |
[error] |
[event (interface gigabitethernet *slot-port*) **| module (** *slot*) **] |**
[ha (interface gigibetethernet *slot-port*) **| module (** *slot*) **] |**
[trace (interface gigibetethernet *slot-port*) **| module (** *slot*) **]**

Syntax Description

all	Enables debugging for all Ethernet port features.
error	Enables debugging for Ethernet port error conditions.
event	Enables debugging for Ethernet port events.
ha	Enables debugging for port high availability.
trace	Enables debugging for Ethernet port traces.
interface gigibetethernet *slot-port*	Specifies the slot and port of the Gigabit Ethernet interface.
module *slot*	Specifies the slot number of the module being debugged.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug ethport all** command is issued:

```
switch# debug ehtport all
```

debug exceptionlog

To enable the exception log debugging feature, use the **debug exceptionlog** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug exceptionlog demux | deque | error | flow | info

Syntax Description

demux	Enables debugging for the exception logger demux functions.
deque	Enables debugging for the exception logger deque function.
error	Enables debugging for exception logger errors.
flow	Enables debugging for the exception logger flow.
info	Enables debugging for exception logger information.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug exceptionlog** command is issued:

```
switch# debug exceptionlog
7), credit(3), empty
```

debug fc2

To enable debugging for the FC2 feature, use the **debug fc2** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug fc2
[credit] |
[error (fcid *fcid* **) | (interface fc** *type number* **| vsan** *vsan-id* **)] |**
[flag] |
[flow (fcid *fcid* **) | (interface fc** *type number* **| vsan** *vsan-id* **)] |**
[frame] |
[loopback] |
[pkt (both | tx | rx) (fcid *fcid* **) | (interface fc** *type number* **| vsan** *vsan-id* **)] |**
[pkthdr (both | tx | rx) (fcid *fcid* **) | (interface fc** *type number* **| vsan** *vsan-id* **)] |**
[rdl] |
[rxhdrhistory (both | tx | rx) (fcid *fcid* **) | (interface fc** *type number* **| vsan** *vsan-id* **)] |**
[txhdrhistory (both | tx | rx) (fcid *fcid* **) | (interface fc** *type number* **| vsan** *vsan-id* **)]**

Syntax Description

credit	Enables FC2 credit debugging.
error	Enables FC2 error debugging.
flag	Enables FC2 flags debugging.
flow	Enables FC2 flow debugging.
frame	Enables FC2 frame debugging.
loopback	Enables FC2 loopback debugging.
pkt	Enables FC packet debugging.
pkthdr	Enables FC header debugging.
rdl	Enables FC2 RDL debugging.
rxhdrhistory	Enables FC2 received header history debugging.
txhdrhistory	Enables FC2 transmitted header history debugging.
both	Enables debugging in both the transmit and receive directions.
tx	Enables debugging in the transmit direction,
rx	Enables debugging in the receive direction.
fcid *fcid*	Restricts debugging to the specified FCID.
interface fc *type number*	Restricts debugging to the specified interface.
vsan *vsan-id*	Restricts debugging to the specified VSAN.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

If FSPF receives a bad FC2 packet analyze the output of the **debug fc2 pkt** command.

Examples

The following example displays the system output when the **debug fc2 error vsan 1** command is issued:

```
switch1# debug fc2 error vsan 1
```

debug fcc

To enable debugging for the Fibre Channel Congestion (FCC) function, use the **debug fcc** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug fcc
[all] |
[errors (module *slot* **)] |**
[events (module *slot* **)] |**
[mts { pkt both | tx | rx (node *range* **| opcode** *range* **| sap** *range* **) } | { (pkthdr both | tx | rx (numpkt** *range* **) }]**
[trace (module *slot* **)]]**

Syntax Description

all	Enables debugging for all FCC features.
errors	Enables debugging for FCC error conditions.
events	Enables debugging for FCC events.
mts	Enables debugging for FCC tx/rx MTS packets.
trace	Enables debugging for FCC traces.
module *slot*	Specifies the slot number of the module being debugged.
pkt	Enables debugging for FCC tx/rx FCC packets.
pkthdr	Enables debugging for FCC tx/rx FCC headers.
numpkt	Specifies the number of required packets
both	Specifies debugging in both the transmit and receive directions.
tx	Specifies debugging in the transmit direction,
rx	Specifies debugging in the receive direction.
node	Specifies the node for the packets in the receive direction.
opcode	Specifies the opcode for the packets in the receive direction.
sap	Specifies the sap for the packets in the receive direction.
range	Specifies the integer range from 1 to 4095.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug fcc all** command is issued:

```
switch# debug fcc all
```

debug fcdomain

To enable debugging for the fcdomain feature, use the **debug fcdomain** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug fcdomain
[all] |
[critical] |
[error]
[fc (pkt | pkthdr) (both | tx | rx) (interface *type number* **| vsan** *vsan-id*) **] |**
[ipc (pkt | pkthdr) (both | tx | rx) (interface *type number* **| vsan** *vsan-id*) **] |**
[memory] |
[notify] |
[phase]

Syntax Description

all	Enables debugging of all fcdomain parameters.
critical	Enables debugging of critical operations.
error	Enables debugging of error operation.
fc	Enables debugging of Fibre Channel Packets and Headers.
ipc	Enables debugging of IPC Packets and Headers.
pkt	Enables debugging of packets.
pkthdr	Enables debugging of headers.
both	Enables debugging in both the transmit and receive directions.
tx	Enables debugging in the transmit direction,
rx	Enables debugging in the receive direction.
interface *type number*	Specifies the interface to be debugged.
vsan *vsan-id*	Restricts debugging to the specified VSAN.
memory	Enables debugging of memory operations.
notify	Enables debugging of notifications
phase	Enables debugging of global phases

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug fcdomain critical** command is issued:

```
switch# debug fcdomain critical
Jan 27 07:04:31 fcdomain: Src: 0x00000501/6243  Dst: 0x00000501/14  ID: 0x0005BF
41  Size: 252 [REQ] Opc: 182 (MTS_OPC_DEBUG_WRAP_MSG) RR: 0x0005BF41  HA_SEQNO:
0x00000000  TS: 0x183C4D027F4A3
Jan 27 07:04:31 fcdomain: 00 00 00 00 68 00 00 00 00 00 00 00 00 00 00 00
Jan 27 07:04:31 fcdomain: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Jan 27 07:04:31 fcdomain: 00 00 00 00 00 00 00 00 00 00 00 00 FF FF FF FF
Jan 27 07:04:31 fcdomain: 2F 64 65 76 2F 70 74 73 2F 30 00 00 00 00 00 00
Jan 27 07:04:31 fcdomain: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
...
```

The following example displays the system output when the **debug fcdomain error** command is issued:

```
switch# debug fcdomain error
Jan 27 07:05:29 fcdomain: Src: 0x00000501/6245  Dst: 0x00000501/14  ID: 0x0005BF
7E  Size: 252 [REQ] Opc: 182 (MTS_OPC_DEBUG_WRAP_MSG) RR: 0x0005BF7E  HA_SEQNO:
0x00000000  TS: 0x183D5E63C081A
Jan 27 07:05:29 fcdomain: 00 00 00 00 64 00 00 00 00 00 00 00 00 00 00 00
Jan 27 07:05:29 fcdomain: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Jan 27 07:05:29 fcdomain: 00 00 00 00 00 00 00 00 00 00 00 00 FF FF FF FF
Jan 27 07:05:29 fcdomain: 2F 64 65 76 2F 70 74 73 2F 30 00 00 00 00 00 00
...
```

The following example displays the system output when the **debug fcdomain ipc pkthdr both** command is issued:

```
vegas2# debug fcdomain ipc pkthdr both
Apr  8 20:44:38 fcdomain: Src: 0x00000501/3883  Dst: 0x00000501/14  ID: 0x00038E
1D  Size: 252 [REQ] Opc: 182 (MTS_OPC_DEBUG_WRAP_MSG) RR: 0x00038E1D  HA_SEQNO:
0x00000000  TS: 0x5DD9B14EA3AA  REJ:0
Apr  8 20:44:38 fcdomain: 00 00 00 00 08 00 00 00 00 00 00 00 00 00 00 00
Apr  8 20:44:38 fcdomain: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr  8 20:44:38 fcdomain: 00 00 00 00 00 00 00 00 00 00 00 00 FF FF FF FF
Apr  8 20:44:38 fcdomain: 2F 64 65 76 2F 70 74 73 2F 30 00 00 00 00 00 00
Apr  8 20:44:38 fcdomain: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr  8 20:44:38 fcdomain: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
...
Apr  8 20:44:38 fcdomain: Src: 0x00000501/3883  Dst: 0x00000501/14  ID: 0x00038E
20  Size: 252 [REQ] Opc: 182 (MTS_OPC_DEBUG_WRAP_MSG) RR: 0x00038E20  HA_SEQNO:
0x00000000  TS: 0x5DD9B186CCEB  REJ:0
Apr  8 20:44:38 fcdomain: 00 00 00 00 07 00 00 00 00 00 00 00 00 00 00 00
Apr  8 20:44:38 fcdomain: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr  8 20:44:38 fcdomain: 00 00 00 00 00 00 00 00 00 00 00 00 FF FF FF FF
Apr  8 20:44:38 fcdomain: 2F 64 65 76 2F 70 74 73 2F 30 00 00 00 00 00 00
Apr  8 20:44:38 fcdomain: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr  8 20:44:38 fcdomain: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
...
```

Related Commands

Command	Description
show fcdomain domain-list	Displays current domains in the fabric.
fcdomain	Enables fcdomain features.

debug fcfwd

To enable debugging for the Fibre Channel forwarding feature, use the **debug fcfwd** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug fcfwd
[flogimap error (module *slot* **| vsan** *vsan-id*) **| event (module** *slot* **| vsan** *vsan-id*) **| trace (module** *slot* **| vsan** *vsan-id*) **] |**
[idxmap error (module *slot* **| vsan** *vsan-id*) **| event (module** *slot* **| vsan** *vsan-id*) **| trace (module** *slot* **| vsan** *vsan-id*) **] |**
[pcmap error (module *slot* **| vsan** *vsan-id*) **| event (module** *slot* **| vsan** *vsan-id*) **| trace (module** *slot* **| vsan** *vsan-id*) **] |**
[sfib error (module *slot* **| vsan** *vsan-id*) **| event (module** *slot* **| vsan** *vsan-id*) **| trace (module** *slot* **| vsan** *vsan-id*) **] |**
[spanmap error (module *slot* **| vsan** *vsan-id*) **| event (module** *slot* **| vsan** *vsan-id*) **| trace (module** *slot* **| vsan** *vsan-id*) **]**

Syntax Description

flogimap	Enables flogimap debugging.
idxmap	Enables idxmap debugging.
pcmap	Enables pcmap debugging.
sfib	Enables sfib debugging.
spanmap	Enables spanmap debugging.
error	Enables debugging for FCC error conditions.
event	Enables debugging for FCC events.
trace	Enables debugging for FCC traces.
module *slot*	Specifies the slot number of the module being debugged.
vsan *vsan-id*	Restricts debugging to the specified VSAN.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug fcfwd error** command is issued:

```
switch# debug fcfwd error
```

debug fcns

To enable debugging for name server registration, use the **debug fcns** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug fcns
[all (vsan *vsan-id* **)] |**
[errors (vsan *vsan-id* **)] |**
[events mts (vsan *vsan-id* **) | query (vsan** *vsan-id* **) | register (vsan** *vsan-id* **)]**

Syntax Description

all	Enables debugging for all name server features.
errors	Enables debugging for name server error conditions.
events	Enables debugging for name server events.
mts	Enables debugging for name server tx/rx MTS packets.
query	Enables debugging for name server tx/rx CDP packets.
register	Enables debugging for name server PSS related events.
vsan *vsan-id*	Restricts debugging to the specified VSAN.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug fcns events register vsan 99** command is issued:

```
switch# debug fcns events register vsan 99
Feb 17 04:42:54 fcns: vsan 99: Got Entry for port-id 27800
Feb 17 04:42:54 fcns: vsan 99: Registered port-name 36a4078be0000021 for port-id 780200
Feb 17 04:42:54 fcns: vsan 99: Registered node-name 36a4078be0000020 for port-id 780200
...
```

debug fcs

To enable debugging for the fabric configuration server, use the **debug fcs** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug fcs
[all (vsan *vsan-id* **)] |**
[discovery events] |
[errors (vsan *vsan-id* **)] |**
[mts events (brief | detail)] |
[pss events] |
[queries events (vsan *vsan-id* **)] |**
[registration events (vsan *vsan-id* **)] |**
[rscn events (vsan *vsan-id* **)] |**
[snmp events]

Syntax Description

all	Enables debugging for all FCS features.
discovery events	Enables debugging for FCS discovery events.
errors	Enables debugging for FCS error conditions.
mts events	Enables debugging for FCS tx/rx MTS events.
brief	Provides brief information for each event.
detail	Provides detailed information for each event.
queries events	Enables debugging for FCS tx/rx events.
registration events	Enables debugging for FCS PSS related events.
rscn events	Enables debugging for FCS RSCN events.
snmp events	Enables debugging for FCS SNMP events.
vsan *vsan-id*	Restricts debugging to the specified VSAN.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug fcs all** command is issued:

```
switch# debug fcs all
```

debug flogi

To enable debugging for the fabric login (FLOGI) feature, use the **debug flogi** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug flogi
[action (interface *type number* **| vsan** *vsan-id* **)]**
[all] |
[demux (interface *type number* **| vsan** *vsan-id* **)]**
[error] |
[event (interface *type number* **| vsan** *vsan-id* **)] |**
[ha (interface *type number* **| vsan** *vsan-id***)] |**
[init (interface *type number* **| vsan** *vsan-id***)] |**
[timers (interface *type number* **| vsan** *vsan-id***)]**
[trace (interface *type number* **| vsan** *vsan-id***)]**
[warning]

Syntax Description

action	Enables all FLOGI debug features.
all	Enables all FLOGI debug options.
demux	Enables FLOGI demux
error	Enables debugging for FLOGI error conditions.
event	Enables debugging for FLOGI FSMs and events.
ha	Enables debugging for FLOGI high availability.
init	Enables debugging of FLOGI addition, deletion, and initialization.
timer	Enables debugging for FLOGI message timers
trace	Enables debugging for FLOGI traces.
warning	Enables debugging for FLOGI warnings.
interface *type number*	Restricts debugging to the specified interface.
vsan *vsan-id*	Restricts debugging to the specified VSAN.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug flogi all** command is issued:

```
switch# debug flogi all
Apr  9 22:44:08 flogi: fs_demux: msg consumed by sdwrap_process msg
Apr  9 22:44:08 flogi: fu_fsm_execute_all: match_msg_id(0), log_already_open(0)
Apr  9 22:44:08 flogi: fu_fsm_execute_all: null fsm_event_list
Apr  9 22:44:08 flogi: fu_fsm_engine: mts msg MTS_OPC_DEBUG_WRAP_MSG(msg_id 67690) dropped
```

The following example displays the system output when the **debug flogi event** command is issued:

```
switch# debug flogi event
Apr 10 00:07:16 flogi: fu_fsm_execute_all: match_msg_id(0), log_already_open(0)
Apr 10 00:07:16 flogi: fu_fsm_execute_all: null fsm_event_list
Apr 10 00:07:16 flogi: fu_fsm_engine: mts msg MTS_OPC_DEBUG_WRAP_MSG(msg_id 71314) dropped
```

The following example displays the system output when the **debug flogi trace** command is issued:

```
switch# debug flogi trace
Apr 10 00:42:36 flogi: fs_genport_vsan_hash_fn: key: 0x1 index: 0x1
Apr 10 00:42:36 flogi: fs_mts_hdlr_fs_flogo: FLOGI HOLD(0x8122144) refcnt:3
Apr 10 00:42:36 flogi: fs_clear_all_outstanding_responses_for_flogi: FLOGI FREE(
a07e00300500252b) refcnt:3
```

debug fspf

To enable debugging for the FSPF feature, use the **debug fspf** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug fspf
[all (interface *type number* **| vsan** *vsan-id* **)] |**
[database] |
[error (interface *type number* **| vsan** *vsan-id* **)] |**
[event (interface *type number* **| vsan** *vsan-id* **)] |**
[fc (pkt | pkthdr) (both | tx | rx) (interface *type number* **| vsan** *vsan-id***)] |**
[flood (interface *type number* **| vsan** *vsan-id***)] |**
[ha (interface *type number* **| vsan** *vsan-id***)] |**
[mts (pkt | pkthdr) (both | tx | rx) (interface *type number* **| vsan** *vsan-id***)] |**
[retrans (interface *type number* **| vsan** *vsan-id***)] |**
[route] |
[timer]

Syntax Description

all	Enables debugging for all FSPF features.
database	Enables debugging for the FSPF database.
error	Enables debugging for FSPF error conditions.
events	Enables debugging for FSPF events.
fc	Enables debugging of Fibre Channel Packets and Headers.
ipc	Enables debugging of IPC Packets and Headers.
pkt	Enables debugging of packets.
pkthdr	Enables debugging of headers.
both	Enables debugging in both the transmit and receive directions.
tx	Enables debugging in the transmit direction,
rx	Enables debugging in the receive direction.
flood	Enables debugging for FSPF flooding events.
ha	Enables debugging for FSPF high availability.
mts	Enables debugging for FSPF tx/rx MTS events.
retrans	Enables debugging for FSPF retransmits.
route	Enables debugging for FSPF route computation.
timer	Enables debugging for FSPF timers.
interface *type number*	Restricts debugging to the specified interface.
vsan *vsan-id*	Restricts debugging to the specified VSAN.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

If you receive bad packets on an interface, use the **debug fc pkt** command.

If you receive an error in processing a packet on an interface in VSAN, turn on **debug fspf error** to get more information. Make sure there is no misconfiguration of FSPF parameters on the two ends of the interface. Also issue the **debug fspf fc pkt** command for the specific interface.

If you receive an error in flooding the local LSR in a VSAN issue the **debug fspf flood** and **debug fspf error** commands. If error is reported in transmitting packet check if interface is up and turn on **debug fc2 error**.

If you receive an error in processing a timer event for the interface in a VSAN, issue the **debug fspf error** command.

If you receive an error in processing due to a wrong MTS message, use the **debug fspf mts pkt** and **debug fspf error** commands.

If you receive an error when interacting with RIB, use the **debug fspf route** command along with the RIB debug traces.

If you receive an error in computing routes for VSANs, issue the **debug fspf error** and the **debug fspf route** commands.

If you receive an error due to the interface being stuck in a state other than FULL, use the **debug fspf event** and **debug fspf fc pkt** commands on the interfaces involved.

Examples

The following example displays the system output when the **debug fspf all** command is issued:

```
switch1# debug fspf all
Apr 5 11:50:01 fspf: Wrong hello interval for packet on interface 100f000 in VSAN 1
Apr 5 11:50:04 fspf: Error in processing hello packet , error code = 4
```

debug hardware

To configures debugging for the hardware kernel module parameters, use the **debug hardware** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug hardware
[arbiter error | flow] |
[sso flow | init | interrupt]

Syntax Description

arbiter	Enables debugging for the hardware arbiter driver.
sso	Enables debugging for the SSO driver.
errors	Enables debugging for hardware kernel errors.
flow	Enables debugging for hardware flow errors
init	Enables debugging for hardware initialization.
interrupt	Enables debugging for hardware interrupts.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug hardware arbiter error group** command is issued:

```
switch# debug hardware arbiter error group 1
```

debug idehsd

To enable IDE hot swap handler debugging, use the **debug idehsd** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug idehsd
[cmd dbglevel *debug-level* **] |**
[error] |
[flow]

Syntax Description

cmd	Enables debugging for the IDE hot swap handler.
dbglevel *debug-level*	Specifies the debug level (0 to 8).
error	Enables debugging for IDE hot swap handler error conditions.
flow	Enables debugging for IDE hot swap handler flow.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug idehsd cmd dbglevel** command is issued:

```
switch# debug idehsd cmd dbglevel 5
set debug level to 5 succeeded
```

debug ipconf

To enable IP configuration debugging, use the **debug ipconf** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug ipconf all | errors | events | info | pss

Syntax Description

all	Enables debugging for all IP configuration features.
errors	Enables debugging for IP configuration error conditions.
events	Enables debugging for IP configuration tx/rx MTS events.
info	Enables debugging for IP configuration information.
pss	Enables debugging for IP configuration PSS operations.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug ipconf all** command is issued:

```
switch# debug ipconf all
```

debug ipfc

To enable IPFC debugging, use the **debug ipfc** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug ipfc
[all] |
[errors] |
[events] |
[info] |
[kernel (errors | events)]

Syntax Description

all	Enables debugging for all IPFC features.
errors	Enables debugging for IPFC error conditions.
events	Enables debugging for IPFC tx/rx MTS events.
info	Enables debugging for IPFC n information.
kernel	Enables debugging for IPFC PSS operations.
errors	Enables debugging for IPFC kernel error conditions.
events	Enables debugging for IPFC kernel events.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug ipfc kernel errors** command is issued:

```
switch# debug ipfc kernel errors
```

debug ips

To enable debugging for the IP storage (IPS) manager, use the **debug ips** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug ips
[all] |
[demux]
[error] |
[flow (ethernet | fcip | iscsi | iscsi_detail)] |
[fsm] |
[ha] |
[init] |
[show_all] |
[timers]
[warning]

Syntax Description

all	Enables all IPS debug options.
demux	Enables IPS demux
error	Enables debugging for IPS error conditions.
flow	Enables debugging for the IPS flow.
ethernet	Restricts debugging to the Ethernet flow
fcip	Restricts debugging to the FCIP flow
iscsi	Restricts debugging to the iSCSI flow
iscsi_detail	Restricts debugging to a detailed iSCSI flow
fsm	Enables debugging for IPS FSM and events.
ha	Enables debugging for IPS high availability.
init	Enables debugging of IPS addition, deletion, and initialization.
show_all	Enables all debugging IPS manager flags.
timers	Enables debugging for FLOGI message timers
warning	Enables debugging for FLOGI warnings.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug ips show_all** command is issued:

```
switch# debug ips show_all
IPS Manager:
iSCSI Trace Detail debugging is on
```

debug logfile

To direct the output of the debug commands to a specified file, use the **debug logfile** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug logfile *filename* **[size** *size* **]**

Syntax Description

filename	Assigns the name of the log file.
size *size*	Specifies the logfile size in bytes (4096-4194304).

Defaults

Disabled.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Use this command to log debug messages to a special log file. This file is more secure and easier to process than sending the debug output to the console.

Examples

The following example redirects the output of the debug commands to the file named ***sample***.

```
switch# debug logfile sample
```

The following example assigns the log file size for the file named ***sample***.

```
switch# debug logfile sample size 410000
```

debug mcast

To enable debugging for multicast definitions, use the **debug mcast** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug mcast
[all] |
[error (vsan *vsan-id* **) (interface fc** *slot-port* **)] |**
[event (vsan *vsan-id* **) (interface fc** *slot-port* **)] |**
[mts { pkt both | tx | rx) (node *range* **| opcode** *range* **| sap** *range* **) } | { (pkthdr both | tx | rx (numpkt** *range* **)] } |**
[trace (vsan *vsan-id* **) (interface fc** *slot-port* **)]**

Syntax Description

all	Enables debugging for all multicast definitions.
error	Enables debugging for multicast errors.
event	Enables debugging for multicast events.
mts	Enables debugging for multicast tx/rx MTS events.
trace	Enables debugging for multicast traces.
vsan *vsan-id*	Restricts debugging to the specified VSAN.
interface fc *slot-port*	Restricts debugging to the specified interface.
pkt	Specifies debugging of packets.
pkthdr	Specifies debugging of headers.
numpkt	Specifies the number of required packets
both	Specifies debugging in both the transmit and receive directions.
tx	Specifies debugging in the transmit direction,
rx	Specifies debugging in the receive direction.
node	Specifies the node for the packets in the receive direction.
opcode	Specifies the opcode for the packets in the receive direction.
sap	Specifies the sap for the packets in the receive direction.
range	Specifies the integer range from 1 to 4095.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug mcast all** command is issued:

```
switch# debug mcast all
```

debug mip

To enable debugging for multiple IP (MIP) kernel drivers, use the **debug mip** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug mip errors | events

Syntax Description

errors	Enables debugging for MIP error conditions.
events	Enables debugging for MIP events.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug mip errors** command is issued:

```
switch# debug mip errors
```

debug module

To enable debugging for switching or service modules, use the **debug module** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug module
[all] |
[error (module *slot* **)] |**
[event] |
[ha] |
[no-powerdown] |
[trace (module *slot* **)]**

Syntax Description

all	Enables debugging for all module features.
error	Enables debugging for module error conditions.
event	Enables debugging for module events.
ha	Enables debugging for a module's high availability features.
no-powerdown	Disables the power cycle feature for the module.
trace	Enables debugging for a module's trace flows.
module *slot*	Restricts debugging to the specified module.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug fcs all** command is issued:

```
switch# debug fcs all
Apr 28 19:23:20 module: fu_fsm_execute: (ID(5): Slot 4, node 0x0402)
Apr 28 19:23:20 module:     current state [LCM_ST_LC_ONLINE]
Apr 28 19:23:20 module:     current event [LCM_EV_LCM_HEARTBEAT_TIMEOUT]
Apr 28 19:23:20 module:     next state    [LCM_ST_LC_ONLINE]
Apr 28 19:23:20 module: fu_add_pss_data: adding data for key <8, 0x3300000000000
004> to the pss runtime service add data list
Apr 28 19:23:20 module: fu_add_pss_data: added key <8, 0x3300000000000004> data
...
```

debug ntp

To enable debugging for the NTP module, use the **debug ntp** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug ntp errors | info

Syntax Description

errors	Enables debugging for NTP error conditions.
info	Enables debugging for NTP information and events.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug ntp errors** command is issued:

```
switch# debug ntp errors
```

debug platform

To enable debugging for the platform manager, use the **debug platform** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug platform
[all (fc_id *fc-id* **)] |**
[error (module *slot* **)] |**
[flow (module *slot* **)**
[fsm] |
[ha] |
[hitless] |
[mts (pkt | pkthdr) (both | tx | rx)]

Syntax Description

all	Enables debugging for all platform features.
error	Enables debugging for platform-related error conditions.
flow	Enables debugging for platform-related flows.
fsm	Enables debugging for platform-related FSMs.
ha	Enables debugging for platform-related high availability.
hitless	Enables the platform loading feature while the switch is in hitless mode.
mts	Enables debugging for platform-related tx/rx MTS events.
fcid *f c-id*	Restricts debugging to the specified FC ID module number (from 0 to 2147483647).
pkt	Enables debugging of packets.
pkthdr	Enables debugging of headers.
both	Enables debugging in both the transmit and receive directions.
tx	Enables debugging in the transmit direction,
rx	Enables debugging in the receive direction.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug platform all** command is issued:

```
switch# debug platform all
```

debug port

To enable debugging for ports, use the **debug port** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug port
[all] |
[error] |
[event (interface *type number* **| vsan** *vsan-id* **)] |**
[ha (interface *type number* **| vsan** *vsan-id*) **] |**
[trace (interface *type number* **| vsan** *vsan-id*)**]**

Syntax Description

action	Enables all port debug features.
all	Enables all port debug options.
error	Enables debugging for port error conditions.
event	Enables debugging for port FSMs and events.
ha	Enables debugging for port high availability.
trace	Enables debugging for port traces.
interface *type number*	Restricts debugging to the specified interface.
vsan *vsan-id*	Restricts debugging to the specified VSAN.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug port all** command is issued:

```
switch# debug port all
Apr 10 00:49:38 port: fu_fsm_execute_all: match_msg_id(0), log_already_open(0)
Apr 10 00:49:38 port: fu_fsm_execute_all: null fsm_event_list
Apr 10 00:49:38 port: fu_fsm_engine: mts msg MTS_OPC_DEBUG_WRAP_MSG(msg_id 40239) dropped
```

The following example displays the system output when the **debug port event** command is issued:

```
switch# debug port event
Apr 10 15:30:35 port: fu_fsm_execute_all: match_msg_id(0), log_already_open(0)
Apr 10 15:30:35 port: fu_fsm_execute_all: null fsm_event_list
Apr 10 15:30:35 port: fu_fsm_engine: mts msg MTS_OPC_DEBUG_WRAP_MSG(msg_id 7002)
 dropped
switch# Apr 10 15:30:35 port: fu_priority_select:  - setting fd[3] for select call  -
setting fd[5] for select call  - setting fd[6] for select call
Apr 10 15:30:35 port: fu_priority_select_select_queue: round credit(16)
Apr 10 15:30:35 port:     curr_q - FU_PSEL_Q_CAT_FD, usr_q_info(32), fd(5), priority(3),
credit(2), empty
Apr 10 15:30:35 port: fu_priority_select: returning FU_PSEL_Q_CAT_MTS queue, fd(3),
usr_q_info(8)
```

debug port-channel

To enable debugging for PortChannels, use the **debug port-channel** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug port-channel
[all (interface port-channel *number)* **] |**
[error] |
[event (interface port-channel *number* **)] |**
[ha (interface port-channel *number*) **] |**
[mts (pkt | pkthdr) (both | tx | rx) (interface port-channel *number*) **]**
[query]
[trace (interface port-channel *number*) **]**

Syntax Description

all	Enables all PortChannel debug options.
error	Enables debugging for PortChannel error conditions.
event	Enables debugging for PortChannel FSMs and events.
ha	Enables debugging for PortChannel high availability.
pkt	Enables debugging of packets.
pkthdr	Enables debugging of headers.
both	Enables debugging in both the transmit and receive directions.
tx	Enables debugging in the transmit direction,
rx	Enables debugging in the receive direction.
trace	Enables debugging for PortChannel traces.
interface port-channel *number*	Restricts debugging to the specified PortChannel.
vsan *vsan-id*	Restricts debugging to the specified VSAN.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug port-channel all** command is issued:

```
switch# debug port-channel all
```

debug qos

To enable debugging for quality of Service (QoS), use the **debug qos** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug qos all | detail | errors | flow | trace

Syntax Description

all	Enables all QoS debug options.
detail	Enables all QoS debug output.
error	Enables debugging for QoS error conditions.
flow	Enables flow-level QoS debug options.
trace	Enables debugging for QoS traces.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug qos all** command is issued:

```
switch# debug qos all
```

debug rd-reg

To enable debugging for the list of devices using the read-register feature, use the **debug rd-reg** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug rd-reg (*device-name* | *register address*)

Syntax Description

device-name	Specifies the device name for the required device.
register address	Specifies the register address for the required device.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug rd-reg abc** command is issued:

```
switch# debug rd-reg abc
```

debug rdl

To enable debugging for the list of devices using the read-register feature, use the **debug rdl** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug rdl errors

Syntax Description

errors	Enables debugging for RDL errors.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug rdl errors** command is issued:

```
switch# debug rdl errors
```

debug rib

To enable debugging for the routing information base (RIB) feature, use the **debug rib** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug rib all | error | event | trace

Syntax Description

all	Enables debugging for all RIB features.
error	Enables debugging for RIB errors.
event	Enables debugging for RIB events.
trace	Enables debugging for trace events.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

If a RIB operation is ignored or not supported, then issue the **debug rib all** command to find out more details.

Examples

The following example displays the system output when the **debug rib error** command is issued:

```
switch# debug rib error
```

debug rscn

To enable debugging for the registered state change notification (RSCN) feature, use the **debug rscn** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug rscn
[all (vsan *vsan-id* **)] |**
[errors (vsan *vsan-id* **)] |**
[events (vsan *vsan-id* **)] |**
[mts-errors (vsan *vsan-id* **)] |**
[mts-events (vsan *vsan-id* **)]**

Syntax Description

all	Enables debugging for all RSCN features.
error	Enables debugging for RSCN errors.
event	Enables debugging for RSCN events.
mts-errors	Enables debugging for RSCN MTS errors.
mts-events	Enables debugging for RSCN MTS events.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug rscn error** command is issued:

```
switch# debug rscn error
```

debug scsi-target

To enable debugging for SCSI targets, use the **debug scsi-target** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug scsi-target error | flow

Syntax Description

error	Enables debugging for SCSI target daemon errors.
flow	Enables debugging for the SCSI target flow.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug scsi-target flow** command is issued:

```
switch# debug scsi-target flow
Apr 28 21:11:52 vhbad: vhba_mts_handler: sdwrap_dispatch: retval:0
Apr 28 21:11:54 vhbad: vhbad_handle_timeout: timer:1 context:(nil)
Apr 28 21:12:06 vhbad: vhba_mts_handler: sysmgr_dispatch: retval:-1
```

debug security

To enable debugging for the security and accounting features, use the **debug security** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug security all | events | mts | radius

Syntax Description

all	Enables debugging for all security features.
events	Enables debugging for security events.
mts	Enables debugging for security MTS packets.
radius	Enables debugging for RADIUS events.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug security radius** command is issued:

```
switch# debug security radius
Mar  5 00:51:13 securityd: RADIUS is enabled, hence it will be tried first for CHAP
authentication
Mar  5 00:51:13 securityd: reading RADIUS configuration
Mar  5 00:51:13 securityd: opening radius configuration for group:default
Mar  5 00:51:13 securityd: opened the configuration successfully
Mar  5 00:51:13 securityd: GET request for RADIUS global config
Mar  5 00:51:13 securityd: got back the return value of global radius configuration
operation:success
Mar  5 00:51:13 securityd: closing RADIUS pss configuration
Mar  5 00:51:13 securityd: opening radius configuration for group:default
```

debug sensor

To enable debugging for the sensor manager, use the **debug sensor** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug sensor demux | deque | error | info | init

Syntax Description

demux	Enables debugging for sensor demux functions.
deque	Enables debugging for sensor deque events.
error	Enables debugging for sensor errors.
info	Enables debugging for sensor information.
init	Enables debugging for sensor initialization.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Use this command to debug sensor manager events and information.

Examples

The following example displays the system output when the **debug sensor info** command is issued:

```
switch# debug sensor info
```

Related Commands

Command	Description
show environment temperature	Displays current temperature threshold settings and state.

debug snmp

To enable debugging for the SNMP manager, use the **debug snmp** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug snmp
[all] |
[errors] |
[mts (pkt both | tx | rx (node *range* **| opcode** *range* **| sap** *range* **) | { pkthdr both | tx | rx (numpkt** *range* **) }] |**
[pkt-dump] |
[trace (trace-entryexit | trace-stub)]

Syntax Description

all	Enables debugging for all SNMP output.
errors	Enables debugging for SNMP error output.
mts	Enables debugging for SNMP packets and headers.
pkt-dump	Enables a packet dump of debug output.
trace	Enables trace level debug output.
pkt	Specifies debugging of packets.
pkthdr	Specifies debugging of headers.
both	Specifies debugging in both the transmit and receive directions.
tx	Specifies debugging in the transmit direction.
rx	Specifies debugging in the receive direction.
node	Specifies the node for the packets in the receive direction.
opcode	Specifies the opcode for the packets in the receive direction.
sap	Specifies the sap for the packets in the receive direction.
numpkt	Specifies the number of required packets
range	Specifies the integer range from 1 to 4095.
trace-entryexit	Specifies trace-level entry or exit debug output.
trace-stub	Specifies trace-level stub debug output.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug snmp trace** command is issued:

```
switch# debug snmp trace
Apr 29 16:03:34 snmpd[1177]: SDWRAP message Successfully processed
```

debug span

To enable SPAN debugging, use the **debug span** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug span all | error | event | trace | warning

Syntax Description

all	Enables debugging for all SPAN features.
error	Enables debugging for SPAN errors.
event	Enables debugging for SPAN events.
trace	Enables debugging for SPAN traces.
warning	Enables debugging for SPAN warning messages.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug span all** command is issued:

```
switch# debug span all
Apr 29 16:06:44 span: span_demux: msg consumed by sdwrap_process msg
Apr 29 16:06:44 span: fu_fsm_execute_all: match_msg_id(0), log_already_open(0)
Apr 29 16:06:44 span: fu_fsm_execute_all: null fsm_event_list
Apr 29 16:06:44 span: fu_fsm_engine: mts msg MTS_OPC_DEBUG_WRAP_MSG(msg_id 2548887)
dropped
Apr 29 16:06:48 span: fu_priority_select:  - setting fd[3] for select call
Apr 29 16:06:48 span: fu_priority_select_select_queue: round credit(12)
Apr 29 16:06:48 span:     curr_q - FU_PSEL_Q_CAT_CQ, usr_q_info(4), priority(7),
credit(6), empty
Apr 29 16:06:48 span: fu_priority_select: returning FU_PSEL_Q_CAT_MTS queue, fd(3),
usr_q_info(2)
Apr 29 16:06:48 span: span_get_data_from_mts_q dequeued mts msg (26e525),
MTS_OPC_DEBUG_WRAP_MSG
```

debug system

To enable system debugging, use the **debug system** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug system [all | error | ha | health (all | error | event | ha | trace)]

Syntax Description

all	Enables all PortChannel debug options.
error	Enables debugging for PortChannel error conditions.
ha	Enables debugging for PortChannel high availability.
health	Enables online health monitoring debugging.
all	Specifies debugging of all health monitoring flags.
error	Specifies debugging of health monitoring error flags.
event	Specifies debugging of health monitoring event flags.
ha	Specifies debugging of health monitoring HA flags.
trace	Specifies debugging of health monitoring trace flags.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug system** command is issued:

```
switch# debug system all
```

debug tcap

To enable debugging the exception logger, use the **debug tcap** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug tcap demux | deque | error | info | init

Syntax Description

demux	Enables debugging for terminal capture demux functions.
deque	Enables debugging for terminal capture deque events.
error	Enables debugging for terminal capture errors.
info	Enables debugging for terminal capture information.
init	Enables debugging for terminal capture initialization.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Use this command to debug terminal capture utility events and information.

Examples

The following example displays the system output when the **debug demux** command is issued:

```
switch# debug demux
```

debug tlport

To enable debugging for TL port interfaces, use the **debug tlport** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug tlport
[all (interface fc *slot* **)] |**
[errors (interface fc *slot*) **] |**
[events fc2 terminal (interface fc *slot*) **| fc2 transit (interface fc** *slot*) **| mts (interface fc** *slot*)
| pss (interface fc *slot*) **]**

Syntax Description

all	Enables debugging for all TL port features.
errors	Enables debugging for TL port error conditions.
events	Enables debugging for TL port monitoring events.
fc2	Enables debugging for TL port monitoring FC 2 events.
terminal	Specifies TL port monitoring FC 2 terminating events.
transit	Specifies TL port monitoring FC 2 transit events.
mts	Enables debugging for TL port monitoring MTS packets.
pss	Enables debugging for TL port monitoring PSS packets.
interface fc *slot*	Restricts debugging to the specified interface.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug tlport events pss** command is issued:

```
switch# debug tlport events pss
```

debug ttyd

To enable TTYD debugging, use the **debug ttyd** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug ttyd all | errors | events

Syntax Description

all	Enables debugging for all TTYD features.
errors	Enables debugging for TTYD error conditions.
events	Enables debugging for TTYD events.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug ttyd events** command is issued:

```
switch# debug ttyd events
```

debug vni

To enable debugging for a virtual network interface (VNI), use the **debug vni** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug vni all | errors | events | info | pss

Syntax Description

all	Enables debugging for all VNI features.
errors	Enables debugging for VNI error conditions.
events	Enables debugging for VNI events.
info	Enables debugging for VNI events.
pss	Enables debugging for VNI PSS packets.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug vni all** command is issued:

```
switch# debug vni all
Apr 29 17:00:59 vni: Received MTS message
Apr 29 17:00:59 vni: message not processed by system mgr library , so process it normal
way
```

debug vrrp

To enable debugging for a Virtual Router Redundancy Protocol (VRRP), use the **debug vrrp** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug vrrp
[configuration all | error | event | info] |
[engine all | error | event | info]

Syntax Description

configuration	Enables VRRP configuration debugging.
engine	Enables VRRP engine debugging.
all	Enables debugging for all VRRP features.
error	Enables debugging for VRRP error conditions.
event	Enables debugging for VRRP events.
info	Enables debugging for VRRP events.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug vrrp engine all** command is issued:

```
switch# debug vrrp engine all
Apr 29 17:35:58 vrrp_eng: fu_priority_select:  - setting fd[7] for select call - setting
fd[11] for select call  - setting fd[12] for select call  - setting fd [13] for select
call  - setting fd[15] for select call
Apr 29 17:35:58 vrrp_eng: fu_priority_select_select_queue: round credit(6)
Apr 29 17:35:58 vrrp_eng:     curr_q - FU_PSEL_Q_CAT_FD, usr_q_info(6), fd(15),
priority(2), credit(1), empty
Apr 29 17:35:58 vrrp_eng: fu_priority_select: returning FU_PSEL_Q_CAT_FD queue, fd(7),
usr_q_info(3)
Apr 29 17:35:58 vrrp_eng: heartbeat sent
Apr 29 17:35:58 vrrp_eng: message not processed by system mgr library , so process it
normal way
```

debug vsan

To enable debugging for VSANs, use the **debug vsan** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug vsan [all | global | ha | info | membership | mts]

Syntax Description

all	Enables all debugging flags for the VSAN feature.
global	Enables debugging of events for the VSAN global parameter database
ha	Enables debugging of VSAN's HA-related events.
info	Enables debugging of events for VSAN information database.
membership	Enables debugging of events for VSAN membership database.
mts	Enables Tx/Rx packets of MTS.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug port all** command is issued:

```
switch# debug port-channel all
```

debug wr-reg

To enable debugging for the list of devices using the write-register feature, use the **debug wr-reg** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug wr-reg (*device-name* | *register address*)

Syntax Description

device-name	Specifies the device name for the required device.
register address	Specifies the register address for the required device.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug wr-reg** command is issued:

```
switch# debug wr-reg
```

debug wwn

To enable debugging for the world wide name (WWN) manager, use the **debug wwn** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug wwn all | detail | errors | flow | trace

Syntax Description

all	Enables all WWN debug options.
detail	Enables all WWN output
error	Enables debugging for WWN error conditions.
flow	Enables flow-level WWN debug options.
trace	Enables debugging for WWN traces.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug qos all** command is issued:

```
switch# debug wwn all
Apr 29 19:24:17 wwn: 53601-wwnm_sdwrap_dispatch:77|SDWRAP massage Successfully processed
Apr 29 19:24:17 wwn: Src: 0x00000601/5206  Dst: 0x00000601/46  ID: 0x002C7DE4  Size: 252
[REQ] Opc: 182 (MTS_OPC_DEBUG_WRAP_MSG) RR: 0x002C7DE4  HA_SEQNO: 0x00000000  TS:
0x55D49A130243  REJ:0
Apr 29 19:24:17 wwn: 01 00 00 00 E7 03 00 00 00 00 00 00 00 00 00 00
Apr 29 19:24:17 wwn: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr 29 19:24:17 wwn: 00 00 00 00 00 00 00 00 00 00 00 00 FF FF FF FF
Apr 29 19:24:17 wwn: 2F 64 65 76 2F 70 74 73 2F 30 00 00 00 00 00 00
Apr 29 19:24:17 wwn: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr 29 19:24:17 wwn: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr 29 19:24:17 wwn: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr 29 19:24:17 wwn: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr 29 19:24:17 wwn: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr 29 19:24:17 wwn: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr 29 19:24:17 wwn: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr 29 19:24:17 wwn: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr 29 19:24:17 wwn: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr 29 19:24:17 wwn: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr 29 19:24:17 wwn: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Apr 29 19:24:17 wwn: 00 00 00 00 00 00 00 00 2E 00 00 00
Apr 29 19:24:17 wwn: 53601-wwnm_unmask_sigalrm:1261|TRACE:
FILE=_manager/wwnm/wwnm_utilities.c
```

debug xbar

To enable crossbar debugging (XBAR), use the **debug xbar** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug xbar
[all] |
[demux] |
[deque] |
[error (module *slot* **)] |**
[fsm (module *slot* **)] |**
[ha (module *slot* **)] |**
[init] |
[main]

Syntax Description

all	Enables all XBAR debug options.
demux	Enables debugging for XBAR demux functions.
deque	Enables debugging for XBAR deque events.
error	Enables debugging for XBAR errors.
fsm	Enables debugging for XBAR FSMs.
ha	Enables debugging for XBAR high availability information.
init	Enables debugging for XBAR initialization.
main	Enables XBAR debugging for main functions.
module *slot*	Specifies the slot number of the module being debugged.

Defaults

Enabled.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug xbar all** command is issued:

```
switch# debug xbar all
Apr 29 19:48:34 xbar:  its a sdwrap msg, fsm utils dropping the mts msg
Apr 29 19:48:34 xbar: fu_fsm_engine: (Error) SYSERR_FU_xx: 0x10, err_num (16) in demux
Apr 29 19:48:34 xbar: fu_fsm_execute_all: match_msg_id(0), log_already_open(0)
Apr 29 19:48:34 xbar: fu_fsm_execute_all: null fsm_event_list
...
```

debug xbc

To enable crossbar client debugging (XBC), use the **debug xbc** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug xbc
[demux] |
[deque] |
[init] |
[main]

Syntax Description

demux	Enables debugging for crossbar demux functions.
deque	Enables debugging for crossbar deque events.
init	Enables debugging for crossbar initialization.
main	Enables debugging for crossbar main functions.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Use this command to debug crossbar client events and information.

Examples

The following example displays the system output when the **debug xbc init** command is issued:

```
switch# debug xbc init
```

debug zone

To enable debugging for zones, use the **debug zone** command in EXEC mode. When you finish using a debug command, remember to disable it with its specific **no** command (or use the **no debug all** command to turn off all debugging).

debug zone
[all] |
[change errors (vsan *vsan-id*) **| events (vsan** *vsan-id*) **| packets (vsan** *vsan-id*) **] |**
[database errors (vsan *vsan-id*) **| events (vsan** *vsan-id*) **] |**
[gs errors (vsan *vsan-id*) **| events (vsan** *vsan-id*) **| packets (vsan** *vsan-id*) **] |**
[merge errors (vsan *vsan-id*) **| events (vsan** *vsan-id*) **| packets (vsan** *vsan-id*) **] |**
[mts notifications (vsan *vsan-id*) **] |**
[pss errors (vsan *vsan-id*) **| events (vsan** *vsan-id*) **] |**
[tcam errors (vsan *vsan-id*) **| events (vsan** *vsan-id*) **| packets (vsan** *vsan-id*) **]**

Syntax Description

all	Enables all zone server debug options.
change	Enables change protocol message debugging.
errors	Enables debugging for zone errors.
events	Enables debugging for zone events.
packets	Enables debugging l for zone packets.
vsan *vsan-id*	Restricts debugging to the specified VSAN.
database	Specifies database message debugging.
gs	Specifies GS protocol message debugging.
merge	Specifies merge protocol message debugging.
mts notification	Specifies MTS notification message debugging.
tcam	Specifies TCAM message debugging.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the system output when the **debug zone all** command is issued:

```
switch# debug zone all
```

E Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

end

To exit any of the configuration modes and return to EXEC mode, use the **end** command in configuration mode.

end

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

You can also press **Ctrl-Z** to exit configuration mode.

Examples

The following example changes the name to george. Entering the **end** command causes the system to exit configuration mode and return to EXEC mode.

```
switch(config)# hostname george
switch(config)# end
switch#
```

Related Commands

Command	Description
exit	Exits configuration mode, or any of the configuration modes.

exit

To exit any configuration mode or close an active terminal session and terminate the EXEC, use the exit command at the system prompt.

exit

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC and Configuration modes.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Use the **exit** command at the EXEC levels to exit the EXEC mode. Use the **exit** command at the configuration level to return to privileged EXEC mode. Use the **exit** command in interface configuration mode to return to configuration mode. You also can press **Ctrl-Z**, or use the **end** command, from any configuration mode to return to EXEC mode.

Note The **exit** command is associated with privilege level 0. If you configure AAA authorization for a privilege level greater than 0, this command will not be included in the command set for that privilege level.

Examples

The following example displays an exit from the interface configuration mode for VRRP to return to the interface configuration mode.

```
switch(config-if-vrrp)# exit
switch(config-if)#
```

The following example displays an exit from the interface configuration mode to return to the configuration mode.

```
switch(config-if)# exit
switch(config)#
```

The following example shows how to exit an active session (log-out).

```
switch# exit
```

Related Commands

Command	Description
end	Returns you to EXEC mode.

F Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

fabric-binding activate

To activate fabric binding in a FICON enabled VSAN, use the **fabric-binding activate** command in configuration mode. To disable an FC alias, use the **no** form of this command.

fabric-binding activate vsan *vsan-id* **[force]**

no fabric-binding activate vsan *vsan-id* **[force]**

Syntax Description

activate	Activates fabric binding on that switch.
vsan *vsan-id*	Specifies the FICON-enabled VSAN. The ID of the VSAN is from 1 to 4093.
force	Forces fabric binding activation.

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Fabric binding is configured on a per-VSAN basis and can only be implemented in FICON VSANs.

Examples

The following example activates the fabric binding database for the specified VSAN.

```
switch# config t
switch(config)# fabric-binding activate vsan 1
```

The following example deactivates the fabric binding database for the specified VSAN.

```
switch(config)# no fabric-binding activate vsan 10
```

The following example activates the fabric binding database for the specified VSAN forcefully—even if the configuration is not acceptable.

```
switch(config)# fabric-binding activate vsan 3 force
```

The following example reverts to the previously-configured state or to the factory default (if no state is configured)

```
switch(config)# no fabric-binding activate vsan 1 force
```

Related Commands

Command	Description
fabric-binding database	Configures a fabric-binding database.
fabric-binding enable	Enables fabric-binding.

fabric-binding database copy

To copy from the active fabric binding database to the configuration fabric binding database, use the **fabric-binding database copy** command in EXEC mode.

fabric-binding database copy vsan *vsan-id*

Syntax Description

database	Enters the fabric binding submode for the specified VSAN.
copy	Copies from the active database to the config database.
vsan *vsan-id*	Specifies the FICON-enabled VSAN. The ID of the VSAN is from 1 to 4093.

Defaults

None

Command Modes

EXEC mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Fabric binding is configured on a per-VSAN basis and can only be implemented in FICON VSANs.

If the configured database is empty, this command is not accepted

Examples

The following example copies from the active database to the config database in VSAN 1.

```
switch# fabric-binding database copy vsan 1
```

Related Commands

Command	Description
fabric-binding diff	Provides the differences between the fabric-binding databases.

fabric-binding database diff

To view the differences between the active database and the configuration database in a FICON enabled VSAN, use the **fabric-binding database diff** command in EXEC mode.

fabric-binding database diff active | config vsan *vsan-id*

Syntax Description

database	Enters the fabric binding submode for the specified VSAN.
active	Provides information on the differences between the active database and the configuration database.
config	Provides information on information on the differences between the configuration database and the active database.
vsan *vsan-id*	Specifies the FICON-enabled VSAN. The ID of the VSAN is from 1 to 4093.

Defaults

None

Command Modes

EXEC mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Fabric binding is configured on a per-VSAN basis and can only be implemented in FICON VSANs.

Examples

The following example displays the differences between the active database and the configuration database in VSAN 1.

```
switch# fabric-binding database diff active vsan 1
```

The following example displays information on the differences between the configuration database and the active database.

```
switch# fabric-binding database diff config vsan 1
```

Related Commands

Command	Description
fabric-binding copy	Copies from the active to the config fabric binding database.

fabric-binding database vsan

To configure a user-specified fabric binding list in a FICON enabled VSAN, use the **fabric-binding database** command in configuration mode. To disable an FC alias, use the **no** form of this command.

fabric-binding database vsan *vsan-id*
swwn *switch-wwn* **domain** *domain-id*

no fabric-binding database vsan *vsan-id*
swwn *switch-wwn* **domain** *domain-id*

Syntax Description

database	Enters the fabric binding submode for the specified VSAN.
vsan *vsan-id*	Specifies the FICON-enabled VSAN. The ID of the VSAN is from 1 to 4093.
swwn *switch-wwn*	Configures the switch WWN in dotted hex format.
domain *domain-id*	Specifies the specified domain ID. The domain ID is a number from 1 to 239.

Defaults

None

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Fabric binding is configured on a per-VSAN basis and can only be implemented in FICON VSANs.

The persistent domain ID must be specified along with the sWWN. Domain ID authorization is required in FICON VSANs where the domains are statically configured and the end devices reject a domain ID change in all switches in the fabric.

Examples

The following example enters the fabric binding database submode and adds the sWWN and domain ID of a switch to the configured database list.

```
switch# config t
switch(config)# fabric-binding database vsan 5
switch(config-fabric-binding)# swwn 21:00:05:30:23:11:11:11 domain 102
```

The following example deletes a fabric binding database for the specified VSAN.

```
switch(config)# no fabric-binding database vsan 10
```

The following example deletes the sWWN and domain ID of a switch from the configured database list.

```
switch(config-fabric-binding)# no swwn 21:00:15:30:23:1a:11:03 domain 101
```

Related Commands

Command	Description
fabric-binding activate	Activates fabric-binding.
fabric-binding enable	Enables fabric-binding.

fabric-binding enable

To enable fabric binding in a FICON-enabled VSAN, use the **fabric-binding enable** command. To disable an FC alias, use the **no** form of this command.

fabric-binding enable vsan *vsan-id*

no fabric-binding enable vsan *vsan-id*

Syntax Description

enable	Enables fabric binding
vsan *vsan-id*	Specifies the FICON-enabled VSAN. The ID of the VSAN is from 1 to 4093.

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Fabric binding is configured on a per-VSAN basis and can only be implemented in FICON VSANs.

The fabric binding feature must be enabled in each switch in the fabric that participate in the fabric binding.

Examples

The following examples enables fabric binding on that switch.

```
switch# config t
switch(config)# fabric-binding enable
```

The following example disables fabric binding on that switch.

```
switch(config)# no fabric-binding enable
```

Related Commands

Command	Description
fabric-binding activate	Activates fabric-binding.
fabric-binding database	Configures a fabric-binding database.

fcalias name

To configure an FC alias, use the **fcalias name** command. To disable an FC alias, use the **no** form of this command.

fcalias name *alias name* **vsan** *vsan-id*

no fcalias name *alias name* **vsan** *vsan-id*

Syntax Description

alias-name	The name of the fcalias. Maximum length is 64 characters.
vsan	The fcalias is for a VSAN.
vsan-id	The ID of the VSAN is from 1 to 4093.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

To include multiple members in any alias, use the FC ID, fWWN, or pWWN values.

Examples

The following examples show how to configure an fcalias called AliasSample on VSAN 3.

```
switch# config t
switch(config)# fcalias name AliasSample vsan 3
switch(config-fcalias)#
switch(config-fcalias)# member fcid 0x222222
switch(config-fcalias)#
switch(config-fcalias)# member pwwn 10:00:00:23:45:67:89:ab
switch(config-fcalias)#
switch(config-fcalias)# member fwwn 10:01:10:01:10:ab:cd:ef
switch(config-fcalias)#
```

Related Commands

Command	Description
member fcid	Configures alias member for a specified zone.
member pwwn	Configures alias members based on the specified port WWN type and value.
member fwwn	Configures alias members based on the specified fWWN type and value.

fcanalyzer

To configure the Cisco Fabric Analyzer use the **fcanalyzer** command in configuration mode.

fcanalyzer [local | local brief | display-filter | limit-frame-size | limit-captured-frames write] [remote *ip-address* **active** *port-number***]**

Syntax Description

local	Begins capturing the frames locally (supervisor module).
local brief	Displays the protocol summary in a brief format.
display-filter	Displays the filtered frames.
limit-frame-size	Limits the size of the frame capture to the first 64 bytes. The allowed range is 64 to 65536 bytes.
limit-captured-frames	Limits the number of frames captured to 10. The allowed range is 0 to 2147483647 frames and the default is 100 frames. Use 0 if you do not want to limit the captures frames.
write	Saves the captured frames to a specified file.
remote	Configures the remote IP address to which the captured frames will be sent.
ip-address	Specifies IP address or histamine. Maximum length is 1024 characters.
active	Enables active mode (passive is the default) with the remote host.
port-number	Specifies port number

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

You can capture Fibre Channel control traffic from a switch and decode it without having to disrupt connectivity and without having to be local to the point of analysis.

Examples

The following examples shows how to configure the Cisco Fabric Analyzer.

```
switch# config t
switch(config)# fcanalyzer local
Capturing on eth2
switch(config)#
switch(config)# fcanalyzer local brief
Capturing on eth2
switch(config)#
switch(config)# fcanalyzer local display-filter SampleF
Capturing on eth2
switch(config)# fcanalyzer local limit-frame-size 64
Capturing on eth2
switch(config)#
switch(config)# fcanalyzer local limit-captured-frames 10
Capturing on eth2
switch(config)#
switch(config)# fcanalyzer local write SampleFile
Capturing on eth2
switch(config)#
switch(config)# fcanalyzer remote 10.21.0.3
Capturing on eth2
switch(config)#
switch(config)# fcanalyzer remote 10.21.0.3 active
Capturing on eth2
```

Related Commands

Command	Description
clear fcanalyzer	Clears the entire list of configured hosts.
show fcanalyzer	Displays the list of hosts configured for a remote capture.

fcc

To assign Fibre Channel Congestion Control priority, use the **fcc priority** command in configuration mode.

fcc [priority *number* **]**

Syntax Description

fcc	Enables FCC for the entire switch.
priority	Assigns FCC priority for the entire switch.
number	The FCC priority threshold. with 0 being the lowest and 7 being the highest.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

FCC reduces the congestion in the traffic without interfering with standard Fibre Channel protocol.

Examples

The following example shows the FCC priority threshold configured as 2.

```
switch# config t
switch(config)# fcc priority 2
```

Related Commands

Command	Description
show fcc	Displays FCC settings.

fcdomain

To configure the Fibre Channel domain feature, use the **fcdomain** command. The **no** form of this command, disables the FC domain.

fcdomain [allowed *range* **vsan** *vsan-id* | **auto-reconfigure vsan** *vsan-id*] **[contiguous-allocation vsan** *vsan-id*] **[domain** *id* **preferred | static vsan** *vsan-id* **| static c] [fabric-name** *name*] **[fcid database vsan** *vsan-id* **| persistent vsan** *vsan-id*] **[priority** *value* **vsan** *vsan-id*] **[restart disruptive vsan** *vsan-id*] **[vsan** *vsan-id*] **[restart vsan** *vsan-id*] **[vsan** *vsan-id*]

Syntax Description

allowed *range*	Configures the allowed domain ID list ranging from 1 to 239.
auto-reconfigure	Configures autoreconfigure.
vsan	Specifies a VSAN.
vsan-id	The ID of the VSAN is from 1 to 4093.
contiguous-allocation	Configures contiguous allocation.
domain	Configures the domain ID and its type.
id	Specifies the domain ID, which is from 0 to 239.
preferred	Configures the domain ID as preferred (default—the local switch accepts the domain ID assigned by the principal switch and the assigned domain ID becomes the runtime domain ID).
static	Configures the domain ID as static (the assigned domain ID is discarded, all local interfaces are isolated, and the local switch assigns itself the configured domain ID, which becomes the runtime domain ID.).
fabric-name	Configures the fabric name.
name	Specifies the fabric name.
fcid	Configures FC domain persistent FCIDs.
database	Enters persistent FCIDs submode.
persistent	Enables or disables FC domain persistent FCIDs.
priority	Configures the FC domain priority.
value	Specifies the FC domain priority, which is from 1 to 254.
restart disruptive	Forces the disruptive fabric reconfiguration.
restart	Starts a disruptive or nondisruptive reconfiguration.

Defaults

Enabled.

Command Modes

Configuration mode.

Usage Guidelines

You can use this command to select the principle switch, domain ID distribution, reconfigure fabric, and allocate FC IDs.

Examples

The following examples show how to configure the Fibre Channel domain feature.

```
switch# config t

switch(config)# fcdomain domain 3 preferred vsan 87

switch(config)# no fcdomain domain 3 preferred vsan 87

switch(config)# fcdomain domain 2 static vsan 237

switch(config)# no fcdomain domain 2 static vsan 237

switch(config)# fcdomain restart vsan 1

switch(config)# fcdomain restart disruptive vsan 1

switch(config)# fcdomain priority 25 VSAN 99

switch(config)# no fcdomain priority 25 VSAN 99

switch(config)# fcdomain auto-reconfigure vsan 10

switch(config)# fcdomain contiguous-allocation vsan 81-83

switch(config)# no fcdomain contiguous-allocation vsan 1030

switch(config)# fcdomain fabric-name 20:1:ac:16:5e:0:21:01 vsan 3

switch(config)# no fcdomain fabric-name 20:1:ac:16:5e:0:21:01 vsan 3010

switch(config)# fcdomain allowed 50-110 vsan 4

switch(config)# no fcdomain allowed 50-110 vsan 5
```

Related Commands

Command	Description
show fcdomain	Displays global information about the FC domain configurations.

fcdomain rcf-reject

To configure the domain features for a Fibre Channel or FCIP interface, use the **fcdomain** option. The **no** form of this option, disables the FC domain.

fcdomain rcf-reject vsan *number*

no fcdomain rcf-reject vsan *number*

Syntax Description

fcdomain	Enters the fcdomain mode for this FCIP interface
rcf-reject	Configures the RCF reject option.
vsan	Specifies a VSAN.
vsan-id	Specifies the VSAN ID, which is from 1 to 4093.

Defaults

Enabled

Command Modes

Configuration mode

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

Use this option to configure the RCF reject option for the selected FCIP interface.

Examples

The following examples show how to configure the FCIP rcf-reject fcdomain feature.

```
switch# config t

switch(config)# interface fcip 1

switch(config-if)# fcdomain rcf-reject vsan 1
```

Related Commands

Command	Description
show fcdomain	Displays global information about the FC domain configurations.
show interface fcip	Displays an interface configuration for a specified FCIP interface.

fcdroplatency

To configure the network and switch FC drop latency time, use the **fcdroplatency** command in configuration mode. To disable the FC latency time, use the **no** form of this command.

fcdroplatency [network *milliseconds***| switch** *milliseconds***]**

Syntax Description

network *milliseconds*	Configures network latency.
switch	Configures switch latency.
milliseconds	Specifies latency from 0 to 2147483647 milliseconds.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example shows how to configure the network latency to 5000 milliseconds.

```
switch# config t
switch(config)#
switch(config)# fcdroplatency network 5000
switch(config)#
```

The following example shows how to disable network latency.

```
switch(config)# no fcdroplatency network
switch(config)#
```

The following example shows how to configure the switch latency to 4000 milliseconds.

```
switch(config)# fcdroplatency switch 4000
switch(config)#
```

The following example shows how to disable switch latency.

```
switch(config)# no fcdroplatency switch
switch(config)#
```

Related Commands

Command	Description
show fcdroplatency	Displays the configured FC drop latency parameters.

fcflow stats

To configure fcflow statistics, use the **fcflow stats** command in configuration mode. To disable the counter, use the **no** form of this command.

fcflow stats {aggregated module *module-number* **index** *flow-number* **vsan** *vsan-id* **| module** *module-number* **index** *flow-number destination-fcid source-fcid netmask***}**

no fcflow stats {aggregated module *module-number* **index** *flow-number* **vsan** *vsan-id* **| module** *module-number* **index** *flow-number destination-fcid source-fcid netmask***}**

Syntax Description

aggregated	Configures aggregated fcflow statistics.
index	Specifies the flow index.
flow-number	Specifies a flow number from 0-2147483647.
vsan	Specifies a VSAN.
vsan-id	The ID of the VSAN is from 1 to 4093.
module	Clear fcflow statistics on a module.
module-number	Specifies a module number from 1 to 9.
destination-fcid	Enters the destination FC ID in hex format.
source-fcid	Enters the source FC ID in hex format.
netmask	Enters the mask for the source and destination FC ID (restricted to 6 characters ranging from 000000 to ffffff).

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

If you enable flow counters, you can enable a maximum of 1K entries for aggregate flow and flow statistics. Be sure to assign an unused flow index to a module for each new flow. Flow indexes can be repeated across modules. The number space for flow index is shared between the aggregate flow statistics and the flow statistics.

Examples

The following example shows how to configure aggregated fcflow statistics for module 1.

```
switch-config# fcflow stats aggregated module 1
switch-config#
```

The following example enables the aggregated flow counter.

```
switch(config)# fcflow stats aggregated module 1 index 1005 vsan 1
```

The following example disables the aggregated flow counter.

```
switch(config)# no fcflow stats aggregated module 1 index 1005 vsan 1
```

The following example enables the flow counter for module 1.

```
switch(config)# fcflow stats module 1 index 1 0x145601 0x5601 fffff vsan 1
```

The following example disables the flow counter for module 1.

```
switch(config)# no fcflow stats aggregated module 2 index 1001 vsan 2
```

fcid-last-byte

Use the **fcid-last-byte** command to allocate the last byte FC ID for the fabric address. To disable the configuration or to revert to factory defaults, use the **no** form of the command.

fcid-last-byte *last-byte-id*

Syntax Description

fcid-last-byte	Configures code page on a FICON-enabled VSAN.
last-byte-fcid	Specifies the last-byte FC ID range from 0 to 250.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

This is an optional configuration. If you are not sure of the EBCDIC format to be used, we recommend retaining the **us-canada** (default) option.

Examples

The following example assigns the last byte FC ID for the fabric address.

```
switch(config)# ficon vsan 2
switch(config-ficon)# fcid-last-byte 12
```

The following example removes the configured last byte FC ID for the fabric address and reverts to the factory default of 0.

```
switch(config-ficon)# no fcid-last-byte 3
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.
ficon vsan *vsan-id*	Enables FICON on the specified VSAN.

fcinterop fcid-allocation

To allocate FC IDs on the switch, use the **fcinterop fcid-allocation** command in configuration mode. To disable FC IDs on the switch, use the **no** form of the command.

fcinterop [fcid-allocation auto | flat | none]

no fcinterop [fcid-allocation auto | flat | none]

Syntax Description

fcid-allocation	Sets single FCID interop mode.
auto	Assigns single FCID to compatible HBAs.
flat	Assign single FCID.
none	Assigns FCID range.

Defaults

The default is **fcinterop fcid-allocation auto**.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

This command defines how the switch assigns FC IDs.

Examples

```
switch# config t
switch(config)#
switch(config)# fcinterop fcid-allocation none
switch(config)#
switch(config)# fcinterop fcid-allocation flat
switch(config)#
switch(config)# fcinterop fcid-allocation auto
switch(config)#
```

Related Commands

Command	Description
show flogi database	Displays the fabric login (FLOGI) table.

fcinterop loop-monitor

To monitor removal of discs from a loop port, use the **fcinterop loop-monitor** command in configuration mode. To disable loop monitoring, use the **no** form of this command.

fcinterop loop-monitor

no fcinterop loop-monitor

Syntax Description

loop-monitor	Configures monitoring of NL ports in a loop.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

This command detects devices that are removed from a looped port.

Examples

The following example configures monitoring of NL ports in a loop.

```
switch# config t
switch(config)#
switch(config)# fcinterop loop-monitor
switch(config)# no fcinterop loop-monitor
```

Related Commands

Command	Description
show flogi database	Verify if a storage device is displayed in the Fabric login (FLOGI) table.

fcip enable

To enable the FCIP feature in any switch in the Cisco MDS Family, issue the fcip enable command.

fcip enable

no fcip enable

Syntax Description

fcip	Configures FCIP parameters.
enable	Enables the FCIP feature in this switch.

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The configuration and verification commands for the iSCSI feature are only available when FCIP is enabled on a switch. When you disable this feature, all related configurations are automatically discarded.

Examples

The following command enables the FCIP feature.

```
switch(config)# fcip enable
```

The following command disables the FCIP feature (default).

```
switch(config)# no fcip enable
```

fcip profile

To configure the FCIP profile, provide the local IP address to determine the Gigabit Ethernet port where the FCIP links terminates.

fcip profile *profile-id*

no fcip profile *profile-id*

Syntax Description

fcip profile	Configures the FCIP profile.
profile-id	Specifies a ID range from 1 to 255.

Defaults

Disabled

Command Modes

Configuration mode,

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

You can specify a range of interfaces by issuing a command with the following example format:

interface spacefcipspace1space-space5space,spacefc2/5space-space7

Examples

```
switch## config t
switch(config)# fcip ?
  profile  Configure fcip profile

switch(config)# fcip profile 5
switch(config-profile)# ?
Submode Commands:
  exit  Exit from this submode
  ip    Config ip to profile
  no    Negate a command or set its defaults
  port  Config local port to profile
  tcp   Config TCP Parameters for the Profile
```

Related Commands

Command	Description
show fcip profile	Displays information about the FCIP profile.
interface fcip *interface_number* **use-profile** *profile-id*	Configures the interface using an existing profile ID from 1 to 255.
show interface fcip	Displays an interface configuration for a specified FCIP interface.

fcns proxy-port

To register a name server proxy, use the **fcns proxy-port** command in configuration mode.

fcns [proxy-port *wwn-id* **| [vsan** *vsan-id***]**

Syntax Description

wwn-id	The port WWN, with the format *hh:hh:hh:hh:hh:hh:hh:hh*.
vsan	Configures a proxy port for the specified VSAN.
vsan-id	The ID of the VSAN is from 1 to 4093.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

One name server can be configured to proxy another name server and name server information can be displayed using the CLI. The name server can be viewed using the CLI or the Cisco Fabric Manager.

All name server registration requests come from the same port whose parameter is registered or changed. If it doesn't, then the request is rejected.

Examples

The following example shows registering a name server proxy.

```
switch# config t
switch(config)#
switch(config)# fcns proxy-port 21:00:00:e0:8b:00:26:d
switch(config)#
```

The following example shows configuring a proxy port for VSAN 2.

```
switch(config)# fcns proxy-port 21:00:00:e0:8b:00:26:d vsan 2
switch(config)#
```

Related Commands

Command	Description
show fcns	Displays the name server database and statistical information for a specified VSAN or for all VSANs.

fcping

To ping an N port with a specified FC ID, use the **fcping fcid** command in EXEC mode.

fcping {**fcid** [*fc-port* | *domain-controller-id*] **vsan** *vsan-id* [**count** *number* | **timeout** *value* | **usr-priority**] | **pwwn** *wwn-id*}

Syntax Description

fc id	The FC ID of the destination N port.
fc-port	The port FC ID, with the format *0xhhhhhh*.
domain-controller-id	Verifies connection to the destination switch.
pwwn	The port WWN of the destination N port.
wwn-id	The port WWN, with the format *hh:hh:hh:hh:hh:hh:hh:hh*.
vsan	Configures the VSAN ID of the destination N port.
vsan-id	The ID of the VSAN is from 1 to 4093.
count	Configure the frames to send.
number	Specifies the number of frames to send. A value of 0 sends forever.
timeout	The timeout value.
usr-priority	The priority the frame receives in the switch fabric.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

To obtain the domain controller address, concatenate the domain ID with **FFFC**. For example, if the domain ID is **0xda**(218), the concatenated ID is **0xfffcda**.

Examples

The following example shows a fcping operation for the specified pWWN or the FCID of the destination. By default, five frames are sent.

```
switch# fcping fcid 0xd70000 vsan 1
28 bytes from  0xd70000  time = 730 usec
28 bytes from  0xd70000  time = 165 usec
28 bytes from  0xd70000  time = 262 usec
28 bytes from  0xd70000  time = 219 usec
28 bytes from  0xd70000  time = 228 usec

5 frames sent, 5 frames received, 0 timeouts
Round-trip min/avg/max = 165/270/730 usec
```

The following example shows the setting of the number of frames to be sent using the count option. The range is from 0 through 2147483647. A value of 0 will ping forever.

```
switch# fcping fcid 0xd70000 vsan 1 count 10
28 bytes from  0xd70000  time = 730 usec
28 bytes from  0xd70000  time = 165 usec
28 bytes from  0xd70000  time = 262 usec
28 bytes from  0xd70000  time = 219 usec
28 bytes from  0xd70000  time = 228 usec
28 bytes from  0xd70000  time = 230 usec
28 bytes from  0xd70000  time = 230 usec
28 bytes from  0xd70000  time = 225 usec
28 bytes from  0xd70000  time = 229 usec
28 bytes from  0xd70000  time = 183 usec

10 frames sent, 10 frames received, 0 timeouts
Round-trip min/avg/max = 165/270/730 usec
```

The following example shows the setting of the timeout value. The default period to wait is 5 seconds. The range is from 1 through 10 seconds.

```
switch# fcping fcid 0xd500b4 vsan 1 timeout 10
28 bytes from  0xd500b4  time = 1345 usec
28 bytes from  0xd500b4  time = 417 usec
28 bytes from  0xd500b4  time = 340 usec
28 bytes from  0xd500b4  time = 451 usec
28 bytes from  0xd500b4  time = 356 usec

5 frames sent, 5 frames received, 0 timeouts
Round-trip min/avg/max = 340/581/1345 usec
```

This command shows the `No response from the N port` message even when the N port or NL port is active. This is due to resource exhaustion at the N port or NL port. Retry the command a few seconds later.

```
switch# fcping fcid 0x010203 vsan 1
No response from the N port.

switch# fcping pwwn 21:00:00:20:37:6f:db:dd vsan 1
28 bytes from 21:00:00:20:37:6f:db:dd time = 1454 usec
28 bytes from 21:00:00:20:37:6f:db:dd time = 471 usec
28 bytes from 21:00:00:20:37:6f:db:dd time = 372 usec
28 bytes from 21:00:00:20:37:6f:db:dd time = 364 usec
28 bytes from 21:00:00:20:37:6f:db:dd time = 1261 usec

5 frames sent, 5 frames received, 0 timeouts
Round-trip min/avg/max = 364/784/1454 usec
```

fcroute

To configure Fibre Channel routes, use the **fcroute** command.

fcroute *FCID* **[***network_mask***] interface** *type* **[domain** *domain-id***| metric** *number* **| remote | vsan** *vsan-id***]**

Syntax Description

network_mask	Configures the FCID network mask.
interface	Configures the route for the specified Fibre Channel interface.
type	Specifies the Fibre Channel number or the PortChannel number.
domain	Configures the route for the domain of the next hop switch.
domain-id	Specifies the domain ID.
metric	Assigns the cost of the route.
number	Specifies the cost of the route. Default cost is 10.
vsan	Configures the static route for a specific VSAN.
vsan-id	The ID of the VSAN is from 1 to 4093.
remote	Configures the static route for a destination switch remotely connected.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Use this command to assign forwarding information to the switch.

Examples

```
switch# config t
switch(config)#
switch(config)# fcroute 0x111211 interface fc1/1 domain 3 vsan 2
switch(config)#
switch(config)# fcroute 0x111211 interface port-channel 1 domain 3 vsan 4
switch(config)#
switch(config)# fcroute 0x031211 interface fc1/1 domain 3 metric 1 vsan 1
switch(config-if)#
switch(config)# fcroute 0x111112 interface fc1/1 domain 3 metric 3 remote vsan 3
```

Related Commands

Command	Description
show fcroute	Displays Fibre Channel routes.

fcs

To perform platform and node name checking fabric wide, and register FCS attributes, use the **fcs** command in configuration mode.

fcs {plat-check-global vsan *vsan-id* **| register [exit | no | platform]** *name***}**

Syntax Description

plat-check-global vsan	Configures platform name or node name checking.
vsan-id	Specifies the VSAN ID for platform checking, which is from 1 to 4096.
register	Registers FCS attributes.
exit	Exits submode.
no	Negates a command or sets its defaults.
platform	Configures platform object registration.
name	Specifies name of the platform.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

```
switch## config t
switch(config)##
switch(config)# # fcs plat-check-global vsan 2
switch (config)# fcs register
switch (config-fcs-register)# platform Platform1
```

Related Commands

Command	Description
show fcs	Displays fabric configuration server information.

fcsp dhchap

To configure DHCHAP options in a switch, use the **fcsp dhchap** command in configuration mode. This command is only available when the FC-SP feature is enabled. Use the **no** form of the command to revert to factory defaults.

fcsp enable

fcsp dhchap
devicename *switch-wwn* **password [0 | 7 |]** *password* **|**
dhgroup [0 | 1| 2 | 3 | 4] |
hash [MD5 | SHA1] |
password [0 | 7 |] *password* **[wwn** *wwn-id* **]**

Syntax Description

fcsp enable	Enables the FC-SP feature in the switch.
dhchap	Configures DHCHAP parameters.
devicename	Configures a password of another device in the fabric
switch-wwn	Provides the WWN of the device being configured
dhgroup	Configures DHCHAP Diffie-Hellman group priority list.
0	Null DH—no exchange is performed (default).
**1| 2	3	4**	Specifies one or more of the groups specified by the standards.
hash	Configures DHCHAP Hash algorithm priority list in order of preference.
MD5	Specifies the MD5 Hash algorithm.
SHA1	Specifies the SHA-1 Hash algorithm
password	Configures DHCHAP password for the local switch.
0	Specifies a clear text password.
7	Specifies a password in encrypted text.
password	Provides the password with a maximum of 64 alphanumeric characters
WWN *wwn-id*	The WWN ID with the format hh:hh:hh:hh:hh:hh:hh:hh.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

You can only see the **fcsp dhchap** command if you issue the **fcsp enable** command.

Using SHA-1 as the hash algorithm may prevent RADIUS or TACACS+ usage.

If you change the DH group configuration, ensure to change it globally for all switches in the fabric.

Examples

The following example enables FC-SP.

```
switch## config t
switch(config)# # fcsp enable
switch (config)#
```

The following example configures the use of only the SHA-1 hash algorithm.

```
switch(config)# fcsp dhchap hash sha1
```

The following example configures the use of only the MD-5 hash algorithm.

```
switch(config)# fcsp dhchap hash MD5
```

The following example defines the use of the default hash algorithm priority list of MD-5 followed by SHA-1 for DHCHAP authentication.

```
switch(config)# fcsp dhchap hash md5 sha1
```

The following example reverts to the factory default priority list of the MD-5 hash algorithm followed by the SHA-1 hash algorithm.

```
switch(config)# no fcsp dhchap hash sha1
```

The following example prioritizes the use of DH group 2, 3, and 4 in the configured order.

```
switch(config)# fcsp dhchap group 2 3 4
```

The following example reverts to the DHCHAP factory default order of 0, 4, 1, 2, and 3 respectively.

```
switch(config)# no fcsp dhchap group 0
```

The following example configures a clear text password for the local switch.

```
switch(config)# fcsp dhchap password 0 mypassword
```

The following example configures a clear text password for the local switch to be used for the device with the specified WWN.

```
switch(config)# fcsp dhchap password 0 mypassword 30:11:bb:cc:dd:33:11:22
```

The following example removes the clear text password for the local switch to be used for the device with the specified WWN.

```
switch(config)# no fcsp dhchap password 0 mypassword 30:11:bb:cc:dd:33:11:22
```

The following example configures a password entered in an encrypted format for the local switch.

```
switch(config)# fcsp dhchap password 7 sfsfdf
```

The following example configures a password entered in an encrypted format for the local switch to be used for the device with the specified WWN.

```
switch(config)# fcsp dhchap password 7 sfsfdf 29:11:bb:cc:dd:33:11:22
```

The following example removes the password entered in an encrypted format for the local switch to be used for the device with the specified WWN.

```
switch(config)# no fcsp dhchap password 7 sfsfdf 29:11:bb:cc:dd:33:11:22
```

The following example configures a clear text password for the local switch to be used with any connecting device.

```
switch(config)# fcsp dhchap password mypassword1
```

The following example configures a password for another switch in the fabric which is identified by the Switch WWN device name.

```
switch(config)# fcsp dhchap devicename 00:11:22:33:44:aa:bb:cc password NewPassword
```

The following example removes the password entry for this switch from the local authentication database.

```
switch(config)# no fcsp dhchap devicename 00:11:22:33:44:aa:bb:cc password NewPassword
```

The following example configures a clear text password for another switch in the fabric which is identified by the Switch WWN device name.

```
switch(config)# fcsp dhchap devicename 00:11:55:66:00:aa:bb:cc password 0 NewPassword
```

The following example configures a password entered in an encrypted format for another switch in the fabric which is identified by the Switch WWN device name.

```
switch(config)# fcsp dhchap devicename 00:11:22:33:55:aa:bb:cc password 7 asdflkjh
```

Related Commands

Command	Description
show fcsp	Displays configured FC-SP information.

fcsp enable

To enable the Fibre Channel Security Protocol (FC-SP) in a switch, use the **fcsp enable** command in configuration mode. Further FC-SP commands are available when the FC-SP feature is enabled. To disable FC-SP, use the **no** form of this command.

fcsp enable

no fcsp enable

Syntax Descriptionf

fcsp	Specifies the FC-SP feature in the switch.
enable	Enables the FC-SP feature in this switch.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example enables FC-SP.

```
switch## config t
switch(config)# fcsp enable
switch (config)#
```

Related Commands

Command	Description
show fcsp	Displays configured FC-SP information.

fcsp timeout

To configure the timeout value for FC-SP message, use the **fcsp timeout** command in configuration mode. This command is only available when the FC-SP feature is enabled. Use the **no** form of the command to revert to factory defaults.

fcsp enable

fcsp timeout *timeout-period*]

Syntax Description

fcsp enable	Enables the FC-SP feature in the switch.
timeout *timeout-period*	Specifies the time out period. The time ranges from 20 to 100 seconds. The default is 30 seconds.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

You can only see the **fcsp timeout** command if you issue the **fcsp enable** command.

Examples

The following example configures the FCSP timeout value.

```
switch## config t
switch(config)# fcsp enable
switch (config)# fcsp timeout 60
```

Related Commands

Command	Description
show fcsp	Displays configured FC-SP information.

fctimer

To change the default Fibre Channel timers, use the **fctimer** command in configuration mode.

fctimer D_S_TOV *milliseconds* **[vsan** *vsan-id* **] | E_D_TOV** *milliseconds* **[vsan** *vsan-id* **] | R_A_TOV** *milliseconds* **[vsan** *vsan-id* **]**

Syntax Description

D_S_TOV	The distributed services time out value ranges from 5000 to 100000 ms.
E_D_TOV	The error detect time out value ranges from 1000 to 100000, with a default of 2000.
R_A_TOV	The resolution allocation time out value ranges from 5000 to 100000, with a default of 10000.
milliseconds	Number of milliseconds
vsan *vsan-id*	Configures the VSAN ID ranging from 1 to 4096.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

The Cisco MDS 9000, Brocade, and McData FC Error Detect (ED_TOV) and Resource Allocation (RA_TOV) timers default to the same values. They can be changed if needed. In accordance with the FC-SW2 standard, these values must be the same on each switch within in the fabric.

Use the vsan option to configure different TOV values for VSANs with special types of links like FC or IP tunnels.

Examples

The following examples show how to change the default Fibre Channel timers.

```
switch# config t
switch(config)#
switch(config)# fctimer e_d_tov ?
  <1000-100000>  E_D_TOV in milliseconds(1000-100000)
switch(config)# fctimer r_a_tov ?
  <5000-100000>  R_A_TOV in milliseconds(5000-100000)
```

Related Commands

Command	Description
show fctimer	Displays the configured Fibre Channel timer values.

fctrace

To trace the route to an N port, use the **fctrace** command in EXEC mode.

fctrace {fcid *fcid* **vsan** *vsan-id* [**timeout** *value]* | **pwwn** *pwwn-id* [**timeout** *value*]}

Syntax Description

fcid	The FCID of the destination N port.
fcid	The port FCID, with the format *0xhhhhhh*.
pwwn	The PWWN of the destination N port.
pwwn-id	The port WWN, with the format *hh:hh:hh:hh:hh:hh:hh:hh*.
vsan	Configures the VSAN ID of the destination N-port.
vsan-id	Specifies the VSAN ID of the destination N-port, which is from 1 to 4096.
timeout	Configures the timeout value.
value	Specifies the timeout value, which is from 1 to 10 seconds.

Defaults

By default, the period to wait before timing out is 5 seconds.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example traces a route to the specified fcid in VSAN 1.

```
switch# fctrace fcid 0x660000 vsan 1
Route present for :  0x660000
20:00:00:05:30:00:5f:1e(0xfffc65)
Latency: 0 msec
20:00:00:05:30:00:61:5e(0xfffc66)
Latency: 0 msec
20:00:00:05:30:00:61:5e(0xfffc66)
```

fc-tunnel

To terminate a Fibre Channel tunnel in a destination switch, use the **fc-tunnel** command. To remove a configuration or revert it to factory defaults, use the **no** form of the command.

fc-tunnel enable | explicit-path *name* **[next-address** *ip-address* **loose | strict] | tunnel-id-map** *tunnel-id* **interface fc** *slot-number*

no fc-tunnel enable | explicit-path *name* **[next-address** *ip-address* **loose | strict] | tunnel-id-map** *tunnel-id* **interface fc** *slot-number*

Syntax Description

enable	Enables the FC tunnel feature
explicit-path	Configure an explicit path.
name	Assigns a path for the explicit path.
next-address	Configures the IP address of the next hop switch.
ip-address	Specifies the IP address of the next hop switch.
loose	Specifies that a direct connection to the next hop is not required.
strict	Specifies that a direct connection to the next hop is required.
tunnel-id-map	Configure fc-tunnel id to outgoing interface.
interface fc	Configures the Fiber Channel interface in the destination switch.
slot-number	Specifies the slot number and port number.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

All VSANs with RSPAN traffic must be enabled. If a VSAN containing RSPAN traffic is not enabled, it will be dropped.

The FC tunnel can only be configured in the same subnet as the VSAN interface.

The Fibre Channel tunnel feature must be enabled (the **interface fc-tunnel** command) on *each* switch in the end-to-end path of the Fibre Channel fabric in which RSPAN is to be implemented

Examples

The following example enables the FC tunnel feature.

```
switch# config t
switchS(config)# fc-tunnel enable
```

The following example places you at the explicit path prompt for the path named Path 1and specifies that the next hop VSAN interface IP addresses.

```
switch# config t
switchS(config)# fc-tunnel explicit-path Path1
switchS(config-explicit-path)# next-address 10.10.10.2 strict
switchS(config-explicit-path)# next-address 10.10.10.3 strict
switchS(config-explicit-path)# next-address 10.10.10.4 strict
```

The following example places you at the explicit path prompt for the path named Path 3 and configures a minimum cost path in which this IP address exists.

```
switchS(config)# fc-tunnel explicit-path Path3
switchS(config-explicit-path)# next-address 10.10.10.3 loose
```

The following example configures the FC tunnel (100) in the destination switch (switch D).

```
switchD(config)# fc-tunnel tunnel-id-map 100 interface fc2/1
```

The following example creates two explicit paths and configures the next hop addresses for each path in the source switch (switch S).

```
switchS# config t
switchS(config)# fc-tunnel explicit-path Path1
switchS(config-explicit-path)# next-address 10.10.10.2 strict
switchS(config-explicit-path)# next-address 10.10.10.3 strict
switchS(config-explicit-path)# next-address 10.10.10.4 strict
switchS(config-explicit-path)# exit
switchS(config)# fc-tunnel explicit-path Path3
switchS(config-explicit-path)# next-address 10.10.10.3 loose
```

The following example references the configured path in the source switch (switch S).

```
switchS# config t
switchS(config)# interface fc-tunnel 100
switchS(config)# explicit-path Path1
```

Related Commands

Command	Description
show span session	Displays all SPAN session information.
show fc-tunnel tunnel-id-map	Displays FC tunnel egress mapping information

ficon swap

To enable the FICON feature in a specified VSAN, use the **ficon swap** command in configuration mode.

ficon swap portnumber *port-number port-number* **[after swap noshut]**

Syntax Description

swap	Swap two FICON ports.
portnumber	Configures the FICON port number for this interface.
port-number	Specifies the port numbers that must be swapped
after swap noshut	Initializes the port shut down after the ports are swapped.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The **ficon swap portnumber** *old-port-number new port-number* command causes all configuration associated with *old-port-number* and *new port-number* to be swapped, including VSAN configurations. This command is only associated with the two ports in concerned. You must issue this VSAN-independent command from the EXEC mode.

If you specify the **ficon swap portnumber after swap noshut** command, the ports will automatically be initialize.

Refer to the *Cisco MDS 9000 Family Configuration Guide* for further information.

Examples

The following example swaps the contents of ports 3 with port 15, shuts them down, and automatically initializes both ports.

```
switch# ficon swap portnumber 3 15 after swap noshut
```

The following example swaps the contents of ports 3 with port 15 and shuts them down.

```
switch# ficon swap portnumber 3 15
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.

ficon vsan

To configure FICON related parameters in EXEC mode, use the **ficon vsan** command.

ficon vsan *vsan-id* **apply file** *file-name* **| copy** *old-file-name new-file-name***| offline | online**

Syntax Description

vsan *vsan-id*	Enters the FICON configuration mode for the specified VSAN (from 1 to 4096).
apply file	Applies the specified FICON configuration file after switch initialization.
file-name	Specifies the existing FICON configuration file name.
copy	Makes a copy of the specified FICON configuration file.
old-file-name	Specifies the old (existing) FICON configuration file name
new-file-name	Specifies the new name for the copied file.
offline	

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

When an MDS switch is booting up with saved configuration, if FICON is enabled on a VSAN, the IPL configuration file is applied automatically by the SAN-OS software after the switch initialization is completed.

Use the **ficon vsan** *vsan-id* **copy file** *exiting-file-name save-as-file-name* command to copy an existing FICON configuration file. You can see the list of existing configuration files by issuing the **show ficon vsan** *vsan-id* command

Examples

The following example applies the configuration from the saved files to the running configuration.

```
switch# ficon vsan 2 apply file SampleFile
```

The following example copies an existing FICON configuration file called IPL and renames it to IPL3.

```
switch# ficon vsan 20 copy file IPL IPL3
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.

ficon vsan

To enable the FICON feature in a specified VSAN, use the **ficon vsan** command in configuration mode. To disable the feature or to revert to factory defaults, use the **no** form of the command.

ficon vsan *vsan-id*

Syntax Description

vsan *vsan-id*	Enters the FICON configuration mode for the specified VSAN (from 1 to 4096).

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

An IPL configuration file is automatically created

Once you enable FICON, you cannot disable in-order delivery, fabric binding, or static domain ID configurations.

When you disable FICON, the FICON configuration file is also deleted.

Examples

The following example is enables FICON on VSAN 2.

```
switch(config)# ficon vsan 2
```

The following example is disables FICON on VSAN 6.

```
switch(config)# no ficon vsan 6
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.

file

To access FICON configuration files in a specified VSAN, use the **file** command in configuration mode. To disable the feature or to revert to factory defaults, use the **no** form of the command.

file *file-name*

Syntax Description

file *file-name*	Creates or accesses the FICON configuration file in the specified VSAN

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The configuration file submode allows you to create and edit FICON configuration files. If a specified file does not exist, it is created. Up to 16 files can be saved. Each file name is restricted to 8 alphanumeric characters.

Examples

The following example accesses the FICON configuration file called IplFile1 for VSAN 2. If this file does not exist, it is created.

```
switch# config t
switch(config)# ficon vsan 2
switch(config-ficon)# file IplFile1
```

The following example deletes a previously-created FICON configuration file.

```
switch(config-ficon-file)# no file IplFileA
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.

find

To display a list of files on a file system, use the **find** command in EXEC mode.

find *filename*

Syntax Description

filename	Filenames with the specified characteristics.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Use the **find** (Flash file system) command to display more detail about the files in a particular file system.

Examples

The following example is sample output of all files that begin with the letter *a*:

```
switch# find a
./accountingd
./acl
./ascii_cfg_server
./arping
```

Related Commands

Command	Description
cd	Changes the default directory or file system.
dir	Displays all files in a given file system.

format

To erase all the information on a module, use the **format** command in EXEC mode.

format {bootflash: | slot0:}

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

The SAN-OS software only supports Cisco-certified CompactFlash devices that are formatted using Cisco MDS switches. Using uncertified CompactFlash devices may result in unpredictable consequences; formatting CompactFlash devices using other platforms may result in errors.

Examples

The following example erases all information on a module's bootflash.

```
switch# format bootflash:
```

fspf config

To configure an FSPF feature for the entire VSAN, and to enable or disable FSPF, use the **fspf config** command in configuration mode. To delete FSPF configuration for the entire VSAN, and to enable or disable FSPF routing protocols, use the **no** form of the command.

fspf config vsan *vsan-id* | **enable vsan** *vsan-id*

no fspf config vsan *vsan-id* | **enable vsan** *vsan-id*

Syntax Description

vsan *vsan-id*	Enters FSPF global configuration mode for the specified VSAN or range of VSANs. If no VSAN ID is specified, the default VSAN is selected.
fspfenable vsan	Enables FSPF on the entire VSAN.
vsan-id	The ID of the VSAN is from 1 to 4093.
region	Defines the autonomous region to which the switch belongs.
region-id	Specifies the autonomous region to which the switch belongs. The backbone region has *region-id*=0. The parameter *region-id* is an unsigned integer value ranging from 0 to 255.
spf hold-time	Configures the time between two consecutive SPF computations. If the time is small then routing will react faster to changes but CPU usage will be more.
spf-holdtime	Specifies the time between two consecutive SPF computations. The parameter *spf-holdtime* is an integer (0-65535) specifying time in milliseconds.
min-ls-arrival	Configures the minimum time before a new link state update for a domain will be accepted by switch.
ls-arrival-time	Specifies the minimum time before a new link state update for a domain will be accepted by switch. The parameter *ls-arrival-time* is an integer (0-65535) specifying time in milliseconds.
min-ls-interval	Configures the minimum time before a new link state update for a domain will be generated by the switch.
ls-interval-time	Specifies the minimum time before a new link state update for a domain will be generated by the switch. The parameter *ls-interval-time* is an integer (0-65535) specifying time in milliseconds.

Defaults

In Configuration mode, the default is enabled.

In the FSPF configuration mode, the default is dynamic.

If configuring spf hold-time, the default value for FSPF is 0.

If configuring min-ls-arrival, the default value for FSPF is 1000 msecs.

If configuring min-ls-interval, the default value for FSPF is 5000 msecs.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

This command configures FSPF on VSANs globally.

For the commands issued in FSPF configuration mode, you do not have to specify the VSAN number every time. This prevents configuration errors that might result from specifying the wrong VSAN number for these commands.

Examples

The following example configures FSPF globally in VSAN 1, deletes the FSPF configured in VSAN 3, disables FSPF in VSAN 5, and enables FSPF in VSAN 7.

```
switch## config t
switch(config)#
switch(config)# fspf config vsan 1
switch-config-(fspf-config)#
switch-config-(fspf-config)# exit
switch(config)#
switch(config)# no fspf config vsan 3
switch(config)#
switch(config)# no fspf enable vsan 5
switch(config)#
switch(config)# fspf enable vsan 7
switch(config)#
```

Related Commands

Command	Description
show fspf interface	Displays information for each selected interface.
fspf enable	Enables FSPF routing protocol in the specified VSAN (from the `switch(config-if)#` prompt).
fspf cost	Configures the cost for the selected interface in the specified VSAN (from the `switch(config-if)#` prompt).
fspf hello-interval	Specifies the hello message interval to verify the health of a link in the VSAN (from the `switch(config-if)#` prompt).
fspf passive	Disables the FSPF protocol for the specified interface in the specified VSAN (from the `switch(config-if)#` prompt).
fspf retrasmit	Specifies the retransmit time interval for unacknowledged link state updates in specified VSAN (from the `switch(config-if)#` prompt).

fspf cost

To configure FSPF link cost for the entire VSAN, use the **fspf cost** command. To delete this configuration, or negate this feature, use the **no** form of the command.

fspf cost *link_cost* **vsan** *vsan-id*

no fspf cost *link_cost* **vsan** *vsan-id*

Syntax Description

fspf	Configures FSPF parameters.
cost	Configures FSPF link cost.
link-cost	Enters FSPF link cost from 1 to 65535.
vsan *vsan-id*	Enters FSPF global configuration mode for the specified VSAN or range of VSANs from 1 to 4096. If no VSAN ID is specified, the default VSAN is selected.

Defaults

Enabled.

Command Modes

Configuration mode

Command History

This command was modified in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

This command configures FSPF for the specified FCIP interface.

Examples

```
switch# config t
switch(config)# interface fcip 1
switch(config-if)# fspf cost 5000 vsan 1
```

Related Commands

Command	Description
show fspf interface	Displays information for each selected interface.
show interface fcip	Displays an interface configuration for a specified FCIP interface.

fspf dead-interval

To set the maximum interval for which a hello message must be received before the neighbor is considered lost, use the **fspf dead-interval** command. To delete this configuration, or negate this feature, use the **no** form of the command.

fspf dead-interval *seconds* **vsan** *vsan-id*

no fspf dead-interval *seconds* **vsan** *vsan-id*

Syntax Description

fspf	Configures FSPF parameters.
dead-interval	Configures FSPF dead interval.
seconds	Specifies interval in seconds from 2 to 65535.
vsan *vsan-id*	Enters FSPF global configuration mode for the specified VSAN or range of VSANs from 1 to 4096. If no VSAN ID is specified, the default VSAN is selected.

Defaults

Enabled.

Command Modes

Configuration mode

Command History

This command was modified in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

This command configures FSPF for the specified FCIP interface.

Examples

```
switch# config t
switch(config)# interface fcip 1
switch(config-if)# fspf dead-interval 4000 vsan 1
```

Related Commands

Command	Description
show fspf interface	Displays information for each selected interface.
show interface fcip	Displays an interface configuration for a specified FCIP interface.

fspf hello-interval

To verify the health of the link, use the **fspf hello-interval** command. To delete this configuration, or negate this feature, use the **no** form of the command.

fspf hello-interval *seconds* **vsan** *vsan-id*

no fspf hello-interval *seconds* **vsan** *vsan-id*

Syntax Description

fspf	Configures FSPF parameters.
hello-interval	Configures FSPF hello-interval.
seconds	Specifies interval in seconds from 2 to 65535.
vsan *vsan-id*	Enters FSPF global configuration mode for the specified VSAN or range of VSANs from 1 to 4096. If no VSAN ID is specified, the default VSAN is selected.

Defaults

Enabled.

Command Modes

Configuration mode

Command History

This command was modified in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

This command configures FSPF for the specified FCIP interface.

Examples

```
switch# config t
switch(config)# interface fcip 1
switch(config-if)# fspf hello-interval 3 vsan 1
```

Related Commands

Command	Description
show fspf interface	Displays information for each selected interface.
show interface fcip	Displays an interface configuration for a specified FCIP interface.

fspf passive

To disable the FSPF protocol for selected interfaces, use the **fspf passive** command. To delete this configuration, or negate this feature, use the **no** form of the command.

fspf passive vsan *vsan-id*

no fspf passive vsan *vsan-id*

Syntax Description

fspf	Configures FSPF parameters.
passive	Enables or disables FSPF on the interface.
vsan *vsan-id*	Enters FSPF global configuration mode for the specified VSAN or range of VSANs from 1 to 4096. If no VSAN ID is specified, the default VSAN is selected.

Defaults

Enabled.

Command Modes

Configuration mode

Command History

This command was modified in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

This command configures FSPF for the specified FCIP interface.

Examples

```
switch# config t
switch(config)# interface fcip 1
switch(config-if)# fspf passive vsan 1
```

Related Commands

Command	Description
show fspf interface	Displays information for each selected interface.
show interface fcip	Displays an interface configuration for a specified FCIP interface.

fspf retransmit-interval

To specify the time after which an unacknowledged link state update should be transmitted on the interface, use the **fspf retransmit-interval** command. To delete this configuration, or negate this feature, use the **no** form of the command.

fspf retransmit-interval *seconds* **vsan** *vsan-id*

no spf retransmit-interval *seconds* **vsan** *vsan-id*

Syntax Description

fspf	Configures FSPF parameters.
retransmit-interval	Configures FSPF retransmit interface from 1 to 65535.
seconds	Specifies interval in seconds from 2 to 65535.
vsan *vsan-id*	Enters FSPF global configuration mode for the specified VSAN or range of VSANs from 1 to 4096. If no VSAN ID is specified, the default VSAN is selected.

Defaults

Enabled.

Command Modes

Configuration mode

Command History

This command was modified in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

This command configures FSPF for the specified FCIP interface.

Examples

```
switch# config t
switch(config)# interface fcip 1
switch(config-if)# fspf retransmit-interval 6 vsan 1
```

Related Commands

Command	Description
show fspf interface	Displays information for each selected interface.
show interface fcip	Displays an interface configuration for a specified FCIP interface.

G Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "About the CLI Command Modes" section on page 1-3 to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

gzip

To compress (zip) a specified file using LZ77 coding, use the **gzip** command in EXEC mode.

gzip [bootflash: | slot0: | volatile:] *filename*

Syntax Description

bootflash:	Source or destination location for the file to be compressed.
slot0:	Source or destination location for file to be compressed.
volatile:	Source or destination location for file to be compressed. This is the default directory.
filename	The name of the file to be compressed.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

This command is useful in compressing large files. The output of the **show tech-support** command can directed to a file and compressed for further use.

Examples

This example directs the output of the **show tech-support** command to a file (Samplefile) and then zips the file and displays the difference in the space used up in the volatile: directory:

```
switch# show tech-support > Samplefile
Building Configuration ...
switch# dir
    1525859     Jul 04 00:51:03 2003  Samplefile
Usage for volatile://
    1527808 bytes used
   19443712 bytes free
   20971520 bytes total
switch# gzip volatile:Samplefile
switch# dir
     266069     Jul 04 00:51:03 2003  Samplefile.gz
Usage for volatile://
     266240 bytes used
   20705280 bytes free
   20971520 bytes total
```

Related Commands

Command	Description
gunzip	Uncompresses LZ77 coded files.

gunzip

To un compress (unzip) LZ77 coded files, use the **gzip** command in EXEC mode.

gunzip [bootflash: | slot0: | volatile:] *filename*

Syntax Description

bootflash:	Source or destination location for the compressed file.
slot0:	Source or destination location for the compressed file.
volatile:	Source or destination location for the compressed file. This is the default directory.
filename	The name of the compressed file.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

This command is useful in uncompressing large files.

Examples

This example unzips a compressed file and displays the space used:

```
switch# gunzip Samplefile
switch# dir
    1525859     Jul 04 00:51:03 2003 Samplefile
Usage for volatile://
    1527808 bytes used
   19443712 bytes free
   20971520 bytes total
```

Related Commands

Command	Description
gzip	Compresses a specified file using LZ77 coding.

H Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "About the CLI Command Modes" section on page 1-3 to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

host

Use the **host** command to configure the switch offline state, the mainframe access control parameters, and the mainframe time stamp parameters. To disable the configuration or to revert to factory defaults, use the **no** form of the command.

host control switch offline | port control | set-timestamp

Syntax Description

host	Enables host control of the FICON configurations
control switch offline	Allows the host to move the switch to an offline state and shut down the ports (default).
port control	Enables the host to configure FICON parameters.
set-timestamp	Allows the host to set the director clock

Defaults

Enabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

By default, the clock in each VSAN is the same as the switch hardware clock. Mainframe users are allowed to change the VSAN-clock.

Examples

The following example prohibits mainframe users from moving the switch to an offline state.

```
switch# config t
switch(config)# ficon vsan 2
switch(config-ficon)# no host control switch offline
```

The following example allows the host to move the switch to an offline state and shut down the ports (default).

```
switch(config-ficon)# host control switch offline
```

The following example prohibits mainframe users to configure FICON parameters in the Cisco MDS switch.

```
switch(config-ficon)# no host port control
```

The following example allows mainframe users to configure FICON parameters in the Cisco MDS switch (default).

```
switch(config-ficon)# host port control
```

The following example prohibits mainframe users from changing the VSAN-specific clock.

```
switch(config-ficon)# no host set-timestamp
```

The following example allows the host to set the clock on this switch (default).

```
switch(config-ficon)# host set-timestamp
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.
ficon vsan *vsan-id*	Enables FICON on the specified VSAN.

I Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

in-order-guarantee

To enable in-order delivery in the Cisco MDS 9000 Family of switches, use the **in-order-guarantee** command in configuration mode. To disable in-order delivery, use the **no** form of the command.

in-order-guarantee

no in-order-guarantee

Syntax Description

This command has no arguments or keywords.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

In-order delivery of data frames guarantees frame delivery to a destination in the same order that they were sent by the originator.

Examples

The following example shows how to enable in-order delivery.

```
switch## config t
switch(config)#
switch(config)# in-order-guarantee
switch(config)#
switch(config)# no in-order-guarantee
switch(config)#
```

install all

To upgrade all modules in any Cisco MDS 9000 family switch, use the **install all** command. This upgrade can happen nondisruptively or disruptively depending on the current configuration of your switch.

install all asm-sfn | kickstart | system *URL*

Syntax Description

install all	Upgrades the system.
asm-sfn	Upgrades the ASM image.
system	Upgrades the system image.
kickstart	Upgrades the kickstart image.
URL	The location URL of the source file to be installed.

The following table lists the aliases for *URL*.

bootflash:	Source location for internal bootflash memory.
slot0:	Source location for the CompactFlash memory or PCMCIA card.
volatile:	Source location for the volatile file system.
tftp:	Source location for a Trivial File Transfer Protocol (TFTP) network server. The syntax for this URL is **tftp:[[//location]/directory]/filename**.
ftp:	Source location for a File Transfer Protocol (FTP) network server. The syntax for this URL is **ftp:[[//location]/directory]/filename**.
sftp:	Source location for a Secure Trivial File Transfer Protocol (SFTP) network server. The syntax for this URL is **sftp:[[//<username@>location]/directory]/filename**.
scp:	Source location for a Secure Copy Protocol (SCP) network server. The syntax for this URL is **scp:[[//location]/directory]/filename**.
image-filename	The name of the source image file.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

The **install all** command upgrades all modules in any Cisco MDS 9000 Family switch.

To copy a remote file, specify the entire remote path exactly as it is.

Caution If a switchover is required when you issue the **install all** command from a Telnet or SSH session, all open sessions are terminated. If no switchover is required, the session remains unaffected. The software issues a self-explanatory warning at this point and provides the option to continue or terminate the installation.

See the *Cisco MDS 9000 Family Configuration Guide* for detailed procedures.

Examples

The following example displays the result of the **install all** command if the system and kickstart files are specified locally.

```
Hacienda# install all sys bootflash:isan-1.3.1 kickstart bootflash:boot-1.3.1

Verifying image bootflash:/boot-1.3.1
[####################] 100% -- SUCCESS

Verifying image bootflash:/isan-1.3.1
[####################] 100% -- SUCCESS

Extracting "slc" version from image bootflash:/isan-1.3.1.
[####################] 100% -- SUCCESS

Extracting "ips" version from image bootflash:/isan-1.3.1.
[####################] 100% -- SUCCESS

Extracting "system" version from image bootflash:/isan-1.3.1.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image bootflash:/boot-1.3.1.
[####################] 100% -- SUCCESS

Extracting "loader" version from image bootflash:/boot-1.3.1.
[####################] 100% -- SUCCESS



Compatibility check is done:
Module  bootable          Impact  Install-type  Reason
------  --------  --------------  ------------  ------
     1       yes  non-disruptive       rolling
     2       yes      disruptive       rolling  Hitless upgrade is not supported
     3       yes      disruptive       rolling  Hitless upgrade is not supported
     4       yes  non-disruptive       rolling
     5       yes  non-disruptive         reset
     6       yes  non-disruptive         reset



Images will be upgraded according to following table:
Module       Image       Running-Version           New-Version  Upg-Required
------  ----------  --------------------  --------------------  ------------
     1         slc               1.3(2a)               1.3(1)           yes
     1        bios      v1.1.0(10/24/03)      v1.1.0(10/24/03)            no
     2         ips               1.3(2a)               1.3(1)           yes
     2        bios      v1.1.0(10/24/03)      v1.1.0(10/24/03)            no
     3         ips               1.3(2a)               1.3(1)           yes
     3        bios      v1.1.0(10/24/03)      v1.1.0(10/24/03)            no
     4         slc               1.3(2a)               1.3(1)           yes
     4        bios      v1.1.0(10/24/03)      v1.1.0(10/24/03)            no
     5      system               1.3(2a)               1.3(1)           yes
```

```
      5   kickstart              1.3(2a)              1.3(1)          yes
      5        bios      v1.1.0(10/24/03)      v1.1.0(10/24/03)        no
      5      loader               1.2(2)               1.2(2)          no
      6      system              1.3(2a)              1.3(1)          yes
      6   kickstart              1.3(2a)              1.3(1)          yes
      6        bios      v1.1.0(10/24/03)      v1.1.0(10/24/03)        no
      6      loader               1.2(2)               1.2(2)          no

Do you want to continue with the installation (y/n)?  [n] y

Install is in progress, please wait.

Syncing image bootflash:/boot-1.3.1 to standby.
[####################] 100% -- SUCCESS

Syncing image bootflash:/isan-1.3.1 to standby.
[####################] 100% -- SUCCESS
Jan 18 23:40:03 Hacienda %VSHD-5-VSHD_SYSLOG_CONFIG_I: Configuring console from

Performing configuration copy.
[####################] 100% -- SUCCESS

Module 6: Waiting for module online.
|
Auto booting bootflash:/boot-1.3.1 bootflash:/isan-1.3.1...
Booting kickstart image: bootflash:/boot-1.3.1....
.....................................Image verification OK

Starting kernel...
INIT: version 2.78 booting
Checking all filesystems..r.r.. done.
Loading system software
Uncompressing system image: bootflash:/isan-1.3.1
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCC
INIT: Entering runlevel: 3
```

The following example displays the file output continuation of the **install all** command on the console of the standby supervisor module.

```
Hacienda(standby)#

Auto booting bootflash:/boot-1.3.1 bootflash:/isan-1.3.1...
Booting kickstart image: bootflash:/boot-1.3.1....
.....................................Image verification OK

Starting kernel...
INIT: version 2.78 booting
Checking all filesystems..r.r.. done.
Loading system software
Uncompressing system image: bootflash:/isan-1.3.1
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCC
INIT: Entering runlevel: 3


Continue on installation process, please wait.
The login will be disabled until the installation is completed.

Module 6: Waiting for module online.
Jan 18 23:43:02 Hacienda %PORT-5-IF_UP: Interface mgmt0 is up
Jan 18 23:43:19 Hacienda %LICMGR-3-LOG_LIC_NO_LIC: No license(s) present for feature
FM_SERVER_PKG. Application(s) shutdown in 53 days.
```

```
Jan 18 23:43:19 Hacienda %LICMGR-3-LOG_LIC_NO_LIC: No license(s) present for feature
ENTERPRISE_PKG. Application(s) shutdown in 50 days.
Jan 18 23:43:19 Hacienda %LICMGR-3-LOG_LIC_NO_LIC: No license(s) present for feature
SAN_EXTN_OVER_IP. Application(s) shutdown in 50 days.
Jan 18 23:43:19 Hacienda %LICMGR-3-LOG_LICAPP_NO_LIC: Application port-security running
without ENTERPRISE_PKG license, shutdown in 50 days
Jan 18 23:43:19 Hacienda %LICMGR-4-LOG_LICAPP_EXPIRY_WARNING: Application Roles evaluation
license ENTERPRISE_PKG expiry in 50 days
Jan 18 23:44:54 Hacienda %BOOTVAR-5-NEIGHBOR_UPDATE_AUTOCOPY: auto-copy supported by
neighbor, starting...

Module 1: Non-disruptive upgrading.
[#                   ]   0%Jan 18 23:44:56 Hacienda %MODULE-5-STANDBY_SUP_OK: Supervisor 5
is standby
Jan 18 23:44:55 Hacienda %IMAGE_DNLD-SLOT1-2-IMG_DNLD_STARTED:  Module image download
process. Please wait until completion...
Jan 18 23:45:12 Hacienda %IMAGE_DNLD-SLOT1-2-IMG_DNLD_COMPLETE:  Module image download
process. Download successful.
Jan 18 23:45:48 Hacienda %MODULE-5-MOD_OK: Module 1 is online
[####################] 100% -- SUCCESS

Module 4: Non-disruptive upgrading.
[#                   ]   0%Jan 18 23:46:12 Hacienda %IMAGE_DNLD-SLOT4-2-IMG_DNLD_STARTED:
Module image download process. Please wait until completion...
Jan 18 23:46:26 Hacienda %IMAGE_DNLD-SLOT4-2-IMG_DNLD_COMPLETE:  Module image download
process. Download successful.
Jan 18 23:47:02 Hacienda %MODULE-5-MOD_OK: Module 4 is online
[####################] 100% -- SUCCESS

Module 2: Disruptive upgrading.
...
-- SUCCESS

Module 3: Disruptive upgrading.
...
 -- SUCCESS

Install has been successful.

MDS Switch
Hacienda login:
```

The following example displays the result of the **install all** command if the system and kickstart files are specified remotely.

```
switch# install all system
scp://user@171.69.16.26/tftpboot/HKrel/qa/vegas/final/m9500-sf1ek9-mz.1.3.2a.bin kickstart
scp://user@171.69.16.26/tftpboot/HKrel/qa/vegas/final/m9500-sf1ek9-kickstart-mz.1.3.2a.bin
For scp://user@171.69.16.26, please enter password:
For scp://user@171.69.16.26, please enter password:

Copying image from
scp://user@171.69.16.26/tftpboot/HKrel/qa/vegas/final/m9500-sf1ek9-kickstart-mz.1.3.2a.bin
to bootflash:///m9500-sf1ek9-kickstart-mz.1.3.2a.bin.
[####################] 100% -- SUCCESS

Copying image from
scp://user@171.69.16.26/tftpboot/HKrel/qa/vegas/final/m9500-sf1ek9-mz.1.3.2a.bin to
bootflash:///m9500-sf1ek9-mz.1.3.2a.bin.
[####################] 100% -- SUCCESS

Verifying image bootflash:///m9500-sf1ek9-kickstart-mz.1.3.2a.bin
[####################] 100% -- SUCCESS
```

```
Verifying image bootflash:///m9500-sf1ek9-mz.1.3.2a.bin
[####################] 100% -- SUCCESS

Extracting "slc" version from image bootflash:///m9500-sf1ek9-mz.1.3.2a.bin.
[####################] 100% -- SUCCESS

Extracting "ips" version from image bootflash:///m9500-sf1ek9-mz.1.3.2a.bin.
[####################] 100% -- SUCCESS

Extracting "system" version from image bootflash:///m9500-sf1ek9-mz.1.3.2a.bin.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image
bootflash:///m9500-sf1ek9-kickstart-mz.1.3.2a.bin.
[####################] 100% -- SUCCESS

Extracting "loader" version from image bootflash:///m9500-sf1ek9-kickstart-mz.1.3.2a.bin.
[####################] 100% -- SUCCESS



Compatibility check is done:
Module  bootable          Impact  Install-type  Reason
------  --------  --------------  ------------  ------
     1       yes  non-disruptive       rolling
     2       yes      disruptive       rolling  Hitless upgrade is not supported
     3       yes  non-disruptive       rolling
     4       yes  non-disruptive       rolling
     5       yes  non-disruptive         reset
     6       yes  non-disruptive         reset
     7       yes  non-disruptive       rolling
     8       yes  non-disruptive       rolling
     9       yes      disruptive       rolling  Hitless upgrade is not supported



Images will be upgraded according to following table:
Module       Image       Running-Version           New-Version  Upg-Required
------  ----------  --------------------  --------------------  ------------
     1         slc                1.3(1)                1.3(2a)           yes
     1        bios      v1.1.0(10/24/03)      v1.0.8(08/07/03)            no
     2         ips                1.3(1)                1.3(2a)           yes
     2        bios      v1.1.0(10/24/03)      v1.0.8(08/07/03)            no
     3         slc                1.3(1)                1.3(2a)           yes
     3        bios      v1.1.0(10/24/03)      v1.0.8(08/07/03)            no
     4         slc                1.3(1)                1.3(2a)           yes
     4        bios      v1.1.0(10/24/03)      v1.0.8(08/07/03)            no
     5      system                1.3(1)                1.3(2a)           yes
     5   kickstart                1.3(1)                1.3(2a)           yes
     5        bios      v1.1.0(10/24/03)      v1.0.8(08/07/03)            no
     5      loader                1.2(2)                 1.2(2)            no
     6      system                1.3(1)                1.3(2a)           yes
     6   kickstart                1.3(1)                1.3(2a)           yes
     6        bios      v1.1.0(10/24/03)      v1.0.8(08/07/03)            no
     6      loader                1.2(2)                 1.2(2)            no
     7         slc                1.3(1)                1.3(2a)           yes
     7        bios      v1.1.0(10/24/03)      v1.0.8(08/07/03)            no
     8         slc                1.3(1)                1.3(2a)           yes
     8        bios      v1.1.0(10/24/03)      v1.0.8(08/07/03)            no
     9         ips                1.3(1)                1.3(2a)           yes
     9        bios      v1.1.0(10/24/03)      v1.0.8(08/07/03)            no

Do you want to continue with the installation (y/n)?  [n]
```

Related Commands

Command	Description
install module bios	Upgrades the supervisor or switching module BIOS.
install module loader	Upgrades the bootloader on the active or standby supervisor or modules.

install license

To program the supervisor or switching module BIOS, use the **install license** command.

install license [bootflash: | slot0: | volatile:] *file-name*

Syntax Description

install license	Upgrades the BIOS for a supervisor or switching module.
bootflash:	Source location for the license file.
slot0:	Source location for the license file.
volatile:	Source location for the license file.
file-name	The name of the license file.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

If a target file name is provided after the source URL, the license file is installed with that name. Otherwise, the filename in the source URL is used. This command also verifies the license file before installing it.

Examples

The following example installs a file named license-file which resides in the bootflash: directory..

```
switch# install license bootflash:license-file
```

install module bios

To program the supervisor or switching module BIOS, use the **install module bios system** command.

install module *module-number* **bios {system [bootflash: | slot0: | volatile: |** *system-image***]}**

Syntax Description

install module	Upgrades the BIOS for a supervisor or switching module.
module-number	From slot 1 to 9 in a Cisco MDS 9500 Series switch. From slot 1 to 2 in a Cisco MDS 9200 Series switch.
bios	Configures the BIOS in the specified module.
system	Specifies the system image to use (optional). If system is not specified, the current running image is used.
bootflash:	Source location for internal bootflash memory
slot0:	Source location for the CompactFlash memory or PCMCIA card.
volatile:	Source location for the volatile file system.
system-image	The name of the system or kickstart image.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(3).

Usage Guidelines

If the BIOS is upgraded, you need to reboot to make the new BIOS effective. You can schedule the reboot at a convenient time so traffic will not be impacted.

The console baud rate automatically reverts to the default rate (9600) after any BIOS upgrade.

The URL is always the system image URL in the supervisor module, and points to the bootflash: or slot0: directories.

Examples

The following example shows how to perform a non disruptive upgrade for the system.

```
switch# install module 1 bios
Started bios programming .... please wait
###
BIOS upgrade succeeded for module 1
```

In this example, the switching module in slot 1 was updated.

install module epld

To upgrade the electrically programmable logical devices (EPLDs) module, use the **install module epld** command. This command is only for supervisor modules, not switching modules.

install module *module-number* **epld [bootflash: |ftp: | scp: | sftp: | tftp: | volatile:]**

Syntax Description

install module	Upgrades the BIOS for a supervisor or switching module.
module-number	Enters the number for the standby supervisor modules or any other line card.
epld	Upgrades the EPLD images on the specified module.
bootflash:	Source location for internal bootflash memory.
ftp	Local/Remote URI containing EPLD Image.
scp	Local/Remote URI containing EPLD Image.
sftp	Local/Remote URI containing EPLD Image.
tftp	Local/Remote URI containing EPLD Image.
volatile:	Source location for the volatile file system.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

Issue this command from the active supervisor module to update any other module.

If you forcefully upgrade a module that is not online, all EPLDs are forcefully upgraded. If the module is not present in the switch, an error is returned. If the module is present, the command process continues.

Do not insert or extract any modules while an EPLD upgrade or downgrade is in progress.

Examples

The following example upgrades the EPLDs for the module in slot 2.

```
switch# install module 2 epld scp://user@10.6.16.22/users/dino/epld.img

The authenticity of host '10.6.16.22' can't be established.
RSA1 key fingerprint is 55:2e:1f:0b:18:76:24:02:c2:3b:62:dc:9b:6b:7f:b7.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.6.16.22' (RSA1) to the list of known hosts.
user@10.6.16.22's password:
epld.img             100% |*****************************|  1269 KB    00:00

Module Number                                       2
EPLD                              Curr Ver     New Ver
-----------------------------------------------------
Power Manager                        0x06
XBUS IO                              0x07        0x08
UD chip Fix                          0x05
Sahara                               0x05        0x05

Module 2 will be powered down now!!
Do you want to continue (y/n) ? y
\ <-----------------------------------------------------------progress twirl
Module 2 EPLD upgrade is successful
```

The following example forcefully upgrades the EPLDs for the module in slot 2.

```
switch# install module 2 epld scp://user@10.6.16.22/epld-img-file-path

Module 2 is not online, Do you want to continue (y/n) ? y
cchetty@171.69.16.22's password:
epld.img             100% |*****************************|  1269 KB    00:00
\ <-----------------------------------------------------------progress twirl
Module 2 EPLD upgrade is successful
```

Related Commands

Command	Description
show version module *number* **epld**	Displays the current EPLD versions.
show version epld	Displays the available EPLD versions.

install module loader

To upgrade the bootloader on either the active or standby supervisor module, use the **install module loader** command. This command is only for supervisor modules, not switching modules.

install module *module-number* **loader kickstart [bootflash: | slot0: | volatile: |** *kickstart-image***]**

Syntax Description

install module	Upgrades the BIOS for a supervisor or switching module.
module-number	Enters the module number for the active or standby supervisor modules (only slot 5 or 6).
loader	Configures the bootloader.
kickstart	Specifies the kickstart image to use.
bootflash:	Source location for internal bootflash memory
slot0:	Source location for the CompactFlash memory or PCMCIA card.
volatile:	Source location for the volatile file system.
kickstart-image	The name of the kickstart image.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(3).

Usage Guidelines

Before issuing the **install module loader** command, be sure to read the release notes to verify compatibility issues between the boot loader and the kickstart or system images.

If you install a loader version that is the same as the currently-installed version, the loader will not be upgraded. When both the current version and the installed version are the same, use the **init system** command to force a loader upgrade.

Examples

The following example shows how to perform a non disruptive upgrade for the system.

```
switch# install module 6 loader bootflash:kickstart_image
```

This example displays the command being issued on the standby supervisor module in slot 6.

Related Commands

Command	Description
show version	Verify the output before and after the upgrade.

interface

To configure an interface on the Cisco MDS 9000 Family of switches, use the **interface** command in configuration mode. To disable an interface, use the **no** form of the command.

interface cpp | fc | fc-tunnel | fcip | gigabitethernet | iscsi | mgmt | port-channel | vsan

no interface cpp | fc | fc-tunnel | fcip | gigabitethernet | iscsi | mgmt | port-channel | vsan

Syntax Description

cpp	Configures a Control Plane Process (CPP) interface for the Advanced Services Module (ASM)—see the interface cpp command.
fc	Configures a Fiber Channel interface—see the interface fc command.
fc-tunnel	Configures a Fiber Channel link interface—see the interface fc-tunnel command.
fcip	Configures a Fibre Channel over IP (FCIP) interface—see the interface fcip command.
gigabitethernet	Configures a Gigabit Ethernet interface—see the interface gigabitethernet command.
iscsi	Configures an iSCSI interface—see the interface iscsi command.
mgmt	Configures a management interface—see the interface mgmt command.
port-channel	Configures a PortChannel interface—see the interface port-channel command.
vsan	Configures a VSAN interface—see the interface vsan command.

Defaults

Disabled.

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

You can specify a range of interfaces by issuing a command with the following example format:

interface fc1/1 - 5 , fc2/5 - 7

The spaces are required before and after the dash (-) and before and after the comma (,).

Examples

The following example displays the options for the interface command.

```
switch## config t
switch(config)# interface ?
  cpp              Virtualization IPFC interface
  fc               Fiber Channel interface
  fc-tunnel        Fc-tunnel interface
  fcip             Fcip interface
```

```
gigabitethernet  Ethernet interface
iscsi            ISCSI interface
mgmt             Management interface
port-channel     Port Channel interface
sup-fc           Inband Interface
vsan             IPFC VSAN interface
```

Related Commands

Command	Description
show interface	Displays an interface configuration for a specified interface.

interface fc

To configure a Fibre Channel interface on the Cisco MDS 9000 Family of switches, use the **interface fc** command. To disable a Fibre Channel interface, use the **no** form of the command.

interface fc *slot_number* **[channel-group** *number* **force] | [fcdomain rcf-reject vsan** *vsan-id]* **| [fspf cost** *link_cost* **vsan** *vsan-id* **| ficon portnumber** *portnumber* **| dead-interval** *seconds* **vsan** *vsan-id* **| hello-interval** *seconds* **vsan** *vsan-id* **| passive vsan** *vsan-id* **| retransmit-interval** *seconds* **vsan** *vsan-id***]**

no interface fc *slot_number* **[channel-group** *number* **force] | [fcdomain rcf-reject vsan** *vsan-id]* **| [fspf cost** *link_cost* **vsan** *vsan-id* **| ficon portnumber** *portnumber* **| dead-interval** *seconds* **vsan** *vsan-id* **| hello-interval** *seconds* **vsan** *vsan-id* **| passive vsan** *vsan-id* **| retransmit-interval** *seconds* **vsan** *vsan-id***]**

Syntax Description

slot-number	Specifies a slot number and port number.
channel-group	Adds to or removes from a PortChannel.
number	Specify a PortChannel number from 1 to 128.
force	Forcefully adds a port.
exit	Exits from submode.
fcdomain	Enters the interface submode.
rcf-reject	Configures the rcf-reject flag.
vsan	Configures the VSAN range.
vsan-id	The ID of the VSAN is from 1 to 4093.
fspf	Configures FSPF parameters.
cost	Configures FSPF link cost.
link-cost	Enters FSPF link cost 1-65535.
dead-interval	Configures FSPF dead interval.
seconds	Specifies interval in seconds from 1 to 65535.
ficon	Configures FICON parameters.
portnumber *portnumber*	Configures the FICON port number for this interface.
hello-interval	Configures FSPF hello-interval.
passive	Enables or disables FSPF on the interface.
retransmit-interval	Configures FSPF retransmit interface.
no	Negates a command or sets its defaults.
shutdown	Enables or disables an interface.
switchport	Configures switchport parameters.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

You can specify a range of interfaces by issuing a command with the following example format:

interface space fc1/1space-space5space,spacefc2/5space-space7

Refer to the *Cisco MDS 9000 Family Configuration Guide* for information on port number allocation.

Examples

The following example configures ports 1 to 4 in Fibre Channel interface 9.

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# int fc9/1 - 4
```

The following example assigns the FICON port number to the selected Fibre Channel port.

```
switch# config t
switch(config)# interface fc1/1
switch(config-if)# ficon portnumber 15
```

Related Commands

Command	Description
show interface	Displays an interface configuration for a specified interface.

interface fc-tunnel

To configure a Fibre Channel interface on the Cisco MDS 9000 Family of switches, use the **interface fc** command. To disable a Fibre Channel interface, use the **no** form of the command.

interface fc-tunnel *number* **[destination** *ip-address* **] | [explicit-path** *path-name* **] | [source** *ip-address* **]**

no interface fc-tunnel *number* **[destination** *ip-address* **] | [explicit-path** *path-name* **] | [source** *ip-address* **]**

Syntax Description

fc-tunnel	Configures a FC tunnel.
number	Specifies a tunnel ID range form 1 to 255.
destination *ip-address*	Maps the IP address of the destination switch
explicit-path *path-name*	Specifies a name for the explicit path (16 alphanumeric characters).
source *ip-address*	Maps the IP address of the source switch

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

None.

Examples

The following example initiates the FC tunnel (100) in the source switch (switch S).

```
switchS(config)# interface fc-tunnel 100
switchS(config-if)#
```

The following example maps the IP address of the source switch (switch S) to the FC tunnel (100).

```
switchS(config-if)# source 10.10.10.1
```

The following example maps the IP address of the destination switch (switch D) to the FC tunnel (100).

```
switchS(config-if)# destination 10.10.10.2
```

The following example enables traffic flow through this interface. .

```
switchS(config-if)# no shutdown
```

The following example references the configured path in the source switch (switch S).

```
switchS# config t
switchS(config)# interface fc-tunnel 100
switchS(config)# explicit-path Path1
```

Related Commands

Command	Description
show interface fc-tunnel	Displays an FC tunnel interface configuration for a specified interface.
fc-tunnel explicit-path	Configures a new or existing next-hop path.

interface fcip

To configure a Fibre Channel over IP Protocol (FCIP) interface on the Cisco MDS 9000 Family of switches, use the **interface fcip** command. To disable a FCIP interface, use the **no** form of the command.

interface fcip *interface_number* **bport | bport-keepalives | [channel-group** *number* **| force] exit | fcdomain rcf-reject vsan** *vsan-id* **[fspf cost** *link_cost* **vsan** *vsan-id* **| dead-interval** *seconds* **vsan** *vsan-id* **| ficon portnumber** *portnumber* **| hello-interval** *seconds* **vsan** *vsan-id* **| passive vsan** *vsan-id* **| retransmit-interval** *seconds* **vsan** *vsan-id***] | no | passive-mode | [peer-info ipaddress** *address* **| port** *number***] | special-frame peer-wwn** *pwwn-id* **| tcp-connections** *number* **| [time-stamp | acceptable-diff** *number***] | use-profile** *profile-id* **| write-accelerator**

no interface fcip *interface_number* **bport | bport-keepalives | [channel-group** *number* **| force] exit | fcdomain rcf-reject vsan** *vsan-id* **[fspf cost** *link_cost* **vsan** *vsan-id* **| dead-interval** *seconds* **vsan** *vsan-id* **| ficon portnumber** *portnumber* **| hello-interval** *seconds* **vsan** *vsan-id* **| passive vsan** *vsan-id* **| retransmit-interval** *seconds* **vsan** *vsan-id***] | no | passive-mode | [peer-info ipaddress** *address* **| port** *number***] | special-frame peer-wwn** *pwwn-id* **| tcp-connections** *number* **| [time-stamp | acceptable-diff** *number***] | use-profile** *profile-id* **| write-accelerator**

Syntax Description

interface fcip	Selects the FCIP interface to configure.
interface-number	Configures the specified interface from 1 to 255.
bport	Sets the B port mode.
bport-keepalives	Sets the B port keepalive responses.
channel-group	Adds to or removes from a PortChannel.
number	Specifies a PortChannel number from 1 to 128.
force	Forcefully adds a port.
exit	Exits from submode.
fcdomain	Enters the fcdomain mode for this FCIP interface
ficon	Configures FICON parameters.
portnumber *portnumber*	Configures the FICON port number for this interface.
rcf-reject	Configures the rcf-reject flag.
vsan	Configures the VSAN.
vsan-id	Specifies a VSAN ID from 1 to 4093.
fspf	Configures FSPF parameters.
cost	Configures FSPF link cost.
link-cost	Enters FSPF link cost from 1 to 65535.
dead-interval	Configures FSPF dead interval.
seconds	Specifies interval in seconds from 1 to 65535.
hello-interval	Configures FSPF hello-interval.
passive	Enables or disables FSPF on the interface.
retransmit-interval	Configures FSPF retransmit interface.
vsan *vsan-id*	Enters FSPF global configuration mode for the specified VSAN or range of VSANs from 1 to 4096. If no VSAN ID is specified, the default VSAN is selected.

passive-mode	Configures a passive connection.
peer-info	Configures the peer information.
ipaddress	Configures the peer IP address.
address	Enters the IP address.
port	Configures a peer port.
number	Enters the peer port number from 1 to 65535.
shutdown	Enables or disables an interface.
special-frame	Configures special frames.
peer-wwn	Configures the peer WWN for special frames.
pwwn-id	Enters the peer pWWN ID.
switchport	Configures switchport parameters.
tcp-connections	Configures the number of TCP connection attempts.
number	Enters the number of attempts (1 or 2).
time-stamp	Configures time-stamp.
acceptable-diff	Configures the acceptable time difference for time-stamps.
number	Enters the acceptable time from 1 to 60000.
use-profile	Configures the interface using an existing profile.
profile-id	Enters the profile ID to be used from 1 to 255.
write-accelerator	Enables the write acceleration feature.
ip-compression	Enables compression on the FCIP link.
high-throughput	Enables faster compression.
high-comp-ratio	Enables a better compression ratio.

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

You can specify a range of interfaces by issuing a command with the following example format:

interface space fcip space1space-space5space,spacefc2/5space-space7

Refer to the *Cisco MDS 9000 Family Configuration Guide* for information on port number allocation.

Examples

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# interface fcip 1
switch(config-if)#
```

The following example assigns the FICON port number to the selected FCIP interface.

```
switch# config t
switch(config)# interface fcip 51
switch(config-if)# ficon portnumber 234
```

Related Commands

Command	Description
show interface fcip	Displays an interface configuration for a specified FCIP interface.

interface fcsp

To configure an Fibre Channel Security Protocol (FC-SP) authentication mode for a specific interface in a FC-SP-enabled switch, use the **interface fcsp** command. To disable a FCIP interface, use the **no** form of the command.

interface fcsp
auto-active [*timeout-period* **] |**
auto-passive [*timeout-period* **] |**
on [*timeout-period* **] |**
off

Syntax Description

auto-active	Configures the auto-active mode to authenticate the specified interface.
auto-passive	Configures the auto-passive mode to authenticate the specified interface.
on	Configures the auto-active mode to authenticate the specified interface.
off	Configures the auto-active mode to authenticate the specified interface.
timeout-period	Specifies the time out period to reauthenticate the interface. The time ranges from 0 (default—no authentication is performed) to 100,000 minutes.

Defaults

Auto-passive.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

You can specify a range of interfaces by issuing a command with the following example format:

interface iscsi space fc1/1space-space5space,spacefc2/5space-space7

Examples

The following example turns on the authentication mode for ports 1 to 3 in Fibre Channel interface 2.

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# interface fc 2/1 - 3
switch(config-if)# fcsp on
switch(config-if)#
```

The following example reverts to the factory default of auto-passive for these three interfaces.

```
switch(config-if)# no fcsp on
```

The following example changes these three interfaces to initiate FC-SP authentication, but does not permit reauthentication.

```
switch(config-if)# fcsp auto-active 0
```

The following example changes these three interfaces to initiate FC-SP authentication and permits reauthentication within two hours (120 minutes) of the initial authentication attempt.

```
switch(config-if)# fcsp auto-active 120
```

Related Commands

Command	Description
show interface	Displays an interface configuration for a specified interface.

interface fc-tunnel

To configure a Fibre Channel tunnel and facilitate RSPAN traffic in the Cisco MDS 9000 Family of switches, use the **interface fc-tunnel** command. To remove a configured tunnel or revert to factory defaults, use the **no** form of the command.

interface fctunnel *tunnel-id* {**destination** *destination-ip-address* | **explicit-path** *path-name* | **shutdown** | **source** *source-ip-address* }

no interface fctunnel *tunnel-id* {**destination** *destination-ip-address* | **explicit-path** *path-name* | **shutdown** | **source** *source-ip-address* }

Syntax Description

tunnel-id	Enters the FC tunnel ID from 1 to 4095.
destination	Maps the IP address of the destination switch to the FC tunnel.
destination-ip-address	Specifies the IP address of the destination switch.
explicit-path	Configures a name for an explicit-path for the FC tunnel.
path-name	Specifies the path name (maximum of 16 alphanumeric characters).
shutdown	Configures traffic flow through the interface.
source	Maps the IP address of the source switch to the FC tunnel.
source-ip-address	Specifies the IP address of the source switch.

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

None.

Examples

```
switch(config)# interface fc-tunnel 100
switch(config-if)# source 10.10.10.1
switch(config-if)# destination 10.10.10.2
switch(config-if)# no shutdown
```

Related Commands

Command	Description
show interface fc-tunnel	Displays an interface configuration for a specified FC tunnel.

interface fc switchport

To configure an interface on the Cisco MDS 9000 Family of switches, use the **interface** command in configuration mode.

interface fc *slot-number* **{switchport beacon | description** *text* **| encap eisl | [fcrxbbcredit** *credit* **mode E | Fx] fcrxbbcredit default | switchport [fcrxbufsize** *size* **| mode auto (E | F | FL | Fx | SD | TL) | speed (1000 | 2000 | auto) | trunk allowed vsan** *vsan-id***] | add [vsan** *number* **| all] | mode [auto | off | on]}**

no interface fc *slot-number* **{switchport beacon | description** *text* **| encap eisl | [fcrxbbcredit** *credit* **mode E | Fx] fcrxbbcredit default | switchport [fcrxbufsize** *size* **| mode auto (E | F | FL | Fx | SD | TL) | speed (1000 | 2000 | auto) | trunk allowed vsan** *vsan-id***] | add [vsan** *number* **| all] | mode [auto | off | on]}**

Syntax Description

interface	Selects an interface to configure.
fc	Fiber Channel interface. Slot number range is 1-9.
slot-number	Specifies a slot number and port number.
switchport	**Configure switchport parameters**
beacon	**Disable/enable the beacon for an interface**
description	**Enter description of maximum 80 characters**
text	Description text of maximum 80 characters (Max Size - 80)
encap	**Configure encapsulation for the port**
eisl	**EISL encapsulation**
fcrxbbcredit	**Configure receive BB_credit for the port**
credit	**Enter receive BB_credit 1-255**
mode	**Configure receive BB_credit for specific mode**
E	**Configure receive BB_credit for E or TE mode**
Fx	**Configure receive BB_credit for F or FL mode**
default	**Default receive BB_credit**
fcrxbufsize	**Configure receive data field size for the port**
size	**Enter receive data field size 256-2112**
mode	**Enter the port mode**
auto	**Autosense mode**
E	**E port mode**
F	**F port mode**
FL	**FL port mode**
Fx	**Fx port mode**
SD	**SD port mode**
TL	**TL port mode**
speed	**Enter the port speed**
1000	**1000 Mbps speed**
2000	**2000 Mbps speed**

auto	**Autosense speed**
trunk	**Configure trunking parameters on an interface**
allowed	**Configure allowed list for interface(s)**
add	**Give VSAN id range to add to allowed vsan list**
all	**Add all the VSANs to allowed VSAN list**
mode	**Configure trunking mode**
auto	**Autosense trunking for an interface**
off	**Disable trunking for an interface**
on	**Enable trunking for an interface**

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

You can specify a range of interfaces by issuing a command with the following example format:

interface space fc1/1space-space5space,spacefc2/5space-space7

Examples

The following example changes to Configuration mode, configures a Fibre Channel interface, and configures switchport mode E for the specified BB credit.

```
switch## config t
switch(config)# interface fc1/1
switch(config-if)# switchport fcrxbbcredit 2 mode E
```

Related Commands

Command	Description
show interface	Displays an interface configuration for a specified interface.

interface gigabitethernet

To configure an iSCSI interface on the Cisco MDS 9000 Family of switches, use the **interface gigabitethernet** command. To disable a FCIP interface, use the **no** form of the command.

interface gigabitethernet *slot_number*
cdp | channel-group | ip | iscsi | isns *profile-name* **| shutdown | switchport | vrrp**

Syntax Description

slot-number	Specifies a slot number and port number.
cdp	Configures a Cisco Discovery Protocol (CDP) interface configuration parameters.
channel-group	Configures a Gigabit Ethernet interface in a channel group.
ip	Configures the IP address and IP mask for the Gigabit Ethernet interface.
iscsi	Configures iSCSI authentication parameters for the selected interface.
isns	Tags this interface to the Internet Storage Name Service (iSNS) profile.
profile-name	SPecifies the profile name to tag the interface.
shutdown	Enables or disables an interface.
switchport	Configures switchport parameters.
vrrp	Configures virtual routing parameters for the selected interface

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

You can specify a range of interfaces by issuing a command with the following example format:

interface iscsi space fc1/1space-space5space,spacefc2/5space-space7

Examples

The following example configures a Gigabit Ethernet interface in Slot 4 Port 1.

```
switch# config t
switch(config)# interface gigabitethernet 4/1
```

The following example enters a IP address and subnet mask for the selected Gigabit Ethernet interface.

```
switch(config-if)# ip address 10.1.1.100 255.255.255.0
```

The following example changes the IP maximum transmission unit (MTU) value for the selected Gigabit Ethernet interface.

```
switch(config-if)# switchport mtu 3000
```

The following example creates a VR ID for the selected Gigabit Ethernet interface, configures the virtual IP address for the VR ID (VRRP group), and assigns a priority.

```
switch(config-if)# vrrp 100
switch(config-if-vrrp)# address 10.1.1.100
switch(config-if-vrrp)# priority 10
```

The following example adds the selected Gigabit Ethernet interface to a channel group. If the channel group does not exist, it is created, and the port is shut down.

```
switch(config-if)# channel-group 10
gigabitethernet 4/1 added to port-channel 10 and disabled
please do the same operation on the switch at the other end of the port-channel, then do
"no shutdown" at both ends to bring them up
```

Related Commands

Command	Description
show interface	Displays an interface configuration for a specified interface.

interface iscsi

To configure an iSCSI interface on the Cisco MDS 9000 Family of switches, use the **interface iscsi** command. To disable a FCIP interface, use the **no** form of the command.

interface iscsi *slot_number*
mode pass-thru | mode store-and-forward | port | shutdown | switchport | tcp

Syntax Description

slot-number	Specifies a slot number and port number.
mode	Configures a forwarding mode
pass-thru	Forwards one frame at a time (default).
store-and-forward	Forwards data at the desired size.
port	Configures a listener port.
shutdown	Enables or disables an interface.
switchport	Configures switchport parameters.
tcp-connection	Configures the number of TCP connection attempts.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

You can specify a range of interfaces by issuing a command with the following example format:
interface iscsi space fc1/1space-space5space,spacefc2/5space-space7

Examples

The following example enables the iSCSI feature.

```
switch# config t
switch(config)# iscsi enable
```

The following example enables the store-and-forward mode for iSCSI interfaces 9/1 to 9/4.

```
switch(config)# int iscsi 9/1 - 4
switch(config-if)# mode store-and-forward
```

The following example reverts to using the default pass-thru mode for iSCSI interface 9/1.

```
switch(config)# interface iscsi 9/1
switch(config-if)# mode pass-thru
```

Related Commands

Command	Description
show interface	Displays an interface configuration for a specified interface.

interface mgmt

To configure a management interface on the Cisco MDS 9000 Family of switches, use the **interface mgmt** command in configuration mode. Use the **no** form of this command to negate the command or return it to its factory defaults.

interface mgmt *number* | **ip** | **shutdown** *force* | **switchport description** *text* **[vrrp** *vrrp_id***]**

nointerface mgmt *number* | **ip** | **shutdown** *force* | **switchport description** *text* **[vrrp** *vrrp_id***]**

Syntax Description

number	Specifies the management interface number which is 0.
ip	IP address of the interface.
shutdown	Enables the interface.
force	Forces the management 0 interface to shutdown without a confirmation.
switchport	Configure switchport parameters
description	Enter description of maximum 80 characters
text	Description text of maximum 80 characters (Max Size - 80)
vrrp	Configure vrrp on this interface
vrrp_id	Enters VRRP id.

Defaults

Disabled.

Command Modes

Configuration mode. Issue **interface mgmt** commands from the config-interface (config-if) mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

When you try to shutdown a management interface(mgmt0), a follow-up message confirms your action before performing the operation. Use the **force** option to bypass this confirmation, if required.

Examples

The following example configures the management interface, displays the options available for the configured interface, and exits to configuration mode.

```
switch## config t
switch(config)#
switch(config)# interface mgmt 0
switch(config-if)# ?
Interface configuration commands:
  exit        Exit from this submode
  ip          [no] ip address
  no          Negate a command or set its defaults
  shutdown    Enable/disable an interface
  switchport  Configure switchport parameters
  vrrp        [no] vrrp vr_id: Configure vrrp on this interface

switch(config-if)# exit
switch(config)#
```

The following example shuts down the interface without using the **force** option:

```
switch# conf t
switch(config-if)# shutdown
Shutting down this interface will drop all telnet sessions.
Do you wish to continue (y/n)? y
```

The following example shuts down the interface using the **force** option:

```
switch# conf t
switch(config-if)# shutdown force
```

Related Commands

Command	Description
show interface mgmt	Displays interface configuration for specified interface.

interface port-channel

To configure a port channel interface on the Cisco MDS 9000 Family of switches, use the **interface port-channel** command.

interface port-channel *number* **[fcdomain rcf-reject vsan** *vsan-id***] | fspf [cost** *link_cost* **| dead-interval** *seconds* **| ficon portnumber** *portnumber* **| hello-interval** *seconds* **| isns** *profile-name* **| passive | retransmit-interval** *seconds***] | shutdown | switchport**

no interface port-channel *number* **[fcdomain rcf-reject vsan** *vsan-id***] | fspf [cost** *link_cost* **| dead-interval** *seconds* **| ficon portnumber** *portnumber* **| hello-interval** *seconds* **| isns** *profile-name* **| passive | retransmit-interval** *seconds***] | shutdown | switchport**

Syntax Description

interface	Selects an interface to configure.
port-channel	Configure port channel parameters
number	Enter PortChannel number 1-128
fcdomain	Enter the interface submode
rcf-reject	Configure the rcf-reject flag
vsan	Specify the vsan range
vsan-id	The ID of the VSAN is from 1 to 4093.
fspf	Configure FSPF parameters
cost	Configure FSPF link cost
link_cost	Enter FSPF link cost 1-65535
dead-interval	Configure FSPF dead interval
seconds	Enter dead interval (in sec) 2-65535
ficon	Configures FICON parameters.
portnumber *portnumber*	Configures the FICON port number for this interface.
hello-interval	Configure FSPF hello-interval
seconds	Enter hello interval (in sec) 1-65535
isns	Tags this interface to the Internet Storage Name Service (iSNS) profile.
profile-name	SPecifies the profile name to tag the interface.
passive	Enable/disable FSPF on the interface
retransmit-interval	Configure FSPF retransmit interface
seconds	Enter retransmit interval (in sec) 1-65535
no	Negate a command or set its defaults
shutdown	Enable/disable an interface
switchport	Configure switchport parameters

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Refer to the *Cisco MDS 9000 Family Configuration Guide* for information on port number allocation.

Examples

The following example enters configuration mode and configures a PortChannel interface.

```
switch## config t
switch(config)#
switch(config)# interface port-channel 32
switch(config-if)#
```

The following example assigns the FICON port number to the selected PortChannel port.

```
switch# config t
switch(config)# interface Port-channel 1
switch(config-if)# ficon portnumber 234
```

Related Commands

Command	Description
show interface	Displays interface configuration for specified interface.

interface vsan

To configure a VSAN interface on the Cisco MDS 9000 Family of switches, use the **interface vsan** command.

interface vsan *vsan-id* **exit [ip | no ip] no | shutdown | [vrrp | no vrrp** *vr_id*]

Syntax Description

interface	Selects an interface to configure.
vsan	IPFC VSAN interface. VSAN number range is 1-4093.
vsan-id	VSAN id range 1-4093
no	Negate a command or set its defaults
shutdown	Enable/disable an interface
ip	ip address
shutdown	Enable/disable an interface
vrrp	Configure vrrp on this interface
vr_id	Enter vrrp id

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example configures a VSAN interface.

```
switch(config)# interface vsan 1
switch(config-if)#
```

Related Commands

Command	Description
show interface	Displays interface configuration for specified interface.

ip access-group

To create an access group to use an access list, use the **ip access-group** command in interface mode. Use the **no** form of this command to negate a previously issued command or revert to factory defaults.

ip access-group *group-name* **[in | out]**

Syntax Description

ip access-group	Specifies the IP access-group .
group-name	Identifies the IP access-group name with a limit of 29 alphanumeric characters, case insensitive.
in	Specifies that the group is for ingress traffic.
out	Specifies that the group is for egress traffic.

Defaults

Groups are created for both ingress and egress traffic.

Command Modes

Interface mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

The access-group command controls access to an interface. Each interface can only be associated with one access list. The access group becomes active on creation.

We recommend creating all rules in an access list, before creating the access group that uses this access -list.

If you create an access group before an access-list, all packets in that interface are dropped, because the access list is empty.

The access-group configuration for the ingress traffic applies to both local and remote traffic. The access-group configuration for the egress traffic applies only to local traffic. You can create a different access-group for each type of traffic.

Examples

The following example creates an access group called SampleName for both the ingress and egress traffic (default)

```
switch(config-if)# ip access-group SampleName
```

The following example deletes the access group called NotRequired.

```
switch(config-if)# no ip access-group NotRequired
```

The following example creates an access group called SampleName (if it does not already exist) for ingress traffic.

```
switch(config-if)# ip access-group SampleName1 in
```

The following example deletes the access group called SampleName for ingress traffic.

```
switch(config-if)# no ip access-group SampleName1 in
```

The following example creates an access group called SampleName (if it does not already exist) for local egress traffic.

```
switch(config-if)# ip access-group SampleName2 out
```

The following example deletes the access group called SampleName for local egress traffic.

```
switch(config-if)# no ip access-group SampleName2 out
```

Related Commands

Command	Description
ip access-list	Configures IP access control lists.
show ip access-list	Displays the IP-ACL configuration information.

ip access-list

To configure IP access control lists (ACL), use the **ip access-list** command in configuration mode. Use the **no** form of this command to negate a previously issued command or revert to factory defaults.

ip access-list *list-number* **[deny | permit]** *ip-protocol source source-wildcard* **[** *operator port-value* **] destination** *destination-wildcard* **[** *operator port port-value* **] [icmp-type** *icmp-value* **] [established] [precedence** *precedence-value* **] [tos** *tos-value* **] [log]**

Syntax Description

ip access-list	Specifies the IP access-list .
list-number	Identifies the IP-ACL with an integer ranging from 1 to 256.
deny	Denies access if the conditions match.
permit	Provides access if the conditions match.
ip-protocol	Specifies the name or number (integer range from 0 to 255) of an IP protocol. The IP protocol name can be EIGRP, GRE, ICMP, IGMP, IGRP, IP, IPINIP, NOS, OSPF, PIM, TCP, or UDP.
source	Specifies the network from which the packet is sent. There are two ways to specify the source: • A 32-bit quantity in four-part, dotted-decimal format • A keyword **any** as an abbreviation for a destination and destination-wildcard of 0.0.0.0 255.255.255.255
source-wildcard	Applies the wildcard bits to the source. Each wildcard bit set to zero indicates that the corresponding bit position in the packet's IP address must exactly match the bit value in the corresponding position of the packet's ip address will be considered a match to this access list. There are two ways to specify the destination wildcard: • A 32-bit quantity in four-part, dotted-decimal format • A keyword **any** as an abbreviation for a destination and destination-wildcard of 0.0.0.0 255.255.255.255
destination	Specifies the network from which the packet is sent. There are two ways to specify the destination: • A 32-bit quantity in four-part, dotted-decimal format • A keyword **any** as an abbreviation for a destination and destination-wildcard of 0.0.0.0 255.255.255.255
destination-wildcard	Applies the wildcard bits to the destination. There are two ways to specify the destination wildcard: • A 32-bit quantity in four-part, dotted-decimal format • A keyword **any** as an abbreviation for a destination and destination-wildcard of 0.0.0.0 255.255.255.255
operator	Compares source or destination ports. and has the following options: **eq** = equal **neq** = not equal

port-value	Specifies the decimal number (ranges from 0 to 65535) or one of the following names to indicate a TCP or UDP port. The TCP port names are: bgp, chargen, daytime, discard, domain, echo, finger, ftp, ftp-data, gopher, hostname, irc, klogin, kshell, lpd, nntp, pop2, pop3, smtp, sunrpc, syslog, tasacs-ds, talk, telnet, time, uucp, whois, or www. The UDP port names are, biff, bootpc, bootps, discard, dns, dnsiz, echo, mobile-ip, nameserver, netbios-dgm, netbios-ns, ntp, rip, snmp, snmptrap, sunrpc, syslog, tacacs-ds, talk, tftp, time, who, or xdmcp.
icmp-type *icmp-value*	Filters ICMP packets by ICMP message type (a number from 0 to 255).
established	Indicates an established connection for the TCP protocol. A match occurs if the TCP datagram has the ACK, FIN, PSH, RST, SYN or URG control bits set. The non matching case is that of the initial TCP datagram to form a connection.
precedence *precedence-value*	Filters packets by precedence level (a number from 0 to 7), or the following names: critical, flash, flash-override, immediate, internet, network, priority, or routine.
tos *tos-value*	Filters packets by type of service level (a number from 0 to 15), or the following names: max-reliability, max-throughput, min-delay, min-monetary-cost, or normal
log	Sends an information logging message to the console about the packet that matches the entry.

Defaults

Denied.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

Using the **log-deny** option at the end of the individual ACL entries shows the ACL number and whether the packet was permitted or denied, in addition to port-specific information. This option causes an information logging message about the packet that matches the dropped entry (or entries).

Examples

The following example configures the an IP-ACL called List 1 and permits IP traffic from any source address to any destination address

```
switch# config t
switch(config)# ip access-list List1 permit ip any any
```

The following example removes the IP-ACL called List 1.

```
switch# config t
switch(config)# no ip access-list List1 permit ip any any
```

The following example updates List 1 to deny TCP traffic from any source address to any destination address.

```
switch# config t
switch(config)# ip access-list List1 deny tcp any any
```

The following example defines an IP-ACL that permits this network. Subtracting 255.255.248.0 (normal mask) from 255.255.255.255 yields 0.0.7.255.

```
switch# config t
switch(config)# ip access-list List1 permit udp 192.168.32.0 0.0.7.255
```

The following example permits all IP traffic from and to the specified networks.

```
switch# config t
switch(config)# ip access-list List1 permit ip 10.1.1.0 0.0.0.255 172.16.1.0 0.0.0.255
```

The following example denies TCP traffic from 1.2.3.0 through source port 5 to any destination.

```
switch# config t
switch(config)# ip access-list List2 deny tcp 1.2.3.0 0.0.0.255 eq port 5 any
```

The following example removes this entry from the IP-ACL.

```
switch# config t
switch(config)# no ip access-list List2 deny tcp 1.2.3.0 0.0.0.255 eq port 5 any
```

The following example creates an access group called SampleName for both the ingress and egress traffic (default).

```
switch# config t
switch(config)# interface mgmt0
switch(config-if)# ip access-group SampleName
```

The following example deletes the access group called NotRequired.

```
switch# config t
switch(config)# interface mgmt0
switch(config-if)# no ip access-group SampleName
```

The following example creates an access group called SampleName (if it does not already exist) for ingress traffic.

```
switch# config t
switch(config)# interface mgmt0
switch(config-if)# ip access-group SampleName1 in
```

Related Commands

Command	Description
show ip access-list	Displays the IP-ACL configuration information.

ip address

To assign the local IP address of a Gigabit Ethernet interface to the FCIP profile, use the **ip address** command.

ip address *address*

no ip address *address*

Syntax Description

ip address	Configures the peer IP address.
address	Enters the IP address.

Defaults

Disabled

Command Modes

Configuration mode—fcip profile submode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

To create a FCIP profile, you must assign a local IP address of a Gigabit Ethernet interface to the FCIP profile.

Examples

```
switch## config t

switch(config)# fcip profile 5

switch(config-profile)# ip address 10.5.1.1
```

Related Commands

Command	Description
show fcip profile	Displays information about the FCIP profile.
interface fcip *interface_number* **use-profile** *profile-id*	Configures the interface using an existing profile ID from 1 to 255.
show interface fcip	Displays an interface configuration for a specified FCIP interface.

ip-compression

To enable compression on the FCIP link, use the **ip-compression** command. To disable a FCIP interface, use the **no** form of the command.

ip-compression high-throughput | high-comp-ratio

no ip-compression high-throughput | high-comp-ratio

Syntax Description

ip-compression	Enables compression on the FCIP link.
high-throughput	Enables faster compression.
high-comp-ratio	Enables a better compression ratio.

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None

Examples

The following example enables faster compression.

```
switch(config-if)# ip-compression high-throughput
```

The following example enables a better compression ratio.

```
switch(config-if)# ip-compression high-comp-ratio
```

The following example disables compression.

```
switch(config-if)# ip-compression
```

Related Commands

Command	Description
show interface fcip	Displays an interface configuration for a specified FCIP interface.

ip default-gateway

To configure the IP address of the default gateway, use the **ip default-gateway** command. To disable the IP address of the default gateway, use the **no** form of the command.

ip default-gateway *destination-ip-address*

no ip default-gateway *destination-ip-address*

Syntax Description

destination-ip-address	Specifies the IP address,

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following examples configures the IP default gateway to 1.1.1.4.

```
switch## config t
switch(config)##
switch(config)# ip default-gateway 1.1.1.4
switch(config)#
```

Related Commands

Command	Description
show ip route	Displays the IP address of the default gateway.

ip default-network

To configure the IP address of the default network, use the **ip default-network** command in configuration mode. To disable the IP address of the default network, use the **no** form of the command.

ip default-network *ip-address*

no ip default-network *ip-address*

Syntax Description

ip-address	Specifies the IP address of the default network.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following examples configures the IP address of the default network to 1.1.1.4.

```
switch## config t
switch(config)##
switch(config)# ip default-network 1.1.1.4
switch(config)#
```

ip domain-list

To configure the IP domain list, use the **ip domain-list** command in configuration mode. To disable the IP domain list, use the **no** form of the command.

ip domain-list *domain-name*

no ip domain-list *domain-name*

Syntax Description

domain-name	Specifies the domain name for the IP domain list.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example configures the IP domain list.

```
switch## config t
switch(config)##
switch(config)# ip domain domain name
switch(config)#
```

ip domain-lookup

To enable the DNS server lookup feature, use the **ip domain-lookup** command in configuration mode. Use the **no** form of this command to disable this feature.

ip domain-lookup

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Instead of IP addresses, you can configure the switch using meaningful names. The configured name automatically looks up the corresponding IP address.

Examples

The following example configures a DNS server domain name.

```
switch## config t
switch(config)#
switch(config)# ip domain-lookup
switch(config)#
```

ip domain-name

To configure a domain name, use the **ip domain-name** command in configuration mode.

ip domain-name *domain name*

Syntax Description		
	domain-name	Specifies the domain name.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example configures a domain name.

```
switch## config t
switch(config)##
switch(config)# ip domain-name domain name
switch(config)#
```

ip name-server

To configure a name server, use the **ip name-server** command in configuration mode.

ip name-server *ip-address*

Syntax Description		
	ip-address	Specifies the IP address for the name server.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

You can configure a maximum of six servers. By default, no server is configured.

Examples

The following example configure a name server with an IP address of 1.1.1.4.

```
switch## config t
switch(config)# ip name-server 1.1.1.4
```

The following example specifies the first address (15.1.0.1) as the primary server and the second address (15.2.0.0) as the secondary sever.

```
switch(config)# ip name-server 15.1.0.1 15.2.0.0
```

The following example deletes the configured server(s) and reverts to factory default.

```
switch(config)# no ip name-server
```

ip route

To configure a static route, use the **ip route** command in configuration mode.

ip route *ip-address subnet-mask* **[***nexthop_ip-address***] [interface (mgmt 0 | vsan** *number)* **]**
[distance *distance-number***]**

Syntax Description

ip-address	Specifies the IP address for the route.
subnet-mask	Specifies the subnet mask for the route.
nexthop_ip-address	Specifies the IP address of the next hop switch.
interface	Configures the interface associated with the route.
mgmt 0	Specifies the managment interface (mgmt 0).
vsan	Specifies a VSAN interface.
number	Specifies the VSAN interface number.
distance	Configures the distance metric for this route.
distance-number	Specifies the distance metric for this route. It can be from 0 to 32766.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following examples shows how to configure a static route.

```
switch## config t
switch(config)##
switch(config)# IP route 10.0.0.0 255.0.0.0 20.20.20.10 distance 10 interface vsan 1
switch(config)#
```

Related Commands

Command	Description
show ip route	Displays the IP address routes configured in the system.

ip routing

To enable the IP forwarding feature, use the **ip routing** command in configuration mode.

ip routing

Syntax Description

This command has no arguments or keywords.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example enables the IP forwarding feature.

```
switch## config t
switch(config)##
switch(config)# ip routing
switch(config)#
```

iscsi authentication

Use the **iscsi authentication** command to configure the default authentication method for iSCSI.

iscsi authentication chap-none | chap | none

no iscsi authentication chap-none chap | none

Syntax Description

iscsi	Configures iSCSI parameters.
authentication	Configures the global iSCSI authentication level.
chap-none	Configure either the CHAP or no authentication.
chap	Configures the Challenge Handshake Authentication Protocol (CHAP) authentication method.
none	Specifies that no authentication is required for the selected interface

Defaults

CHAP or none.

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

By default, the MDS switch accepts an iSCSI initiator with either no authentication or CHAP authentication. If CHAP authentication is always required, use the **iscsi authentication chap** command. If no authentication is always required, use the **iscsi authentication none** command. To change back to the default setting use the **no iscsi authentication** command.

Use the **chap-none** option to override the global configuration which might have been configured to allow only one option—either CHAP or none—not both.

Examples

```
switch## config t
switch(config)# iscsi authentication chap
switch(config)# iscsi authentication none
switch(config)# iscsi authentication chap-none
```

Related Commands

Command	Description
show iscsi global	Displays all iSCSI initiators configured by the user.

iscsi enable

To enable the iSCSI feature in any Cisco MDS switch, issue the **iscsi enable** command.

iscsi enable

no iscsi enable

Syntax Description

iscsi	Configures iSCSI parameters.
enable	Enables or disables the iSCSI feature.

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The configuration and verification commands for the iSCSI feature are only available when iSCSI is enabled on a switch. When you disable this feature, all related configurations are automatically discarded.

Examples

The following command enables the iSCSI feature.

```
switch(config)# iscsi enable
```

The following command disables the iSCSI feature (default).

```
switch(config)# no iscsi enable
```

iscsi interface vsan-membership

To configure VSAN membership for iSCSI interfaces, use the **iscsi interface vsan-membership** command. Use the **no** form of this command to disable this feature or to revert to factory defaults.

iscsi interface vsan-membership

no iscsi interface vsan-membership

Syntax Description

iscsi	Configures iSCSI parameters.
interface	Configures properties for the iscsi interface.
vsan-membership	Enables the iSCSI interface VSAN membership.

Defaults

Disabled.

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

If the **iscsi interface vsan-membership** command is disabled, you will not be able to configure iSCSI VSAN membership

Examples

The following command enables the iSCSI interface VSAN membership.

```
switch(config)# iscsi interface vsan-membership
```

The following command disables the iSCSI interface VSAN membership (default).

```
switch(config)# no iscsi interface vsan-membership
```

Related Commands

Command	Description
show iscsi initiator	Displays information about configured iSCSI initiators.

iscsi import target fc

To allow dynamic mapping of Fibre Channel targets, use the **iscsi import target fc** command.

iscsi import target fc

no iscsi import target fc

Syntax Description

iscsi	Configures iSCSI parameters.
import	Imports Fibre Channel targets to iSCSI domains.
targets	Configures targets to import to the iSCSI domain.
fc	Specifies Fibre Channel targets.

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

This command directs iSCSI to dynamically import all Fibre Channel targets into iSCSI.

Examples

```
switch## config t
switch(config)# iscsi import target fc
switch(config)# no iscsi import target fc
```

Related Commands

Command	Description
show iscsi global	Displays all iSCSI initiators configured by the user..

iscsi initiator ip address

To assign persistent WWNs to an iSCSI initiator or assign an iSCSI initiator into VSANs other than the default VSAN, use the **iscsi initiator ip address** command.

iscsi initiator ip address *ipaddress* **[static (nwwn** *wwn-id* **| pwwn** *wwn-id* **) | system-assign** *number* **] | vsan** *vsan-id* **]**

no iscsi initiator ip address *ipaddress* **[static (nwwn** *wwn-id* **| pwwn** *wwn-id* **) | system-assign** *number***] | vsan** *vsan-id* **]**

Syntax Description

iscsi	Configures iSCSI parameters.
initiator	Configures the iSCSI initiator node name.
ip address *ipaddress*	Configures the specified initiator IP address.
exit	Exits from submode.
nwwn	Configures the inititiator node WWN hex value.
pwwn	Configures the peer WWN for special frames.
wwn-id	Enters the pWWN or nWWN ID.
system-assign *number*	Generates the nWWN value automatically. The number ranges from 1 to 64.
vsan	Configures the VSAN.
vsan-id	Specifies a VSAN ID from 1 to 4093.

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Under a circumstance where an iSCSI initiator needs to have a persistent binding to FC WWNs, this command should be used. Also, an iSCSI initiator can be put into multiple VSANs. An iSCSI host can become a member of one or more VSANs.

Examples

The following command configures an iSCSI initiator. using the IP address of the initiator node.

```
switch(config)# iscsi initiator ip address 10.50.1.1
```

The following command deletes the configured iSCSI initiator.

```
switch(config)# no iscsi initiator ip address 10.5.0.0
```

The following command uses the switch's WWN pool to allocate the nWWN for this iSCSI initiator and keeps it persistent.

```
switch(config-(iscsi-init))# static nWWN system-assign
```

The following command assigns the user provided WWN as nWWN for the iSCSI initiator. You can only specify one nWWN for each iSCSI node.

```
switch(config-(iscsi-init))# nWWN 20:00:00:05:30:00:59:11
```

The following command uses the switch's WWN pool to allocate two pWWNs for this iSCSI initiator and keeps it persistent.

```
switch(config-(iscsi-init))# static pWWN system-assign 2
```

The following command assigns the user provided WWN as pWWN for the iSCSI initiator.

```
switch(config-(iscsi-init))# pWWN 21:00:00:20:37:73:3b:20
```

Related Commands

Command	Description
show iscsi initiator	Displays information about configured iSCSI initiators.

iscsi initiator name

To assign persistent WWNs to an iSCSI initiator or assign an iSCSI initiator into VSANs other than the default VSAN, use the **iscsi initiator name** command.

iscsi initiator name *name* **[static (nwwn** *wwn-id* **| pwwn** *wwn-id* **) | system-assign] | vsan** *vsan-id* **]**

no iscsi initiator name *name* **[static (nwwn** *wwn-id* **| pwwn** *wwn-id* **) | system-assign] | vsan** *vsan-id* **]**

Syntax Description

iscsi	Configures iSCSI parameters.
initiator	Configures the iSCSI initiator node name.
name	Configures the initiator node name.
name	Enters the initiator name to be used. The minimum length is 16 characters and maximum of 223 bytes.
exit	Exits from submode.
nwwn	Configures the inititiator node WWN hex value.
pwwn	Configures the peer WWN for special frames.
wwn-id	Enters the pWWN or nWWN ID.
system-assign	Generates the nWWN value automatically.
vsan	Configures the VSAN.
vsan-id	Specifies a VSAN ID from 1 to 4093.

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(2).

Usage Guidelines

Under a circumstance where an iSCSI initiator needs to have a persistent binding to FC WWNs, this command should be used. Also, an iSCSI initiator can be put into multiple VSANs. An iSCSI host can become a member of one or more VSANs.

Examples

The following command configures an iSCSI initiator using the iSCSI name of the initiator node.

```
switch(config)# iscsi initiator name iqn.1987-02.com.cisco.initiator
```

The following command deletes the configured iSCSI initiator.

```
switch(config)# no iscsi initiator name iqn.1987-02.com.cisco.initiator
```

The following command configures an iSCSI initiator. using the IP address of the initiator node.

```
switch(config)# iscsi initiator ip-address 10.50.0.0
```

The following command deletes the configured iSCSI initiator.

```
switch(config)# no iscsi initiator ip-address 10.50.0.0
```

The following command uses the switch's WWN pool to allocate the nWWN for this iSCSI initiator and keeps it persistent.

```
switch(config-(iscsi-init))# static nWWN system-assign
```

The following command assigns the user provided WWN as nWWN for the iSCSI initiator. You can only specify one nWWN for each iSCSI node.

```
switch(config-(iscsi-init))# nWWN 20:00:00:05:30:00:59:11
```

The following command uses the switch's WWN pool to allocate two pWWNs for this iSCSI initiator and keeps it persistent.

```
switch(config-(iscsi-init))# static pWWN system-assign 2
```

The following command assigns the user provided WWN as pWWN for the iSCSI initiator.

```
switch(config-(iscsi-init))# pWWN 21:00:00:20:37:73:3b:20
```

Related Commands

Command	Description
show iscsi initiator	Displays information about configured iSCSI initiators.

iscsi save-initiator

To permanently save the automatically-assigned nWWN/pWWN mapping, use the **iscsi initiator name** command.

iscsi save-initiator [name *name* **]**

no iscsi save-initiator [name *name* **]**

Syntax Description

iscsi	Configures iSCSI parameters.
save-initiator	Saves the automatically-assigned nWWN/pWWN mapping.
name	Configures the initiator node name.
name	Enters the initiator name to be used from 1 to 255 characters. The minimum length is 16 characters.

Defaults

None

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following commands save the automatically assigned mapping.

```
switch(config)# iscsi save-initiator

switch(config)# iscsi save-initiator name iqn.1987-02.com.cisco.initiator
```

The following command configures an iSCSI initiator. using the IP address of the initiator node.

```
switch(config)# iscsi initiator ip-address 10.50.0.0
```

The following command deletes the configured iSCSI initiator.

```
switch(config)# no iscsi initiator ip-address 10.50.0.0
```

The following command uses the switch's WWN pool to allocate the nWWN for this iSCSI initiator and keeps it persistent.

```
switch(config-(iscsi-init))# static nWWN system-assign
```

The following command assigns the user provided WWN as nWWN for the iSCSI initiator. You can only specify one nWWN for each iSCSI node.

```
switch(config-(iscsi-init))# nWWN 20:00:00:05:30:00:59:11
```

The following command uses the switch's WWN pool to allocate two pWWNs for this iSCSI initiator and keeps it persistent.

```
switch(config-(iscsi-init))# static pWWN system-assign 2
```

The following command assigns the user provided WWN as pWWN for the iSCSI initiator.

```
switch(config-(iscsi-init))# pWWN 21:00:00:20:37:73:3b:20
```

Related Commands

Command	Description
show iscsi initiator	Displays information about configured iSCSI initiators.

iscsi virtual-target name

To create a static iSCSI virtual target, use the **iscsi virtual-target** command.

iscsi virtual-target name *name* [**advertise interface gigabitethernet** *interface-number* | **initiator name** *initiator-name* | **pwwn** *pwwn-id* (**secondary-pwwn** *secondary pwwn-id* | **fc-lun** *number* **iscsi-lun** *number* | **name** *initiator-name*) | **ip-address** *ip-address* (*ip-subnet*) **permit** [**trespass**]

no iscsi virtual-target name *name* [**advertise interface gigabitethernet** *interface-number* | **initiator name** *initiator-name* | **pwwn** *pwwn-id* (**secondary-pwwn** *secondary pwwn-id* | **fc-lun** *number* **iscsi-lun** *number* | **name** *initiator-name*) | **ip-address** *ip-address* (*ip-subnet*) **permit** [**trespass**]

Syntax Description

iscsi	Configures iSCSI parameters.
virtual-target	Configures the iSCSI virtual target name.
name	Configures the virtual target name.
name	Enters the virtual target name to be used. The minimum length is 16 characters and maximum of 223 bytes.
advertise	Advertises the virtual target name on the specified interface.
interface gigabitethernet	Selects the Gigabit Ethernet interface to configure.
interface-number	Configures the specified interface from 1 to 255.
initiator	Allows the iSCSI initiator to access a specified target.
name	Configures the iSCSI initiator name.
initiator-name	Enters the initiator name to be used from 1 to 255 characters.
ip-address	Configures the iSCSI initiator's IP address.
ip-address	Enters the initiator IP address.
ip-subnet	Configures all initiators in the subnet.
permit	Permits access to the specified target.
pwwn	Configures the peer WWN for special frames.
pwwn-id	Enters the peer pWWN ID.
secondary-pwwn	Enters the secondary pWWN ID.
secondary pwwn-id	Enters the peer pWWN ID.
fc-lun *number*	Specifies the Fibre Channel Logical Unit Number.
iscsi-lun *number*	Specifies the iSCSI virtual target number.
tresspas	Move LUNs forcefully from one port to another.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(2).

Usage Guidelines

This command is used to configure a static iSCSI target for access by iSCSI initiators. A virtual target may contain a subset of LUs of an FC target or one whole FC target.

Don't specify the LUN if you wish to map the whole Fibre Channel target to an iSCSI target. All Fibre Channel LUN targets are exposed to iSCSI.

One iSCSI target cannot contain more than one Fibre Channel target.

Examples

```
switch## config t

switch(config)# iscsi virtual-target name abc123
switch(config-(iscsi-tgt))# ?
ISCSI Virt-tgt Configuration:
  advertise  Advertise virtual target on interfaces specified
  exit       Exit from this submode
  initiator  Allow iSCSI initiator access to this target
  no         Negate a command or set its defaults
  pWWN       Enter the pWWN of the fc-target
```

The following command advertises the virtual target only on the specified interface. By default, it is advertised on all interfaces in all IPS modules

```
switch(config-(iscsi-tgt))# advertise interface gigabitethernet 4/1
```

The following command maps a virtual target node to a Fibre Channel target.

```
switch(config-(iscsi-tgt))# pWWN 26:00:01:02:03:04:05:06
```

The following command enters the secondary pWWN for the virtual target node.

```
switch(config-(iscsi-tgt))# pWWN 26:00:01:02:03:04:05:06 secondary-pwwn
66:00:01:02:03:04:05:02
```

Use the LUN option to map different Fibre Channel LUNs to different iSCSI virtual targets. If you have already mapped the whole Fibre Channel target, you will not be able to use this option.

```
switch(config-(iscsi-tgt))# pWWN 26:00:01:02:03:04:05:06 fc-lun 0 iscsi-lun 0
```

The following command allows the specified iSCSI initiator node to access this virtual target. You can issue this command multiple times to allow multiple initiators.

```
switch(config-(iscsi-tgt))# initiator iqn.1987-02.com.cisco.initiator1 permit
```

The following command prevents the specified initiator node from accessing virtual targets.

```
switch(config-(iscsi-tgt))# no initiator iqn.1987-02.com.cisco.initiator1 permit
```

The following command allows the specified IP address to access this virtual target:

```
switch(config-(iscsi-tgt))# initiator ip address 10.50.1.1 permit
```

The following command prevents the specified IP address from accessing virtual targets:

```
switch(config-(iscsi-tgt))# no initiator ip address 10.50.1.1 permit
```

The following command allows all initiators in this subnetwork to access this virtual target:

```
switch(config-(iscsi-tgt))# initiator ip address 10.50.0.0 255.255.255.0 permit
```

The following command prevents all initiators in this subnetwork from accessing virtual targets:

```
switch(config-(iscsi-tgt))# no initiator ip address 10.50.0.0 255.255.255.0 permit
```

The following command allows all initiator nodes to access this virtual target.

```
switch(config-(iscsi-tgt))# all-initiator-permit
```

The following command prevents any initiator node from accessing virtual targets.

```
switch(config-(iscsi-tgt))# no all-initiator-permit
```

The following command configures a primary and secondary port and moves the LUNs from one port to the other using the **trespass** command.

```
switch# config terminal
switch(config)#iscsi virtual-target name iqn.1987-02.com.cisco.initiator
switch(config-(iscsi-tgt))# pwwn 50:00:00:a1:94:cc secondary-pwwn 50:00:00:a1:97:ac
switch(config-(iscsi-tgt))# trespass
```

Related Commands

Command	Description
show iscsi virtual target	Displays information about iSCSI virtual targets.

isns profile

To create an Internet Storage Name Service (iSNS) profile, use the **isns profile** command.

isns profile name [server]

no isns profile name [server]

Syntax Description

isns	Configures iSNS parameters.
profile	Creates a iSNS profile.
name	Specifies the iSNS profile name
server	Specifies the iSNS server for the profile.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Use this command to create an iSNS profile or to add or modify the iSNS server for a profile.

Examples

The following command configures a profile called MyIsns and specifies the IP address of an iSNS server for the profile:

```
switch# config t
switch(config)# isns profile name MyIsns
switch(config-(isns-profile))# server 10.10.100.211
```

Related CommandsT

Command	Description
show isns profile	Displays details for configured iSNS profiles.

isns reregister

To register all Internet Storage Name Service (iSNS) objects for an interface that is already tagged to an iSNS profile, use the **isns register** command.

isns reregister gigabitethernet *slot-number* | **port-channel** *channel-group*

Syntax Description

isns	Configures iSNS parameters.
reregister	Reregisters iSNS objects for the specified interface with he iSNS server
gigabitethernet *slot-number*	Specifies tagged Gigabit Ethernet interface slot and port with slot-number.
port-channel *channel-group*	Specifies tagged PortChannel group as channel-group number.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Use this command to reregister portals and targets with the iSNS server for a tagged interface.

Examples

The following command re-registers portal and targets for a tagged interface:

```
switch# isns reregister gigabitethernet 1/4
```

Related CommandsT

Command	Description
show isns profile	Displays details for configured iSNS profiles.

ivr enable

To enable the Inter-VSAN Routing (IVR) feature, use the **ivr enable** command.

ivr enable

no ivr enable

Syntax Description

ivr	Configures IVR parameters.
enable	Enable the IVR feature.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The IVR feature must be enabled in all edge switches in the fabric that participate in the IVR.

The configuration and display commands for the IVR feature are only available when IVR is enabled on a switch.

When you disable this configuration, all related configurations are automatically discarded.

Examples

The following command enters the configuration mode and enables the IVR feature on this switch:

```
switch# config t
switch(config)# ivr enable
```

Related CommandsT

Command	Description
show ivr status	Displays the status of the IVR feature.

ivr vsan-topology

To configure a VSAN topology for Inter-VSAN Routing (IVR), use the **ivr vsan-topology** command.

ivr vsan-topology activate | auto |
database --> autonomous-fabric-id *fabric-id* **switch-wwn** *swwn* **vsan-ranges** *vsan-id*

no ivr vsan-topology activate | auto |
database --> autonomous-fabric-id *fabric-id* **switch-wwn** *swwn* **vsan-ranges** *vsan-id*

Syntax Description

ivr	Configures IVR parameters.
vsan-topology	Enable the IVR feature.
activate	Activates the VSAN topology database for inter-VSAN routing.
auto	Enables discovery of VSAN topology for inter-VSAN routing.
database	Configures VSAN topology database for inter-VSAN routing.
autonomous-fabric-id *fabric-id*	Configures the fabric ID for the IVR topology.
switch-wwn *swwn*	Configures the switch WWN in dotted hex format.
vsan-ranges	Configures up to 5 ranges of VSANs to be added to the database.
vsan-id	Specifies the VSAN ID from 1 to 4093.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following command enters the configuration mode, enables the IVR feature, enters the VSAN topology database, and configures the pWWN—VSAN association for VSANs 2 and 2000:

```
switch# config t
switch(config)# ivr enable
switch(config)# ivr vsan-topology database
switch(config-ivr-topology-db)# autonomous-fabric-id 1 switch 20:00:00:00:30:00:3c:5e
vsan-ranges 3,2000
```

Related CommandsT

Command	Description
show ivr vsan-topology	Displays the configured VSAN topology for a fabric.

ivr zone

To configure a zone for Inter-VSAN Routing (IVR), use the **ivr zone** command.

ivr zone name *ivzs-name*

no ivr zone name *ivz-name*

Syntax Description

ivr	Configures IVR parameters.
zone	Specifies the inter-VSAN zone (IVZ) configuration.
name *ivz-name*	Assigns a 64-character name for the IVZ.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following command enters the configuration mode, enables the IVR feature, creates an IVZ, and adds a pWWN-VSAN member:

```
switch# config t
switch(config)# ivr enable
switch(config)# ivr zone name Ivz_vsan2-3
switch(config-ivr-zone)# member pwwn 21:00:00:e0:8b:02:ca:4a vsan 3
```

Related CommandsT

Command	Description
show ivr zone	Displays the configured VSAN topology for a fabric.

ivr zoneset

To configure a zoneset for Inter-VSAN Routing (IVR), use the **ivr zoneset** command.

ivr zoneset activate name *ivzs-name* (**force**) | **name** *ivzs-name*

no ivr zoneset activate name *ivzs-name* (**force**) | **name** *ivzs-name*

Syntax Description

ivr	Configures IVR parameters.
zoneset	Specifies the inter-VSAN zoneset (IVZS) configuration.
activate	Activates a previously-configured IVZS.
force	Forces a IVZS activation
name *ivzs-name*	Assigns a 64-character name for the IVZS.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following command enters the configuration mode, enables the IVR feature, creates an IVZS, adds a IVZ member, and activates the IVZS:

```
switch# config t
switch(config)# ivr enable
switch(config)# ivr zoneset name Ivr_zoneset1
switch(config-ivr-zoneset)# member Ivz_vsan2-3
switch(config-ivr-zoneset)# exit
switch(config)# ivr zoneset activate name IVR_ZoneSet1
```

Related CommandsT

Command	Description
show ivr zoneset	Displays the configured VSAN topology for a fabric.

CHAPTER 12

K Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

kernel core

Use the **kernel core** command to generate a core dump for each module. Use the **no** form of this command to negate the command or revert to its factory

kernel core limit *number* **| module** *slot* **(level all | header | kernel | ram | used-ram)| target** *ipaddress*

no kernel core limit | module *slot* **| target** *ipaddress*

Syntax Description

limit	Limits the number of modules for which the core is generated.
number	Specifies the number of modules for core generation
module	Configures the module requiring the core generation.
slot	Specifies the slot number of the module.
level	Specifies the core dump level for the selected module.
all	Dumps all the memory (required 1G of space)
header	Dumps kernel header only.
kernel	Dumps all kernel memory pages.
ram	Dumps all the RAM pages.
used-ram	Dumps all the used ram pages.
target	Configures the external server on the sme physical LAN.
ipaddress	Specifies the IP address of the external server.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

None.

Examples

The following example limits core generation to two modules.

```
sw5(config)# kernel core limit 2
succeeded
```

The following example configures module 5 to generate cores.

```
sw5(config)# kernel core module 5
succeeded
```

The following example configures module 5 to generate only header-level cores.

```
sw5(config)# kernel core module 5 level header
succeeded
```

The following example configures the external server.

```
sw5(config)# kernel core target 10.50.5.5
succeeded
```

Related Commands

Command	Description
show kernel	Displays configured kernel core settings.
show running-config	Displays all switch configurations saved to PSS.

CHAPTER 13

L Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

line com1

To configure auxiliary COM 1 port, use the **line com1** command. Use the **no** form of a command to negate the previously issued command or to revert to factory defaults

line com1
[databits *number* **] |**
[flowcontrol hardware]
[modem in | init-string (default | user-input) | set-string user-input *string* **] |**
[parity even | none | odd]
[speed *speed* **] |**
[stopbits 1 | 2]

SyntaxDescription

line com1	Configures a primary terminal line.
databits	Set number of databits per character (ranges from 5 to 8).
number	Enters number of databits.
flowcontrol hardware	Enables modem flowcontrol on the COM1 port.
modem	Enables the modem mode.
in	Enables the COM 1 port to only connect to a modem.
init-string default	Writes the default initialization string to the modem.
set-string user-input *string*	Sets the user-specified initilization string to its corresponding profile.
init-string user-default	Writes the provided initialization string to the modem.
parity	Sets terminal parity.
even	Sets even parity.
none	Sets no parity.
odd	Sets odd parity.
speed	Sets the transmit and receive speeds (ranges from 110 to 115, 200 baud).
speed	Sets transmit and receive speeds.
stopbits	Sets async line stopbits.
1	Sets one stop bit.
2	Sets two stop bits.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

The **line com1** command available in **config t** command mode. The **line com1** configuration commands are available in `config-com1` submode.

You can perform the configuration specified in this section only if you are connected to the console port or the COM1 port.

We recommend you use the default initialization string. If the required options are not provided in the user-input string, the initialization string is not processed.

You must first set the user-input string, before initializing the string.

Examples

The following example configures a line console and sets the options for that terminal line.

```
switch## config t
switch(config)#
switch(config)# line com1
switch(config-com1)# databits 6
switch(config-com1)# parity even
switch(config-com1)# stopbits 1
```

The following example disables the current modem from executing its functions.

```
switch# config t
switch(config)# line com1
switch(config-com1)# no modem in
```

The following example enables (default) the COM1 port to only connect to a modem.

```
switch# config t
switch(config)# line com1
switch(config-com1)# modem in
```

The following example Writes the provides initialization string to the modem. This is the default.

```
switch# config t
switch(config)# line com1
switch(config-com1)# modem init-string default
```

The following example assigns the user-specified initialization string to its corresponding profile.

```
switch# config t
switch(config)# line com1
switch(config-com1)# modem set-string user-input ATE0Q1&D2&C1S0=3\015
```

The following example deletes the configured initialization string.

```
switch# config t
switch(config)# line com1
switch(config-com1)# no modem set-string user-input ATE0Q1&D2&C1S0=3\015
```

The following example writes the user-specified initialization string to the modem.

```
switch# config t
switch(config)# line com1
switch(config-com1)# modem init-string user-input
```

Related Commands

Command	Description
line console	Configure primary terminal line.
line vty	Configure virtual terminal line.

line console

To configure a terminal line, use the **line console** command. Use the **no** form of the command to negate a previously-issued command or revert to factory defaults.

line console
[databits *number* **] |**
[exec-timeout *minutes***] [flowcontrol none | software]**
[modem in | init-string (default | user-input) | set-string user-input *string* **] |**
[parity even | none | odd]
[speed *speed* **] |**
[stopbits 1 | 2]

Syntax Description

line console	Configures a primary terminal line.
databits	Set number of databits per character. (ranges from 5 to 8)
number	Enters number of databits.
exec-timeout	Configure exec timeout.
minutes	Enters timeout in minutes 0-525600. 0 to disable.
flowcontrol	Set the flow control.
none	Sets no flowcontrol.
software	Sets software flowcontrol.
init-string default	Writes the default initialization string to the modem.
set-string user-input *string*	Sets the user-specified initilization string to its corresponding profile.
init-string user-input	Writes the provided initialization string to the modem.
parity	Sets terminal parity.
even	Sets even parity.
none	Sets no parity.
odd	Sets odd parity.
speed	Sets the transmit and receive speeds.
speed	Sets transmit and receive speeds.
stopbits	Sets async line stopbits.
1	Sets one stop bit.
2	Sets two stop bits.

Defaults

Disabled

Command Modes

Configuration mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

The **line console** command available in **config t** command mode. The **line console** configuration commands are available in `config-console` submode.

Examples

The following example configures a line console and sets the options for that terminal line.

```
switch## config t
switch(config)##
switch(config)# line console
switch(config-console)# databits 60
switch(config-console)# exec-timeout 60
switch(config-console)# flowcontrol software
switch(config-console)# parity even
switch(config-console)# stopbits 1
```

The following example disables the current modem from executing its functions.

```
switch# config t
switch(config)# line console
switch(config-console)# no modem in
```

The following example enables (default) the COM1 port to only connect to a modem.

```
switch# config t
switch(config)# line console
switch(config-console)# modem in
```

The following example Writes the provides initialization string to the modem. This is the default.

```
switch# config t
switch(config)# line console
switch(config-console)# modem init-string default
```

The following example assigns the user-specified initialization string to its corresponding profile.

```
switch# config t
switch(config)# line console
switch(config-console)# modem set-string user-input ATE0Q1&D2&C1S0=3\015
```

The following example deletes the configured initialization string.

```
switch# config t
switch(config)# line console
switch(config-console)# no modem set-string user-input ATE0Q1&D2&C1S0=3\015
```

The following example writes the user-specified initialization string to the modem.

```
switch# config t
switch(config)# line console
switch(config-console)# modem init-string user-input
```

Related Commands

Command	Description
line vty	Configure virtual terminal line.
line com1	Configures the auxiliary COM 1 port

line vty

To configure a virtual terminal line, use the **line vty** command.

line vty exec-timeout *minutes* **| exit | no**

Syntax Description

line vty	Configures a virtual terminal line.
exec-timeout	Configure exec timeout.
minutes	Enter timeout in minutes 0-525600. 0 to disable.
exit	Exit from this submode.
no	Negate a command or set its defaults.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

The **line vty** command available in **config t** command mode. **line vty** configuration commands available in config-line submode.

Examples

The following example configures a virtual terminal line and sets the timeout for that line.

```
switch## config t
switch(config)# line vty
switch(config-line)# exec-timeout 60
```

Related Commands

Command	Description
line console	Configure primary terminal line.
line com1	Confgiures the auxiliary COM 1 port

logging console

To set console logging, use the **logging console** command.

logging console *range* **[size** *bytes***]**

Syntax Description

logging console	Sets console logging.
range	0-7 0-emerg;1-alert;2-crit;3-err;4-warn;5-notif;6-inform;7-debug
size *bytes*	Configures the size of the log file in bytes. The valid range is 4096- 4194304 bytes.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example reverts console logging to the factory set default severity level of 2 (critical). Logging messages with a severity level of 2 or above will be displayed on the console.

```
switch## config t
switch(config)# logging console 2
switch(config-console)#
```

logging level

To modify message logging facilities, use the **logging level** command.

logging level *facility-name severity-level*

no logging level *facility-name severity-level*

Syntax Description

logging level	Sets console logging.
facility-name	Specifies the required facility name (for example **acl**, or **ivr**, or **port**, etc.)
severity-level	Sets 0-7 syslog message level for the specified facility. 0-emerg;1-alert;2-crit;3-err;4-warn;5-notif;6-inform;7-debug

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

Configures Telnet or SSH logging for the kernel facility at level 4 (warning). As a result, logging messages with a severity level of 4 or above will be displayed.

```
switch## config t
switch(config)# logging level kernel 4
```

logging logfile

To set message logging for logfile, use the **logging logfile** command.

logging logfile *file name severity level*

Syntax Description

logging logfile	Sets message logging for logfile.
file name	Enters the logfile name.
severity level	0-7 0-emerg;1-alert;2-crit;3-err;4-warn;5-notif;6-inform;7-debug

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example configures logging information for errors or events above a severity level of 3 (errors) to be logged in a file named ManagerLogFile. By configuring this limit, the file size is restricted to 3000000 bytes.

```
switch## config t
switch(config)# logging logfile ManagerLogFile 3 size 3000000
```

Related Commands

Command	Description
show logging logfile	Displays the message logging for the logfile.

logging module

To set message logging for linecards, use the **logging module** command.

logging module *severity level*

Syntax Description

logging module	Sets message logging for modules.
severity level	0-7 0-emerg;1-alert;2-crit;3-err;4-warn;5-notif;6-inform;7-debug

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example sets message logging for modules at level 7.

```
switch## config t
switch(config)##
switch(config)# logging module 7
```

logging monitor

To set monitor message logging, use the **logging monitor** command.

logging monitor *severity level*

Syntax Description

logging monitor	Sets message logging.
severity level	0-7 0-emerg;1-alert;2-crit;3-err;4-warn;5-notif;6-inform;7-debug

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example sets terminal line (monitor) message logging at level 2.

```
switch## config t
switch(config)# logging monitor 2
```

Related Commands

Command	Description
show logging monitor	Displays the message logging for the logfile.

logging server

To set message logging for the remote server, use the **logging server** command.

logging server [*hostname* **|** *ip address severity_level* **| facility auth | authpriv | cron | daemon | ftp | kernel | local0 | local1 | local2 | local3 | local4 | local5 | local6 | local7 | lpr | mail | news | syslog | user | uucp]**

Syntax Description

logging server	Sets message logging for remote server.
hostname	Enters host name for remote server.
ip address	Enters the IP address for the remote server.
severity_level	Enter severity level of message. 0-emerg;1-alert;2-crit;3-err;4-warn;5-notif;6-inform;7-debug
facility	Facility to use when forwarding to server
auth	Use auth facility
authpriv	Use authpriv facility
cron	Use Cron/at facility
daemon	Use daemon facility
ftp	Use file transfer system facility
kernel	Use kernel facility
local0	Use local0 facility
local1	Use local1 facility
local2	Use local2 facility
local3	Use local3 facility
local4	Use local4 facility
local5	Use local5 facility
local6	Use local6 facility
local7	Use local7 facility
lpr	Use lpr facility
mail	Use mail facility
news	Use USENET news facility
syslog	Use syslog facility
user	Use user facility
uucp	Use Unix-to-Unix copy system facility

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

Enable message logging to the specified remote server for level 7 messages.

```
switch## config t
switch(config)# logging sever sanjose 7
```

Related Commands

Command	Description
show logging server	Displays the message logging for the remote server.

M Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

mkdir

To create a directory in the Flash file system, use the **mkdir** command in EXEC mode.

mkdir *directory*

Syntax Description

directory	Name of the directory to create.

Defaults

This command has no default settings.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

This command is only valid on Class C Flash file systems.

You can specify whether to create the directory on bootflash: or on slot0 or on volatile:

If you do not specify the directory name in the command line, the switch prompts you for it.

Examples

The following example creates a directory called test in the slot0 directory.

```
switch# mkdir slot0:test
```

The following example creates a directory called test at the current directory level.

```
switch# mkdir test
```

If the current directory is slot0:mydir, this command creates a directory called slot0:mydir/test.

Related Commands

Command	Description
dir	Displays a list of files on a file system.
rmdir	Removes an existing directory in the Flash file system.

modem connect line

To enable a modem connection when the switch is already in operation, use the **modem connect line** command in EXEC mode.

modem connect line [com1 | console]

SyntaxDescription

modem	Enables the modem mode.
connect line	Notifies the switch about a modem connection.
com1	Connects the modem through a COM1 line connection
console	Connects the modem through a console line connection

Defaults

Disabled.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

If the switch is already in operation when the modem is connected, issue this command to notify the software that a modem is going to be added.

You must issue the **modem connect line** command before setting the user-input string for initialization.

Examples

The following example announces a modem connection from the line console.

```
switch# modem connect line console
```

The following example announces a modem connection from the COM1 port.

```
switch# modem connect line com1
```

move

To remove a file from the source directory and place it in the destination directory, use the **move** command in EXEC mode.

move {bootflash: | slot0: | volatile:} *directory* **{bootflash: | slot0: | volatile:}** *directory*

Syntax Description

bootflash:	Source or destination location for internal bootflash memory.
slot0:	Source or destination location for the CompactFlash memory or PCMCIA card.
volatile:	Source or destination location for volatile memory.
directory	Name of the directory to move or to create.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

If you do not specify the directory name in the command line, the switch prompts you for it.

Examples

The following example moves the file called samplefile from the slot0 directory to the mystorage directory.

```
switch# move slot0:samplefile slot0:mystorage/samplefile
```

The following example moves a file from the current directory level.

```
switch# move samplefile mystorage/samplefile
```

If the current directory is slot0:mydir, this command moves slot0:mydir/samplefile to slot0:mydir/mystorage/samplefile.

Related Commands

Command	Description
dir	Displays a list of files on a file system.
mkdir	Creates a directory in the Flash file system.
rmdir	Removes an existing directory in the Flash file system.

CHAPTER 15

N Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

ntp

To configure NTP settings on the switch, use the **ntp** command in configuration mode.

ntp {peer *hostname* **| server | tstamp-check}**

Syntax Description

peer *hostname*	The hostname/IP address of the NTP peer (Max Size - 80).
server	The hostname/IP address of the NTP server (Max Size - 80).
tstamp-check	Enables or disables the Timestamp Check.

Defaults

This command has no default settings.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

This example forms a server association with a server.

```
switch(config)# ntp server 10.10.10.10
switch(config)#
```

This example forms a peer association with a peer. You can specify multiple associations.

```
switch(config)# ntp peer 10.20.10.0
switch(config)#
```

P Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

passive-mode

To configure the required mode to initiate an IP connection, use the **passive-mode** option. To enable passive mode for the FCIP interface, use the **no** form of the option.

passive-mode

no passive-mode

Syntax Description

passive-mode	Configures a passive connection.

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

By default, the active mode is enabled to actively attempt an IP connection.

If you enable the passive mode, the switch does not initiate a TCP connection and merely waits for the peer to connect to it.

Examples

```
switch# config t
switch(config)# interface fcip 1
switch(config-if)# passive-mode
```

Related Commands

Command	Description
show interface fcip	Displays an interface configuration for a specified FCIP interface.

peer-info

To configure the peer information for the FCIP interface, use the **peer-info** option. To disable the passive mode for the FCIP interface, use the **no** form of the option.

peer-info ipaddress *address* **| port** *number*

no peer-info ipaddress *address* **| port** *number*

Syntax Description

peer-info	Configures the peer information.
ipaddress	Configures the peer IP address.
address	Enters the IP address.
port	Configures a peer port.
number	Enters the peer port number from 1 to 65535.

Defaults

None.

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

The basic FCIP configuration uses the peer's IP address to configure the peer information. You can also use the peer's port number, port profile ID, or port WWN to configure the peer information. If you do not specify a port, the default 3225 port number is used to establish connection.

Examples

The following command assigns an IP address to configure the peer information. Since no port is specified, the default port number, 3225, is used.

```
switch(config-if)# peer-info ipaddr 10.1.1.1
```

The following command deletes the assigned peer port information.

```
switch(config-if)# no peer-info ipaddr 10.10.1.1
```

The following command assigns the IP address and sets the peer TCP port to 3000. The valid port number range is from 0 to 65535.

```
switch(config-if)# peer-info ipaddr 10.1.1.1 port 3000
```

The following command deletes the assigned peer port information.

```
switch(config-if)# no peer-info ipaddr 10.1.1.1 port 2000
```

The following command assigns the peer profile ID to connect to 20. The valid range is from 1 to 255

```
switch(config-if)# peer-info profile_id 20
```

The following command deletes the assigned peer profile ID information.

```
switch(config-if)# no peer-info profile_id 500
```

Related Commands

Command	Description
show interface fcip	Displays an interface configuration for a specified FCIP interface.

ping

To diagnose basic network connectivity, use the **ping** (packet internet groper) command in EXEC mode.

ping {*host-name* | *system-address*}

Syntax Description

host-name	Host name of system to ping. Maximum length is 64 characters.
system-address	Address of system to ping.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

The ping program sends an echo request packet to an address, and then awaits a reply. The ping output can help you evaluate path-to-host reliability, delays over the path, and whether the host can be reached or is functioning.

Verify connectivity to the TFTP server using the **ping** command.

To abnormally terminate a ping session, type the **Ctrl-C** escape sequence

Examples

The following example pings system 192.168.7.27.

```
switch# ping 192.168.7.27
PING 192.168.7.27 (192.168.7.27): 56 data bytes
64 bytes from 192.168.7.27: icmp_seq=0 ttl=255 time=0.4 ms
64 bytes from 192.168.7.27: icmp_seq=1 ttl=255 time=0.2 ms
64 bytes from 192.168.7.27: icmp_seq=2 ttl=255 time=0.2 ms
64 bytes from 192.168.7.27: icmp_seq=3 ttl=255 time=0.2 ms

--- 192.168.7.27 ping statistics ---
13 packets transmitted, 13 packets received, 0% packet loss
round-trip min/avg/max = 0.2/0.2/0.4 ms
```

port

To assign the port number of a Gigabit Ethernet interface to the FCIP profile, use the **port** command. Use the **no** form of the command to negate the command or revert to factory defaults.

port *number*

no port *number*

Syntax Description

port	Configures a peer port.
number	Enters the peer port number from 1 to 65535.

Defaults

Disabled

Command Modes

Configuration mode—fcip profile submode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Associates the profile with the assigned local port number. If a port number is not assigned for a FCIP profile, the default TCP port 3225 is used.

Examples

```
switch## config t

switch(config)# fcip profile 5

switch(config-profile)# port 5000
```

Related Commands

Command	Description
show fcip profile	Displays information about the FCIP profile.
interface fcip *interface_number* **use-profile** *profile-id*	Configures the interface using an existing profile ID from 1 to 255.
show interface fcip	Displays an interface configuration for a specified FCIP interface.

portaddress

To enable the FICON feature in a specified VSAN, use the **ficon vsan** command in configuration mode. To disable the feature or to revert to factory defaults, use the **no** form of the command.

portaddress *portaddress*
block
name *string*
prohibit portaddress *portaddress*

Syntax Description

portnumber *portnumber*	Configures the FICON port number for this interface.
block	Assigns a name for a port address.
name *string*	Enters the FICON configuration mode for the specified VSAN (from 1 to 4096).
prohibit portaddress *portaddress*	Prohibit communication with a range of portaddress.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The **shutdown/no shutdown** port state is independent of the **block/no block** port state. If a port is shutdown, unblocking that port will not initialize the port.

You cannot block or prohibit CUP port (0XFE).

If you prohibit ports, the specified ports are prevented from communicating with each other. Unimplemented ports are always prohibited.

Examples

The following example disables a range of port addresses and retains it in the operationally down state.

```
switch# config t
switch(config)# ficon vsan 2
switch(config-ficon)# portaddress 1 - 5
switch(config-ficon-portaddr)# block
```

The following example enables the selected port address and reverts to the factory default of the port address not being blocked.

```
switch(config-ficon-portaddr)# no block
```

The following example prohibits port address 7 in VSAN 2 from talking to ports 3, 4, and 5.

```
switch(config-ficon-portaddr)# prohibit portaddress 3-5
```

The following example removes port address 5 from a previously-prohibited state.

```
switch(config-ficon-portaddr)# no prohibit portaddress 3-5
```

The following example assigns a name to the port address.

```
switch(config-ficon-portaddr)# name SampleName
```

The following example deletes a previously configured port address name.

```
switch(config-ficon-portaddr)# no name SampleName
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.

port-security

To configure port security features and reject intrusion attempts, use the **port-security** command in configuration mode. Use the **no** form of the command to negate the command or revert to factory defaults.

port-security
activate vsan *vsan-id* **[force | no-auto-learn] |**
auto-learn vsan *vsan-id* **|**
database *vsan-id* [**swwn** *wwn* **| any-wwn | pwwn** *wwn* **| fwwn** *wwn* **| | nwwn** *wwn* **interface** *slot/port* **| port-channel** *number* **]**

no port-security
activate vsan *vsan-id* **[force | no-auto-learn] |**
auto-learn vsan *vsan-id* **|**
database *vsan-id* [**swwn** *wwn* **| any-wwn | pwwn** *wwn* **| fwwn** *wwn* **| | nwwn** *wwn* **interface** *slot/port* **| port-channel** *number* **]**

Syntax Description

activate	Activates a port security database for the specified VSAN and automatically enables auto-learn.
auto-learn	Enables auto-learning for the specified VSAN.
database	Enters the port security database configuration mode for the specified VSAN.
swwn *wwn*	Specifies the switch WWN as the xE port connection.
any-wwn	Specifies any WWN to login to the switch.
pwwn *wwn*	Specifies the port WWN as the Nx port connection.
nwwn *wwn*	Specifies the node WWN as the Nx port connection.
fwwn *wwn*	Specifies a fabric WWN login.
interface *slot/port*	Specifies the device or switch port interface through which each device is connected to the switch.
port-channel *number*	Specifies a PortChannel login.
vsan *vsan-id*	Specifies the VSAN ID (ranges from 1 to 4093).
force	Forces the database activation.
no-auto-learn	Disables the auto-learn feature for the port security database.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

When you activate the port security feature, the **auto-learn** option is also automatically enabled. You can choose to activate the port-security feature and disable **auto-learn** using the **port-security activate vsan** *number* **no-auto-learn** command. In this case, you need to manually populate the port security database by individually securing each port.

If the **auto-learn** option is enabled on a VSAN, you cannot activate the database for that VSAN without the **force** option.

Examples

The following example activates the port security database for the specified VSAN, and automatically enables auto-learn.

```
switch# config t
switch(config)# port-security activate vsan 1
```

The following example deactivates the port security database for the specified VSAN, and automatically disables auto-learn.

```
switch# config t
switch(config)# no port-security activate vsan 1
```

The following example disables the auto-learn feature for the port security database in VSAN 1.

```
switch# config t
switch(config)# port-security activate vsan 1 no-auto-learn
```

The following example enables auto-learning so the switch can learn about any device that is allowed to access VSAN 1. These devices are logged in the port security active database.

```
switch# config t
switch(config)# port-security auto-learn vsan 1
```

The following example disables auto-learning and stops the switch from learning about new devices accessing the switch. Enforces the database contents based on the devices learnt up to this point.

```
switch# config t
switch(config)# no port-security auto-learn vsan 1
```

The following example enters the port security database mode for the specified VSAN.

```
switch# config t
switch(config)# port-security database vsan 1
switch(config-port-security)#
```

The following example configures the specified sWWN to only login through PortChannel 5.

```
switch(config-port-security)# swwn 20:01:33:11:00:2a:4a:66 interface port-channel 5
```

The following example configures any WWN to login through the specified interfaces.

```
switch(config-port-security)# any-wwn interface fc1/1 - fc1/8
```

The following example configures the specified pWWN to only log in through the specified fWWN.

```
switch(config-port-security)# pwwn 20:11:00:33:11:00:2a:4a fwwn 20:81:00:44:22:00:4a:9e
```

The following example deletes the specified pWWN configured in the previous step.

```
switch(config-port-security)# no pwwn 20:11:00:33:11:00:2a:4a fwwn 20:81:00:44:22:00:4a:9e
```

The following example configures the specified nWWN to log in through the specified fWWN.

```
switch(config-port-security)# nwwn 26:33:22:00:55:05:3d:4c fwwn 20:81:00:44:22:00:4a:9e
```

The following example configures the specified pWWN to login through any port on the local switch.

```
switch(config-port-security)# pwwn 20:11:33:11:00:2a:4a:66
```

The following example configures any WWN to log in through the specified interface.

```
switch(config-port-security)# any-wwn interface fc3/1
```

The following example deletes the wildcard configured in the previous step.

```
switch(config-port-security)# no any-wwn interface fc2/1
```

The following example deletes the port security configuration database from the specified VSAN.

```
switch# config t
switch(config)# no port-security database vsan 1
switch(config)#
```

The following example forces the VSAN 1 port security database to activate despite conflicts.

```
switch(config)# port-security activate vsan 1 force
```

Related Commands

Command	Description
port-security	Configures port security features.
show port-security database	Displays configured port security information.

port-security database

To copy the port security database or to view the difference within the port security database, use the **port-security database** command in EXEC mode.

port-security database
copy vsan *vsan-id* |
diff [active | config] vsan *vsan-id*

Syntax Description

port-security	Activates a port security database for the specified VSAN and automatically enables auto-learn.
database	Enters the port security database configuration mode for the specified VSAN.
copy	Copies the active database to the configuration database.
diff	Provides the difference between the active and configuration port security database.
active	Writes the active database to the configuration database.
config	Writes the configuration database to the active database.
vsan *vsan-id*	Specifies the VSAN ID (ranges from 1 to 4093).

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

If the active database is empty, the port-security database is empty.

Use the **port-security database diff active** command to resolve conflicts.

Examples

The following example copies the active to the configured database.

```
switch# port-security database copy vsan 1
```

The following example provides the differences between the active database and the configuration database.

```
switch# port-security database diff active vsan 1
```

The following example provides information on the differences between the configuration database and the active database.

```
switch# port-security database diff config vsan 1
```

Related Commands

Command	Description
port-security database	Copies and provides information on the differences within the port security database.
show port-security database	Displays configured port security information.

power redundancy-mode

To configure the capacity of the power supplies on the Cisco MDS 9500 Family of switches, use the **power redundancy-mode** command in configuration mode. Use the **no** form of the command to negate the command or revert to factory defaults.

power redundancy-mode {combined | redundant [force]}

no power redundancy-mode {combined | redundant [force]}

Syntax Description

combined	Configures power supply redundancy mode as combined.
force	Forces combined mode without prompting.
redundant	Configures power supply redundancy mode as redundant.

Defaults

Redundant mode.

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

- If power supplies with different capacities are installed in the switch, the total power available differs based on the configured mode:
- In redundant mode, the total power is the lesser of the two power supply capacities. This reserves enough power to keep the system powered on in case of a power supply failure. This is the recommended or default mode.
- In combined mode, the total power is twice the lesser of the two power supply capacities. In case of a power supply failure, the entire system could be shut down, depending on the power usage at that time.
- When a new power supply is installed, the switch automatically detects the power supply capacity. If the new power supply has a capacity that is lower than the current power usage in the switch and the power supplies are configured in redundant mode, the new power supply will be shut down.
- When you change the configuration from combined to redundant mode and the system detects a power supply that has a capacity lower than the current usage, the power supply is shut down. If both power supplies have a lower capacity than the current system usage, the configuration is not allowed.

Examples

The following examples demonstrate how the power supply redundancy mode could be set.

```
switch(config)# power redundancy-mode combined
WARNING: This mode can cause service disruptions in case of a power supply failure.
Proceed ? [y/n] y
switch(config)# power redundancy-mode redundant
```

Related Commands

Command	Description
show environment power	Displays status of power supply modules, power supply redundancy mode, and power usage summary.
copy running-config startup-config	Copies all running configuration to the startup configuration.

poweroff module

To power off individual modules in the system, use the **poweroff module** command in configuration mode. Use the **no** form of this command to power up the specified module.

poweroff module *module-number*

no poweroff module *module-number*

Syntax Description

poweroff module	Powers off the specified module in the switch
module-number	Specifies the module number from 1 to 9.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Use the **poweroff module** command to power off individual modules. The **poweroff module** command cannot be used to power off supervisor modules.

Examples

The following example powers off and powers up module 1.

```
switch# config t
switch(config)# poweroff module 1
switch(config)#
switch(config)# no poweroff 1
switch(config)#
```

Related Commands

Command	Description
show module	Displays information for a specified module.
copy running-config startup-config	Copies all running configuration to the startup configuration.

purge fcdomain fcid

To purge persistent FCIDs, use the **purge fcdomain fcid** command in EXEC mode.

purge fcdomain fcid vsan *vsan-id*

Syntax Description

vsan	Indicates that FCIDs are to be purged for a VSAN.
vsan-id	The ID of the VSAN is from 1 to 4093.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example shows how to purge all dynamic, unused FC IDs in VSAN 4

```
switch# purge fcdomain fcid vsan 4
switch#
```

The following example shows how to purge all dynamic, unused FC IDs in VSANs 4, 5, and 6.

```
switch# purge fcdomain fcid vsan 3-5
switch#
```

purge module

To delete configurations for nonexistent modules, use the **purge module** command in EXEC mode.

purge module *slot* **running-config**

Syntax Description

module *slot*	Specifies the module slot number.
running-config	Purges the running configuration from the specified module.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

This command cannot be issued on a supervisor module.

Examples

The following example displays the output of the **purge module** command issued on the module in slot 8.

```
switch# purge module 8 running-config
switch#
```

pwd

To display the current directory location, use the **pwd** command in EXEC mode.

pwd

Syntax Description

This command has no keywords or arguments.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example changes the directory and displays the current directory.

```
switch# cd bootflash:logs
switch# pwd
bootflash:/logs
```

Related Commands

Command	Description
cd	Changes the current directory to the specified directory.

Q Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

qos control priority

To enable the QoS priority assignment for control traffic feature on the Cisco MDS 9000 family of switches, use the **qos control** command in configuration mode. To disable the QoS priority assignment for control traffic feature. use the **no** form of the command.

qos control priority *value*

no qos control *value*

Syntax Description

qos control	Controls QoS traffic from one fabric controller to another.
priority	Sets the priority level.
value	Specifies priority value ranging from 0 to 7.

Defaults

Enabled and priority 7 are the defaults.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example disables the QoS priority assignment feature.

```
switch# config t
switch(config)# no qos control priority
```

Related Commands

Command	Description
show qos	Displays configured QoS information.

qos enable

To enable the QoS priority assignment for data traffic feature on the Cisco MDS 9000 family of switches, use the **qos enable** command in configuration mode. To disable the QoS priority assignment for control traffic feature, use the **no** form of the command.

qos enable

no qos enable

Syntax Description

qos enable	Enables the configuration of data traffic parameters.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example disables the QoS priority assignment feature.

```
switch# config t
switch(config)# qos enable
```

Related Commands

Command	Description
show qos	Displays configured QoS information.

qos class-map

To create and define a traffic class with match criteria that will be used to identify traffic, use the **qos class-map** command in configuration mode. To remove a previously-configured class, use the **no** form of the command.

qos class-map *class-name* **[match-all | match-any]**
match dest-addr *destination-fcid* **| dest-wwn** *destination-wwn* **| src-addr** *source-fcid* **| src-int fc** *slot/port* **| src-wwn** *source-wwn*

no qos class-map *class-name* **[match-all | match-any]**
match dest-addr *destination-fcid* **| dest-wwn** *destination-wwn* **| src-addr** *source-fcid* **| src-int fc** *slot/port* **| src-wwn** *source-wwn*

Syntax Description

qos class-map	Configures a QoS class map.
class-name	Assigns a class-map name that is restricted to 63 alpha-numeric characters.
match-all	Specifies a logical AND operator for all matching statements in this class. (default).
match-any	Specifies a logical OR operator for all matching statements in this class.
match	Specifies a match criteria.
dest-addr *destination-fcid*	Specifies the destination FC ID to match frames.
dest-wwn *destination-wwn*	Specifies the destination WWN to match frames.
src-addr *source-fcid*	Specifies the source FC ID to match frames.
src-intf fc *slot/port*	Specifies the source Fibre Channel interface to match frames.
src-wwn *source-wwn*	Specifies the source WWN to match frames.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

You can access this command only if you enable the QoS data traffic feature using the **qos enable** command.

Examples

The following example creates a class map called MyClass and places you in the class-map submode to match all (default) criteria specified for this class.

```
switch(config)# qos class-map MyClass
switch(config-cmap)#
```

The following example creates a class map called MyClass1 and places you in the class-map submode to match any (default) criteria specified for this class.

```
switch(config)# qos class-map MyClass1 match-any
switch(config-cmap)#
```

The following example specifies a destination address match for frames with the specified destination FC ID.

```
switch(config-cmap)# match dest-addr 0x12ee00
```

The following example specifies a source address and mask match for frames with the specified source FC ID. Mask refers to a single or entire area of FC IDs.

```
switch(config-cmap)# match src-addr 0x6d1090 mask 0
```

The following example specifies a destination WWN to match frames.

```
switch(config-cmap)# match dest-wwn 20:01:00:05:30:00:28:df
Operation in progress. Please check class-map parameters
```

The following example specifies a source WWN to match frames.

```
switch(config-cmap)# match src-wwn 23:15:00:05:30:00:2a:1f
Operation in progress. Please check class-map parameters
```

The following example specifies a source interface to match frames.

```
switch(config-cmap)# dest-addr src-intf fc 2/1
Operation in progress. Please check class-map parameters
```

The following example removes a match based on the specified source interface.

```
switch(config-cmap)# no dest-addr src-intf fc 3/5
```

Related Commands

Command	Description
show qos	Displays configured QoS information.

qos dwrr-q

To associate a weight with a DWRR queue, use the **qos dwrr-q** command in configuration mode. To remove a previously-configured class, use the **no** form of the command.

qos dwrr-q high | low | medium

no qos dwrr-q high | low | medium

Syntax Description

qos dwrr-q	Configures Deficit Weighted Round Robin (DWRR) scheduling queues.
high	Assigns the dwrr-q high option to DWRR queues.
low	Assigns the dwrr-q low option to DWRR queues (default).
medium	Assigns the dwrr-q medium option to DWRR queues.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

You can access this command only if you enable the QoS data traffic feature using the **qos enable** command.

Examples

The following example specifies the priority to be given for each frame matching this class.

```
switch(config-pmap-c)# priority high
```

The following example deletes a previously-assigned priority and reverts to the default value of **low**.

```
switch(config-pmap-c)# no priority high
```

Related Commands

Command	Description
show qos	Displays configured QoS information.

qos policy-map

To specify the class of service, use the **qos policy-map** command in configuration mode. To remove a previously-configured class, use the **no** form of the command.

qos policy-map *policy-name*
class *class-name*
dscp *dscp-value*
priority high | low | medium

no qos policy-map *policy-name*
class *class-name*
dscp *dscp-value*
priority high | low | medium

Syntax Description

qos policy-map	Configures a QoS policy map.
policy-name	Assigns a policy-map name that is restricted to 63 alpha-numeric characters.
class *class-name*	Enters the submode for a pre-defined class policy.
dscp *dscp-value*	Enters the Differentiated Services Code Point (DSCP) classification for the selected class map.
priority	Configures the priority to match frames.
high	Assigns frames matching the class-map to get high priority.
low	Assigns frames matching the class-map to get low priority.
medium	Assigns frames matching the class-map to get medium priority.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

You can access this command only if you enable the QoS data traffic feature using the **qos enable** command.

As an alternative, you can map a classmap to a Differentiated Services Code Point (DSCP).The DSCP is an indicator of the service level for a specified frame. The DSCP value ranges from 0 to 63. A dscp value of 46 is disallowed.

Examples

The following example creates a policy map called MyPolicy and places you in the policy-map submode.

```
switch(config)# qos policy-map MyPolicy
switch(config-pmap)#
```

The following example deletes the policy map called OldPolicy and places you in the policy-map submode.

```
switch(config)# no qos policy-map OldPolicy
switch(config)#
```

The following example specifies the name of a predefined class and places you at the policy-map submode for that class.

```
switch(config-pmap)# class MyClass
switch(config-pmap-c)#
```

The following example exits the policy-map submode for this class.

```
switch(config-pmap)# no class OldClass
```

The following example specifies the DSCP value to mark each frame matching this class.

```
switch(config-pmap-c)# dscp 2
Operation in progress. Please check class-map parameters
```

The following example deletes a previously-assigned DSCP value.

```
switch(config-pmap-c)# no dscp 60
```

Related Commands

Command	Description
show qos	Displays configured QoS information.

qos service

To apply a service policy, use the **qos service** command in configuration mode. To remove a previously-configured class, use the **no** form of the command.

qos service policy *policy-name*

no qos service policy *policy-name*

Syntax Description

qos service	Configure a QoS service policy for a VSAN(s)
policy *policy-name*	Associates a policy map with the VSAN.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

You can access this command only if you enable the QoS data traffic feature using the **qos enable** command.

Examples

The following example applies a configured policy to VSAN 3.

```
switch(config)# qos service policy MyPolicy vsan 3
Operation in progress. Please check policy-map parameters
```

The following example deletes a configured policy that was applied to VSAN 7.

```
switch(config)# no qos service policy OldPolicy vsan 7
Operation in progress. Please check policy-map parameters
```

Related Commands

Command	Description
show qos	Displays configured QoS information.

quiesce

To gracefully shutdown an ISL in a PortChannel, use the **quiesce** command in configuration mode. To remove a previously-configured class, use the **no** form of the command.

quiesce interface fc *slot/port*

queisce no interface fc *slot/port*

Syntax Description

quiesce	Shuts down the specified interface gracefully.
interface fc *slot/port*	Specifies the interface to be quiesced.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The following conditions return an error:

- The interface is not part of port-channel
- The interface is not up
- The interface is the last operational interface in the PortChannel

Examples

The following example gracefully shuts down the one end of the ISL link in a PortChannel.

```
switchA# quiesce interface fc 2/1
WARNING: this command will stop forwarding frames to the specified interfaces. It is
intended to be used to gracefully shutdown interfaces in a port-channel. The procedure is:
1. quiesce the interfaces on both switches.
2. shutdown the interfaces administratively.
Do you want to continue? (y/n)  [n] y
```

Related Commands

Command	Description
show qos	Displays configured QoS information.

R Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

radius-server host

To configure RADIUS server parameters, use the **radius** command. Use the no form of this command to revert to the factory defaults.

radius-server host *server-name or ip-address*
[key [0|7] shared-secret]
[auth-port *port-number*] **[acct-port** *port-number*]
[authentication] [accounting]
[timeout *seconds*] **[retransmit** *count*]

no radius-server host *server-name or ip-address*
[key [0|7] shared-secret]
[auth-port *port-number*] **[acct-port** *port-number*]
[authentication] [accounting]
[timeout *seconds*] **[retransmit** *count*]

Syntax Description

server-name or ip-address	Enters RADIUS server's DNS name or its IP address. The maximum character size is 256.
auth-port port-number	Configures the RADIUS server's port for authentication
acct-port *port-number*	RADIUS server's port for accounting.
authentication	Use for authentication.
accounting	Use for accounting.
key	RADIUS server’s shared secret.
0	Configures a preshared key specified in clear text (indicated by 0) to authenticate communication between the RADIUS client and server. This is the default.
7	Configures a preshared key specified in encrypted text (indicated by 7) to authenticate communication between the RADIUS client and server.
shared-secret	Configures a preshared key to authenticate communication between the RADIUS client and server.
retransmit	RADIUS server retransmit count.
count	Configures the number of times (3) the switch tries to connect to a RADIUS server(s) before reverting to local authentication.
timeout	RADIUS server timeout period in seconds.
seconds	Specifies the time (in seconds) between retransmissions to the RADIUS server. The default is one (1) second and the valid range is 1 to 60 seconds.

Defaults

None.

Command Modes

Configuration mode.

Command History This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines None.

Examples The following examples provide various scenarios to configure RADIUS authentication.

```
switch# config t
switch(config)# radius-server host 10.10.2.3 key HostKey
switch(config)# radius-server host 10.10.2.3 auth-port 2003
switch(config)# radius-server host 10.10.2.3 acct-port 2004
switch(config)# radius-server host 10.10.2.3 accounting
switch(config)# radius-server host radius2 key 0 abcd
switch(config)# radius-server host radius3 key 7 1234
```

radius-server key

To configure a global RADIUS shared secret, use the **radius-server key** command. Use the **no** form of this command to removed a configured shared secret.

radius-server key [0 | 7] *shared-secret*

no radius-server key [0 | 7] *shared secret*

Syntax Description

key	Global RADIUS shared secret.
0	Configures a preshared key specified in clear text (indicated by 0) to authenticate communication between the RADIUS client and server. This is the default.
7	Configures a preshared key specified in encrypted text (indicated by 7) to authenticate communication between the RADIUS client and server.
shared-secret	Configures a preshared key to authenticate communication between the RADIUS client and server.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

You need to configure the RADIUS preshared key to authenticate the switch to the RADIUS server. The length of the key is restricted to 65 characters and can include any printable ASCII characters (white spaces are not allowed). You can configure a global key to be used for all RADIUS server configurations on the switch. You can override this global key assignment by explicitly using the **key** option in the **radius-server host** command.

Examples

The following examples provide various scenarios to configure RADIUS authentication.

```
switch# config t

switch(config)# radius-server key AnyWord

switch(config)# radius-server key 0 AnyWord

switch(config)# radius-server key 7 public
```

radius-server retransmit

To globally specify the number of times the switch should try a request with a RADIUS server, use the **radius-server retransmit** command.

radius-server retransmit *count*

Syntax Description

retransmit	RADIUS server retransmit count.
count	Configures the number of times (3) the switch tries to connect to a RADIUS server(s) before reverting to local authentication.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

By default, a switch retries a RADIUS server connection only once. This number can be configured. The maximum is five retries per server. You can revert the retry number to its default by issuing the **no radius-server retransmit** command.

Examples

The following examples provide various scenarios to configure RADIUS authentication.

```
switch# config t

switch(config)# radius-server retransmit 3
```

radius-server timeout

To specify the time between retransmissions to the RADIUS servers, use the **radius-server timeout** command. You can revert the retransmission time to its default by issuing the **no** form of this command.

radius-server timeout *seconds*

no radius-server timeout *seconds*

Syntax Description

timeout	RADIUS server timeout period in seconds.
seconds	Specifies the time (in seconds) between retransmissions to the RADIUS server. The default is one (1) second and the valid range is 1 to 60 seconds.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following examples provide various scenarios to configure RADIUS authentication.

```
switch# config t

switch(config)# radius-server timeout 30
```

reload

To reload the entire switch, an active supervisor module, a standby supervisor module, or a specific module, or to force a netboot on a given module, use the **reload** command in EXEC mode.

reload [module *module-number* **force-dnld]**

Syntax Description

module	Reloads a specific module or active/standby supervisor module.
module-number	Specifies a module, either 1 or 2.
force-dnld	Reloads, initiates netboot, and forces the download of the latest module firmware version to a specific module.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Use the **reload** command to reboot the system, or to reboot a specific module, or to force a netboot on a specific module. The **reload** command used by itself, powers down all the modules and reboots the supervisor modules.

The **reload module** *module-number* command is used if the given slot has a module or standby supervisor module. It then power-cycles that module. If the given slot has an active supervisor module, then it causes the currently active supervisor module to reboot and the standby supervisor module becomes active.

The **reload module** *module-number* **force-dnld** command is similar to the previous command. This command forces netboot to be performed. If the slot contains a module, then the module netboots with the latest firmware and updates its corresponding flash with this image.

Examples

The following example uses **reload** to reboot the system.

```
switch# reload
This command will reboot the system. (y/n)? y
```

The following example uses **reload** to initiate netboot on a specific module.

```
switch# reload module 8 force-dnld
```

The following example uses **reload** to reboot a specific module.

```
switch# reload module 8
reloading module 8 ...
```

The following example uses **reload** to reboot an active supervisor module.

```
switch# reload module 5
This command will cause supervisor switchover. (y/n)? y
```

Related Commands

Command	Description
install	Installs a new software image.
copy system:running-config nvram:startup-config	Copies any file from a source to a destination.

rmdir

To delete an existing directory from the Flash file system, use the **rmdir** command in EXEC mode.

rmdir {bootflash: | slot0: | volatile:} ***directory***

Syntax Description

bootflash:	Source or destination location for internal bootflash memory.
slot0:	Source or destination location for the CompactFlash memory or PCMCIA card.
volatile:	Source or destination location for volatile file system.
directory	Name of the directory to remove.

Defaults

This command has no default settings.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

This command is only valid on Flash file systems.

The **rmdir** command deletes an existing directory at the current directory level or at a specified directory level. The directory must be empty to be deleted.

Examples

The following example deletes the directory called test in the slot0 directory.

```
switch# rmdir slot0:test
```

The following example deletes the directory called test at the current directory level.

```
switch# rmdir test
```

If the current directory is slot0:mydir, this command deletes the slot0:mydir/test directory.

Related Commands

Command	Description
dir	Displays a list of files on a file system.
mkir	Creates a new directory in the Flash file system.

role name

To configure and assign users to a new role or to modify the profile for an existing role, use the **role name** command in configuration mode. Use the **no** form of this command to delete a configured role.

role name *name* **[description** *user description*] **[rule** *number* **permit clear feature** *name* **|permit config feature** *name* **| permit debug feature** *name* **| permit show feature** *name*] **[rule** *number* **deny clear feature** *name* **| deny config feature** *name* **| deny debug feature** *name* **| deny exec feature** *name* **| deny show feature** *name*]

no role name *name* **[description** *user description*] **[rule** *number* **permit clear feature** *name* **| permit config feature** *name* **| permit debug feature** *name* **| permit show feature** *name*] **[rule** *number* **deny clear feature** *name* **| deny config feature** *name* **| deny debug feature** *name* **| deny exec feature** *name* **| deny show feature** *name*]

Syntax Description

role name	Configures RADIUS server.
name	Adds RADIUS server. The maximum size is 32.
description	Add a description for the role. The maximum size is 80.
user description	Add description of users to the role.
exit	Exit from this submode
no	Negate a command or set its defaults
rule	Enter the rule number 1-16.
number	Enter the rule number 1-16.
permit	Remove commands from the role.
deny	Add commands to the role
clear	Clear commands
config	Configuration commands
debug	Debug commands
show	Show commands
feature	Enter the feature name
exec	Exec commands
name	Enter the feature name (Max Size - 32)

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Roles are assigned rules. Roles are a group of rules defining a user's access to certain commands. Users are assigned roles. The rules within roles can be assigned to permit or deny access to the following commands:

clear Clear commands
config Configuration commands
debug Debug commands
exec EXEC commands
show Show commands

These commands can have **permit** or **deny** options within that command line.

Examples

The following example shows how to assign users to a new role.

```
switch# config t
switch(config)# role name techdocs
switch(config-role)#
switch(config)# no role name techdocs
switch(config)#
switch(config-role)# description Entire Tech. Docs. group
switch(config-role)# no description
switch# config t
switch(config)# role name sangroup
switch(config-role)#
switch(config-role)# rule 1 permit config
switch(config-role)# rule 2 deny config feature fspf
switch(config-role)# rule 3 permit debug feature zone
switch(config-role)# rule 4 permit exec feature fcping
switch(config-role)# no rule 4

Role: network-operator
Description: Predefined Network Operator group. This role cannot be modified
Access to Show commands and selected Exec commands
```

Related Commands

Command	Description
show role	Displays all roles configured on the switch including the rules based on each role.

rscn

To configure a registered state change notification (RSCN), a Fibre Channel service that informs Nx ports about changes in the fabric, use the **rscn** command in configuration mode.

rscn {multi-pid *value* **| supress interface fc** *slot-number* }

Syntax Description

multi-pid	Sends RSCNs in multi-PID format.
vsan	Configures VSAN information or membership.
vsan-id	The ID of the VSAN is from 1 to 4093.
fc	Fiber Channel interface. Slot number range is from 1 to 9.
slot-number	Specifies a slot number and port number.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example configures RSCNs in multi-PID format.

```
switch# config t
excal-113(config)# rscn multi-pid vsan 1
```

Related Commands

Command	Description
show rscn internal	Displays RSCN internal information.
show rscn src-table	Displays state change registration table,
show rscn statistics	Displays RSCN statistics.

run-script

To execute the commands specified in a file, use the **run script** command.

run-script {bootflash: | slot0: | volatile:} *filename*

Syntax Description

bootflash:	Source or destination location for internal bootflash memory.
slot0:	Source or destination location for the CompactFlash memory or PCMCIA card.
volatile:	Source or destination location for volatile file system.
filename	Name of the file containing the commands.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

To use this command, be sure to create the file and specify commands in the required order.

Examples

The following example executes the CLI commands specified in the testfile that resides in the slot0 directory.

```
switch# show file slot0:testfile
conf t
interface fc 1/1
no shutdown
end
sh interface fc1/1
```

In response to the **run-script** command, this is the file output:

```
switch# run-script slot0:testfile
'conf t'
Enter configuration commands, one per line. End with CNTL/Z.

'interface fc 1/1'

'no shutdown'

'end'

'sh interface fc1/1'
fc1/1 is down (Fcot not present)
    Hardware is Fibre Channel
    Port WWN is 20:01:00:05:30:00:48:9e
    Admin port mode is auto, trunk mode is on
```

```
vsan is 1
Beacon is turned off
Counter Values (current):
  0 frames input, 0 bytes, 0 discards
  0 runts, 0 jabber, 0 too long, 0 too short
  0 input errors, 0 CRC, 0 invalid transmission words
  0 address id, 0 delimiter
  0 EOF abort, 0 fragmented, 0 unknown class
  0 frames output, 0 bytes, 0 discards
  Received 0 OLS, 0 LRR, 0 NOS, 0 loop inits
  Transmitted 0 OLS, 0 LRR, 0 NOS, 0 loop inits
Counter Values (5 minute averages):
  0 frames input, 0 bytes, 0 discards
  0 runts, 0 jabber, 0 too long, 0 too short
  0 input errors, 0 CRC, 0 invalid transmission words
  0 address id, 0 delimiter
  0 EOF abort, 0 fragmented, 0 unknown class
  0 frames output, 0 bytes, 0 discards
  Received 0 OLS, 0 LRR, 0 NOS, 0 loop inits
  Transmitted 0 OLS, 0 LRR, 0 NOS, 0 loop inits
```

rspan-tunnel

To associate and bind the SPAN tunnel (ST) port with the RSPAN tunnel, use the **rspan-tunnel** command.

rspan-tunnel interface fc-tunnel *tunnel-id*

Syntax Description

rspan-tunnel	Configures the remote SPAN (RSPAN) tunnel.
interface	Specifies the interface to configure this tunnel.
fc-tunnel	Specifies the FC tunnel interface.
tunnel-id	Configures an ID that ranges from 1 to 255.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

The interface is not operationally up until the Fibre Channel tunnel mapping is configured in the source and destination switches.

Examples

The following example configures an interface to associate and bind the ST port with the RSPAN tunnel and enables traffic flow trough this interface..

```
switchS# config t
switchS(config)# interface fc2/1
switchS(config-if)# rspan-tunnel interface fc-tunnel 100
switchS(config-if)# no shutdown
```

S Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

send

To send a message to all active CLI users currently using the switch, use the **send** command in EXEC mode.

send *message-text*

Syntax Description

message-text	The text of your message.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

This message is restricted to 80 alphanumeric characters with spaces.

Examples

The following example sends a warning message to all active users about the switch being shut down.

```
switch# send Shutting down the system in 2 minutes. Please log off.

Broadcast Message from admin@excal-112
        (/dev/pts/3) at 16:50 ...

Shutting down the system in 2 minutes. Please log off.
```

setup

To enter the switch setup mode, use the **setup** command in EXEC mode.

setup

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Refer to the *Cisco MDS 9000 Family Configuration Guide* for more information on using the **setup** command.

The setup utility guides you through the basic configuration process. Type **Ctrl-c** at any prompt to skip the remaining configuration options and proceed with what is configured until that point.

If you do not wish to answer a previously-configured question, or if you wish to skip answers to any questions press **Enter**. If a default answer is not available (for example switch name), the switch uses what is previously configured and skips to the next question.

Examples

The following example shows how to enter switch setup mode.

```
switch# setup
---- Basic System Configuration Dialog ----

This setup utility will guide you through the basic configuration of
the system. Setup configures only enough connectivity for management
of the system.

*Note: setup always assumes a predefined defaults irrespective
of the current system configuration when invoked from CLI.

Press Enter incase you want to skip any dialog. Use ctrl-c at anytime
to skip away remaining dialogs.

Would you like to enter the basic configuration dialog (yes/no): yes
```

setup ficon

To enter the automated FICON setup mode, use the **setup ficon** command in EXEC mode.

setup ficon

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Refer to the *Cisco MDS 9000 Family Configuration Guide* for more information on using the **setup ficon** command.

The setup utility guides you through the basic configuration process. Type **Ctrl-c** at any prompt to skip the remaining configuration options and proceed with what is configured until that point.

If you do not wish to answer a previously-configured question, or if you wish to skip answers to any questions press **Enter**. If a default answer is not available (for example switch name), the switch uses what is previously configured and skips to the next question.

Examples

The following example shows how to enter switch setup mode.

```
switch# setup ficon
---- Basic System Configuration Dialog ----

--- Ficon Configuration Dialog ---

This setup utility will guide you through basic Ficon Configuration
on the system.

Press Enter if you want to skip any dialog. Use ctrl-c at anytime
to skip all remaining dialogs.

Would you like to enter the basic configuration dialog (yes/no): yes
```

sleep

To delay an action by a specified number of seconds, use the **sleep** command.

sleep <*seconds*>

Syntax Description

<*seconds*>	The number of seconds to delay an action.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

This command is useful within scripts. For example, if you create a script called test-script:

```
switch# show file slot0:test-script
discover scsi-target remote
sleep 10
show scsi-target disk

switch# run-script slot0:test-script
```

When you execute the slot0:test-script, the switch software executes the **discover scsi-target remote** command, and then waits for 10 seconds before executing the **show scsi-target disk command**.

Examples

The following example shows how to delay the switch prompt return.

```
switch# sleep 30
```

You will see the switch prompt return after 30 seconds.

snmp port

Use the **snmp port** command to enable SNMP control of FICON configurations. To disable the configuration or to revert to factory defaults, use the **no** form of the command.

snmp port control

Syntax Description

snmp port control	Enables SNMP control of FICON configurations.

Defaults

Enabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

By default, SNMP users can configure FICON parameters through the Fabric Manager application. You can prohibit this access, if required, by issuing the **no snmp port control** command.

Examples

The following example prohibits SNMP users from configuring FICON parameters.

```
switch(config)# ficon vsan 2
switch(config-ficon)# no snmp port control
```

The following example allows SNMP users to configure FICON parameters (default).

```
switch(config-ficon)# snmp port control
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.
ficon vsan *vsan-id*	Enables FICON on the specified VSAN.

snmp-server

To set the contact information, switch location, and switch name, use the **snmp-server** command in configuration mode. To remove the system contact information, use the **no** form of the command.

snmp-server [community *community string***] [ro | rw] [contact** *name-string***] [location** *location***] [user** *name rolename* **auth md5** *password* **priv** *password* **| sha** *password* **priv** *password***]**

no snmp-server [community *snmp community string***] [ro | rw] [contact** *name-string***] [location** *location***] [user** *name group* **auth md5** *password* **priv** *password* **| sha** *password* **priv** *password* **| localizedkey]**

Syntax Description

community	Sets community string and access privileges.
community string	Specifies SNMP community string. Maximum length is 32 characters.
ro	Sets read-only access with this community string.
rw	Sets read-write access with this community string.
contact	Modifies system contact.
name-string	Specifies the name of the contact.
location	Modifies sysLocation.
location	Specifies and modifies system location.
user	Sets a user who can access the SNMP engine.
rolename	Specifies group to which the user belongs. Maximum length is 32 characters.
auth	Sets authentication parameters for the user.
md5	Sets HMAC MD5 algorithm for authentication.
password	Specifies user password. Maximum length is 64 characters.
priv	Sets encryption parameters for the user.
sha	Uses HMAC SHA algorithm for authentication.
localizedkey	Sets passwords in localized key format.

Defaults

The default is read-only (ro).

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

The localized keys are not portable across devices as they contain information on the engine ID of the device. If a configuration file is copied into the device, the passwords may not be set correctly if the configuration file was generated at a different device. We recommend that passwords be explicitly configured to the desired passwords after copying the configuration into the device.

Examples

The following example sets the contact information, switch location, and switch name.

```
switch# config t
switch(config)# snmp-server contact NewUser
switch(config)#
switch(config)# no snmp-server contact NewUser
switch(config)#
switch(config)# snmp-server location SanJose
switch(config)#
switch(config)# no snmp-server location SanJose
switch(config)#
switch(config)# snmp-server name NewName
switch(config)#
switch(config)# no snmp-server name NewName
switch(config)#
switch(config)# snmp-server user joe network-admin auth sha abcd1234
switch(config)#
switch(config)# snmp-server user sam network-admin auth md5 abcdefgh
switch(config)#
switch112(config)# snmp-server user Bill network-admin auth sha abcd1234 priv abcdefgh
switch112(config)#
switch112(config)# no snmp-server user usernameA
switch112(config)# snmp-server user user1 network-admin auth md5 0xab0211gh priv
0x45abf342 localizedkey
```

snmp-server host

To specify the recipient of an Simple Network Management Protocol notification operation, use the **snmp-server host** global configuration command. To remove the specified host, use the no form of this command.

snmp-server host *host-address* **[traps | informs] [version {1 | 2c | 3 [auth | noauth | priv]}]** *community-string* **[udp-port port] [notification-type]**

no snmp-server host *host-address* **[traps | informs]**

Syntax Description

host-address	Specifies the name or IP address of the host (the targeted recipient).
traps	Sends SNMP traps to this host.
informs	Sends SNMP informs to this host.
version	Specifies the version of the Simple Network Management Protocol (SNMP) used to send the traps. Version 3 is the most secure model, as it allows packet encryption with the **priv** keyword.
1	SNMPv1 (default). This option is not available with informs.
2c	SNMPv2C.
3	SNMPv3 has three optional keywords (**auth**, **no auth** (default), or **priv**).
auth	Enables Message Digest 5 (MD5) and Secure Hash Algorithm (SHA) packet authentication
noauth	Specifies the noAuthNoPriv security level.
priv	Enables Data Encryption Standard (DES) packet encryption (privacy).
community-string	Sends a password-like community string with the notification operation.
udp-port	Specifies the port UDP port of the host to use. The default is 162.

Defaults

Sends SNMP traps.

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(3).

Usage Guidelines

If you use the version keyword, one of the following must be specified: 1, 2c, or 3.

Though you can set the **community-string** using the **snmp-server host** command by itself, we recommend you define this string using the snmp-server community command prior to using the **snmp-server host** command.

Examples

The following example specify the recipient of an SNMP notification.

```
switch# config t
switch(config)# snmp-server host 10.1.1.1 traps version 2c abcddsfsf udp-port 500
```

span session

To configure a SPAN session, use the **span session** command. To remove a configured SPAN feature or revert it to factory defaults, use the **no** form of the command.

span session *session-id*
{ destination interface (fc *slot-number* **| fc-tunnel** *tunnel-id* **) |**
source [filter | (interface fc *slot-number* **rx | tx | fcip** *interface_number* **| iscsi slot/port |**
port-channel *port-channel-number* **rx | tx | sup-fc** *inband-interface-number* **rx | tx) | (vsan** *vsan-id* **)] |**
suspend }

no span session *session-id*
{ destination interface (fc *slot-number* **| fc-tunnel** *tunnel-id* **) |**
source [filter | (interface fc *slot-number* **rx | tx | port-channel** *port-channel-number* **rx | tx |**
sup-fc *inband-interface-number* **rx | tx) | (vsan** *vsan-id* **)] |**
suspend }

Syntax Description

session-id	Enter SPAN session ID from 1 to 16.
destination	Specifies the SPAN destination.
interface	Specifies SPAN destination configuration.
fc	Configures the Fiber Channel interface.
slot-number	Specifies the slot number and port number.
fc-tunnel	Configures the Fiber Channel tunnel interface.
tunnel-id	Specifies the FC tunnel ID.
source	Specifies the SPAN source.
rx	Specifies SPAN traffic in ingress direction
tx	Specifies SPAN traffic in egress direction
interface	SPAN source interface configuration.
fcip	Selects the FCIP interface to configure.
interface-number	Configures the specified FCIP interface from 1 to 255.
iscsi	Selects the iSCSI interface to configure.
slot-number	Specifies a slot number and port number.
port-channel	Configures the specified PortChannel interface.
port-channel-number	PortChannel number from 1 to 128.
sup-fc	Inband interface.
inband interface number	Inband interface number, which is 0.
suspend	SPAN suspend session.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

None.

Examples

The following example shows how to configure a SPAN session.

```
switch# config t
switch(config)# span session 1
switch(config-span)#
switch(config)# no span session 6

switch(config-span)# destination interface fc9/1

switch(config-span)# no destination interface fc1/5

switch(config-span)# source interface sup-fc0

switch(config-span)# source vsan1

switch(config-span)# source interface po1

switch(config-span)# no source interface po3

switch(config-span)# suspend

switch(config-span)# no suspend

switch(config-span)# exit

switch(config)# span session 1

switch(config-span)# source interface fc9/1 tx filter vsan 1

switch(config-span)# source interface fcip 51

switch(config-span)# source interface iscsi 4/1

switch(config-span)# source filter vsan 1-2

switchS(config)# span session 11

switchS(config-span)# destination interface fc-tunnel 1500
```

Related Commands

Command	Description
show span session	Displays all SPAN session information.

special-frame

To enable or disable special-frames for the FCIP interface, use the **special-frame** option. To disable the passive mode for the FCIP interface, use the **no** form of the option.

special-frame peer-wwn *pwwn-id*

no special-frame peer-wwn *pwwn-id*

Syntax Description

special-frame	Configures special frames.
peer-wwn	Configures the peer WWN for special frames.
pwwn-id	Enters the peer pWWN ID.

Defaults

Disabled

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

When a new TCP Connection is established, an FCIP special frame (if enabled) makes one round trip from the FCIP profile and initiates the TCP connect operation to the FCIP profile receiving the TCP connect request and back. Use these frames to identify the FCIP link endpoints, to learn about the critical parameters shared by Fibre Channel and FCIP profile pairs involved in the FCIP link, and to perform configuration discovery

Examples

```
switch# config t

switch(config)# interface fcip 1

switch(config)# peer-info ipaddr 10.1.1.1

switch(config)# peer-info ipaddr 10.1.1.1 port 4000

switch(config)# no peer-info ipaddr 10.1.1.1 port 4000
```

Related Commands

Command	Description
show interface fcip	Displays an interface configuration for a specified FCIP interface.

ssh key

To generate a host key, use the **ssh key** command in configuration mode.

ssh key {dsa *number* **| rsa** *number* **| rsa1** *number*}

Syntax Description

dsa	Generates a DSA key.
rsa	Generates an RSA key.
rsa1	Generates an RSA1 key.
number	Specifies a number of bits from 768 to 2048.

Defaults

Disabled

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example shows how to generate a host key.

```
switch# config t
switch(config)# ssh key rsa1 1024
generating rsa1 key.....
generated rsa1 key
switch(config)#
switch(config)# ssh key dsa 1024
generating dsa key.....
generated dsa key
switch(config)#
switch(config)# ssh key rsa 1024
generating rsa key.....
generated rsa key
switch(config)#
switch(config)# no ssh key rsa 1024
cleared RSA keys
switch(config)#
```

Related Commands

Command	Description
ssh server enable	Enables SSH server.

ssh server enable

To enable the SSH server, use the **ssh server enable** command in configuration mode. To disable the SSH service, use the **no** form of the command.

ssh server enable

no ssh server enable

Syntax Description

This command has no arguments or keywords.

Defaults

Disabled

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example enables the SSH server.

```
switch# config t
switch(config)# ssh server enable
updated
switch(config)# no ssh server enable
updated
```

Related Commands

Command	Description
ssh key	Generates an SSH key.

switchname

To change the name of the switch, use the **switchname** command in configuration mode. To revert the switch name to the default name, use the **no** form of the command.

switchname *name*

no switchname *name*

Syntax Description

name	Specifies a switch name

Defaults

Disabled

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example changes the name of the switch to myswitch1.

```
switch# config t
switch(config)# switchname myswitch1
myswitch1(config)#
myswitch1(config)# no switchname
switch(config)#
```

Related Commands

Command	Description
snmp-server	Sets the contact information, switch location, and switch name within the limit of 20 characters (without spaces).

switchport

To assign the port mode, allowed VSAN numbers, or the description of an FCIP interface, use the **switchport** command in configuration mode. Use the **no** form of the command to delete the configured switchport information.

switchport [beacon] | [description *text***] | [encap eisl] | [fcrxbbcredit** *value* **| default | performance-buffers (** *value* **| default)] | [fcrxbufsize default |** *size* **] |[mode auto | E] | [proxy-initiator nwwn** *nwwn* **pwwn** *pwwn* **] [trunk allowed vsan** *number* **| add vsan** *number* **| all]**

no switchport [beacon] | [description *text***] | [encap eisl] | [fcrxbbcredit** *value* **| default | performance-buffers (** *value* **| default)] | [fcrxbufsize default |** *size* **] | [loop-tenancy] |[mode auto | E] | [trunk allowed vsan** *number* **| add vsan** *number* **| all]**

Syntax Description

switchport	Configures switchport parameters.
beacon	Configures beacon mode.
description	Enter description of maximum 80 characters.
text	Description text of maximum 80 characters.
encap eisl	Configures enhanced inter-switch link (EISL) encapsulation.
SD	Configures encapsulation for the selected SD port.
fcrxbbcredit	Configure receive BB_credit for the port.
value	Assigns a BB_credit value (1 and 255) to the selected interface.
default	Applies the default fcrxbbcredit value to the selected interface. The operational value depends on the port mode.
performance-buffers	Configures a performance buffer value to the selected interface.
value	Assigns a BB_credit value (1 and 145) to the selected interface.
default	Assigns the factory default (0) of using the built-in algorithm.
fcrxbufsize	Configures receive data field size for the port.
size	Assigns the data field size for the selected interface. The default is 2112 bytes and the range is from 256 to 2112 bytes.
mode	Enter the port mode.
auto	Autosensing mode.
E	Configures BB_credits for E or TE port modes.
F	Configures BB_credits for F or FL port modes.
proxy-initiator	Configures the proxy-initiator feature
nwwn *nwwn*	Specifies the nWWN of the iSCSI interface.
pwwn *pwwn*	Specifies the pWWN of the iSCSI interface.
speed	Enters the port speed
trunk	Configure trunking parameters on an interface.
allowed vsan	Configure allowed list for interface(s).
number	Enter the VSAN ID.
add	Give VSAN ID range to add to allowed list
all	Add all the VSANs to allowed list

Defaults

Disabled

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

Examples

```
switch## config t

switch(config)# interface fc 1/23

switch(config-if)# switchport description techdocsSample

switch(config-if)# switchport mode E

switch(config-if)# switchport trunk mode auto

switch(config-if)# switchport trunk allowed vsan all

switch(config-if)# switchport trunk allowed vsan 3

switch(config-if)# switchport trunk allowed vsan add 2

switch(config-if)# switchport encap eisl

switch(config-if)# switchport fcrxbbcredit performance-buffers 45

switch(config-if)# switchport proxy-initiator nWWN 11:11:11:11:11:11:11:11 pwwn
22:22:22:22:22:22:22:22

switch(config-if)# no switchport proxy-initiator nWWN 11:11:11:11:11:11:11:11 pwwn
22:22:22:22:22:22:22:22
```

Related Commands

Command	Description
show interface fcip	Displays an interface configuration for a specified FCIP interface.

switchport ingress-rate

To configure the port rate limit for a specified interface, use the **switchport ingress-rate** command in configuration mode. Use the **no** form of the command to delete the configured switchport information.

switchport ingress-rate *value*

no switchport ingress-rate *value*

Syntax Description

switchport	Configures switchport parameters.
ingress-rate *value*	Configures the iSCSI initiator ID

Defaults

Disabled

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode. This command is only available if the following conditions hold true:

- The QoS feature is enabled using the **qos enable** command.
- The command is issued in a Cisco MDS 9100 series switch.

Examples

```
switch## config t
switch(config)# interface fc 2/5
switch(config-if)# switchport ingress-rate 5
```

Related Commands

Command	Description
show interface	Displays an interface configuration for a specified FCIP interface.

switchport initiator id

To identify the iSCSI initiator, use the **switchport initiator id** command in configuration mode. Use the **no** form of the command to delete the configured switchport information.

switchport [initiator id ip-address | name]

no switchport [initiator id ip-address | name]

Syntax Description

switchport	Configures switchport parameters.
initiator id	Configures the iSCSI initiator ID
ip-address	Identifies initiators using the IP address.
name	Identifies initiators using the specified name.

Defaults

Disabled

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

Examples

```
switch## config t
switch(config)# interface iscsi 2/5
switch(config-if)# switchport initiator id ip-address
switch(config-if)# switchport initiator name
```

Related Commands

Command	Description
show interface fcip	Displays an interface configuration for a specified FCIP interface.

system cores

To copy the core and log files periodically, use the **system cores** command in configuration mode. To revert the switch to factory defaults, use the **no** form of this command.

system cores slot0 | tftp:

no system cores

Syntax Description

slot0	Selects destination file system.
tftp:	Selects destination file system.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Create any required directory before issuing this command. If the directory specified by this command does not exist, the switch software logs a syslog message each time a copy cores is attempted.

Examples

The following example copies the core and log files.

```
switch# config t
switch(config)# system cores slot0:coreSample
switch(config)#
switch(config)# no system cores
switch(config)#
```

Related Commands

Command	Description
show system cores	Displays the currently configured scheme for copying cores.

system default switchport

To configure default values for various switchport attributes, use the **system default switchport** command in configuration mode.

system default switchport [shutdown] [trunk mode auto | off | on]

Syntax Description

shutdown	(Optional) Disables or enables switch ports by default.
trunk	(Optional) Configures trunking parameters as a default.
mode	(Optional) Configures trunking mode.
auto	(Optional) Sets autosense trunking.
off	(Optional) Disables trunking.
on	(Optional) Enables trunking.

Defaults

Enabled

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Attributes configured using this command are applied globally to all future switch port configurations, even if you do not individually specify them at that time.

Examples

The following example configures default values for switchport attributes.

```
switch# config t
switch(config)# system default switchport shutdown
switch(config-if)#
switch(config)# no system default switchport shutdown
switch(config-if)#
switch(config)# system default switchport trunkmode auto
switch(config-if)#
```

Related Commands

Command	Description
show system default switchport	Displays default values for switch port attributes.

system hap-reset

To configure the HA reset policy, use the **system hap-reset** command in EXEC mode. Use the **no** form of this command to disable this feature.

system hap-reset

system no hap-reset

Syntax Description

This command has no arguments or keywords.

Defaults

Enabled

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

You can disable the HA policy supervisor reset feature (enabled by default) for debugging and troubleshooting purposes.

Examples

The following example enables the supervisor reset HA policy.

```
switch# system hap-reset
```

system heartbeat

To enable system heartbeat checks, use the **system heartbeat** command in EXEC mode. Use the **no** form of this command to disable this feature.

system heartbeat

system no heartbeat

Syntax Description

This command has no arguments or keywords.

Defaults

Enabled

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

You can disable the heartbeat checking feature (enabled by default) for debugging and troubleshooting purposes like attaching a GDB to a specified process.

Examples

The following example enables the system heartbeat checks.

```
switch# system heartbeat
```

system memlog

To collect system memory statistics, use the **system memlog** command in EXEC mode.

system memlog

Syntax Description

This command has no arguments or keywords.

Defaults

Enabled

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Use this command for debugging and troubleshooting purposes.

Examples

The following example enables system memory logging.

```
switch# system memlog
```

system statistics reset

To reset the high availability statistics collected by the system, use the **system statistics reset** command in EXEC mode.

system statistics reset

Syntax Description

This command has no arguments or keywords.

Defaults

Enabled

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

You can disable the system statistics reset feature (enabled by default) for debugging and troubleshooting purposes.

Examples

The following example resets the HA statistics.

```
switch# system statistics reset
```

system switchover

To specifically initiate a switchover from an active supervisor module to a standby supervisor module, use the **system switchover** command in configuration mode.

system switchover

Syntax Description

This command has no arguments or keywords.

Defaults

None

Command Modes

EXEC

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Any switchover function is nonrevertive. Once a switchover has occurred and the failed processor has been replaced or successfully restarted, you cannot switch back to the original, active supervisor module (unless there is a subsequent failure or you issue the **system switchover** command).

Examples

The following example initiates a HA switchover from an active supervisor module to a standby supervisor module.

```
switch# system switchover
```

Related Commands

Command	Description
show version compatibility	Determines version compatibility between switching modules.
show module	Displays the HA-standby state for the standby supervisor module.
show system redundancy status	Determines whether the system is ready to accept a switchover.

system trace

To configure the system trace level, use the **system trace** command in configuration mode. Use the **no** form of this command to disable this feature.

system trace *bit-mask*

no system trace

Syntax Description

bit-mask	Specifies the bit mask to change the trace level.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

This command is used for debugging purposes.

Examples

The following example shows how to configure the system trace level.

```
switch# config t
switch(config)# system trace bit-mask
```

system watchdog

To enable watchdog checks, use the **system watchdog** command in EXEC mode. Use the no form of this command to disable this feature.

system watchdog

system no watchdog

Syntax Description

This command has no arguments or keywords.

Defaults

Enabled

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

If a watchdog is not logged at every 8 seconds by the software, the supervisor module reboots the switch.

You can disable the watchdog checking feature (enabled by default) for debugging and troubleshooting purposes like attaching a GDB or a kernel GDB (KGDB) to a specified process.

Examples

The following example enables the supervisor reset HA policy.

```
switch# system watchdog
```

CHAPTER 20

Show Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

show aaa authentication

To display configured authentication information, use the **show aaa authentication** command.

show aaa authentication

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

To display configured authentication parameters.

```
switch# show aaa authentication
         default: group TacServer local none
         console: local
         iscsi: local
         dhchap: local
```

show aaa groups

To display configured server groups, use the **show aaa groups** command.

show aaa groups

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

To display configured server groups.

```
switch# show aaa groups
radius
TacServer
```

show aaa accounting

To display configured accounting information, use the **show accounting** command.

show aaa accounting {config | log | logsize}

Syntax Description

config	Shows RADIUS accounting configuration information.
log	Shows accounting log.
logsize	Shows local accounting log file size.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

To display configured accounting parameters.

```
switch# show accounting config
RADIUS accounting not enabled
local accounting enabled
```

To display configured log size.

```
switch# show accounting logsize
maximum local accounting log size:29000
```

To display the entire log file.

```
switch# show accounting log
2002:stop:snmp_1033151784_171.71.49.83:admin:
Fri Sep 27 18:36:24 2002:start:_1033151784:root
Fri Sep 27 18:36:28 2002:update:::fcc configuration requested
Fri Sep 27 18:36:33 2002:start:snmp_1033151793_171.71.49.83:admin
Fri Sep 27 18:36:33 2002:stop:snmp_1033151793_171.71.49.83:admin:
Fri Sep 27 18:39:28 2002:start:snmp_1033151968_171.71.49.96:admin
Fri Sep 27 18:39:28 2002:stop:snmp_1033151968_171.71.49.96:admin:
Fri Sep 27 18:39:28 2002:start:_1033151968:root
Fri Sep 27 18:39:31 2002:update:::fcc configuration requested
Fri Sep 27 18:39:37 2002:start:snmp_1033151977_171.71.49.96:admin
Fri Sep 27 18:39:37 2002:stop:snmp_1033151977_171.71.49.96:admin:
Fri Sep 27 18:39:37 2002:start:snmp_1033151977_171.71.49.96:admin
Fri Sep 27 18:42:12 2002:start:snmp_1033152132_171.71.49.96:admin
Fri Sep 27 18:42:12 2002:stop:snmp_1033152132_171.71.49.96:admin:
Fri Sep 27 18:42:12 2002:start:snmp_1033152132_171.71.49.96:admin
Fri Sep 27 18:42:40 2002:start:snmp_1033152160_171.71.49.96:admin
```

show arp

To view Address Resolution Protocol (ARP) entries, use the **show arp** command.

show arp

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

This displays the ARP table.

```
switch# show arp
Protocol Address           Age (min)      Hardware Addr  Type  Interface
Internet  171.1.1.1        0              0006.5bec.699c  ARPA  mgmt0
Internet  172.2.0.1        4              0000.0c07.ac01  ARPA  mgmt0
```

Related Commands

Command	Description
clear arp-cache	Clears the arp-cache table entries.

show boot auto-copy

To display state of the auto-copy feature, use the **show boot auto-copy** command.

show boot auto-copy [list]

Syntax Description

show auto-copy	Displays if the auto-copy feature is enabled of disabled.
list	Displays the list of files to be auto-copied

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

None.

Examples

The following example displays the current state of the auto-copy feature.

```
switch# show boot auto-copy
Boot variables Auto-Copy ON
```

The following example displays the ilc1.bin image being copied to the standby supervisor module's bootflash, and once this is successful, the next file will be lasilc1.bin. This command only displays files on the active supervisor module.

```
switch# show boot auto-copy list
File: /bootflash/ilc1.bin
Bootvar: ilce

File:/bootflash/lasilc1.bin
Bootvar: lasilc
```

The following example displays a typical message when the auto-copy option is disabled or if no files are copied.

```
switch# show boot auto-copy list
No file currently being auto-copied
```

show boot

To display the boot variables or modules, use the **show boot** command.

show boot [module (*slot-number*) **| variables]**

Syntax Description

show boot	Displays the boot variables in any Cisco MDS 9000 Family switch.
module	Displays the boot variables for all modules.
slot-number	Displays the boot variable for the specified module.
variables	Displays the list of boot variables.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was modified in Release 1.2(2).

Usage Guidelines

None.

Examples

The following example displays the current contents of the boot variable.

```
switch# show boot
kickstart variable = bootflash:/kickstart-image
system variable = bootflash:/system-image
Module 2
asm-sfn variable = bootflash:/asm-image
```

The following example displays the images on the specified ASM module.

```
switch# show boot module
Module 2
asm-sfn variable = bootflash:/asm-image
```

The following example displays a list of all boot variables. The ASM-SFN boot variable is used for the ASM.

```
switch# show boot variables
List of boot variables are:
     asm-sfn
     system
     kickstart
```

The following example displays image1.bin being copied to the standby supervisor module's bootflash, and once this is successful, the next file will beimage2.bin. This command only displays files on the active supervisor module.

```
switch# show boot auto-copy list
File: /bootflash/image1.bin
Bootvar: IMAGE1_VARIABLE

File:/bootflash/image2.bin
Bootvar: IMAGE2_VARIABLE
```

The following example displays a typical message when the auto-copy option is disabled or if no files are copied.

```
switch# show boot auto-copy list
No file currently being auto-copied
```

show callhome

To display related Call Home information configured on a switch, use the **show callhome** command.

show callhome [**destination-profile** *profile*] [**transport-email**]

Syntax Description

destination-profile *profile*	Shows callhome destination profile information for the specified profile.
transport-email	Shows callhome email transport information.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays configured callhome information.

```
switch# show callhome
callhome enabled
Callhome Information:
contact person name:who@where
contact person's email:person@place.com
contact person's phone number:310-408-4000
street addr:1234 Picaboo Street, Any city, Any state, 12345
site id:Site1ManhattanNewYork
customer id:Customer1234
contract id:Andiamo1234
switch priority:0
```

The following example displays destination profile information.

```
switch# show callhome destination-profile
XML destination profile information
maximum message size:250000
email addresses configured:
findout@.cisco.com

Short-txt destination profile information
maximum message size:4000
email addresses configured:
person1@epage.company.com

full-txt destination profile information
maximum message size:250000
email addresses configured:
person2@company2.com
```

The following example displays the full-text profile.

```
switch# show callhome destination-profile profile full-txt-destination
full-txt destination profile information
maximum message size:250000
email addresses configured:
person2@company2.com
```

The following example displays the short-text profile.

```
switch# show callhome destination-profile profile short-txt-destination
Short-txt destination profile information
maximum message size:4000
email addresses configured:
person2@company2.com
```

The following example displays the XML destination profile.

```
switch# show callhome destination-profile profile XML-destination
XML destination profile information
maximum message size:250000
email addresses configured:
findout@.cisco.com
```

The following example displays e-mail and SMTP information.

```
switch# show callhome transport-email
from email addr:user@company1.com
reply to email addr:pointer@company.com
return receipt email addr:user@company1.com
smtp server:server.company.com
smtp server port:25
```

show cdp

To display CDP parameters configured globally or for a specific interface, use the **show cdp** command.

show cdp { all | entry [all | name *cdp-name* **] | global | interface [gigbitethernet** *slot-port* **| mgmt 0] | neighbors [detail | interface (gigbitethernet** *slot-port* **| mgmt 0)] | traffic interface [gigbitethernet** *slot-port* **| mgmt 0]}**

Syntax Description

all	Displays all enabled CDP interfaces.
entry	Displays CDP database entries.
all	Displays all CDP entries in the database
name	Displays CDP entries that match a specified name.
cdp-name	Specifies the name matching a CDP entry (restricted to 256 characters).
global	Displays global CDP parameters.
interface	Displays CDP parameters for an interface.
gigabitethernet	Specifies the Gigabit Ethernet interface.
slot-port	Specifies the slot number and port number separated by a slash (/).
mgmt 0	Specifies the Ethernet management interface.
neighbors	Displays all CDP neighbors.
detail	Displays detailed information for all CDP neighbors
interface	Displays CDP information for neighbors on a specified interface.
traffic	Displays CDP traffic statistics for an interface.

Defaults

None

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

This command is allowed only on the active supervisor module in the Cisco MDS 9500 Series.

Examples

The following example displays all CDP capable interfaces and parameters.

```
switch# show cdp all
GigabitEthernet4/1 is up
    CDP enabled on interface
    Sending CDP packets every 60 seconds
    Holdtime is 180 seconds
GigabitEthernet4/8 is down
    CDP enabled on interface
    Sending CDP packets every 60 seconds
    Holdtime is 180 seconds
mgmt0 is up
    CDP enabled on interface
    Sending CDP packets every 100 seconds
    Holdtime is 200 seconds
```

The following example displays all CDP neighbor entries.

```
switch# show cdp entry all
----------------------------------------
Device ID:069038747(Kiowa3)
Entry address(es):
    IP Address: 172.22.92.5
Platform: WS-C5500, Capabilities: Trans-Bridge Switch
Interface: mgmt0, Port ID (outgoing port): 5/22
Holdtime: 136 sec

Version:
WS-C5500 Software, Version McpSW: 2.4(3) NmpSW: 2.4(3)
Copyright (c) 1995-1997 by Cisco Systems

Advertisement Version: 1
```

The following example displays the specified CDP neighbor.

```
switch# show cdp entry name 0
----------------------------------------
Device ID:0
Entry address(es):
    IP Address: 0.0.0.0
Platform: DS-X9530-SF1-K9, Capabilities: Host
Interface: GigabitEthernet4/1, Port ID (outgoing port): GigabitEthernet4/1
Holdtime: 144 sec

Version:
1.1(0.144)

Advertisement Version: 2
Duplex: full
```

The following example displays global CDP parameters.

```
switch# show cdp global
Global CDP information:
    CDP enabled globally
    Sending CDP packets every 60 seconds
    Sending a holdtime value of 180 seconds
    Sending CDPv2 advertisements is enabled
```

The following example displays CDP parameters for the management interface.

```
switch# show cdp interface mgmt 0
mgmt0 is up
    CDP enabled on interface
    Sending CDP packets every 60 seconds
    Holdtime is 180 seconds
```

The following example displays CDP parameters for the Gigabit Ethernet interface.

```
switch# show cdp interface gigabitethernet 4/1
GigabitEthernet4/1 is up
    CDP enabled on interface
    Sending CDP packets every 80 seconds
    Holdtime is 200 seconds
```

The following example displays CDP Neighbors (brief).

```
switch# show cdp neighbors
Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater

Device ID        Local Intrfce   Hldtme  Capability  Platform      Port ID
0                Gig4/1          135     H           DS-X9530-SF1- Gig4/1
069038732(Kiowa2 mgmt0           132     T S         WS-C5500      8/11
069038747(Kiowa3 mgmt0           156     T S         WS-C5500      6/20
069038747(Kiowa3 mgmt0           158     T S         WS-C5500      5/22
```

The following example displays CDP neighbors (detail).

```
switch# show CDP neighbor detail
----------------------------------------
Device ID:0
Entry address(es):
    IP Address: 0.0.0.0
Platform: DS-X9530-SF1-K9, Capabilities: Host
Interface: GigabitEthernet4/1, Port ID (outgoing port): GigabitEthernet4/1
Holdtime: 162 sec

Version:
1.1(0.144)

Advertisement Version: 2
Duplex: full
----------------------------------------
Device ID:069038732(Kiowa2)
Entry address(es):
    IP Address: 172.22.91.5
Platform: WS-C5500, Capabilities: Trans-Bridge Switch
Interface: mgmt0, Port ID (outgoing port): 8/11
Holdtime: 132 sec

Version:
WS-C5500 Software, Version McpSW: 2.4(3) NmpSW: 2.4(3)
Copyright (c) 1995-1997 by Cisco Systems

Advertisement Version: 1
```

The following example displays the specified CDP neighbor (detail).

```
switch# show CDP neighbors interface gigabitethernet 4/1 detail
----------------------------------------
Device ID:0
Entry address(es):
    IP Address: 0.0.0.0
Platform: DS-X9530-SF1-K9, Capabilities: Host
Interface: GigabitEthernet4/1, Port ID (outgoing port): GigabitEthernet4/1
Holdtime: 144 sec

Version:
1.1(0.144)

Advertisement Version: 2
Duplex: full
```

The following example displays CDP traffic statistics for the management interface.

```
switch# show cdp traffic interface mgmt 0
----------------------------------------
Traffic statistics for mgmt0
Input Statistics:
    Total Packets: 1148
    Valid CDP Packets: 1148
        CDP v1 Packets: 1148
        CDP v2 Packets: 0
    Invalid CDP Packets: 0
        Unsupported Version: 0
        Checksum Errors: 0
        Malformed Packets: 0

Output Statistics:
    Total Packets: 2329
        CDP v1 Packets: 1164
        CDP v2 Packets: 1165
    Send Errors: 0
```

The following example displays CDP traffic statistics for the Gigabit Ethernet interface

```
switch# show cdp traffic interface gigabitethernet 4/1
----------------------------------------
Traffic statistics for GigabitEthernet4/1
Input Statistics:
    Total Packets: 674
    Valid CDP Packets: 674
        CDP v1 Packets: 0
        CDP v2 Packets: 674
    Invalid CDP Packets: 0
        Unsupported Version: 0
        Checksum Errors: 0
        Malformed Packets: 0

Output Statistics:
    Total Packets: 674
        CDP v1 Packets: 0
        CDP v2 Packets: 674
    Send Errors: 0
```

show clock

To show the system date and time and verify the time zone configuration., use the **show clock** command.

show clock

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

```
switch# show clock
Fri Mar 14 01:31:48 UTC 2003
```

show cores

To shows all the cores presently available for upload from active sup, use the **show cores** command.

show cores

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

In the following example, an FSPF core was generated on the active supervisor (slot 5), an FCC core on the standby supervisor (slot 6) and acltcam and fib on module (slot 8).

```
switch# show cores

Module-num     Process-name       PID     Core-create-time
----------     ------------       ---     ----------------
5               fspf             1524     Jan 9 03:11
6               fcc               919     Jan 9 03:09
8               acltcam           285     Jan 9 03:09
8               fib               283     Jan 9 03:08
```

show environment

To display all environment-related switch information (status of chassis clock, chassis fan modules, power supply modules, power supply redundancy mode and power usage summary, module temperature thresholds and alarm status, use the **show environment** command.

show environment [clock | fan | power | temperature]

Syntax Description

clock	Displays status of chassis clock modules
fan	Displays status of chassis fan modules
power	Displays status of power supply modules, power supply redundancy mode and power usage summary.
temperature	Displays module temperature thresholds and alarm status of temperature sensors.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the status and alarm states of the clock, fan, power supply and temperature sensors.

```
switch# show environment
switch-180# show env
Clock:
----------------------------------------------------------
Clock           Model                Hw         Status
----------------------------------------------------------
A               DS-C9500-CL          0.0        ok/active
B               DS-C9500-CL          0.0        ok/standby


Fan:
-----------------------------------------------------
Fan             Model                Hw         Status
-----------------------------------------------------
Chassis         WS-9SLOT-FAN         0.0        ok
PS-1            --                   --         ok
PS-2            --                   --         ok
```

```
Temperature:
----------------------------------------------------------------
Module   Sensor   MajorThresh   MinorThres   CurTemp     Status
                  (Celsius)     (Celsius)    (Celsius)
----------------------------------------------------------------
1        Outlet   75            60           38          ok
1        Intake   65            50           35          ok

5        Outlet   75            60           36          ok
5        Intake   65            50           36          ok

6        Outlet   75            60           40          ok
6        Intake   65            50           33          ok

9        Outlet   75            60           28          ok
9        Intake   65            50           40          ok

Power Supply:
------------------------------------------------------
PS  Model                Power     Power       Status
                         (Watts)   (Amp @42V)
------------------------------------------------------
1   DS-CAC-2500W         1153.32   27.46       ok
2   WS-CAC-2500W         1153.32   27.46       ok

Mod Model                Power     Power       Power     Power       Status
                         Requested Requested   Allocated Allocated
                         (Watts)   (Amp @42V)  (Watts)   (Amp @42V)
--- -------------------  -------   ----------  --------- ----------  ----------
1    DS-X9016            220.08    5.24        220.08    5.24        powered-up
5    DS-X9530-SF1-K9     220.08    5.24        220.08    5.24        powered-up
6    DS-X9530-SF1-K9     220.08    5.24        220.08    5.24        powered-up
9    DS-X9016            220.08    5.24        220.08    5.24        powered-up

Power Usage Summary:
--------------------
Power Supply redundancy mode:                  non-redundant (combined)

Total Power Capacity                           2306.64  W

Power reserved for Supervisor(s)[-]            440.16   W
Power reserved for Fan Module(s)[-]            210.00   W
Power currently used by Modules[-]             440.16   W

                                               -------
Total Power Available                          1216.32  W
                                               -------
```

Related Commands

Command	Description
show hardware	Displays all hardware components on a system.

show fabric-binding

To view configured fabric binding information, use the **show fabric-binding** command in EXEC mode.

show fabric-binding
database [active | vsan *vsan-id* **] |**
efmd event-history interface fc *slot/port* **| statistics [interface fc** *slot/port* **| vsan** *vsan-id* **] |**
status [vsan *vsan-id* **] |**
statistics [interface fc *slot/port* **| vsan** *vsan-id* **] |**
status [vsan *vsan-id* **] |**
violations [last *number* **]**

Syntax Description

database	Displays configured database information.
active	Displays the active database configuration information.
vsan *vsan-id*	Specifies the FICON-enabled VSAN. The ID of the VSAN is from 1 to 4093.
efmd	Displays Exchange Fabric Membership Data (EFMD).
event-history	Displays EFMD event log
interface fc *slot/port*	Specifies the Fibre Channel interface.
statistics	Displays fabric binding statistics.
status	Displays fabric binding status
violations	Displays violations in the fabric binding configuration.
last *number*	Displays between 1 and 100 recent violations as specified.

Defaults

None

Command Modes

EXEC mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None

Examples

The following example displays configured fabric binding database information.

```
switch# show fabric-binding database
-------------------------------------------------
Vsan   Logging-in Switch WWN     Domain-id
-------------------------------------------------
1      21:00:05:30:23:11:11:11   0x66(102)
1      21:00:05:30:23:1a:11:03    0x19(25)
1      20:00:00:05:30:00:2a:1e   0xea(234)
4      21:00:05:30:23:11:11:11   0x66(102)
4      21:00:05:30:23:1a:11:03    0x19(25)
61     21:00:05:30:23:1a:11:03    0x19(25)
```

```
61      21:00:05:30:23:11:11:11   0x66(102)
[Total 7 entries]
```

The following example displays active fabric binding information.

```
switch# show fabric-binding database active
-------------------------------------------------
Vsan   Logging-in Switch WWN     Domain-id
-------------------------------------------------
1      21:00:05:30:23:11:11:11   0x66(102)
1      21:00:05:30:23:1a:11:03    0x19(25)
1      20:00:00:05:30:00:2a:1e   0xea(234)
61     21:00:05:30:23:1a:11:03    0x19(25)
61     21:00:05:30:23:11:11:11   0x66(102)
61     20:00:00:05:30:00:2a:1e   0xef(239)
```

The following example displays active VSAN-specific fabric binding information.

```
switch# show fabric-binding database active vsan 61
-------------------------------------------------
Vsan   Logging-in Switch WWN     Domain-id
-------------------------------------------------
61     21:00:05:30:23:1a:11:03    0x19(25)
61     21:00:05:30:23:11:11:11   0x66(102)
61     20:00:00:05:30:00:2a:1e   0xef(239)
[Total 3 entries]
```

The following example displays configured VSAN-specific fabric binding information.

```
switch# show fabric-binding database vsan 4
-------------------------------------------------
Vsan   Logging-in Switch WWN     Domain-id
-------------------------------------------------
4      21:00:05:30:23:11:11:11   0x66(102)
4      21:00:05:30:23:1a:11:03    0x19(25)
[Total 2 entries]
```

The following example displays fabric binding statistics.

```
switch# show fabric-binding statistics
Statistics For VSAN: 1
-----------------------
Number of sWWN permit: 0
Number of sWWN deny  : 0

Total Logins permitted  : 0
Total Logins denied     : 0
Statistics For VSAN: 4
-----------------------
Number of sWWN permit: 0
Number of sWWN deny  : 0

Total Logins permitted  : 0
Total Logins denied     : 0
Statistics For VSAN: 61
-----------------------
Number of sWWN permit: 0
Number of sWWN deny  : 0

Total Logins permitted  : 0
Total Logins denied     : 0
Statistics For VSAN: 345
-----------------------
Number of sWWN permit: 0
Number of sWWN deny  : 0
```

```
Total Logins permitted  : 0
Total Logins denied     : 0
Statistics For VSAN: 346
------------------------
Number of sWWN permit: 0
Number of sWWN deny  : 0

Total Logins permitted  : 0
Total Logins denied     : 0
Statistics For VSAN: 347
------------------------
Number of sWWN permit: 0
Number of sWWN deny  : 0

Total Logins permitted  : 0
Total Logins denied     : 0
Statistics For VSAN: 348
------------------------
Number of sWWN permit: 0
Number of sWWN deny  : 0

Total Logins permitted  : 0
Total Logins denied     : 0
Statistics For VSAN: 789
------------------------
Number of sWWN permit: 0
Number of sWWN deny  : 0

Total Logins permitted  : 0
Total Logins denied     : 0
Statistics For VSAN: 790
------------------------
Number of sWWN permit: 0
Number of sWWN deny  : 0

Total Logins permitted  : 0
Total Logins denied     : 0
```

The following example displays fabric binding status for each VSAN.

```
switch# show fabric-binding status
VSAN 1 :Activated database
VSAN 4 :No Active database
VSAN 61 :Activated database
VSAN 345 :No Active database
VSAN 346 :No Active database
VSAN 347 :No Active database
VSAN 348 :No Active database
VSAN 789 :No Active database
VSAN 790 :No Active database
```

The following example displays EFMD statistics.

```
switch# show fabric-binding efmd statistics

EFMD Protocol Statistics for VSAN 1
---------------------------------------
Merge Requests -> Transmitted : 0 , Received : 0
Merge Accepts  -> Transmitted : 0 , Received : 0
Merge Rejects  -> Transmitted : 0 , Received : 0
Merge Busy     -> Transmitted : 0 , Received : 0
Merge Errors   -> Transmitted : 0 , Received : 0
```

```
EFMD Protocol Statistics for VSAN 4
---------------------------------------
Merge Requests -> Transmitted : 0 , Received : 0
Merge Accepts  -> Transmitted : 0 , Received : 0
Merge Rejects  -> Transmitted : 0 , Received : 0
Merge Busy     -> Transmitted : 0 , Received : 0
Merge Errors   -> Transmitted : 0 , Received : 0

EFMD Protocol Statistics for VSAN 61
---------------------------------------
Merge Requests -> Transmitted : 0 , Received : 0
Merge Accepts  -> Transmitted : 0 , Received : 0
Merge Rejects  -> Transmitted : 0 , Received : 0
Merge Busy     -> Transmitted : 0 , Received : 0
Merge Errors   -> Transmitted : 0 , Received : 0
```

The following example displays EFMD statistics for a specified VSAN.

```
switch# show fabric-binding efmd statistics vsan 4

EFMD Protocol Statistics for VSAN 4
---------------------------------------
Merge Requests -> Transmitted : 0 , Received : 0
Merge Accepts  -> Transmitted : 0 , Received : 0
Merge Rejects  -> Transmitted : 0 , Received : 0
Merge Busy     -> Transmitted : 0 , Received : 0
Merge Errors   -> Transmitted : 0 , Received : 0
```

The following example displays fabric binding violations.

```
switch# show fabric-binding violations
--------------------------------------------------------------------------------
VSAN Switch WWN [domain] Last-Time [Repeat count] Reason
--------------------------------------------------------------------------------
3 20:00:00:05:30:00:4a:1e [*] Nov 25 05:44:58 2003 [2] sWWN not found
3 20:00:00:05:30:00:4a:1e [0xeb] Nov 25 05:46:14 2003 [2] Domain mismatch
4 20:00:00:05:30:00:4a:1e [*] Nov 25 05:46:25 2003 [1] Database mismatch
```

show fc2

To display fc2 information, use the **show fc2** command.

show fc2 {bind | classf | exchange | exchresp | flogi | nport | plogi | plogi_pwwn | port | port brief | socket | sockexch | socknotify | socknport | vsan}

Syntax Description

bind	Shows fc2 socket bindings.
classf	Shows fc2 classf sessions.
exchange	Shows fc2 active exchanges.
exchresp	Shows fc2 active responder exchanges.
flogi	Shows fc2 flogi table.
nport	Shows fc2 local Nports.
plogi	Shows fc2 plogi sessions.
plogi_pwwn	Shows fc2 plogi pwwn entries.
port *brief*	Shows fc2 physical port table.
socket	Shows fc2 active sockets.
sockexch	Shows fc2 active exchanges for each socket.
socknotify	Shows fc2 local nport plogi/logo notifications per each socket.
socknport	Shows fc2 local nports per each socket.
vsan	Shows fc2 vsan table.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

```
switch# show fc2 socket
SOCKET   REFCNT PROTOCOL      PID   RCVBUF  RMEM_USED     QLEN    NOTSK
b2a64b20        2        0     1421    65535          0        0        0
b2a647e0        3        0     1418   262142          0        0        0
b2a644a0        3        0     1417    65535          0        0        0
b2a64160        3        0     1417   262142          0        0        0
b294b180        3        0     1411    65535          0        0        0
b294ae40        3        0     1411    65535          0        0        0
b294a7c0        3        0     1410    65535          0        0        0
b294a480        2        7     1410    65535          0        0        0
b294a140        3        0     1409   262142          0        0        0
b278bb20        3        0     1409   262142          0        0        0
b278b4a0        3        0     1407    65535          0        0        0
b278b160        3        0     1407   256000          0        0        0
b278ae20        3        0     1407    65535          0        0        0
b1435b00        3        0     1408    65535          0        0        0
b1434e00        3        0     1406    65535          0        0        0
b1434ac0        3        0     1406   131072          0        0        0
b1434780        3        0     1406    65535          0        0        0
b1434440        2        0     1405   131072          0        0        0
b1434100        3        0     1405   262142          0        0 b1434440
b22e2420        2        0     1372    65535          0        0        0
...
switch# show fc2 bind
  SOCKET RULE   SINDEX   VSAN     D_ID     MASK TYPE  SUBTYPE M_VALUES
b23ba0c0   16  6081000      1        0        0    0 00:00:00 00:00:00:00:00:00:00:00
b2a647e0    7 ffffffff  65535   fffffd   ffffff   22 03:01:00 14:15:16:00:00:00:00:00
b294b180    7 ffffffff  65535   fffffd   ffffff    1 02:01:00 61:62:00:00:00:00:00:00
b294ae40    7 ffffffff  65535   fffc00   ffff00   22 01:01:00 1b:00:00:00:00:00:00:00
b294a7c0    7 ffffffff  65535   fffffd   ffffff    1 01:01:00 10:00:00:00:00:00:00:00
...
switch# show fc2 nport
REF   VSAN   D_ID   MASK   FL   ST  IFINDEX   CF   TC 2-SO   IC   RC   RS   CS
 EE 3-SO   IC   RC   RS   CS   EE
  1  65535 fffffd ffffff    3    0 ffffffff c800 0128 8000 0000 0000 2112 0064 0
008 8000 0000 0000 2112 0064 0000
  6  65535 fffc00 ffff00  18b    0 ffffffff c800 0128 8000 0000 0000 2112 0064 0
008 8000 0000 0000 2112 0064 0000
  2  65535 fffffa ffffff    3    0 ffffffff c800 0128 8000 0000 0000 2112 0064 0
008 8000 0000 0000 2112 0064 0000
  1  65535 fffffc ffffff    3    0 ffffffff c800 0128 8000 0000 0000 2112 0064 0
008 8000 0000 0000 2112 0064 0000
...
switch# show fc2 plogi
HIX  ADDRESS   VSAN   S_ID   D_ID  IFINDEX   FL  STATE   CF   TC 2-SO   IC   RC
  RS   CS   EE 3-SO   IC   RC   RS   CS   EE EECNT TCCNT 2CNT 3CNT REFCNT
2157 af364064      1 fffc6c 123400 ffffffff 0000      0 0000 0001 8000 0000 2000
 0256 0001 0001 8000 0000 2000 0256 0001 0000     0     0    0    0      1

switch# show fc2 port
 IX ST MODE EMUL   TXPKTS   TXDROP    TXERR   RXPKTS   RXDROP  R_A_TOV  E_D_TOV
F-SO   RC   RS   CS   EE 2-SO   RS 3-SO   RS
  0  D    1    0        0        0        0        0        0    10000     2000
8000 0000 2112 0001 0001 8000 0256 8000 0256
  1  D    1    0        0        0        0        0        0    10000     2000
8000 0000 2112 0001 0001 8000 0256 8000 0256
  2  D    1    0        0        0        0        0        0    10000     2000
8000 0000 2112 0001 0001 8000 0256 8000 0256
  3  D    1    0        0        0        0        0        0    10000     2000
8000 0000 2112 0001 0001 8000 0256 8000 0256
  4  D    1    0        0        0        0        0        0    10000     2000
8000 0000 2112 0001 0001 8000 0256 8000 0256
...
```

```
switch# show fc2 socknotify
  SOCKET  ADDRESS REF   VSAN   D_ID   MASK   FL   ST  IFINDEX
b2a64160 b27f01e4   6  65535 fffc00 ffff00  18b    0 ffffffff
b294a7c0 b27f01e4   6  65535 fffc00 ffff00  18b    0 ffffffff
af8a3a60 b27f01e4   6  65535 fffc00 ffff00  18b    0 ffffffff

switch# show fc2 socknport
  SOCKET  ADDRESS REF   VSAN   D_ID   MASK   FL   ST  IFINDEX
b2a64160 b27f01e4   6  65535 fffc00 ffff00  18b    0 ffffffff
b294b180 b27f0294   1  65535 fffffd ffffff    3    0 ffffffff
b294a7c0 b27f01e4   6  65535 fffc00 ffff00  18b    0 ffffffff
b278ae20 b27f0134   2  65535 fffffa ffffff    3    0 ffffffff
b1434e00 b27f0134   2  65535 fffffa ffffff    3    0 ffffffff
b1434780 b27f0084   1  65535 fffffc ffffff    3    0 ffffffff
af8a3a60 b27f01e4   6  65535 fffc00 ffff00  18b    0 ffffffff

switch# show fc2 vsan
  VSAN     X_ID  E_D_TOV  R_A_TOV                      WWN
     1        4     2000    10000  20:01:00:05:30:00:58:1f
     2        1     2000    10000  20:02:00:05:30:00:58:1f
     3        1     2000    10000  20:03:00:05:30:00:58:1f
     4        1     2000    10000  20:04:00:05:30:00:58:1f
     5        1     2000    10000  20:05:00:05:30:00:58:1f
     6        1     2000    10000  20:06:00:05:30:00:58:1f
     7        1     2000    10000  20:07:00:05:30:00:58:1f
     8        1     2000    10000  20:08:00:05:30:00:58:1f
     9        1     2000    10000  20:09:00:05:30:00:58:1f
    10        1     2000    10000  20:0a:00:05:30:00:58:1f
    11        1     2000    10000  20:0b:00:05:30:00:58:1f
    12        1     2000    10000  20:0c:00:05:30:00:58:1f
    13        1     2000    10000  20:0d:00:05:30:00:58:1f
    14        1     2000    10000  20:0e:00:05:30:00:58:1f
    15        1     2000    10000  20:0f:00:05:30:00:58:1f
    16        1     2000    10000  20:10:00:05:30:00:58:1f
    17        1     2000    10000  20:11:00:05:30:00:58:1f
    18        1     2000    10000  20:12:00:05:30:00:58:1f
....
```

show fcalias

Use the **show fcalias** command to display fcalias configuration.

show fcalias [name *string***] [active] [vsan** *vsan-range***]**

Syntax Description

name *string*	Shows members of a specified fcalias
active	Shows aliases which are part of active zoneset
vsan *vsan-range*	Shows aliases belonging to the specified VSAN range. The VSAN ID range is from 1 to 4093.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays fcalias configuration.

```
switch# show fcalias vsan 1
fcalias name Alias2 vsan 1

fcalias name Alias1 vsan 1
  pwwn 21:00:00:20:37:6f:db:dd
  pwwn 21:00:00:20:37:9c:48:e5
```

show fcanalyzer

Use the **show fcanalyzer** command to display the list of hosts configured for a remote capture.

show fcanalyzer

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

The `DEFAULT` keyword shown with an `ActiveClient` entry specifies that the default port is used in attempting the connection to the client.

Examples

Displays Configured Hosts

```
switch# show fcanalyzer
PassiveClient = 10.21.0.3
PassiveClient = 10.21.0.3
ActiveClient = 10.21.0.3, DEFAULT
```

show fcc

Use the **show fcc** commands to view FCC settings.

show fcc

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

Displays Configured FCC Information

```
switch# show fcc
fcc is disabled
fcc is applied to frames with priority up to 4
```

show fcdomain

To show the fcdomain information, use the **show fcdomain** command.

show fcdomain {address-allocation [cache] | allowed vsan [*vsan-id* | *vsan-range*] **| \domain-list | fcid persistent | statistics | interface | vsan** [*vsan-id* | *vsan-range*]**}**

Syntax Description

address-allocation	Shows statistics for the fcid allocation
cache	The cache is used by the principle switch to reassign the FC IDs for a device (disk or host) that exited and reentered the fabric. In the cache content, VSAN refers to the VSAN that contains the device, WWN refers to the device that owned the FC IDs, and mask refers to a single or entire area of FC IDs.
allowed	Displays a list of allowed domain IDs.
domain-list	Shows list of domain ids granted by the principal sw
fcid persistent	Shows persistent FCIDs (across reboot)
statistics *interface*	Shows the statistics of fcdomain
vsan *vsan-id* | *vsan-range*	The ID or range of the VSAN (from 1 to 4093).

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Issuing the **show fcdomain** with no arguments shows all VSANs. The VSANs should be active or you will get an error.

Examples

switch# **show fcdomain vsan 1**

```
The local switch is a Subordinated Switch.

Local switch run time information:
        State: Stable
        Local switch WWN:    20:01:00:05:30:00:51:1f
        Running fabric name: 10:00:00:60:69:22:32:91
        Running priority: 128
        Current domain ID: 0x64(100) ß verify domain id

Local switch configuration information:
        State: Enabled
        Auto-reconfiguration: Disabled
        Contiguous-allocation: Disabled
        Configured fabric name: 41:6e:64:69:61:6d:6f:21
        Configured priority: 128
```

```
        Configured domain ID: 0x64(100) (preferred)

Principal switch run time information:
        Running priority: 2

Interface               Role          RCF-reject
----------------    -------------    ------------
fc2/1               Downstream       Disabled
fc2/2               Downstream       Disabled
fc2/7               Upstream         Disabled
----------------    -------------    ------------

switch# show fcdomain domain-list vsan 1

Number of domains: 5
Domain ID              WWN
---------    -----------------------
 0x61(97)    10:00:00:60:69:50:0c:fe
 0x62(98)    20:01:00:05:30:00:47:9f
 0x63(99)    10:00:00:60:69:c0:0c:1d
0x64(100)    20:01:00:05:30:00:51:1f [Local]
0x65(101)    10:00:00:60:69:22:32:91 [Principal]
---------    -----------------------

switch# show fcdomain vsan 1
The local switch is a Subordinated Switch.

Local switch run time information:
        State: Stable
        Local switch WWN:    20:01:00:05:30:00:47:9f
        Running fabric name: 10:00:00:60:69:22:32:91
        Running priority: 128
        Current domain ID: 0x62(98) ß verify domain

Local switch configuration information:
        State: Enabled
        Auto-reconfiguration: Disabled
        Contiguous-allocation: Disabled
        Configured fabric name: 41:6e:64:69:61:6d:6f:21
        Configured priority: 128
        Configured domain ID: 0x62(98) (preferred)

Principal switch run time information:

        Running priority: 2

Interface               Role          RCF-reject
----------------    -------------    ------------
fc1/1               Upstream         Disabled
fc1/3               Non-principal    Disabled
fc1/6               Non-principal    Disabled
----------------    -------------    ------------
```

The following example displays the allowed domain ID lists

```
switch# show fcdomain allowed vsan 1
Assigned or unallowed domain IDs: 1-96,100,111-239.
[Interoperability Mode 1] allowed domain IDs: 97-127.
[User] configured allowed domain IDs: 50-110.
```

show fcdroplatency

To view the configured latency parameters, use the **show fcdroplatency** command.

show fcdroplatency [network | switch]

Syntax Description

network	Network latency in milliseconds.
switch	Switch latency in milliseconds.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

```
switch# show fcdroplatency
switch latency value:4000 milliseconds
network latency value:5000 milliseconds
```

show fcflow stats

To view the configured fcflow information, use the **show fcflow stats** command.

show fcflow stats

Syntax Description

aggregated	Shows aggregated fcflow statistics.
module *module-number*	Shows fcflow statistics for a specified module. The module number is a number from 1-9.
usage	Shows flow index usage

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays aggregated fcflow details for the specified module.

```
switch# show fcflow stats aggregated module 2
Idx  VSAN # frames # bytes
---- ---- -------- -------
0000 4    387,653  674,235,875
0001 6    34,402   2,896,628
```

The following example displays fcflow details for the specified module.

```
switch# show fcflow stats module 2
Idx  VSAN D ID        S ID        mask      # frames # bytes
---- ---- ----------- ----------- -----     -------- -------
0000 4    032.001.002 007.081.012 ff.ff.ff   387,653  674,235,875
0001 6    004.002.001 019.002.004 ff.00.00   34,402   2,896,628
```

The following example displays fcflow index usage for the specified module.

```
switch# show fcflow stats usage module 2
2 flows configured
configured flow : 3,7
```

show fcfwd

To view the configured fcfwd tables and statistics, use the **show fcfwd** command.

show fcfwd {idxmap [interface-toport | port-to-interface | statistics] | pcmap [interface] |sfib [multicast | statistics | unicast] | spanmap [rx | tx]}

Syntax Description

idxmap	Shows FC fwd index tables.
interface-to-port	Shows interface index to port index table.
port-to-interface	Shows port index to interface index table.
statistics	Shows index table statistics.
pcmap	Shows FC fwd PortChannel table.
interface	Shows PortChannel table for an interface.
sfib	Shows software forwarding tables.
multicast	Shows multicast software forwarding tables.
statistics	Shows software forwarding statistics.
unicast	Shows unicast software forwarding tables.
spanmap	Shows spanmap tables.
rx	Shows spanmap table in ingress -rx direction.
tx	Shows spanmap table in egress -tx direction.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

```
switch# show fcfwd spanmap rx
SPAN source information: size [c8]
dir source                vsan   bit   drop_thresh destination

switch# show fcfwd idxmap statistics
idxmap statistics:
```

show fcip profile

You can check the status of an interface at any time by using the **show fcip profile** command.

show fcip profile [*profile-id*

Syntax Description

fcip profile	Shows the information for all FCIP profiles.
profile-id	Shows the information for the specified profile from 1 to 255.

Defaults

None.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

None.

Examples

The following example displays all FCIP profiles.

```
switch# show fcip profile
-------------------------------------------------
ProfileId       Ipaddr          TcpPort
-------------------------------------------------
1               41.1.1.2        3225
2               10.10.100.154   3225
3               43.1.1.2        3225
4               44.1.1.100      3225
6               46.1.1.2        3225
7               47.1.1.2        3225
```

The following example displays information for a specified FCIP profile.

```
switch# show fcip profile 7
FCIP Profile 7
    Internet Address is 47.1.1.2 (interface GigabitEthernet4/7)
    Listen Port is 3225
    TCP parameters
        SACK is disabled
        PMTU discovery is enabled, reset timeout is 3600 sec
        Keep alive is 60 sec
        Minimum retransmission timeout is 300 ms
        Maximum number of re-transmissions is 4
        Send buffer size is 0 KB
        Maximum allowed bandwidth is 1000000 kbps
        Minimum available bandwidth is 15000 kbps
        Estimated round trip time is 1000 usec
```

show fcns database

Use the **show fcns database** command to display the results of the discovery, or to display the name server database for a specified VSAN or for all VSANs.

show fcns database {detail [vsan *vsan-id*] **| domain** *domain-id* **[detail] vsan** *vsan-range* | *fcid fcid-id* | *local [detail] vsan vsan-range]* | *vsan vsan-id}*

Syntax Description

detail	Shows all objects in each entry.
vsan *vsan-id*	Shows entries for a specified VSAN or VSANs (from 1 to 4093.).
domain *domain-id*	Shows entries in a domain.
fcid *fcid-id*	Shows entry for the given port.
local	Shows local entries.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

The discovery can take several minutes to complete, especially if the fabric is large fabric or if several devices are slow to respond.

Virtual enclosure ports can be viewed using the **show fcns database** command.

Examples

```
switch# show fcns database
VSAN 1:
--------------------------------------------------------------------------
FCID        TYPE  PWWN                    (VENDOR)        FC4-TYPE:FEATURE
--------------------------------------------------------------------------
0x9c0000    N     21:00:00:e0:8b:08:96:22 (Company 1)        scsi-fcp:init
0x9c0100    N     10:00:00:05:30:00:59:1f (Company 2)       ipfc
0x9c0200    N     21:00:00:e0:8b:07:91:36 (Company 3)        scsi-fcp:init
0x9c03d6    NL    21:00:00:20:37:46:78:97 (Company 4)       scsi-fcp:target
0x9c03d9    NL    21:00:00:20:37:5b:cf:b9 (Company 4)       scsi-fcp:target
0x9c03da    NL    21:00:00:20:37:18:6f:90 (Company 4)       scsi-fcp:target
0x9c03dc    NL    21:00:00:20:37:5a:5b:27 (Company 4)       scsi-fcp:target
0x9c03e0    NL    21:00:00:20:37:36:0b:4d (Company 4)       scsi-fcp:target
0x9c03e1    NL    21:00:00:20:37:39:90:6a (Company 4)       scsi-fcp:target
0x9c03e2    NL    21:00:00:20:37:18:d2:45 (Company 4)       scsi-fcp:target
0x9c03e4    NL    21:00:00:20:37:6b:d7:18 (Company 4)       scsi-fcp:target
0x9c03e8    NL    21:00:00:20:37:38:a7:c1 (Company 4)       scsi-fcp:target
0x9c03ef    NL    21:00:00:20:37:18:17:d2 (Company 4)       scsi-fcp:target

Total number of entries = 13
```

The following example displays the management VSAN (VSAN 2).

```
switch# show fcns database vsan 2
VSAN 2:
------------------------------------------------------------------------
FCID        TYPE  PWWN                    (VENDOR)        FC4-TYPE:FEATURE
------------------------------------------------------------------------
0x6d0001    N     10:00:00:05:30:00:94:9f (Cisco)         ipfc
0x6d0002    N     10:00:00:05:30:00:94:a0 (Cisco)         ipfc virtual:..c_port
0x6d0003    N     24:15:00:05:30:00:94:a0 (Cisco)         virtual:volume_owner
...
Total number of entries = 24
```

The following example displays the database for all configured VSANs.

```
switch# show fcns database
VSAN 2:
------------------------------------------------------------------------
FCID        TYPE  PWWN                    (VENDOR)        FC4-TYPE:FEATURE
------------------------------------------------------------------------
0x6d0001    N     10:00:00:05:30:00:94:9f (Cisco)         ipfc
0x6d0002    N     10:00:00:05:30:00:94:a0 (Cisco)         ipfc virtual:..c_port
0x6d0003    N     24:15:00:05:30:00:94:a0 (Cisco)         virtual:volume_owner
...
Total number of entries = 24
VSAN 3:
------------------------------------------------------------------------
FCID        TYPE  PWWN                    (VENDOR)        FC4-TYPE:FEATURE
------------------------------------------------------------------------
0x650001    N     24:0c:00:05:30:00:94:a0 (Cisco)         scsi-fcp:init vir..t
...
0x720101    NL    21:00:00:20:37:65:1c:cb (Company)       scsi-fcp
...
Total number of entries = 30
VSAN 4:
------------------------------------------------------------------------
FCID        TYPE  PWWN                    (VENDOR)        FC4-TYPE:FEATURE
------------------------------------------------------------------------
0x6b0001    N     23:26:00:05:30:00:59:20 (Cisco)         scsi-fcp:init vir..t
...
0x7800b5    NL    22:00:00:20:37:46:78:97 (Company)       scsi-fcp
...
0x780100    N     50:06:04:82:bf:d0:cf:4b (Company)           scsi-fcp 250
...
Total number of entries = 27
VSAN 5:
------------------------------------------------------------------------
FCID        TYPE  PWWN                    (VENDOR)        FC4-TYPE:FEATURE
------------------------------------------------------------------------
0x6f0001    N     23:43:00:05:30:00:59:20 (Cisco)         scsi-fcp:target vi..
...
```

Related Commands

Command	Description
asm mgmt-vsan	Displays the CPP interface configuration for a specified interface.

show fcns statistics

Use the **show fcns statistics** command to display the statistical information for a specified VSAN or for all VSANs.

show fcns statistics [detail] vsan *vsan-range*

Syntax Description

detail	Shows detailed statistics.
vsan *vsan-range*	Shows statistics for the specified VSAN or VSANs (from 1 to 4093).

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

```
switch# show fcns statistics
registration requests received = 27
deregistration requests received = 0
queries received = 57
queries sent = 10
reject responses sent = 14
RSCNs received = 0
RSCNs sent = 0
switch#
```

show fcroute

Use the **show fcroute** command to view specific information about existing Fibre Channel and FSPF configurations.

show fcroute [distance | label [*label***] vsan** *vsan-id* **| multicast vsan** *vsan-id* **|summary vsan** *vsan-id* **| unicast** *fc-id* **vsan** *vsan-id* **| unicast vsan** *vsan-id***]**

Syntax Description

distance	Shows FC route preference.
label	Shows label routes.
multicast	Shows FC multicast routes.
summary	Shows FC routes summary.
unicast	Shows FC unicast routes.
vsan *vsan-id*	The ID of the VSAN (from 1 to 4093).
fcid-id	The Fibre Channel ID.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

When the number of routes are displayed in the command output, both visible and hidden routes are included in the total number of routes.

Examples

The following example displays administrative distance.

```
switch# show fcroute distance

        Route
UUID    Distance        Name
----    --------        ----
10      20              RIB
22      40              FCDOMAIN
39      80              RIB-CONFIG
12      100             FSPF
17      120             FLOGI
21      140             TLPM
14      180             MCAST
64      200             RIB-TEST
```

The following example displays multicast routing information.

```
switch# show fcroute multicast
VSAN FC ID    # Interfaces
---- -------- ------------
1    0xffffff 0
2    0xffffff 1
3    0xffffff 1
4    0xffffff 0
5    0xffffff 0
6    0xffffff 0
7    0xffffff 0
8    0xffffff 0
9    0xffffff 0
10   0xffffff 0
```

The following example displays FCID information for a specified VSAN.

```
switch# show fcroute multicast vsan 3

VSAN FC ID    # Interfaces
---- -------- ------------
3    0xffffff 1
```

The following example displays FCID and interface information for a specified VSAN.

```
switch# show fcroute multicast 0xffffff vsan 2

VSAN FC ID    # Interfaces
---- -------- ------------
2    0xffffff 1
  fc1/1
```

The following example displays unicast routing information.

```
switch# show fcroute unicast
D:direct R:remote P:permanent V:volatile A:active N:non-active
                                                  # Next
Protocol VSAN    FC ID/Mask     RCtl/Mask Flags Hops   Cost
-------- ---- -------- -------- ---- ---- ----- ------ ----
static   1    0x010101 0xffffff 0x00 0x00 D P A 1      10
static   2    0x111211 0xffffff 0x00 0x00 R P A 1      10
fspf     2    0x730000 0xff0000 0x00 0x00 D P A 4      500
fspf     3    0x610000 0xff0000 0x00 0x00 D P A 4      500
static   4    0x040101 0xffffff 0x00 0x00 R P A 1      103
static   4    0x040102 0xffffff 0x00 0x00 R P A 1      103
static   4    0x040103 0xffffff 0x00 0x00 R P A 1      103
static   4    0x040104 0xffffff 0x00 0x00 R P A 1      103
static   4    0x111211 0xffffff 0x00 0x00 D P A 1      10
```

The following example displays unicast routing information for a specified VSAN.

```
switch# show fcroute unicast vsan 4

D:direct R:remote P:permanent V:volatile A:active N:non-active
                                                  # Next
Protocol VSAN    FC ID/Mask     RCtl/Mask Flags Hops   Cost
-------- ---- -------- -------- ---- ---- ----- ------ ----
static   4    0x040101 0xffffff 0x00 0x00 R P A 1      103
static   4    0x040102 0xffffff 0x00 0x00 R P A 1      103
static   4    0x040103 0xffffff 0x00 0x00 R P A 1      103
static   4    0x040104 0xffffff 0x00 0x00 R P A 1      103
static   4    0x111211 0xffffff 0x00 0x00 D P A 1      10
```

The following example displays unicast routing information for a specified FCID.

```
switch# show fcroute unicast 0x040101 0xffffff vsan 4

D:direct R:remote P:permanent V:volatile A:active N:non-active
                                                    # Next
Protocol VSAN    FC ID/Mask     RCtl/Mask Flags Hops   Cost
-------- ---- -------- -------- ---- ---- ----- ------ ----
static   4    0x040101 0xffffff 0x00 0x00 R P A 1      103
  fc1/2 Domain 0xa6(166)
```

The following example displays route database information.

```
switch# show fcroute summary

FC route database created Tue Oct 29 01:24:23 2002
VSAN    Ucast   Mcast   Label   Last Modified Time
----    -----   -----   -----   ------------------
1       2       1       0       Tue Oct 29 18:07:02 2002
2       3       1       0       Tue Oct 29 18:33:24 2002
3       2       1       0       Tue Oct 29 18:10:07 2002
4       6       1       0       Tue Oct 29 18:31:16 2002
5       1       1       0       Tue Oct 29 01:34:39 2002
6       1       1       0       Tue Oct 29 01:34:39 2002
7       1       1       0       Tue Oct 29 01:34:39 2002
8       1       1       0       Tue Oct 29 01:34:39 2002
9       1       1       0       Tue Oct 29 01:34:39 2002
10      1       1       0       Tue Oct 29 01:34:39 2002
Total   19      10      0
```

The following example displays route database information for a specified VSAN.

```
switch# show fcroute summary vsan 4

FC route database created Tue Oct 29 01:24:23 2002
VSAN    Ucast   Mcast   Label   Last Modified Time
----    -----   -----   -----   ------------------
4       6       1       0       Tue Oct 29 18:31:16 2002
Total   6       1       0
```

show fcs

Use the **show fcs** commands to display the status of the fabric configuration.

show fcs {database vsan *vsan-range* **| ie [nwwn** *wwn* **vsan** *vsan-range* **| vsan** *vsan-range*] **|**
platform [name *string* **vsan** *vsan-range* **| vsan** *vsan-range]* **| port [pwwn** *wwn* **vsan**
vsan-range **| vsan** *vsan-range]* **| statistics vsan** *vsan-range* **| vsan}**

Syntax Description

database	Shows local database of FCS.
ie	Shows Interconnect Element Objects Information.
platform	Shows Platform Objects Information.
port	Shows Port Objects Information.
statistics	Shows statistics for FCS packets.
vsan	Shows list of all the VSANs and plat-check-mode for each.
vsan-range	Range of the required VSANs (from 1 to 4093)

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays FCS database information.

```
switch# show fcs database

FCS Local Database in VSAN: 1
------------------------------
Switch WWN               : 20:01:00:05:30:00:16:df
Switch Domain Id         : 0x7f(127)
Switch Mgmt-Addresses    : snmp://172.22.92.58/eth-ip
                           http://172.22.92.58/eth-ip
Fabric-Name              : 20:01:00:05:30:00:16:df
Switch Logical-Name      : 172.22.92.58
Switch Information List  : [Cisco Systems*DS-C9509*0*20:00:00:05:30:00
Switch Ports:
-----------------------------------------------------------------------
Interface  pWWN                      Type     Attached-pWWNs
-----------------------------------------------------------------------
fc2/1      20:41:00:05:30:00:16:de  TE       20:01:00:05:30:00:20:de
fc2/2      20:42:00:05:30:00:16:de  Unknown  None
fc2/17     20:51:00:05:30:00:16:de  TE       20:0a:00:05:30:00:20:de
```

```
FCS Local Database in VSAN: 5
------------------------------
Switch WWN               : 20:05:00:05:30:00:12:5f
Switch Domain Id         : 0xef(239)
Switch Mgmt-Addresses    : http://172.22.90.171/eth-ip
                           snmp://172.22.90.171/eth-ip
                           http://10.10.15.10/vsan-ip
                           snmp://10.10.15.10/vsan-ip
Fabric-Name              : 20:05:00:05:30:00:12:5f
Switch Logical-Name      : 172.22.90.171
Switch Information List  : [Cisco Systems*DS-C9509**20:00:00:05:30:00:12:5e]
Switch Ports:
-------------------------------------------------------------------
Interface  pWWN                     Type     Attached-pWWNs
-------------------------------------------------------------------
fc3/1      20:81:00:05:30:00:12:5e  TE       22:01:00:05:30:00:12:9e
fc3/2      20:82:00:05:30:00:12:5e  TE       22:02:00:05:30:00:12:9e
fc3/3      20:83:00:05:30:00:12:5e  TE       22:03:00:05:30:00:12:9e
```

The following example displays Interconnect Element object information for a specific VSAN.

```
switch# show fcs ie vsan  1

IE List for VSAN: 1
-------------------------------------------------------------------
IE-WWN                   IE-Type                          Mgmt-Id
-------------------------------------------------------------------
20:01:00:05:30:00:16:df  Switch (Local)                   0xfffc7f
20:01:00:05:30:00:20:df  Switch (Adjacent)                0xfffc64
[Total 2 IEs in Fabric]
```

This command displays Interconnect Element object information for a specific WWN.

```
switch# show fcs ie nwwn 20:01:00:05:30:00:16:df vsan 1
IE Attributes
-------------
Domain-Id = 0x7f(127)
Management-Id = 0xfffc7f
Fabric-Name = 20:01:00:05:30:00:16:df
Logical-Name = 172.22.92.58
Management Address List =
        snmp://172.22.92.58/eth-ip
        http://172.22.92.58/eth-ip
Information List:
        Vendor-Name = Cisco Systems
        Model Name/Number = DS-C9509
        Release-Code = 0
```

This command displays platform information.

```
switch# show fcs platform name SamplePlatform vsan 1
Platform Attributes
-------------------
Platform Node Names:
        11:22:33:44:55:66:77:88
Platform Type = Gateway
Platform Management Addresses:
        1.1.1.1
```

This command displays platform information within a specified VSAN.

```
switch# show fcs platform vsan 1
Platform List for VSAN: 1
Platform-Names
--------------
SamplePlatform
[Total 1 Platforms in Fabric]
```

This command displays FCS port information within a specified VSAN.

```
switch# show fcs port vsan 24
Port List in VSAN: 24
                -- IE WWN: 20:18:00:05:30:00:16:df  --
------------------------------------------------------------------------
Port-WWN                Type      Module-Type            Tx-Type
------------------------------------------------------------------------
20:41:00:05:30:00:16:de  TE_Port   SFP with Serial Id      Shortwave Laser

20:51:00:05:30:00:16:de  TE_Port   SFP with Serial Id      Shortwave Laser

[Total 2 switch-ports in IE]
                -- IE WWN: 20:18:00:05:30:00:20:df  --
------------------------------------------------------------------------
Port-WWN                Type      Module-Type            Tx-Type
------------------------------------------------------------------------
20:01:00:05:30:00:20:de  TE_Port   SFP with Serial Id      Shortwave Laser

20:0a:00:05:30:00:20:de  TE_Port   SFP with Serial Id      Shortwave Laser

[Total 2 switch-ports in IE]
```

This command displays ports within a specified WWN.

```
switch# show fcs port pwwn 20:51:00:05:30:00:16:de vsan 24
Port Attributes
---------------
Port Type = TE_Port
Port Number = 0x1090000
Attached-Port-WWNs:
        20:0a:00:05:30:00:20:de
Port State = Online
```

This command displays FCS statistics.

```
switch# show fcs statistics

FCS Statistics for VSAN: 1
---------------------------
FCS Rx Get Reqs   :2
FCS Tx Get Reqs   :7
FCS Rx Reg Reqs   :0
FCS Tx Reg Reqs   :0
FCS Rx Dereg Reqs :0
FCS Tx Dereg Reqs :0
FCS Rx RSCNs      :0
FCS Tx RSCNs      :3
FCS Rx RJTs       :3
FCS Tx RJTs       :0
FCS Rx ACCs       :4
FCS Tx ACCs       :2
FCS No Response   :0
FCS Retransmit    :0

FCS Statistics for VSAN: 30
---------------------------
FCS Rx Get Reqs   :2
FCS Tx Get Reqs   :2
FCS Rx Reg Reqs   :0
FCS Tx Reg Reqs   :0
FCS Rx Dereg Reqs :0
FCS Tx Dereg Reqs :0
FCS Rx RSCNs      :0
FCS Tx RSCNs      :0
FCS Rx RJTs       :0
FCS Tx RJTs       :0
FCS Rx ACCs       :2
FCS Tx ACCs       :2
FCS No Response   :0
FCS Retransmit    :0
```

show fcsp

Use the **show fcsp** commands to display the status of the Fibre Channel Security Protocol (FC-SP) configuration.

show fcsp [asciiwwn *ascii-wwn* **| dhchap (database) | interface fc** *slot/port* **(statistics | wwn) | fcip** *interface-number* **(statistics | wwn))]**

Syntax Description

fcsp	Specifies the FC-SP feature in the switch.
asciiwwn *ascii-wwn*	Displays the ASCII representation of the WWN used with AAA server.
dhchap	Displays the DHCHAP hash algorithm status.
database	Displays the contents of the local DHCHAP database.
interface	Displays the FC-SP settings for a FC or FCIP interface.
fc *slot/port*	Displays the Fibre Channel interface in the specified slot/port.
fcip *interface-number*	Displays the description of the specified FCIP interface from 1 to 255.
statistics	Displays the statistics for the specified interface.
wwn	Displays the FC-SP identity of the other device.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example displays DHCHAP configurations in FC interfaces.

```
switch# show fcsp interface fc1/9

fc1/9:
        fcsp authentication mode:SEC_MODE_ON
        Status: Successfully authenticated
```

The following example displays DHCHAP statistics for a FC interfaces.

```
switch# show fcsp interface fc1/9 statistics

fc1/9:
        fcsp authentication mode:SEC_MODE_ON
        Status: Successfully authenticated
        Statistics:
        FC-SP Authentication Succeeded:5
        FC-SP Authentication Failed:0
        FC-SP Authentication Bypassed:0
```

The following example displays the FC-SP WWN of the device connected through a specified interface.

```
switch# show fcsp interface fc 2/1 wwn

fc2/1:
        fcsp authentication mode:SEC_MODE_ON
        Status: Successfully authenticated
        Other device's WWN:20:00:00:e0:8b:0a:5d:e7
```

The following example displays hash algorithm and DHCHAP groups configured for the local switch.

```
switch# show fcsp dhchap
Supported Hash algorithms (in order of preference):
DHCHAP_HASH_MD5
DHCHAP_HASH_SHA_1

Supported Diffie Hellman group ids (in order of preference):
DHCHAP_GROUP_NULL
DHCHAP_GROUP_1536
DHCHAP_GROUP_1024
DHCHAP_GROUP_1280
DHCHAP_GROUP_2048
```

The following example displays the DHCHAP local password database.

```
switch# show fcsp dhchap database
DHCHAP Local Password:
        Non-device specific password:mypassword1
        Password for device with WWN:29:11:bb:cc:dd:33:11:22 is pjoalf
        Password for device with WWN:30:11:bb:cc:dd:33:11:22 is mypassword

Other Devices' Passwords:
        Password for device with WWN:00:11:22:33:44:aa:bb:cc is NewPassword
```

The following example displays he ASCII representation of the device WWN.

```
switch# show fcsp asciiwwn 30:11:bb:cc:dd:33:11:22
Ascii representation of WWN to be used with AAA servers:Ox_3011bbccdd331122
```

Related Commands

Command	Description
fcsp enable	Enables the FC-SP feature for this switch.

show fctimer

To view the Fibre Channel timers, use the **show fctimer** command.

show fctimer [D_S_TOV | E_D_TOV | F_S_TOV | R_A_TOV | vsan *vsan-id* **]**

Syntax Description

D_S_TOV	D_S_TOV in milliseconds
E_D_TOV	E_D_TOV in milliseconds
F_S_TOV	F_S_TOV in milliseconds
R_A_TOV	R_A_TOV in milliseconds
vsan *vsan-id*	The ID of the VSAN (from 1 to 4093).

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example displays configured global TOVs:

```
switch# show fctimer
F_S_TOV   D_S_TOV   E_D_TOV   R_A_TOV
---------------------------------------
5000 ms   5000 ms   2000 ms   10000 ms
```

The following example displays configured TOVs for a specified VSAN:

```
switch# show fctimer vsan 10
vsan no.  F_S_TOV   D_S_TOV   E_D_TOV   R_A_TOV
-----------------------------------------------
10        5000 ms   5000 ms   3000 ms   10000 ms
```

show fc-tunnel

To view configured Fibre Channel tunnel information, use the **show fc-tunnel** command.

show fc-tunnel [explicit-path (*name* **) | tunnel-id-map]**

Syntax Description

fc-tunnel	Displays the configured state of the FC tunnel feature
explicit-path	Displays all configured explicit paths.
name	Displays the specified explicit path.
tunnel-id-map	Displays the mapping information for the outgoing interface.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

Multiple tunnel IDs can terminate at the same interface.

Examples

The following example displays the FC tunnel status

```
switch# show fc-tunnel
fc-tunnel is enabled
```

The following example displays the FC tunnel egress mapping information.

```
switch# show fc-tunnel tunnel-id-map
tunnel id egress interface
    150    fc3/1
    100    fc3/1
```

The following example displays explicit mapping information of the FC tunnel.

```
switch# show fc-tunnel explicit-path
Explicit path name: Alternate1
       10.20.1.2 loose
       10.20.1.3 strict
Explicit path name: User2
       10.20.50.1 strict
       10.20.50.4 loose
```

show fdmi

To view the Fabric-Device Management Interface (FDMI) database information, use the **show fdmi** command.

show fdmi database [(detail hba-id *hba-id* **) vsan** *vsan-id* **]**

Syntax Description

fdmi	Accesses the FDMI commands.
database	Displays the FDMI database contents.
detail	Specifies detailed FDMI information.
hba-id *hba-id*	Displays detailed information for the specified HBA entry.
vsan *vsan-id*	Specifies FDMI information for the specified VSAN ranging from 1 to 4093.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example displays all HBA management servers.

```
switch# show fdmi database
Registered HBA List for VSAN 1
  10:00:00:00:c9:32:8d:77
  21:01:00:e0:8b:2a:f6:54
switch# show fdmi database detail
Registered HBA List for VSAN 1
-------------------------------
HBA-ID: 10:00:00:00:c9:32:8d:77
-------------------------------
Node Name        :20:00:00:00:c9:32:8d:77
Manufacturer     :Emulex Corporation
Serial Num       :0000c9328d77
Model            :LP9002
Model Description:Emulex LightPulse LP9002 2 Gigabit PCI Fibre Channel Adapter
Hardware Ver     :2002606D
Driver Ver       :SLI-2 SW_DATE:Feb 27 2003, v5-2.20a12
ROM Ver          :3.11A0
Firmware Ver     :3.90A7
OS Name/Ver      :Window 2000
CT Payload Len   :1300000
  Port-id: 10:00:00:00:c9:32:8d:77
-------------------------------
HBA-ID: 21:01:00:e0:8b:2a:f6:54
-------------------------------
```

```
Node Name        :20:01:00:e0:8b:2a:f6:54
Manufacturer     :QLogic Corporation
Serial Num       :\74262
Model            :QLA2342
Model Description:QLogic QLA2342 PCI Fibre Channel Adapter
Hardware Ver     :FC5010409-10
Driver Ver       :8.2.3.10 Beta 2 Test 1 DBG (W2K VI)
ROM Ver          :1.24
Firmware Ver     :03.02.13.
OS Name/Ver      :500
CT Payload Len   :2040
  Port-id: 21:01:00:e0:8b:2a:f6:54
```

The following example displays VSAN1-specific FDMI information.

```
switch# show fdmi database detail vsan 1
Registered HBA List for VSAN 1
-------------------------------
HBA-ID: 10:00:00:00:c9:32:8d:77
-------------------------------
Node Name        :20:00:00:00:c9:32:8d:77
Manufacturer     :Emulex Corporation
Serial Num       :0000c9328d77
Model            :LP9002
Model Description:Emulex LightPulse LP9002 2 Gigabit PCI Fibre Channel Adapter
Hardware Ver     :2002606D
Driver Ver       :SLI-2 SW_DATE:Feb 27 2003, v5-2.20a12
ROM Ver          :3.11A0
Firmware Ver     :3.90A7
OS Name/Ver      :Window 2000
CT Payload Len   :1300000
  Port-id: 10:00:00:00:c9:32:8d:77
-------------------------------
HBA-ID: 21:01:00:e0:8b:2a:f6:54
-------------------------------
Node Name        :20:01:00:e0:8b:2a:f6:54
Manufacturer     :QLogic Corporation
Serial Num       :\74262
Model            :QLA2342
Model Description:QLogic QLA2342 PCI Fibre Channel Adapter
Hardware Ver     :FC5010409-10
Driver Ver       :8.2.3.10 Beta 2 Test 1 DBG (W2K VI)
ROM Ver          :1.24
Firmware Ver     :03.02.13.
OS Name/Ver      :500
CT Payload Len   :2040
  Port-id: 21:01:00:e0:8b:2a:f6:54
```

The following example displays details for the specified HBA entry.

```
switch# show fdmi database detail Hba-id 21:01:00:e0:8b:2a:f6:54 vsan 1

Node Name        :20:01:00:e0:8b:2a:f6:54
Manufacturer     :QLogic Corporation
Serial Num       :\74262
Model            :QLA2342
Model Description:QLogic QLA2342 PCI Fibre Channel Adapter
Hardware Ver     :FC5010409-10
Driver Ver       :8.2.3.10 Beta 2 Test 1 DBG (W2K VI)
ROM Ver          :1.24
Firmware Ver     :03.02.13.
OS Name/Ver      :500
CT Payload Len   :2040
  Port-id: 21:01:00:e0:8b:2a:f6:54
```

show ficon

To view configured FICON information, use the **show ficon** command.

show ficon [control-device | stat | vsan *vsan-id* **]**

Syntax Description

ficon	Displays FICON-related configuration details.
control-device	Displays FICON control device information.
stat	Displays FICON statistics
vsan *vsan-id*	Specifies FICON information for the specified VSAN ranging from 1 to 4093.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

If FICON is not enabled on a VSAN, you will not be able to view FICON configuration information for that VSAN.

Examples

The following example displays configured FICON information

```
switch# show ficon
Ficon information for VSAN 20
  Ficon is online
  VSAN is active
  Host port control is Enabled
  Host offline control is Enabled
  User alert mode is Enabled
  SNMP port control is Enabled
  Host set director timestamp is Enabled
  Active=Saved is Disabled
  Number of implemented ports are 240
  Key Counter is 73723
  FCID last byte is 0
  Date/Time is set by host to Sun Jun 26 00:04:06.991999 1904
  Device allegiance is locked by Host
  Codepage is us-canada
  Saved configuration files
    IPL
    _TSIRN00
```

The following example displays port address information

```
switch# show ficon vsan 2 portaddress
Port Address 1 is not installed in vsan 2
    Port number is 1, Interface is fc1/1
    Port name is
```

```
    Port is not admin blocked
    Prohibited port addresses are 0,241-253,255

Port Address 2 is not installed in vsan 2
    Port number is 2, Interface is fc1/2
    Port name is
    Port is not admin blocked
    Prohibited port addresses are 0,241-253,255

...
Port Address 239 is not installed in vsan 2
    Port name is
    Port is not admin blocked
    Prohibited port addresses are 0,241-253,255

Port Address 240 is not installed in vsan 2
    Port name is
    Port is not admin blocked
    Prohibited port addresses are 0,241-253,255
```

The following example displays port address information in a brief format.

```
switch# show ficon vsan 2 portaddress 50-55 brief
--------------------------------------------------------------------------------
Port    Port    Interface          Admin     Status           Oper   FCID
Address Number                     Blocked                    Mode
--------------------------------------------------------------------------------
50      50      fc2/18             on     fcotAbsent       --     --
51      51      fc2/19             off       fcotAbsent       --     --
52      52      fc2/20             off       fcotAbsent       --     --
53      53      fc2/21             off       fcotAbsent       --     --
54      54      fc2/22             off       notConnected     --     --
55      55      fc2/23             off       up               FL     0xea0000
56     55                       off       up               FL     0xea0000
```

The following example displays port address counter information.

```
switch# show ficon vsan 20 portaddress 8 counters
Port Address 8(0x8) is up in vsan 20
    Port number is 8(0x8), Interface is fc1/8
    Version presented 1, Counter size 32b
    242811 frames input, 9912794 words
      484 class-2 frames, 242302 class-3 frames
      0 link control frames, 0 multicast frames
      0 disparity errors inside frames
      0 disparity errors outside frames
      0 frames too big, 0 frames too small
      0 crc errors, 0 eof errors
      0 invalid ordered sets
      0 frames discarded c3
      0 address id errors
    116620 frames output, 10609188 words
      0 frame pacing time
    0 link failures
    0 loss of sync
    0 loss of signal
    0 primitive seq prot errors
    0 invalid transmission words
    1 lrr input, 0 ols input, 5 ols output
    0 error summary
```

The following example displays the contents of the specified FICON configuration file

```
switch# show ficon vsan 2 file IplFile1
switch# show ficon vsan 3 file IPL
```

```
FICON configuration file IPL      in vsan 3
    Port address 1
        Port name is
        Port is not blocked
        Prohibited port addresses are 0,81-253,255

    Port address 2
        Port name is
        Port is not blocked
        Prohibited port addresses are 0,81-253,255

    Port address 3
        Port name is
        Port is not blocked
        Prohibited port addresses are 0,81-253,255

    Port address 4
        Port name is
        Port is not blocked
        Prohibited port addresses are 0,81-253,255

...
Port address 80
        Port name is
        Port is not blocked
        Prohibited port addresses are 0,81-253,255

    Port address 254
        Port name is
        Port is not blocked
        Prohibited port addresses are 0,81-253,255
```

The following example displays all FICON configuration files

```
switch# show ficon vsan 2
Ficon information for VSAN 2
  Ficon is enabled
  VSAN is active
  Host control is Enabled
  Host offline control is Enabled
  Clock alert mode is Disabled
  User alert mode is Disabled
  SNMP control is Disabled
  Active=Saved is Disabled
  Number of implemented ports are 240
  Key Counter is 9
  FCID last byte is 0
  Date/Time is same as system time (Sun Dec 14 01:26:30.273402 1980)
  Device Allegiance not locked
  Codepage is us-canada
  Saved configuration files
    IPL
    IPLFILE1
```

The following example displays the specified port addresses for a FICON configuration file

```
switch# show ficon vsan 2 file SampleFile portaddress 1-3
switch# show ficon vsan 2 file iplfile1 portaddress 1-7
FICON configuration file IPLFILE1 in vsan 2
    Port address 1
        Port name is
        Port is not blocked
        Prohibited port addresses are 0,241-253,255
```

```
    Port address 2
        Port name is
        Port is not blocked
        Prohibited port addresses are 0,241-253,255

    Port address 3
        Port name is P3
        Port is not blocked
        Prohibited port addresses are 0,241-253,255
...
    Port address 7
        Port name is
        Port is not blocked
        Prohibited port addresses are 0,241-253,255
```

The following example displays the specified port address when FICON is enabled

```
switch# show ficon vsan 1 portaddress 55
FICON not enabled
switch# show ficon vsan 2 portaddress 55
Port Address 55 is not installed in vsan 2
    Port number is 55, Interface is fc2/23
    Port name is
    Port is not admin blocked
    Prohibited port addresses are 0,241-253,255
    Admin port mode is FL
    Port mode is FL, FCID is 0xea0000
```

The following example displays two port addresses configured with different states

```
switch# show ficon vsan 2 portaddress 2
Port Address 2(0x2) is not installed in vsan 2
    Port number is 2(0x2), Interface is fc1/2
    Port name is
    Port is not admin blocked
    Prohibited port addresses are 0,241-253,255(0,0xf1-0xfd,0xff)
    Admin port mode is auto
    Peer was type model manufactured by

switch# show ficon vsan 2 portaddress 1
Port Address 2(0x2) is not installed in vsan 2
    Port number is 2(0x2), Interface is fc1/2
    Port name is
    Port name is SampleName
    Port is admin blocked
    Prohibited port addresses are 0,241-253,255(0,0xf1-0xfd,0xff)
    Admin port mode is auto
    Peer was type model manufactured by
```

The following example displays control unit information.

```
switch# show ficon control-device sb3
Control Unit Image:0x80b9c2c
VSAN:20 CU:0x20fe00 CUI:0 CUD:0 CURLP:(nil)
ASYNC LP:(nil) MODE:1 STATE:1 CQ LEN:0 MAX:0
PRIMARY LP:   VSAN:0 CH:0x0 CHI:0 CU:0x0 CUI:0
ALTERNATE LP: VSAN:0 CH:0x0 CHI:0 CU:0x0 CUI:0

Logical Path:0x80b9fb4
VSAN:20 CH:0x200600 CHI:15 CU:0x20fe00 CUI:0 STATE:1 FLAGS:0x1
LINK: OH:0x0 OC:0x0 IH:0x0 IC:0x0
DEV:  OH:0x0 OC:0x0 IH:0x0 IC:0x0
SENSE: 00 00 00 00 00 00 00 46
       30 20 00 00 00 00 00 00
```

```
       00 00 00 00 00 00 00 00
       00 00 00 00 00 00 00 00
IUI:0x0 DHF:0x0 CCW:0x0 TOKEN:0x0 PCCW:0x0 FCCW:0x0 PTOKEN:0x0 FTOKEN:0x0
CMD:0x0 CCW_FLAGS:0x0 CCW_COUNT:0 CMD_FLAGS:0x0 PRIO:0x0 DATA_COUNT:0
STATUS:0x0 FLAGS:0x0 PARAM:0x0 QTP:0x0 DTP:0x0
CQ LEN:0 MAX:0 DESTATUS:0x0
```

The following example displays the history buffer for the specified VSAN

```
switch# show ficon vsan 20 director-history
Director History Buffer for vsan 20
-------------------------------------------
Key Counter           Ports Address
                      Changed
-------------------------------------------
74556                 43
74557                 44
74558                 45
74559                 46
74560                 47
74561                 48
74562                 49
74563                 50
74564                 51
74565                 52
74566                 53
74567                 54
74568                 55
74569                 56
74570                 57
74571                 58
74572                 59
74573                 60
74574                 61
74575                 62
74576                 63
74577                 64
74578
74579
74580                 1-3,5,10,12,14-16,34-40,43-45,47-54,56-57,59-64
74581                 3,5
74582                 64
74583
74584                 1-3,10,12,14-16,34-40,43-45,47-54,56-57,59-64
74585                 1
74586                 2
74587                 3
```

The following example displays the running configuration information

```
switch# show running-config
...
ficon vsan 2
portaddress 1
block
name SampleName
prohibit portaddress 3
portaddress 3
prohibit portaddress 1
file IPL
```

show file

To display the contents of a specified file in the file system, use the **show file** command.

show file *filename*

Syntax Description

filename	The name of the file for which you want to display contents.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the contents of the test file that resides in the slot0 directory.

```
switch# show file slot0:test
config t
Int fc1/1
no shut
end
show int
```

The following example displays the contents of a file residing in the current directory.

```
switch# show file myfile
```

show flogi database

To list all the flogi sessions through all interfaces across all vsans, use the **show flogi database** command.

show flogi database [fcid *fcid-id* **| interface** *interface* **| vsan** *vsan-id***]**

Syntax Description

fcid	Optional - filters flogi based on the fcid allocated.
interface	Optional - filters flogi based on the logged in interface.
vsan	Optional - filters flogi based on the vsan.
vsan-id	The ID of the VSAN is from 1 to 4093.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Output of this command is first sorted on interface and then on vsans.

In a Fibre Channel fabric, each host or disk requires an FC ID. Use the **show flogi** command to verify if a storage device is displayed in the Fabric login (FLOGI) table as in the examples below. If the required device is displayed in the FLOGI table, the fabric login is successful. Examine the flogi database on a switch that is directly connected to the host HBA and connected ports.

Examples

This command displays details on the FLOGI database.

```
switch# show flogi database
--------------------------------------------------------------------------------
INTERFACE  VSAN    FCID           PORT NAME               NODE NAME
--------------------------------------------------------------------------------
sup-fc0    2     0xb30100  10:00:00:05:30:00:49:63  20:00:00:05:30:00:49:5e
fc9/13     1     0xb200e2  21:00:00:04:cf:27:25:2c  20:00:00:04:cf:27:25:2c
fc9/13     1     0xb200e1  21:00:00:04:cf:4c:18:61  20:00:00:04:cf:4c:18:61
fc9/13     1     0xb200d1  21:00:00:04:cf:4c:18:64  20:00:00:04:cf:4c:18:64
fc9/13     1     0xb200ce  21:00:00:04:cf:4c:16:fb  20:00:00:04:cf:4c:16:fb
fc9/13     1     0xb200cd  21:00:00:04:cf:4c:18:f7  20:00:00:04:cf:4c:18:f7

Total number of flogi = 6.
```

This command displays the FLOGI interface.

```
switch# show flogi database interface fc1/11
INTERFACE       VSAN    FCID           PORT NAME               NODE NAME
--------------------- ---- -------- ----------------------- ---------------------
fc9/13     1 0xa002ef 21:00:00:20:37:18:17:d2 20:00:00:20:37:18:17:d2
fc9/13     1 0xa002e8 21:00:00:20:37:38:a7:c1 20:00:00:20:37:38:a7:c1
fc9/13     1 0xa002e4 21:00:00:20:37:6b:d7:18 20:00:00:20:37:6b:d7:18
fc9/13     1 0xa002e2 21:00:00:20:37:18:d2:45 20:00:00:20:37:18:d2:45
fc9/13     1 0xa002e1 21:00:00:20:37:39:90:6a 20:00:00:20:37:39:90:6a
fc9/13     1 0xa002e0 21:00:00:20:37:36:0b:4d 20:00:00:20:37:36:0b:4d
fc9/13     1 0xa002dc 21:00:00:20:37:5a:5b:27 20:00:00:20:37:5a:5b:27
fc9/13     1 0xa002da 21:00:00:20:37:18:6f:90 20:00:00:20:37:18:6f:90
fc9/13     1 0xa002d9 21:00:00:20:37:5b:cf:b9 20:00:00:20:37:5b:cf:b9
fc9/13     1 0xa002d6 21:00:00:20:37:46:78:97 20:00:00:20:37:46:78:97

Total number of flogi = 10.
```

This command displays the FLOGI VSAN.

```
switch# show flogi database vsan 1
--------------------------------------------------------------------------------
INTERFACE  VSAN    FCID           PORT NAME               NODE NAME
--------------------------------------------------------------------------------
fc9/13       1     0xef02ef  22:00:00:20:37:18:17:d2  20:00:00:20:37:18:17:d2
fc9/13       1     0xef02e8  22:00:00:20:37:38:a7:c1  20:00:00:20:37:38:a7:c1
fc9/13       1     0xef02e4  22:00:00:20:37:6b:d7:18  20:00:00:20:37:6b:d7:18
fc9/13       1     0xef02e2  22:00:00:20:37:18:d2:45  20:00:00:20:37:18:d2:45
fc9/13       1     0xef02e1  22:00:00:20:37:39:90:6a  20:00:00:20:37:39:90:6a
fc9/13       1     0xef02e0  22:00:00:20:37:36:0b:4d  20:00:00:20:37:36:0b:4d
fc9/13       1     0xef02dc  22:00:00:20:37:5a:5b:27  20:00:00:20:37:5a:5b:27
fc9/13       1     0xef02da  22:00:00:20:37:18:6f:90  20:00:00:20:37:18:6f:90
fc9/13       1     0xef02d9  22:00:00:20:37:5b:cf:b9  20:00:00:20:37:5b:cf:b9
fc9/13       1     0xef02d6  22:00:00:20:37:46:78:97  20:00:00:20:37:46:78:97

Total number of flogi = 10.
```

This command displays the FLOGI FCID.

```
switch# show flogi database fcid 0xef02e2
--------------------------------------------------------------------------------
INTERFACE  VSAN    FCID           PORT NAME               NODE NAME
--------------------------------------------------------------------------------
fc9/13       1     0xef02e2  22:00:00:20:37:18:d2:45  20:00:00:20:37:18:d2:45

Total number of flogi = 1.
```

Related Commands

Command	Description
show fcns database	Shows all the local and remote name server entries

show fspf

To display global FSPF information, use the **show fspf** command. This information includes:

- the domain number of the switch
- the autonomous region for the switch
- Min_LS_arrival: the minimum time that must elapse before the switch accepts LSR updates
- Min_LS_interval: the minimum time that must elapse before the switch can transmit an LSR
- LS_refresh_time: the interval lapse between refresh LSR transmissions
- Max_age: the maximum time aa LSR can stay before being deleted

show fspf database [vsan *vsan-id*] **[domain** *domain-id* **[detail]**

show fspf interface

show fspf [vsan *vsan-id]* [**interface** [*interface range*]]

Syntax Description

database	To display information of fspf database for a VSAN. If no other parameters are given all the LSRs in the database are displayed. If more specific information is required then the domain number of the owner of the LSR may be given. Detail gives more detailed information on each LSR.
domain *domain-id*	The domain of the database. The parameter *domain_num* is unsigned integers in the range 0-255.
interface *interface*	Display FSPF interface information for a given VSAN. If the interface number is specified information on the neighbor on that interface is displayed. If no interface is specified information on all interfaces are displayed. The parameter *interface_range* is of the format fcslot/port - fcslot/port
vsan	Specifies the VSAN.
vsan-id	The ID of the VSAN is from 1 to 4093.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

```
switch# show fspf vsan 1 interface fc 2/14
FSPF interface fc2/14 in VSAN 1
FSPF routing administrative state is active
Interface cost is 500
Timer intervals configured, Hello 20 s, Dead 80 s, Retransmit 5 s
FSPF State is FULL
Neighbor Domain Id is 0x03(3), Neighbor Interface index is 0x0001060d

Statistics counters :
   Number of packets received :LSU  184  LSA  184  Hello 5477  Error packets 0
   Number of packets transmitted :LSU  184  LSA  184  Hello 5478  Retransmitted
 LSU  0
  Number of times inactivity timer expired for the interface = 0
```

The following example displays FSPF interface information.

```
switch# show fspf interface vsan 1 fc1/1
FSPF interface fc1/1 in VSAN 1
FSPF routing administrative state is active
Interface cost is 500
Timer intervals configured, Hello 20 s, Dead 80 s, Retransmit 5 s
FSPF State is FULL
Neighbor Domain Id is 0x0c(12), Neighbor Interface index is 0x0f100000

Statistics counters :
   Number of packets received : LSU  8  LSA  8  Hello 118  Error packets 0
   Number of packets transmitted : LSU  8  LSA  8  Hello 119  Retransmitted LSU
 0
  Number of times inactivity timer expired for the interface = 0
```

The following example displays FSPF database information.

```
switch# show fspf database vsan 1

FSPF Link State Database for VSAN 1 Domain 0x0c(12)
LSR Type                = 1
Advertising domain ID   = 0x0c(12)
LSR Age                 = 1686
LSR Incarnation number  = 0x80000024
LSR Checksum            = 0x3caf
Number of links         = 2
 NbrDomainId      IfIndex   NbrIfIndex    Link Type         Cost
--------------------------------------------------------------------------------
   0x65(101) 0x0000100e     0x00001081               1          500
   0x65(101) 0x0000100f     0x00001080               1          500

FSPF Link State Database for VSAN 1 Domain 0x65(101)
LSR Type                = 1
Advertising domain ID   = 0x65(101)
LSR Age                 = 1685
LSR Incarnation number  = 0x80000028
LSR Checksum            = 0x8443
Number of links         = 6
 NbrDomainId      IfIndex   NbrIfIndex    Link Type         Cost
--------------------------------------------------------------------------------
   0xc3(195) 0x00001085     0x00001095               1          500
   0xc3(195) 0x00001086     0x00001096               1          500
   0xc3(195) 0x00001087     0x00001097               1          500
   0xc3(195) 0x00001084     0x00001094               1          500
    0x0c(12) 0x00001081     0x0000100e               1          500
    0x0c(12) 0x00001080     0x0000100f               1          500
```

```
FSPF Link State Database for VSAN 1 Domain 0xc3(195)
LSR Type                = 1
Advertising domain ID   = 0xc3(195)
LSR Age                 = 1686
LSR Incarnation number  = 0x80000033
LSR Checksum            = 0x6799
Number of links         = 4
 NbrDomainId      IfIndex   NbrIfIndex    Link Type          Cost
--------------------------------------------------------------------------------
   0x65(101) 0x00001095     0x00001085               1          500
   0x65(101) 0x00001096     0x00001086               1          500
   0x65(101) 0x00001097     0x00001087               1          500
   0x65(101) 0x00001094     0x00001084               1          500
```

This command displays FSPF information for a specified VSAN.

```
switch# show fspf vsan 1
FSPF routing for VSAN 1
FSPF routing administration status is enabled
FSPF routing operational status is UP
It is an intra-domain router
Autonomous region is 0
SPF hold time is 0 msec
MinLsArrival = 1000 msec , MinLsInterval = 5000 msec
Local Domain is 0x65(101)
Number of LSRs = 3, Total Checksum = 0x0001288b

Protocol constants :
   LS_REFRESH_TIME = 1800 sec
   MAX_AGE         = 3600 sec

Statistics counters :
   Number of LSR that reached MaxAge = 0
   Number of SPF computations        = 7
   Number of Checksum Errors         = 0
   Number of Transmitted packets :  LSU 65 LSA 55 Hello 474 Retranmsitted LSU 0
   Number of received packets :  LSU 55 LSA 60 Hello 464 Error packets 10
```

show hardware

Use the **show hardware** command to display switch hardware inventory details.

show hardware [ipc-channel status]

Syntax Description

ipc-channel	Identifies the interprocess communication (IPC) channels.
status	Displays the status of the IPC channels.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

None.

Examples

```
switch# show hardware
Cisco Storage Area Networking Operating System (SAN-OS) Software
TAC support:http://www.cisco.com/tac
Copyright (c) 1986-2002 by cisco Systems, Inc. All rights reserved.
The copyright for certain works contained herein are owned by
Andiamo Systems, Inc. and/or other third parties and are used and
distributed under license.

Software
  BIOS:     version 0.0.0
  loader:   version 1.0(0.259)
  kickstart:version 1.0(2) [build 1.0(0.280)]
  system:   version 1.0(2) [build 1.0(0.280)]

  BIOS compile time:      10/10/02
  kickstart image file is:bootflash:/boot-280
  kickstart compile time: 11/20/2002 6:00:00
  system image file is:   isan-280
  system compile time:    11/20/2002 6:00:00

Hardware
  RAM 963108 kB

  bootflash:503808 blocks (block size 512b)
  slot0:         0 blocks (block size 512b)

  172.22.92.28 uptime is 0 days 0 hour 31 minute(s) 23 second(s)

  Last reset
    Reason:Watchdog Timeout/External Reset
    System version:1.0(2)
```

```
This supervisor carries Pentium processor with 963108 kB of memory
Intel(R) Pentium(R) III CPU at 800MHz with 512 KB L2 Cache
Rev:Family  6, Model  11 stepping  1

512K bytes of non-volatile memory.
503808 blocks of internal bootflash (block size 512b)
```

Displays the status of the IPC channel:

```
switch# show hardware ipc-channel status
Active IPC-Channel:            A
```

show hosts

Use the **show hosts** command to display configured DNS host configuration details.

show hosts

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the configures hosts including the default domain, domain list, and name servers.

```
switch# show hosts
Default domain is cisco.com
Domain list: ucsc.edu harvard.edu yale.edu stanford.edu
Name/address lookup uses domain service
Name servers are 15.1.0.1 15.2.0.0
```

show incompatibility

To display the HA compatibility status between the two supervisor modules, use the **show incompatibility** command.

show incompatibility [system (bootflash: | slot0: | volatile:) *image-filename*]

Syntax Description

show incompatibility	Displays the switch configuration incompatibilities.
bootflash:	Source or destination location for internal bootflash memory
slot0:	Source or destination location for the CompactFlash memory or PCMCIA card.
volatile:	Source or destination location for the volatile directory.
image-filename	The name of the system or kickstart image.

Defaults

None.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

If the HA compatibility is `strict` on an active supervisor module, the standby supervisor module synchronization may not succeed and may move into an inconsistent state.

If the HA compatibility is `loose`, the synchronization may happen without errors, but some resources may become unusable when a switchover happens.

Examples

The following examples display kernel core settings.

```
switch# show incompatibility system bootflash:old-image-y
The following configurations on active are incompatible with the system image
1) Feature Index : 67 , Capability : CAP_FEATURE_SPAN_FC_TUNNEL_CFG
Description : SPAN - Remote SPAN feature using fc-tunnels
Capability requirement : STRICT
2) Feature Index : 119 , Capability : CAP_FEATURE_FC_TUNNEL_CFG
Description : fc-tunnel is enabled
Capability requirement : STRICT
```

show install all impact

To view the software compatibility matrix of a specific image, use the **show install all impact** command.

show install all impact *image-filename* **[bootflash: | slot0:]**

Syntax Description

image-filename	The name of the system or kickstart image.
bootflash:	Source location for internal bootflash memory
slot0:	Source location for the CompactFlash memory or PCMCIA card.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

None.

Examples

Use the **show install all impact** command to view the effect of updating the system from the running image to another specified image.

```
switch# show install all impact

Verifying image bootflash:/ilc1.bin
[####################] 100% -- SUCCESS

Verifying image bootflash:/vk73a
[####################] 100% -- SUCCESS

Verifying image bootflash:/vs73a
[####################] 100% -- SUCCESS

Extracting "slc" version from image bootflash:/vs73a.
[####################] 100% -- SUCCESS

Extracting "slc" version from image bootflash:/vs73a.
[####################] 100% -- SUCCESS

Extracting "system" version from image bootflash:/vs73a.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image bootflash:/vk73a.
[####################] 100% -- SUCCESS

Extracting "loader" version from image bootflash:/vk73a.
[####################] 100% -- SUCCESS
```

```
Extracting "slc" version from image bootflash:/vs73a.
[####################] 100% -- SUCCESS

Compatibility check is done:
Module  bootable          Impact  Install-type  Reason
------  --------  --------------  ------------  ------
     2       yes  non-disruptive          none
     4       yes  non-disruptive          none
     6       yes  non-disruptive          none
     9       yes  non-disruptive          none

Images will be upgraded according to following table:
Module       Image       Running-Version           New-Version  Upg-Required
------  ----------  --------------------  --------------------  ------------
     2         slc                1.2(1)                1.2(1)            no
     2        bios      v1.0.7(03/20/03)      v1.0.7(03/20/03)            no
     4         slc                1.2(1)                1.2(1)            no
     4        ilce                1.2(1)                1.2(1)            no
     4        bios      v1.0.7(03/20/03)      v1.0.7(03/20/03)            no
     6      system                1.2(1)                1.2(1)            no
     6   kickstart                1.2(1)                1.2(1)            no
     6        bios      v1.0.7(03/20/03)      v1.0.7(03/20/03)            no
     6      loader               1.0(3a)               1.0(3a)            no
     9         slc                1.2(1)                1.2(1)            no
     9        bios      v1.0.7(03/20/03)      v1.0.7(03/20/03)            no
```

The following command displays the error message that is displayed if a wrong image is provided.

```
switch# show install all impact system_image bootflash:
Compatibility check failed. Return code 0x40930003 (Invalid bootvar specified in
 the input).
```

show install all status

To view the on-going **install all** command or the log of the last installed **install all** command from a Console, SSH, or Telnet session, use the **show install all status** command.

show install all status

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

This command only displays the status of an **install all** command that is issued form the CLI (not the GUI).

Examples

Use the **show install all status** command to view the output of a **install all** command process.

```
switch# show install all status
There is an on-going installation... <---------------------- in progress installation
Enter Ctrl-C to go back to the prompt.


Verifying image bootflash:/b-1.3.0.104
 -- SUCCESS


Verifying image bootflash:/i-1.3.0.104
 -- SUCCESS


Extracting "system" version from image bootflash:/i-1.3.0.104.
 -- SUCCESS


Extracting "kickstart" version from image bootflash:/b-1.3.0.104.
 -- SUCCESS


Extracting "loader" version from image bootflash:/b-1.3.0.104.
 -- SUCCESS


switch# show install all status
This is the log of last installation.          <<<<<< log of last install
```

```
Verifying image bootflash:/b-1.3.0.104
 -- SUCCESS


Verifying image bootflash:/i-1.3.0.104
 -- SUCCESS


Extracting "system" version from image bootflash:/i-1.3.0.104.
 -- SUCCESS


Extracting "kickstart" version from image bootflash:/b-1.3.0.104.
 -- SUCCESS


Extracting "loader" version from image bootflash:/b-1.3.0.104.
 -- SUCCESS
```

show in-order-guarantee

Use the **show in-order-guarantee** command to display the present configured state of the in-order delivery feature.

show in-order-guarantee

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the present configuration status of the in-order delivery feature.

```
switch# show in-order-guarantee
inorder delivery is not guaranteed
```

show interface

You can check the status of an interface at any time by using the **show interface** command.

show interface [*interface range*]
[**bbcredit**] |
[**brief | counters | description**]
[**cpp** *slot/process-number/vsan-id*] | [**fv** *slot/dpp-number/fv-port*]
[**fc** *slot/port*] | [**fc-tunnel** *tunnel-id*] |
[**fcip** *interface-number* | **gigabitethernet** | **iscsi**] |
mgmt | port-channel *portchannel-number. subinterface-number* | **sup-fc** |
transceiver (calibrations | details) | trunk vsan [*vsan-id*] | **vsan** *vsan-id*

Syntax Description

interface range	Displays the interfaces in the specified range.
bbcredit	Displays BB_credit information for all interfaces.
brief	Displays brief info of interface.
counters	Displays the interface counter information.
description	Displays a description of interface.
cpp	Displays the virtualization interface specific to the ASM module (see the "interface cpp" section on page 26-18)
fc *slot/port*	Displays the Fibre Channel interface in the specified slot/port.
fc-tunnel *tunnel-id*	Displays description of the specified FC tunnel from 1 to 4095.
fcip *interface-number*	Displays the description of the specified FCIP interface from 1 to 255.
fv *slot/dpp-number/fv-port*	Displays the virtual F port (FV port) interface in the specified slot along with the data path processor (DPP) number and the FV port number.
gigabitethernet *slot/port*	Displays the description of the Gigabit Ethernet interface in the specified slot/ port.
iscsi *slot/port*	Displays the description of the iSCSI interface in the specified slot/ port.
mgmt	Displays the description of the management interface.
port-channel *portchannel-number. subinterface-number*	Displays the PortChannel interface specified by the PortChannel number followed by a dot (.) indicator and the subinterface number.
sup-fc	Displays the inband interface details.
svc	Displays the virtualization interface specific to the CSM module (see the --section--when we add SVC--Release 1.3.1?)
transceiver	Displays the transceiver information for interface.
calibrations	Displays transceiver calibration information for the specified interface.
details	Show detailed transceiver diagnostics information for the specified interface.
trunk vsan	Displays the trunking status of all VSANs.
vsan-id	Displays the trunking status of the specified VSANs.
vsan *vsan-id*	Displays the VSAN interface (brief, counters, or description for a specified interface or a range of interfaces)

Defaults None.

Command Modes EXEC

Command History This command was modified in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines You can specify a range of interfaces by issuing a command with the following example format:

interface fc1/1 - 5 , fc2/5 - 7

The spaces are required before and after the dash (-) and before and after the comma (,).

The **show interface** *interface-type slot/port* **transceiver** command can only be issued on a switch in the Cisco MDS 9100 Series if the FCOT is present.

Examples

```
switch# show interface fc1/11
fc1/11 is up
    Hardware is Fibre Channel
    Port WWN is 20:0b:00:05:30:00:59:de
    Admin port mode is ST
    Port mode is ST
    Port vsan is 1
    Speed is 1 Gbps
    Rspan tunnel is fc-tunnel 100
    Beacon is turned off
    5 minutes input rate 248 bits/sec, 31 bytes/sec, 0 frames/sec
    5 minutes output rate 176 bits/sec, 22 bytes/sec, 0 frames/sec
      6862 frames input, 444232 bytes
        0 discards, 0 errors
        0 CRC, 0 unknown class
        0 too long, 0 too short
      6862 frames output, 307072 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
     16 receive B2B credit remaining
      3 transmit B2B credit remaining.

switch# show int sup-fc0
sup-fc0 is up
    Hardware is FastEthernet, address is 0000.0000.0000
    MTU 2596 bytes, BW 1000000 Kbit
    66 packets input, 7316 bytes
    Received 0 multicast frames, 0 compressed
    0 input errors, 0 frame, 0 overrun 0 fifo
    64 packets output, 28068 bytes, 0 underruns
    0 output errors, 0 collisions, 0 fifo
    0 carrier errors

switch# show int vsan 2
vsan2 is up, line protocol is up
    WWPN is 10:00:00:05:30:00:59:1f, FCID is 0xb90100
    Internet address is 10.1.1.1/24
    MTU 1500 bytes, BW 1000000 Kbit
    0 packets input, 0 bytes, 0 errors, 0 multicast
```

```
    0 packets output, 0 bytes, 0 errors, 0 dropped

switch# show interface description
fc1/1
    no description
fc1/2
    no description
fc1/15
fcAnl

sup-fc0 is up

mgmt0 is up

vsan1 - IPFC interface

port-channel 15
no description

port-channel 98
no description

switch# show interface fc2/1 - 5 brief
--------------------------------------------------------------------------------
Interface  Vsan   Admin  Admin   Status           Oper  Oper    Port-channel
                  Mode   Trunk                    Mode  Speed
                         Mode                           (Gbps)
--------------------------------------------------------------------------------
fc1/1      1      auto   on      down             --    --      --
fc1/2      1      auto   on      fcotAbsent       --    --      --
fc1/3      1      F      --      notConnected     --    --      --
fc1/4      1      auto   on      fcotAbsent       --    --      --
fc1/5      1      F      --      up               F     2       --
fc1/6      1      auto   on      fcotAbsent       --    --      --
fc1/7      1      auto   on      down             --    --      --
fc1/8      1      auto   on      fcotAbsent       --    --      --
fc1/9      1      auto   on      fcotAbsent       --    --      --
fc1/10     1      auto   on      fcotAbsent       --    --      --
fc1/11     1      auto   on      down             --    --      --
fc1/12     1      auto   on      fcotAbsent       --    --      --
fc1/13     1      auto   on      down             --    --      --
fc1/14     1      auto   on      fcotAbsent       --    --      --
fc1/15     1      auto   on      down             --    --      --
fc1/16     1      auto   on      fcotAbsent       --    --      --
--------------------------------------------------------------------------------
Interface          Status   IP Address               Speed        MTU
--------------------------------------------------------------------------------
sup-fc0            up       --                       1 Gbps       2596
--------------------------------------------------------------------------------
Interface          Status   IP Address               Speed        MTU
--------------------------------------------------------------------------------
mgmt0              up       173.95.112/24         100 Mbps     1500
--------------------------------------------------------------------------------
Interface          Status   IP Address               Speed        MTU
--------------------------------------------------------------------------------
vsan1                 up    10.1.1.1/24              1 Gbps       1500

switch# show interface fcip 3 counters
fcip3
    TCP Connection Information
      2 Active TCP connections
        Control connection: Local 43.1.1.2:3225, Remote 43.1.1.1:65532
        Data connection: Local 43.1.1.2:3225, Remote 43.1.1.1:65534
      30 Attempts for active connections, 0 close of connections
```

```
    TCP Parameters
      Path MTU 1500 bytes
      Current retransmission timeout is 300 ms
      Round trip time: Smoothed 10 ms, Variance: 5
      Advertised window: Current: 122 KB, Maximum: 122 KB, Scale: 1
      Peer receive window: Current: 114 KB, Maximum: 114 KB, Scale: 1
      Congestion window: Current: 2 KB, Slow start threshold: 1048560 KB
    5 minutes input rate 64 bits/sec, 8 bytes/sec, 0 frames/sec
    5 minutes output rate 64 bits/sec, 8 bytes/sec, 0 frames/sec
      910 frames input, 84652 bytes
         910 Class F frames input, 84652 bytes
         0 Class 2/3 frames input, 0 bytes
         0 Error frames timestamp error 0
      908 frames output, 84096 bytes
         908 Class F frames output, 84096 bytes
         0 Class 2/3 frames output, 0 bytes
         0 Error frames 0 reass frames

switch# show interface counters brief

--------------------------------------------------------------------------------
Interface          Input (rate is 5 min avg)      Output (rate is 5 min avg)
                   ------------------------------ ------------------------------
                   Rate     Total                 Rate     Total
                   MB/s     Frames                MB/s     Frames
--------------------------------------------------------------------------------
fc9/1              0        0                     0        0
fc9/2              0        0                     0        0
fc9/3              0        0                     0        0
fc9/4              0        0                     0        0
...
--------------------------------------------------------------------------------
Interface          Input (rate is 5 min avg)      Output (rate is 5 min avg)
                   ------------------------------ ------------------------------
                   Rate     Total                 Rate     Total
                   MB/s     Frames                MB/s     Frames
--------------------------------------------------------------------------------
iscsi4/1           0        0                     0        0
iscsi4/2           0        0                     0        0
iscsi4/3           0        0                     0        0
iscsi4/4           0        0                     0        0
...
vsan10 is up, line protocol is up
    WWPN is 10:00:00:05:30:00:07:23, FCID is 0xee0001
    Internet address is 10.1.1.5/24
    MTU 1500 bytes, BW 1000000 Kbit
    0 packets input, 0 bytes, 0 errors, 0 multicast
    0 packets output, 0 bytes, 0 errors, 0 dropped

--------------------------------------------------------------------------------
Interface          Input (rate is 5 min avg)      Output (rate is 5 min avg)
                   ------------------------------ ------------------------------
                   Rate     Total                 Rate     Total
                   MB/s     Frames                MB/s     Frames
--------------------------------------------------------------------------------

port-channel 100   0        0                     0        0

--------------------------------------------------------------------------------
Interface          Input (rate is 5 min avg)      Output (rate is 5 min avg)
                   ------------------------------ ------------------------------
                   Rate     Total                 Rate     Total
                   Mbits/s  Frames                Mbits/s  Frames
--------------------------------------------------------------------------------
```

```
fcip2              0        0                    0        0
fcip3              9        0                    9        0

fcip6              8        0                    8        0
fcip7              8        0                    8        0

switch# show interface fcip 3
fcip3 is trunking
    Hardware is GigabitEthernet
    Port WWN is 20:ca:00:05:30:00:07:1e
    Peer port WWN is 20:ca:00:00:53:00:18:1e
    Admin port mode is auto, trunk mode is on
    Port mode is TE
    vsan is 1
    Trunk vsans (allowed active) (1,10)
    Trunk vsans (operational)    (1)
    Trunk vsans (up)             (1)
    Trunk vsans (isolated)       (10)
    Trunk vsans (initializing)   ()
    Using Profile id 3 (interface GigabitEthernet4/3)
    Peer Information
      Peer Internet address is 43.1.1.1 and port is 3225
      Special Frame is disabled
    Maximum number of TCP connections is 2
    Time Stamp is disabled
    B-port mode disabled
    TCP Connection Information
      2 Active TCP connections
        Control connection: Local 43.1.1.2:3225, Remote 43.1.1.1:65532
        Data connection: Local 43.1.1.2:3225, Remote 43.1.1.1:65534
      30 Attempts for active connections, 0 close of connections
    TCP Parameters
      Path MTU 1500 bytes
      Current retransmission timeout is 300 ms
      Round trip time: Smoothed 10 ms, Variance: 5
      Advertised window: Current: 122 KB, Maximum: 122 KB, Scale: 1
      Peer receive window: Current: 114 KB, Maximum: 114 KB, Scale: 1
      Congestion window: Current: 2 KB, Slow start threshold: 1048560 KB
    5 minutes input rate 64 bits/sec, 8 bytes/sec, 0 frames/sec
    5 minutes output rate 64 bits/sec, 8 bytes/sec, 0 frames/sec
      866 frames input, 80604 bytes
         866 Class F frames input, 80604 bytes
         0 Class 2/3 frames input, 0 bytes
         0 Error frames timestamp error 0
      864 frames output, 80048 bytes
         864 Class F frames output, 80048 bytes
         0 Class 2/3 frames output, 0 bytes
         0 Error frames 0 reass frames
       16 receive B2B credit remaining
        3 transmit B2B credit remaining.

switch# show interface gigabitethernet 4/1
GigabitEthernet4/1 is up
    Hardware is GigabitEthernet, address is 0005.3000.2e12
    Internet address is 100.1.1.2/24
    MTU 1500 bytes, BW 1000000 Kbit
    Port mode is IPS
    Speed is 1 Gbps
    Beacon is turned off
    5 minutes input rate 32 bits/sec, 4 bytes/sec, 0 frames/sec
    5 minutes output rate 88 bits/sec, 11 bytes/sec, 0 frames/sec
    637 packets input, 49950 bytes
      0 multicast frames, 0 compressed
```

```
      0 input errors, 0 frame, 0 overrun 0 fifo
    659 packets output, 101474 bytes, 0 underruns
      0 output errors, 0 collisions, 0 fifo
      0 carrier errors

switch# show interface iscsi 2/1
iscsi2/1 is up
    Hardware is GigabitEthernet
    Port WWN is 20:41:00:05:30:00:50:de
    Admin port mode is ISCSI
    Port mode is ISCSI
    Speed is 1 Gbps
    iSCSI initiator is identified by name
    Number of iSCSI session: 7, Number of TCP connection: 7
    Configured TCP parameters
        Local Port is 3260
        PMTU discover is disabled
        Keepalive-timeout is 1 sec
        Minimum-retransmit-time is 300 ms
        Max-retransmissions 8
        Sack is disabled
        Minimum available bandwidth is 0 kbps
        Estimated round trip time is 0 usec
    5 minutes input rate 265184 bits/sec, 33148 bytes/sec, 690 frames/sec
    5 minutes output rate 375002168 bits/sec, 46875271 bytes/sec, 33833 frames/sec
    iSCSI statistics
      6202235 packets input, 299732864 bytes
        Command 6189718 pdus, Data-out 1937 pdus, 1983488 bytes, 0 fragments
      146738794 packets output, 196613551108 bytes
        Response 6184282 pdus (with sense 4), R2T 547 pdus
        Data-in 140543388 pdus, 189570075420 bytes

switch# show interface fc2/5 transceiver
fc2/5 fcot is present
    name is CISCO-INFINEON
    part number is V23848-M305-C56C
    revision is A3
    serial number is 30000474
    fc-transmitter type is short wave laser
    cisco extended id is unknown (0x0)

    SFP Diagnostics Information
        Temperature      :  34.98 Celsius
        Voltage          :   3.31 Volt
        Current          :   7.24 mA
        Optical Tx Power :  -5.99 dBm
        Optical Rx Power : -23.01 dBm
    Note: ++  high-alarm; +  high-warning; --  low-alarm; -  low-warning

switch# show interface fc2/5 transceiver details
fc2/5 fcot is present
    name is CISCO-INFINEON
    part number is V23848-M305-C56C
    revision is A3
    serial number is 30000474
    fc-transmitter type is short wave laser
    cisco extended id is unknown (0x0)

    SFP Detail Diagnostics Information
  ------------------------------------------------------------------------------
                                    Alarms                  Warnings
                                High        Low         High          Low
  ------------------------------------------------------------------------------
  Temperature  34.98 C        105.00 C    211.00 C    100.00 C      216.00 C
```

```
  Voltage       3.31 V          3.71 V      2.80 V      3.64 V        2.97 V
  Current       7.24 mA        19.97 mA     3.07 mA    14.85 mA       4.61 mA
  Tx Power     -5.99 dBm       -3.00 dBm  -10.51 dBm   -4.00 dBm     -9.51 dbm
  Rx Power    -23.01 dBm        1.00 dBm  -23.98 dBm    0.00 dBm    -18.86 dBm
  ------------------------------------------------------------------------------
  Note: ++  high-alarm; +  high-warning; --  low-alarm; -  low-warning

switch# show interface fc2/5 transceiver calibrations
fc2/5 fcot is present
    name is CISCO-INFINEON
    part number is V23848-M305-C56C
    revision is A3
    serial number is 30000474
    fc-transmitter type is short wave laser
    cisco extended id is unknown (0x0)

SFP is internally calibrated
switch# show interface fc-tunnel 200
fc-tunnel 200 is up
Dest   IP Addr: 200.200.200.7   Tunnel ID: 200
Source IP Addr: 200.200.200.4   LSP ID: 1
Explicit Path Name:
```

show ip access-list

To display the IP access control lists (IP-ACLs) currently active, use the **show ip access-list** command.

show ip access-list *list-number* | **usage**

Syntax Description

ip access-list	Displays the information for all IP-ACLs
list-number	Identifies the IP-ACL with an integer ranging from 1 to 256.
usage	Specifies the interface type

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

None.

Examples

The following example displays configured IP-ACLs

```
switch# show ip access-list usage
Access List Name/Number          Filters IF   Status    Creation Time
-------------------------------- ------- ---- --------- -------------
abc                              3       7    active    Tue Jun 24 17:51:40 2003
x1                               3       1    active    Tue Jun 24 18:32:25 2003
x3                             0       1    not-ready Tue Jun 24 18:32:28 2003
```

The following example displays a summary of the specified IP-ACL

```
switch# show ip access-list abc
ip access-list abc permit tcp any any (0 matches)
ip access-list abc permit udp any any (0 matches)
ip access-list abc permit icmp any any (0 matches)
ip access-list abc permit ip 10.1.1.0 0.0.0.255 (2 matches)
ip access-list abc permit ip 10.3.70.0 0.0.0.255 (7 matches)
```

show ip route

To display the ip routes currently active, use the **show ip route** command.

show ip route

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

```
switch# show ip route

Codes: C - connected, S - static

Default gateway is 172.22.95.1

C 10.0.0.0/24 is directly connected, vsan1
C 172.22.95.0/24 is directly connected, mgmt0
```

show ip routing

To display the ip routing state, use the **show ip routing** command.

show ip routing

show ips arp interface gigabitethernet *slot-number*

Syntax Description

ips	Displays the information for all IP storage configurations.
arp	Displays the ARP table.
interface gigabitethernet	Specifies the interface type
slot-number	Specifies the slot number and port number of the required interface.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

```
switch# show ip routing
ip routing is disabled
```

show ips arp

You can check the status of an interface at any time by using the **show ips arp** command.

show ips arp interface gigabitethernet *slot-number*

Syntax Description

ips	Displays the information for all IP storage configurations.
arp	Displays the ARP table.
interface gigabitethernet	Specifies the interface type
slot-number	Specifies the slot number and port number of the required interface.

Defaults

None.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Use the **show ips arp interface gigabitethernet** command to display the ARP cache on the Gigabit Ethernet interfaces. This command takes the main Ethernet interface and as a parameter and returns the ARP cache for that interface.

Examples

The following example displays ARP caches in the specified interface:

```
switch# show ips arp interface gigabitethernet 4/4
Protocol         Address   Age (min)   Hardware Addr  Type   Interface
Protocol         Address   Age (min)   Hardware Addr  Type   Interface
Internet     172.22.91.1    2    -  00:00:0c:07:ac:01  ARPA  GigabitEthernet4/4
Internet     172.22.91.2    0    -  00:02:7e:6b:a8:08  ARPA  GigabitEthernet4/4
Internet    172.22.91.17    0    -  00:e0:81:20:45:f5  ARPA  GigabitEthernet4/4
Internet    172.22.91.18    0    -  00:e0:81:05:f7:64  ARPA  GigabitEthernet4/4
Internet    172.22.91.30    0    -  00:e0:18:2e:9d:19  ARPA  GigabitEthernet4/4
...
```

show ips ip route

You can check the status of an interface at any time by using the **show ips ip route** command.

show ips ip route interface gigabitethernet *slot-number*

Syntax Description

ips	Displays the information for all IP storage configurations.
ip route	Displays the IP route table.
interface gigabitethernet	Specifies the interface type
slot-number	Specifies the slot number and port number of the required interface.

Defaults

None.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

None.

Examples

The following example displays all FCIP profiles.

```
switch# show ips ip route interface gigabitethernet 8/1
Codes: C - connected, S - static

No default gateway

C 10.1.3.0/24 is directly connected, GigabitEthernet8/1
```

show ips stats

You can check the status of an interface at any time by using the **show ips stats** command.

show ips stats [buffer | dma-bridge | icmp | ip | mac | tcp (detail)] interface gigabitethernet *slot-number*

Syntax Description

ips	Displays the information for all IP storage configurations.
stats	Displays IP storage statistics for the specified interface.
buffer	Displays IP storage buffer information.
dma-bridge	Displays the direct memory access (DMA) statistics.
icmp	Displays ICMP statistics.
ip	Displays IP statistics.
mac	Displays MAC statistics,
tcp	Displays TCP statistics
detail	Displays all statistical information maintained by the interface.
interface gigabitethernet	Specifies the interface type
slot-number	Specifies the slot number and port number of the required interface.

Defaults

None.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Use the **show ips stats icmp interface gigabitethernet** command to obtain ICMP statistics for the selected interface.

Use the **show IPS stats IP interface gigabitethernet 2/1** command to obtain IP statistics for the selected interface.

Use the **show ips stats mac interface gigabitethernet** command to obtain Ethernet statistics for the selected interface.

Use the **show ips stats tcp interface gigabitethernet** command to obtain TCP stats along with the connection list and TCP state or the selected interface.

Examples

The following example displays iSCSI buffer statistics.

```
switch# show ips stats buffer interface gigabitethernet 8/1
```

The following example displays ICMP statistics.

```
switch# show ips stats icmp interface gigabitethernet 8/1
ICMP Statistics for port GigabitEthernet8/1
    2 ICMP messages received
    0 ICMP messages dropped due to errors
    ICMP input histogram
      2 echo request
    ICMP output histogram
      2 echo reply
```

The following example displays IP statistics.

```
switch# show ips stats ip interface gigabitethernet 8/1
Internet Protocol Statistics for port GigabitEthernet8/1
    22511807 total received, 22509468 good, 2459 error
    0 reassembly required, 0 reassembled ok, 0 dropped after timeout
    27935633 packets sent, 0 outgoing dropped, 0 dropped no route
    0 fragments created, 0 cannot fragment
```

The following example displays MAC statistics.

```
switch# show ips stats mac interface gigabitethernet 8/1
Ethernet MAC statistics for port GigabitEthernet8/1
    Hardware Transmit Counters
      28335543 frame 37251751286 bytes
      0 collisions, 0 late collisions, 0 excess collisions
      0 bad frames, 0 FCS error, 0 abort, 0 runt, 0 oversize
    Hardware Receive Counters
      18992406778 bytes, 22835370 frames, 0 multicasts, 2584 broadcasts
      0 bad, 0 runt, 0 CRC error, 0 length error
      0 code error, 0 align error, 0 oversize error
    Software Counters
      22835370 received frames, 28335543 transmit frames
      0 frames soft queued, 0 current queue, 0 max queue
      0 dropped, 0 low memory
```

The following example displays TCP statistics.

```
switch# show ips stats tcp interface gigabitethernet 8/1
TCP Statistics for port GigabitEthernet8/1
    Connection Stats
      0 active openings, 0 accepts
      0 failed attempts, 0 reset received, 0 established
    Segment stats
      23657893 received, 29361174 sent, 0 retransmitted
      0 bad segments received, 0 reset sent

    TCP Active Connections
      Local  Address        Remote Address        State      Send-Q   Recv-Q
      10.1.3.3:3260         10.1.3.106:51935      ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.106:51936      ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.106:51937      ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.106:51938      ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.106:51939      ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.106:51940      ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.106:51941      ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.106:51942      ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.106:51943      ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.106:51944      ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.115:1026       ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.115:1027       ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.115:1028       ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.115:1029       ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.115:1030       ESTABLISH  48       0
      10.1.3.3:3260         10.1.3.115:1031       ESTABLISH  48       0
      10.1.3.3:3260         10.1.3.115:1032       ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.115:1033       ESTABLISH  0        0
      10.1.3.3:3260         10.1.3.115:1034       ESTABLISH  0        0
      0.0.0.0:3260          0.0.0.0:0             LISTEN     0        0
```

show ips status

You can check the status of an interface at any time by using the **show ips status** command.

show ips status [module *slot-number***]**

Syntax Description

ips	Displays the information for all IP storage configurations.
status	Displays the ARP table.
module *slot-number*	Identifies the module in the specified slot.

Defaults

None.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

None.

Examples

The following example displays all FCIP profiles.

```
switch# show ips status
        Port 8/1 READY
        Port 8/2 READY
        Port 8/3 READY
        Port 8/4 READY
        Port 8/5 READY
        Port 8/6 READY
        Port 8/7 READY
        Port 8/8 READY

switch# show ips status module 9
        Port 9/1 READY
        Port 98/2 READY
        Port 9/3 READY
        Port 9/4 READY
        Port 9/5 READY
        Port 9/6 READY
        Port 9/7 READY
        Port 9/8 READY
...
```

show iscsi global

The **show iscsi global** command shows all the iSCSI initiators that are configured by the user.

show iscsi global

Syntax Description

iscsi global	Displays information for all configured iSCSI initiators.

Defaults

None.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

None.

Examples

The following example displays all configured iSCSI initiators

```
switch# show iscsi global
iSCSI Global information
  Authentication:CHAP, NONE
  Import FC Target:Enabled
  Number of target nodes:11
  Number of portals:8
  Number of sessions:10
  Failed sessions:9, Last failed initiator
name:iqn.1987-05.com.cisco:02.0163c91bbc28.host1
```

show iscsi initiator

The **show iscsi initiator** commands shows all the iSCSI nodes that are remote to the switch.

show iscsi initiator [configured | detail | fcp-session | iscsi-session]

Syntax Description

iscsi initiator	Displays iSCSI information for the initiators.
configured	Displays the configured information for the iSCSI initiator.
detail	Displays detailed iSCSI initiator information.
fcp-session	Specifies the Fibre Channel session details.
iscsi-session	Specifies iSCSI session details.

Defaults

None.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

If no parameter is provided the command lists all the active iSCSI virtual-targets. If the iSCSI node name is provided then the command lists the details of that iscsi virtual-target.

Examples

The following example displays all iSCSI initiators

```
switch# show iscsi initiator
iSCSI Node name is iqn.1987-05.com.cisco.01.15cee6e7925087abc82ed96377653c8
    iSCSI alias name: iscsi7-lnx
    Node WWN is 23:10:00:05:30:00:7e:a0 (dynamic)
    Member of vsans: 1
    Number of Virtual n_ports: 1
    Virtual Port WWN is 23:12:00:05:30:00:7e:a0 (dynamic)
      Interface iSCSI 8/3, Portal group tag: 0x382
        VSAN ID 1, FCID 0xdc0100

iSCSI Node name is iqn.1987-05.com.cisco:02.91b0ee2e8aa1.iscsi16-w2k
    iSCSI alias name: ISCSI16-W2K
    Node WWN is 23:1f:00:05:30:00:7e:a0 (dynamic)
    Member of vsans: 1
    Number of Virtual n_ports: 1
    Virtual Port WWN is 23:28:00:05:30:00:7e:a0 (dynamic)
      Interface iSCSI 8/3, Portal group tag: 0x382
        VSAN ID 1, FCID 0xdc0101
```

```
iSCSI Node name is iqn.1987-05.com.cisco.01.b6ca466f8b4d8e848ab17e92f24bf9cc
    iSCSI alias name: iscsi6-lnx
    Node WWN is 23:29:00:05:30:00:7e:a0 (dynamic)
    Member of vsans: 1, 2, 3, 4
    Number of Virtual n_ports: 1
    Virtual Port WWN is 23:2a:00:05:30:00:7e:a0 (dynamic)
      Interface iSCSI 8/3, Portal group tag: 0x382
        VSAN ID 4, FCID 0xee0000
        VSAN ID 3, FCID 0xee0100
        VSAN ID 2, FCID 0xee0000
        VSAN ID 1, FCID 0xdc0102
...
```

The following example displays detailed Information for all iSCSI initiators

```
switch# show iscsi initiator detail
iSCSI Node name is iqn.1987-05.com.cisco.01.15cee6e7925087abc82ed96377653c8
    iSCSI alias name: iscsi7-lnx
    Node WWN is 23:10:00:05:30:00:7e:a0 (dynamic)
    Member of vsans: 1
    Number of Virtual n_ports: 1

    Virtual Port WWN is 23:10:00:05:30:00:7e:a0 (dynamic)
      Interface iSCSI 8/3, Portal group tag is 0x382
        VSAN ID 1, FCID 0xdc0100
        No. of FC sessions: 3
        No. of iSCSI sessions: 2

        iSCSI session details

          Target node: iqn.com.domainname.172.22.93.143.08-03.gw.22000020374b5247
          Statistics:
            PDU: Command: 0, Response: 0
            Bytes: TX: 0, RX: 0
            Number of connection: 1
          TCP parameters
            Connection Local 10.1.3.3:3260, Remote 10.1.3.107:34112
            Path MTU 1500 bytes
            Current retransmission timeout is 300 ms
            Round trip time: Smoothed 2 ms, Variance: 1
            Advertised window: Current: 6 KB, Maximum: 6 KB, Scale: 3
            Peer receive window: Current: 250 KB, Maximum: 250 KB, Scale: 2
            Congestion window: Current: 8 KB

          Target node: iqn.com.domainname.172.22.93.143.08-03.gw.22000020374b5247
          Statistics:
            PDU: Command: 0, Response: 0
            Bytes: TX: 0, RX: 0
            Number of connection: 1
          TCP parameters
            Connection Local 10.1.3.3:3260, Remote 10.1.3.107:34112
            Path MTU 1500 bytes
            Current retransmission timeout is 300 ms
            Round trip time: Smoothed 2 ms, Variance: 1
            Advertised window: Current: 6 KB, Maximum: 6 KB, Scale: 3
            Peer receive window: Current: 250 KB, Maximum: 250 KB, Scale: 2
            Congestion window: Current: 8 KB
...
```

The following example displays the iSCSI initiator information

```
switch# show iscsi initiator
iSCSI Node name is iqn.1987-05.com.cisco.01.15cee6e7925087abc82ed9637
    iSCSI alias name: iscsi7-lnx
    Node WWN is 23:10:00:05:30:00:7e:a0 (dynamic)
    Member of vsans: 1
    Number of Virtual n_ports: 1
    Virtual Port WWN is 23:12:00:05:30:00:7e:a0 (dynamic)
      Interface iSCSI 8/3, Portal group tag: 0x382
        VSAN ID 1, FCID 0xdc0100

iSCSI Node name is iqn.1987-05.com.cisco:02.91b0ee2e8aa1.iscsi16-w2k
    iSCSI alias name: ISCSI16-W2K
    Node WWN is 23:1f:00:05:30:00:7e:a0 (dynamic)
    Member of vsans: 1
    Number of Virtual n_ports: 1
    Virtual Port WWN is 23:28:00:05:30:00:7e:a0 (dynamic)
      Interface iSCSI 8/3, Portal group tag: 0x382
        VSAN ID 1, FCID 0xdc0101

iSCSI Node name is iqn.1987-05.com.cisco.01.b6ca466f8b4d8e848ab17e92f
    iSCSI alias name: iscsi6-lnx
    Node WWN is 23:29:00:05:30:00:7e:a0 (dynamic)
    Member of vsans: 1, 2, 3, 4
    Number of Virtual n_ports: 1
...
```

show iscsi session

You can check the iSCSI port information by using the **show iscsi port** command.

show iscsi session [detail | incoming | initiator |outgoing | target *word***]**

Syntax Description

iscsi session	Shows the information for all iSCSI ports.
detail	Shows detailed iSCSI session information.
incoming	Shows incoming iscsi sessions
initiator	Shows specific iscsi initiator's session information
outgoing	Shows outgoing iscsi sessions
target	Shows specific iscsi target's session information
word	Specify an existing target name from 1 to 80 characters.

Defaults

None.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

All the parameters are optional in the **show iscsi session** commands. If no parameter is provided the command lists all the active iSCSI initiator or target sessions. If the IP address or i SCSI node name is provided, then the command lists details of all sessions from that initiator or to that target.

Examples

The following command displays the iSCSI Session.

```
switch# show iscsi session
Initiator iqn.1987-05.com.cisco.01.15cee6e7925087abc82ed96377653c8
  Session #1
    Target iqn.com.domainname.172.22.93.143.08-03.gw.22000020374b5247
    VSAN 1, ISID 000000000000, Status active, no reservation

  Session #2
    Target iqn.com.domainname.172.22.93.143.08-03.gw.220000203738e77d
    VSAN 1, ISID 000000000000, Status active, no reservation

Initiator iqn.1987-05.com.cisco:02.91b0ee2e8aa1.iscsi16-w2k
  Session #1
    Discovery session, ISID 00023d00022f, Status active

  Session #2
    Target iqn.com.domainname.172.22.93.143.08-03.gw.2200002037388bc2
    VSAN 1, ISID 00023d000230, Status active, no reservation
...
```

The following command displays the Specified iSCSI Target.

```
switch# show iscsi session target
iqn.com.domainname.172.22.93.143.08-03.gw.220000203738e77d
Initiator iqn.1987-05.com.cisco.01.15cee6e7925087abc82ed96377653c8
  Session #1
    Target iqn.com.domainname.172.22.93.143.08-03.gw.220000203738e77d
    VSAN 1, ISID 000000000000, Status active, no reservation
```

Note On the IPS module, you can verify what iSCSI initiator IQN has been assigned which pWWN when it logs in by using the **show zone active vsan** *vsan-no* command.

```
switch# zone name iscsi_16_A vsan 16
* fcid 0x7700d4 [pwwn 21:00:00:20:37:c5:2d:6d]
* fcid 0x7700d5 [pwwn 21:00:00:20:37:c5:2e:2e]
* fcid 0x770100 [symbolic-nodename
iqn.1987-05.com.cisco.02.BC3FEEFC431B199F81F33E97E2809C14.NUYEAR]
```

The following command displays the Specified iSCSI Initiator.

```
switch# show iscsi session initiator iqn.1987-05.com.cisco:02.91b0ee2e8aa1.iscsi16-w2k
Initiator iqn.1987-05.com.cisco:02.91b0ee2e8aa1.iscsi16-w2k
  Session #1
    Discovery session, ISID 00023d00022f, Status active

  Session #2
    Target iqn.com.domainname.172.22.93.143.08-03.gw.2200002037388bc2
    VSAN 1, ISID 00023d000230, Status active, no reservation

  Session #3
    Target iqn.com.domainname.172.22.93.143.08-03.gw.210000203739ad7f
    VSAN 1, ISID 00023d000235, Status active, no reservation

  Session #4
    Target iqn.com.domainname.172.22.93.143.08-03.gw.210000203739aa3a
    VSAN 1, ISID 00023d000236, Status active, no reservation

  Session #5
    Target iqn.com.domainname.172.22.93.143.08-03.gw.210000203739ada7
    VSAN 1, ISID 00023d000237, Status active, no reservation

  Session #6
    Target iqn.com.domainname.172.22.93.143.08-03.gw.2200002037381ccb
    VSAN 1, ISID 00023d000370, Status active, no reservation

  Session #7
    Target iqn.com.domainname.172.22.93.143.08-03.gw.2200002037388b54
    VSAN 1, ISID 00023d000371, Status active, no reservation

  Session #8
    Target iqn.com.domainname.172.22.93.143.08-03.gw.220000203738a194
    VSAN 1, ISID 00023d000372, Status active, no reservation

  Session #9
    Target iqn.com.domainname.172.22.93.143.08-03.gw.2200002037360053
    VSAN 1, ISID 00023d000373, Status active, no reservation
```

show iscsi stats

You can check the iSCSI port information by using the **show iscsi port** command.

show iscsi stats [clear session| detail | iscsi]

Syntax Description

iscsi stats	Shows iSCSI statistics.
clear session	Clears iSCSI statistics for a session.
detail	Shows detailed iSCSI statistics.
iscsi	Shows statistics for the specified iSCSI interface.

Defaults

None.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

None.

Examples

The following command displays brief iSCSI statistics.

```
switch# show iscsi stats
iscsi8/1
    5 minutes input rate 23334800 bits/sec, 2916850 bytes/sec, 2841 frames/sec
    5 minutes output rate 45318424 bits/sec, 5664803 bytes/sec, 4170 frames/sec
    iSCSI statistics
      86382665 packets input, 2689441036 bytes
        3916933 Command pdus, 82463404 Data-out pdus, 2837976576 Data-out bytes,
 0 fragments
      131109319 packets output, 2091677936 bytes
        3916876 Response pdus (with sense 0), 1289224 R2T pdus
        125900891 Data-in pdus, 93381152 Data-in bytes

iscsi8/2
    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
    iSCSI statistics
      0 packets input, 0 bytes
        0 Command pdus, 0 Data-out pdus, 0 Data-out bytes, 0 fragments
      0 packets output, 0 bytes
        0 Response pdus (with sense 0), 0 R2T pdus
        0 Data-in pdus, 0 Data-in bytes
```

```
iscsi8/3
    5 minutes input rate 272 bits/sec, 34 bytes/sec, 0 frames/sec
    5 minutes output rate 40 bits/sec, 5 bytes/sec, 0 frames/sec
    iSCSI statistics
      30 packets input, 10228 bytes
        0 Command pdus, 0 Data-out pdus, 0 Data-out bytes, 0 fragments
      30 packets output, 1744 bytes
        0 Response pdus (with sense 0), 0 R2T pdus
        0 Data-in pdus, 0 Data-in bytes

iscsi8/4
    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
    iSCSI statistics
      0 packets input, 0 bytes
        0 Command pdus, 0 Data-out pdus, 0 Data-out bytes, 0 fragments
      0 packets output, 0 bytes
        0 Response pdus (with sense 0), 0 R2T pdus
        0 Data-in pdus, 0 Data-in bytes

iscsi8/5
    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
    iSCSI statistics
      0 packets input, 0 bytes
        0 Command pdus, 0 Data-out pdus, 0 Data-out bytes, 0 fragments
      0 packets output, 0 bytes
        0 Response pdus (with sense 0), 0 R2T pdus
        0 Data-in pdus, 0 Data-in bytes

iscsi8/6
    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
    iSCSI statistics
      0 packets input, 0 bytes
        0 Command pdus, 0 Data-out pdus, 0 Data-out bytes, 0 fragments
      0 packets output, 0 bytes
        0 Response pdus (with sense 0), 0 R2T pdus
        0 Data-in pdus, 0 Data-in bytes

iscsi8/7
    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
    iSCSI statistics
      0 packets input, 0 bytes
        0 Command pdus, 0 Data-out pdus, 0 Data-out bytes, 0 fragments
      0 packets output, 0 bytes
        0 Response pdus (with sense 0), 0 R2T pdus
        0 Data-in pdus, 0 Data-in bytes

iscsi8/8
    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
    iSCSI statistics
      0 packets input, 0 bytes
        0 Command pdus, 0 Data-out pdus, 0 Data-out bytes, 0 fragments
      0 packets output, 0 bytes
        0 Response pdus (with sense 0), 0 R2T pdus
        0 Data-in pdus, 0 Data-in bytes
```

The following command displays detailed iSCSI statistics.

```
switch# show iscsi stats detail
iscsi8/1
    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
    iSCSI statistics
      0 packets input, 0 bytes
        0 Command pdus, 0 Data-out pdus, 0 Data-out bytes, 0 fragments
      0 packets output, 0 bytes
        0 Response pdus (with sense 0), 0 R2T pdus
        0 Data-in pdus, 0 Data-in bytes
  iSCSI Forward:
    Command: 0 PDUs (Received: 0)
    Data-Out (Write): 0 PDUs (Received 0), 0 fragments, 0 bytes
  FCP Forward:
    Xfer_rdy: 0 (Received: 0)
    Data-In: 0 (Received: 0), 0 bytes
    Response: 0 (Received: 0), with sense 0
    TMF Resp: 0

  iSCSI Stats:
    Login: attempt: 0, succeed: 0, fail: 0, authen fail: 0
    Rcvd: NOP-Out: 0, Sent: NOP-In: 0
          NOP-In: 0, Sent: NOP-Out: 0
          TMF-REQ: 0, Sent: TMF-RESP: 0
          Text-REQ: 0, Sent: Text-RESP: 0
          SNACK: 0
          Unrecognized Opcode: 0, Bad header digest: 0
          Command in window but not next: 0, exceed wait queue limit: 0
          Received PDU in wrong phase: 0
  FCP Stats:
    Total: Sent: 0
           Received: 0 (Error: 0, Unknown: 0)
    Sent: PLOGI: 0, Rcvd: PLOGI_ACC: 0, PLOGI_RJT: 0
          PRLI: 0, Rcvd: PRLI_ACC: 0, PRLI_RJT: 0, Error resp: 0
          LOGO: 0, Rcvd: LOGO_ACC: 0, LOGO_RJT: 0
          ABTS: 0, Rcvd: ABTS_ACC: 0
          TMF REQ: 0
          Self orig command: 0, Rcvd: data: 0, resp: 0
    Rcvd: PLOGI: 0, Sent: PLOGI_ACC: 0
          LOGO: 0, Sent: LOGO_ACC: 0
          PRLI: 0, Sent: PRLI_ACC: 0
          ABTS: 0

  iSCSI Drop:
    Command: Target down 0, Task in progress 0, LUN map fail 0
             CmdSeqNo not in window 0, No Exchange ID 0, Reject 0
             Persistent Resv 0    Data-Out: 0, TMF-Req: 0
  FCP Drop:
    Xfer_rdy: 0, Data-In: 0, Response: 0

  Buffer Stats:
    Buffer less than header size: 0, Partial: 0, Split: 0
    Pullup give new buf: 0, Out of contiguous buf: 0, Unaligned m_data: 0
```

```
iscsi8/2
    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
    iSCSI statistics
      0 packets input, 0 bytes
        0 Command pdus, 0 Data-out pdus, 0 Data-out bytes, 0 fragments
      0 packets output, 0 bytes
        0 Response pdus (with sense 0), 0 R2T pdus
        0 Data-in pdus, 0 Data-in bytes
  iSCSI Forward:
    Command: 0 PDUs (Received: 0)
    Data-Out (Write): 0 PDUs (Received 0), 0 fragments, 0 bytes
  FCP Forward:
    Xfer_rdy: 0 (Received: 0)
    Data-In: 0 (Received: 0), 0 bytes
    Response: 0 (Received: 0), with sense 0
...
```

The following command displays detailed statistics for the specified iSCSI interface.

```
switch# show iscsi stats iscsi 8/1
iscsi8/1
    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
    iSCSI statistics
      0 packets input, 0 bytes
        0 Command pdus, 0 Data-out pdus, 0 Data-out bytes, 0 fragments
      0 packets output, 0 bytes
        0 Response pdus (with sense 0), 0 R2T pdus
        0 Data-in pdus, 0 Data-in bytes
```

show iscsi virtual-target

The **show iscsi virtual-target** command shows all the iSCSI nodes that are local to the switch.

show iscsi virtual-target [*name*]

Syntax Description

iscsi virtual-target	Show the information for all iSCSI ports.
name	Show iSCSI information for the specified virtual-target.

Defaults

None.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

If no parameter is provided the command lists all the active iSCSI virtual-targets. If the iSCSI node name is provided then the command lists the details of that iSCSI virtual-target.

Examples

The following example displays the local iSCSI node.

```
switch# show iscsi virtual-target
target: abc1
    Port WWN 21:00:00:20:37:a6:b0:bf
    Configured node
target: iqn.com.domainname.172.22.93.143.08-03.gw.22000020374b5247
    Port WWN 22:00:00:20:37:4b:52:47 , VSAN 1
    Auto-created node
...
target: iqn.com.domainname.172.22.93.143.08-03.gw.210000203739aa39
    Port WWN 21:00:00:20:37:39:aa:39 , VSAN 1
    Auto-created node
```

The following example displays a specified local iSCSI node

```
switch# show iscsi virtual-target
iqn.com.domainname.172.22.93.143.08-03.gw.210000203739a95b
target: iqn.com.domainname.172.22.93.143.08-03.gw.210000203739a95b
    Port WWN 21:00:00:20:37:39:a9:5b , VSAN 1
    Auto-created node
```

The following example displays the trespass status for a virtual target.

```
switch# show iscsi virtual-target iqn.abc
target: abc
    Port WWN 00:00:00:00:00:00:00:00
    Configured node
    all initiator permit is disabled
    trespass support is  enabled S
```

show isns profile

The **show isns profile** command shows all configured iSNS profiles and displays the configured interfaces that a tagged to a particular profile.

show isns profile [*profile-name*] **[counters]**

Syntax Description

isns profile	Displays information for all iSNS profiles.
profile-name	Displays information for the specified iSNS profile.
counters	Displays iSNS PDU statistics for tagged interfaces for a specified iSNS profile or for all iSNS profiles

Defaults

None.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

If a specified profile is not provided the command lists all the configured iSNS profiles.

Specify the counters option to list the iSNS PDU statistics for interfaces that are tagged to the profile.

Examples

The following example displays a specified iSNS profile

```
switch# show isns profile ABC

iSNS profile name ABC
tagged interface GigabitEthernet2/3
iSNS Server 10.10.100.204
```

The following example displays all iSNS profiles

```
switch# show isns profile

iSNS profile name ABC
tagged interface GigabitEthernet2/3
iSNS Server 10.10.100.204

iSNS profile name NBV
tagged interface GigabitEthernet2/5
iSNS Server 10.10.100.201
```

The following example displays iSNS PDU statistics for a specified iSNS profile

```
switch# show isns profile ABC counters

iSNS profile name ABC
tagged interface GigabitEthernet2/3
iSNS statistics
```

```
  Input 54 pdus (registration/deregistration pdus only)
    Reg pdus 37,  Dereg pdus 17
  Output 54 pdus (registration/deregistration pdus only)
    Reg pdus  37,  Dereg pdus 17
iSNS Server  10.10.100.204
```

The following example displays iSNS PDU statistics for all iSNS profiles

```
switch# show isns profile counters

iSNS profile name ABC
tagged interface GigabitEthernet2/3
iSNS statistics
  Input 54 pdus (registration/deregistration pdus only)
    Reg pdus 37,  Dereg pdus 17
  Output 54 pdus (registration/deregistration pdus only)
    Reg pdus  37,  Dereg pdus 17
iSNS Server  10.10.100.204


iSNS profile name NBV
tagged interface GigabitEthernet2/5
iSNS statistics
  Input 54 pdus (registration/deregistration pdus only)
    Reg pdus 37,  Dereg pdus 17
  Output 54 pdus (registration/deregistration pdus only)
    Reg pdus  37,  Dereg pdus 17
iSNS Server  10.10.100.201
```

show ivr

The **show ivr** command displays various inter-VSAN routing (IVR) configurations.

show ivr [enabled-switches (vsan *vsan-id* **) | status | vsan-topology (active | configured) | zone (active | name** *name*) **| zoneset (active | brief | name** *name* **| status)]**

Syntax Description

enabled-switches	Displays IVR enabled switches
vsan *vsan-id*	Specifies the VSAN ID from 1 to 4093.
status	Displays the status of the configured IVR feature.
vsan-topology	Displays the IVR VSAN topology
active	Displays the active IVR facilities.
configured	Displays the configured IVR facilities
zone	Displays the Inter-VSA Zone (IVZ) configurations.
name *name*	Specifies the name as configured in the database.
zoneset	Displays the Inter-VSA ZoneSet (IVZS) configurations.
brief	Displays configured information in brief format.

Defaults

None.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example displays debug information for the IVR configuration.

```
switch# show debug ivr
Inter-VSAN Routing:
 FC Receive Packets debugging is on
 FC Transmit Packets debugging is on
 FC Receive Packet header/payload debugging is on
 FC Transmit Packet header/payload debugging is on
 MTS Receive Packets debugging is on
 MTS Transmit Packets debugging is on
 MTS Receive Packet header/payload debugging is on
 MTS Transmit Packet header/payload debugging is on
 High Availability debugging is on
 State Machine debugging is on
 Error debugging is on
 Trace debugging is on
 Trace Detail debugging is on
 Demux debugging is on
```

```
 Dequeue debugging is on
 VSAN Topology debugging is on
 TLV debugging is on
 IVR CAPABILITY FSM debugging is on
 IVR VDRI FSM debugging is on
```

The following example displays the IVR-enabled switches in the fabric

```
switch# show ivr enabled-switches
AFID    VSAN    DOMAIN      CAPABILITY  SWITCH WWN
--------------------------------------------------------------------
   1      1     0x61( 97)    00000001    20:00:00:05:30:01:1b:c2 *
   1      2     0x62( 98)    00000001    20:00:00:05:30:01:1b:c2 *
```

The following example displays IVR-enabled switches for a specified VSAN

```
switch# show ivr enabled-switches vsan 2
AFID    VSAN    DOMAIN      CAPABILITY  SWITCH WWN
--------------------------------------------------------------------
   1      2     0x62( 98)    00000001    20:00:00:05:30:01:1b:c2 *

Total:   1 ivr-enabled VSAN-Domain pair>
```

The following example displays the status of the IVR feature

```
switch# show ivr status
Inter-VSAN Routing is enabled
```

The following example displays the configured IVR VSAN topology

```
switch# show ivr vsan-topology
AFID  SWITCH WWN                 Active   Cfg. VSANS
-------------------------------------------------------------
   1  20:00:00:05:30:00:3c:5e     yes     yes  3,2000
   1  20:00:00:05:30:00:58:de     yes     yes  2,2000
   1  20:00:00:05:30:01:1b:c2 *   yes     yes  1-2
   1  20:02:00:44:22:00:4a:05     yes     yes  1-2,6
   1  20:02:00:44:22:00:4a:07     yes     yes  2-5

Total:   5 entries in active and configured IVR VSAN-Topology

Current Status: Inter-VSAN topology is ACTIVE
Last activation time: Sat Mar 22 21:46:15 1980
```

The following example displays the active IVR VSAN topology

```
switch# show ivr vsan-topology active
AFID  SWITCH WWN                 Active   Cfg. VSANS
-------------------------------------------------------------
   1  20:00:00:05:30:00:3c:5e     yes     yes  3,2000
   1  20:00:00:05:30:00:58:de     yes     yes  2,2000
   1  20:00:00:05:30:01:1b:c2 *   yes     yes  1-2
   1  20:02:00:44:22:00:4a:05     yes     yes  1-2,6
   1  20:02:00:44:22:00:4a:07     yes     yes  2-5

Total:   5 entries in active IVR VSAN-Topology

Current Status: Inter-VSAN topology is ACTIVE
Last activation time: Sat Mar 22 21:46:15
```

The following example displays the configured IVR VSAN topology

```
switch# show ivr vsan-topology configured
AFID  SWITCH WWN                 Active   Cfg. VSANS
-------------------------------------------------------------
```

```
   1  20:00:00:05:30:00:3c:5e     yes     yes  3,2000
   1  20:00:00:05:30:00:58:de     yes     yes  2,2000
   1  20:00:00:05:30:01:1b:c2 *   yes     yes  1-2
   1  20:02:00:44:22:00:4a:05     yes     yes  1-2,6
   1  20:02:00:44:22:00:4a:07     yes     yes  2-5

Total:   5 entries in configured IVR VSAN-Topology
```

The following example displays the IVZ configuration

```
switch# show ivr zone
zone name Ivz_vsan2-3
    pwwn 21:00:00:e0:8b:02:ca:4a vsan 3
    pwwn 21:00:00:20:37:c8:5c:6b vsan 2

zone name ivr_qa_z_all
    pwwn 21:00:00:e0:8b:06:d9:1d vsan 1
    pwwn 21:01:00:e0:8b:2e:80:93 vsan 4
    pwwn 10:00:00:00:c9:2d:5a:dd vsan 1
    pwwn 10:00:00:00:c9:2d:5a:de vsan 2
    pwwn 21:00:00:20:37:5b:ce:af vsan 6
    pwwn 21:00:00:20:37:39:6b:dd vsan 6
    pwwn 22:00:00:20:37:39:6b:dd vsan 3
    pwwn 22:00:00:20:37:5b:ce:af vsan 3
    pwwn 50:06:04:82:bc:01:c3:84 vsan 5
```

The following example displays the active IVZS configuration

```
switch# show ivr zoneset active
zoneset name IVR_ZoneSet1
  zone name Ivz_vsan2-3
    pwwn 21:00:00:e0:8b:02:ca:4a vsan 3
    pwwn 21:00:00:20:37:c8:5c:6b vsan 2
```

The following example displays information for a specified IVZ

```
switch# show ivr zone name Ivz_vsan2-3
zone name Ivz_vsan2-3
    pwwn 21:00:00:e0:8b:02:ca:4a vsan 3
    pwwn 21:00:00:20:37:c8:5c:6b vsan 2
```

The following example displays the specified zone in the active IVZS

```
switch# show ivr zone name Ivz_vsan2-3 active
zone name Ivz_vsan2-3
    pwwn 21:00:00:e0:8b:02:ca:4a vsan 3
    pwwn 21:00:00:20:37:c8:5c:6b vsan 2
```

The following example displays the IVZS configuration

```
switch# show ivr zoneset
zoneset name ivr_qa_zs_all
  zone name ivr_qa_z_all
    pwwn 21:00:00:e0:8b:06:d9:1d vsan 1
    pwwn 21:01:00:e0:8b:2e:80:93 vsan 4
    pwwn 10:00:00:00:c9:2d:5a:dd vsan 1
    pwwn 10:00:00:00:c9:2d:5a:de vsan 2
    pwwn 21:00:00:20:37:5b:ce:af vsan 6
    pwwn 21:00:00:20:37:39:6b:dd vsan 6
    pwwn 22:00:00:20:37:39:6b:dd vsan 3
    pwwn 22:00:00:20:37:5b:ce:af vsan 3
    pwwn 50:06:04:82:bc:01:c3:84 vsan 5

zoneset name IVR_ZoneSet1
  zone name Ivz_vsan2-3
```

```
    pwwn 21:00:00:e0:8b:02:ca:4a vsan 3
    pwwn 21:00:00:20:37:c8:5c:6b vsan 2
```

The following example displays brief information for a IVR VSAN topology

```
switch# show ivr vsan-topology configured
AFID  SWITCH WWN                 Active   Cfg. VSANS
--------------------------------------------------------------
   1  20:00:00:05:30:00:3c:5e     yes     yes  3,2000
   1  20:00:00:05:30:00:58:de     yes     yes  2,2000
   1  20:00:00:05:30:01:1b:c2 *   yes     yes  1-2
   1  20:02:00:44:22:00:4a:05     yes     yes  1-2,6
   1  20:02:00:44:22:00:4a:07     yes     yes  2-5

Total:   5 entries in configured IVR VSAN-Topology
```

The following example displays brief information for the active IVZS

```
switch# show ivr zoneset brief Active
zoneset name IVR_ZoneSet1
  zone name Ivz_vsan2-3
```

The following example displays the status information for the IVZ

```
switch# show ivr zoneset brief status
Zoneset Status

_____________
    name               : IVR_ZoneSet1
    state              : activation success
    last activate time : Sat Mar 22 21:38:46 1980
    force option       : off

status per vsan:

__________________
     vsan     status
     ____     ______
     2        active
```

The following example displays the specified zoneset

```
switch# show ivr zoneset name IVR_ZoneSet1
zoneset name IVR_ZoneSet1
  zone name Ivz_vsan2-3
    pwwn 21:00:00:e0:8b:02:ca:4a vsan 3
    pwwn 21:00:00:20:37:c8:5c:6b vsan 2
```

show kernel core

To display kernel core configurations, use the **show kernel core** command.

show kernel core detailed

Syntax Description

show install impact	Upgrades the BIOS for a supervisor or switching module.
bootflash:	Source or destination location for internal bootflash memory
slot0:	Source or destination location for the CompactFlash memory or PCMCIA card.
volatile:	Source or destination location for the volatile directory.
image-filename	The name of the system or kickstart image.
detailed	Compares the image to the current running system image instead of the system.bin image

Defaults

None.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

None.

Examples

The following examples display kernel core settings.

```
switch# show kernel core limit
2

switch# show kernel core target
10.50.5.5

switch# show kernel core module 5
module 5 core is enabled
         level is header
         dst_ip is 10.50.5.5
         src_port is 6671
         dst_port is 6666
         dump_dev_name is eth1
         dst_mac_addr is 00:00:0C:07:AC:01
```

show license

To display kernel core configurations, use the **show kernel core** command.

show license file *filename* **[brief | host-id | usage]**

Syntax Description

show license	Displays license-related information.
file *filename*	Specifies the name of the license file.
brief	Displays a list of license files installed on a switch.
host-id	Displays host ID used to request node-locked license.
usage	Displays information about the current license usage.

Defaults

None.

Command Modes

EXEC

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(2).

Usage Guidelines

None.

Examples

The following example displays a specific license installed on a switch.

```
switch# show license file fcports.lic
fcports.lic:
SERVER this_host ANY
VENDOR cisco
FEATURE fcports cisco 1.000 permanent 30 HOSTID=VDH=4C0AF664 \
        SIGN=24B2B68AA676 <---------------------- fcport license
```

The following example displays a list of license files installed on a switch.

```
switch# show license brief
fcports.lic
ficon.lic
```

The following example displays all licenses installed on a switch.

```
switch# show license
fcports.lic:
SERVER this_host ANY
VENDOR cisco
FEATURE fcports cisco 1.000 permanent 30 HOSTID=VDH=4C0AF664 \
        SIGN=24B2B68AA676 <----------fcport license
ficon.lic:
FEATURE ficon cisco 1.000 permanent uncounted HOSTID=VDH=4C0AF664 \
        SIGN=CB7872B23700 <----------ficon license
```

The following example displays the host IDs, required to request node locked license.

```
switch# show license host-id
License hostid:VDH=4C0AF664
```

show line

To configure a virtual terminal line, use the **show line** command.

show line com1 | console

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

None.

Examples

The following example displays configured console settings.

```
switch## show line console
line Console:
    Speed:        38400 bauds
    Databits:     8 bits per byte
    Stopbits:     1 bit(s)
    Parity:       none
```

The following example displays configured or default COM1 settings.

```
switch# show line com1
line Aux:
    Speed:        9600 bauds
    Databits:     8 bits per byte
    Stopbits:     1 bit(s)
    Parity:       none
    Modem In: Enable
    Modem Init-String -
        default : ATE0Q1&D2&C1S0=1\015
    Statistics:  tx:17     rx:0     Register Bits:RTS|CTS|DTR|DSR|CD|RI
```

Related Commands

Command	Description
line console	Configure primary terminal line.
line aux	Configures the auxiliary COM 1 port
clear line	Deleted configured line sessions.

show logging

Use the **show logging** command to display the current system message logging configuration.

show logging [console | level [auth | authpriv | callhome | cron | daemon | ftp | kernel | local*n* **|lpr | mail | news | security | syslog | user | uucp | vsan] | info | last** *lines* **| logfile | module | monitor | nvram | server** *servername* **]**

Syntax Description

console	Shows console logging configuration.
info	Shows logging configuration.
last	Shows last few lines of logfile.
level	Shows last few lines of logfile.
logfile	Shows contents of logfile.
module	Shows module logging configuration.
monitor	Shows monitor logging configuration.
nvram	Shows NVRAM log.
server *servername*	Shows server logging configuration.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays current system message logging.

```
switch# show logging

Logging console:                enabled (Severity: notifications)
Logging monitor:                enabled (Severity: information)
Logging linecard:               enabled (Severity: debugging)
Logging server:                 enabled
{172.22.0.0}
        server severity:        debugging
        server facility:        local7
{172.22.0.0}
        server severity:        debugging
        server facility:        local7
Logging logfile:                enabled
        Name - external/sampleLogFile: Severity - notifications Size - 3000000
```

```
syslog_get_levels :: Error(-1) querying severity values for fcmpls at SAP 30
syslog_get_levels :: Error(-1) querying severity values for fcfwd at SAP 38
Facility        Default Severity        Current Session Severity
--------        ----------------        ------------------------
kern                    6                       4
user                    3                       3
mail                    3                       3
daemon                  7                       7
auth                    0                       0
syslog                  3                       3
lpr                     3                       3
news                    3                       3
uucp                    3                       3
cron                    3                       3
authpriv                3                       3
ftp                     3                       3
local0                  3                       3
local1                  3                       3
local2                  3                       3
local3                  3                       3
local4                  3                       3
local5                  3                       3
local6                  3                       3
local7                  3                       3
fspf                    3                       3
fcdomain                2                       2
module                  5                       5
zone                    2                       2
vni                     2                       2
ipconf                  2                       2
ipfc                    2                       2
xbar                    3                       3
fcns                    2                       2
fcs                     2                       2
acl                     2                       2
tlport                  2                       2
port                    5                       5
port_channel            5                       5
fcmpls                  0                       0
wwn                     3                       3
fcc                     2                       2
qos                     3                       3
vrrp_cfg                2                       2
fcfwd                   0                       0
ntp                     2                       2
platform                5                       5
vrrp_eng                2                       2
callhome                2                       2
mcast                   2                       2
rscn                    2                       2
securityd               2                       2
vhbad                   2                       2
rib                     2                       2
vshd                    5                       5

0(emergencies)          1(alerts)       2(critical)
3(errors)               4(warnings)     5(notifications)
6(information)          7(debugging)

Nov  8 16:48:04 excal-113 %LOG_VSHD-5-VSHD_SYSLOG_CONFIG_I: Configuring console
from pts/1 (171.71.58.56)
Nov  8 17:44:09 excal-113 %LOG_VSHD-5-VSHD_SYSLOG_CONFIG_I: Configuring console
from pts/0 (171.71.58.72)
```

The following example displays console logging status.

```
switch# show logging console
Logging console:                enabled (Severity: notifications)
```

The following example displays logging facility status.

```
switch# show logging facility
syslog_get_levels :: Error(-1) querying severity values for fcmpls at SAP 30
syslog_get_levels :: Error(-1) querying severity values for fcfwd at SAP 38
Facility        Default Severity        Current Session Severity
--------        ----------------        ------------------------
kern                    6                       4
user                    3                       3
mail                    3                       3
daemon                  7                       7
auth                    0                       0
syslog                  3                       3
lpr                     3                       3
news                    3                       3
uucp                    3                       3
cron                    3                       3
authpriv                3                       3
ftp                     3                       3
local0                  3                       3
local1                  3                       3
local2                  3                       3
local3                  3                       3
local4                  3                       3
local5                  3                       3
local6                  3                       3
local7                  3                       3
fspf                    3                       3
fcdomain                2                       2
module                  5                       5
zone                    2                       2
vni                     2                       2
ipconf                  2                       2
ipfc                    2                       2
xbar                    3                       3
fcns                    2                       2
fcs                     2                       2
acl                     2                       2
tlport                  2                       2
port                    5                       5
port_channel            5                       5
fcmpls                  0                       0
wwn                     3                       3
fcc                     2                       2
qos                     3                       3
vrrp_cfg                2                       2
fcfwd                   0                       0
ntp                     2                       2
platform                5                       5
vrrp_eng                2                       2
callhome                2                       2
mcast                   2                       2
rscn                    2                       2
securityd               2                       2
vhbad                   2                       2
rib                     2                       2
vshd                    5                       5
```

```
0(emergencies)          1(alerts)       2(critical)
3(errors)               4(warnings)     5(notifications)
6(information)          7(debugging)
```

The following example displays logging information.

```
switch# show logging info

Logging console:                enabled (Severity: notifications)
Logging monitor:                enabled (Severity: information)
Logging linecard:               enabled (Severity: debugging)
Logging server:                 enabled
{172.22.95.167}
        server severity:        debugging
        server facility:        local7
{172.22.92.58}
        server severity:        debugging
        server facility:        local7
Logging logfile:                enabled
        Name - external/sampleLogFile: Severity - notifications Size - 3000000

syslog_get_levels :: Error(-1) querying severity values for fcmpls at SAP 30
syslog_get_levels :: Error(-1) querying severity values for fcfwd at SAP 38
Facility        Default Severity        Current Session Severity
--------        ----------------        ------------------------
kern                    6                       4
user                    3                       3
mail                    3                       3
daemon                  7                       7
auth                    0                       0
syslog                  3                       3
lpr                     3                       3
news                    3                       3
uucp                    3                       3
cron                    3                       3
authpriv                3                       3
ftp                     3                       3
local0                  3                       3
local1                  3                       3
local2                  3                       3
local3                  3                       3
local4                  3                       3
local5                  3                       3
local6                  3                       3
local7                  3                       3
fspf                    3                       3
fcdomain                2                       2
module                  5                       5
zone                    2                       2
vni                     2                       2
ipconf                  2                       2
ipfc                    2                       2
xbar                    3                       3
fcns                    2                       2
fcs                     2                       2
acl                     2                       2
tlport                  2                       2
port                    5                       5
port_channel            5                       5
fcmpls                  0                       0
wwn                     3                       3
fcc                     2                       2
qos                     3                       3
vrrp_cfg                2                       2
```

```
fcfwd                   0                       0
ntp                     2                       2
platform                5                       5
vrrp_eng                2                       2
callhome                2                       2
mcast                   2                       2
rscn                    2                       2
securityd               2                       2
vhbad                   2                       2
rib                     2                       2
vshd                    5                       5

0(emergencies)          1(alerts)       2(critical)
3(errors)               4(warnings)     5(notifications)
6(information)          7(debugging)
```

The following example displays last few lines of a log file.

```
switch# show logging last 2
Nov  8 16:48:04 excal-113 %LOG_VSHD-5-VSHD_SYSLOG_CONFIG_I: Configuring console
from pts/1 (171.71.58.56)
Nov  8 17:44:09 excal-113 %LOG_VSHD-5-VSHD_SYSLOG_CONFIG_I: Configuring console
from pts/0 (171.71.58.72)
```

The following example displays switching module logging status.

```
switch# show logging module
Logging linecard:               enabled (Severity: debugging)
```

The following example displays monitor logging status.

```
switch# show logging monitor
Logging monitor:                enabled (Severity: information)
```

The following example displays server information.

```
switch# show logging server
Logging server:                 enabled
{172.22.95.167}
        server severity:        debugging
        server facility:        local7
{172.22.92.58}
        server severity:        debugging
        server facility:        local7
```

show module

To verify the status of a module, use the **show module** command.

show module [diag | *slot***]**

Syntax Description

diag	Shows module-related information.
slot	Slot number for the required module (1 - 9 for the MDS 9500 Series switch and 1 - 2 for the MDS 9200 Series switch.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

If your chassis has more than one switching module, you will see the progress check if you issue the show module command several times and view the status column each time.

The switching module goes through a testing and an initializing stage before displaying an `ok` status.

The following table describes the possible states in which a module can exist.

show module Output	Description
`powered up`	The hardware has electrical power. When the hardware is powered up, the software begins booting.
`testing`	The module has established connection with the supervisor and the switching module is performing bootup diagnostics.
`initializing`	The diagnostics have passed and the configuration is being downloaded.
`failure`	The switch detects a switching module failure on initialization and automatically attempts to power-cycle the module three (3) times. After the third attempt it continues to display a failed state.
`ok`	The switch is ready to be configured.
`power-denied`	The switch detects insufficient power for a switching module to power up. In this case, issue a **show environment power** command to determine power consumption issues.
`active`	This module is the active supervisor module and the switch is ready to be configured.
`HA-standby`	This module is the standby supervisor module and that the HA switchover mechanism is enabled.
`standby`	This module is the standby supervisor module.

Examples

```
switch# show module
Mod  Ports  Module-Type                       Model              Status
---  -----  --------------------------------- ------------------ ------------
2    32     Advanced Services Module          DS-X9032-SMV       powered-dn
4    32     Advanced Services Module          DS-X9032-SMV       powered-dn
5    0      Supervisor/Fabric-1               DS-X9530-SF1-K9    active *
6    0      Supervisor/Fabric-1               DS-X9530-SF1-K9    ha-standby
8    32     1/2 Gbps FC Module                DS-X9032           ok

Mod  Sw           Hw      World-Wide-Name(s) (WWN)
---  -----------  ------  --------------------------------------------------
5    1.2(2)       0.610   --
6    1.2(2)       0.610   --
8    1.2(2)       0.3     21:c1:00:0b:46:79:f1:40 to 21:e0:00:0b:46:79:f1:40


Mod  MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
5    00-d0-97-38-b4-01 to 00-d0-97-38-b4-05  JAB06350B0H
6    00-d0-97-38-b3-f9 to 00-d0-97-38-b3-fd  JAB06350B1R
8    00-05-30-00-2b-e2 to 00-05-30-00-2b-e6  jab062407x4

* this terminal session

switch# show module diag

Diag status for module 2 (. = PASS, F = FAIL, N = N/A)
CPU           .
SPROM         .
ASICS         .

Diag status for module 4 (. = PASS, F = FAIL, N = N/A)
CPU           .
SPROM         .
ASICS         .
```

show ntp

To display the configured server and peer associations, use the **show ntp** command.

show ntp peers | statistics [io | local | memory | peer (ipaddr | name)] | timestamp-status

Syntax Description

peers	Shows all the peers.
statistics	Shows the NTP statistics
io	Shows the input-output statistics.
local	Shows the counters maintained by the local NTP.
memory	Shows the statistics counters related to memory code.
peer	Shows the per-peer statistics counter of a peer.
ipaddr	Shows the peer statistics for the specified IP address.
name	Shows the peer statistics for the specified peer name.
timestamp-status	Shows if the timestamp check is enabled.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following examples display the NTP information.

```
switch# show ntp peers
-----------------------------------------
  Peer IP Address               Serv/Peer
-----------------------------------------
  10.20.10.2                    Server
  10.20.10.0                    Peer

switch# show ntp statistics io
time since reset:     11152
receive buffers:      9
free receive buffers: 9
used receive buffers: 9
low water refills:    0
dropped packets:      0
ignored packets:      0
received packets:     3
packets sent:         2
packets not sent:     0
interrupts handled:   3
received by int:      3

switch# show ntp statistics local
system uptime:          11166
time since reset:       11166
bad stratum in packet:  0
old version packets:    4
new version packets:    0
unknown version number: 0
bad packet format:      0
packets processed:      0
bad authentication:     0

switch# show ntp statistics memory
time since reset:     11475
total peer memory:    15
free peer memory:     15
calls to findpeer:    0
new peer allocations: 0
peer demobilizations: 0
hash table counts:      0   0   0   0   0   0   0   0
                        0   0   0   0   0   0   0   0
                        0   0   0   0   0   0   0   0
                        0   0   0   0   0   0   0   0

switch# show ntp statistics peer ipaddr 10.1.1.1

switch# show ntp statistics peer name Peer1

switch# show ntp timestamp-status
Linecard 9 does not support Timestamp check.
```

show port-channel

Use the **show port-channel** command to view information about existing PortChannel configurations

show port-channel compatibility-parameters | consistency (detail) | database (interface port-channel *port channel number)* **| summary | usage**

Syntax Description

compatibility-parameters	Shows compatibility parameters.
consistency	Verify database consistency of all modules.
detail	Shows port channel database information for all modules.
database	Shows port-channel database.
interface port-channel *port channel number*	Port channel number (1-128)
summary	Shows port-channel summary.
usage	Shows port-channel number usage.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the PortChannel summary.

```
switch# show port-channel summary
NEW
```

The following example displays the PortChannel compatibility.

```
switch# show port-channel compatibility-parameters
    physical port layer                fibre channel or ethernet
    port mode                          E/TE/AUTO only
    trunk mode
    speed
    port VSAN
    port allowed VSAN list
```

The following example shows the PortChannel database.

```
switch# show port-channel database
port-channel 2
    Administrative channel mode is on
    Operational channel mode is on
    Last membership update succeeded
    First operational port is fc2/2
    1 port in total, 1 port up
    Ports:   fc2/2    [up]
```

The **show port-channel consistency** command has two options—without detail **and detail**.

Command Without Details

```
switch# show port-channel consistency
Database is consistent
switch#
```

Command With Details

```
switch# show port-channel consistency detail
Authoritative port-channel database:
============================================
totally 1 port-channels
port-channel 2:
    1 ports, first operational port is fc2/2
    fc2/2    [up]
============================================
database 1: from module 5
============================================
totally 1 port-channels

port-channel 2:
    1 ports, first operational port is fc2/2
    fc2/2    [up]
============================================
database 2: from module 2
============================================
totally 1 port-channels
port-channel 2:
    1 ports, first operational port is fc2/2
    fc2/2    [up]
============================================
```

The **show port-channel usage** command displays details of the used and unused PortChannel numbers.

PortChannel Usage

```
switch# show port-channel usage
Totally 2 port-channel numbers used
===================================
Used  :   3, 9
Unused:   1-2, 4-8, 10-128
```

show port-security

To display configured port security feature information, use the **show port-security database** command.

show port-security database
[(active | fwwn *wwn* **| interface fc** *slot/port*) **vsan** *vsan-id]* **|**
statistics vsan *vsan-id* **|**
status | violations

Syntax Description

port-security	Displays configured port security informations.
database	Displays database-related port security information
statistics	Displays port security statistics.
status	Displays the port security status on a per VSAN basis.
violations	Displays violations in the port security database.
vsan *vsan-id*	Displays information for the specified database.
active	Displays the activated database information.
fwwn *wwn*	Displays information for the specified fWWN.
interface fc *slot/port*	Displays information for the specified interface.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

The access information for each port can be individually displayed. If you specify the fwwn or interface options, all devices that are paired in the active database (at that point) with the given fWWN or the interface are displayed.

The **show port-security** command issued with the **last** *number* option displays only the specified number of entries that appear first.

Examples

The following example displays the contents of the port security database.

```
switch# show port-security database
--------------------------------------------------------------------------------
VSAN    Logging-in Entity             Logging-in Point(      Interface)
--------------------------------------------------------------------------------
1       21:00:00:e0:8b:06:d9:1d(pwwn) 20:0d:00:05:30:00:95:de(fc1/13)
1       50:06:04:82:bc:01:c3:84(pwwn) 20:0c:00:05:30:00:95:de(fc1/12)
2       20:00:00:05:30:00:95:df(swwn) 20:0c:00:05:30:00:95:de(port-channel 128)
3       20:00:00:05:30:00:95:de(swwn) 20:01:00:05:30:00:95:de(fc1/1)
[Total 4 entries]
```

The following example displays the output of the activated port security database in VSAN 1.

```
switch# show port-security database vsan 1
--------------------------------------------------------------------------------
Vsan   Logging-in Entity              Logging-in Point        (Interface)
--------------------------------------------------------------------------------
1                  *                  20:85:00:44:22:00:4a:9e (fc3/5)
1      20:11:00:33:11:00:2a:4a(pwwn)  20:81:00:44:22:00:4a:9e (fc3/1)
[Total 2 entries]
```

The following example displays the activated database.

```
switch# show port-security database active
--------------------------------------------------------------------------------------------
VSAN    Logging-in Entity             Logging-in Point(      Interface)     Learnt
--------------------------------------------------------------------------------------------
1       21:00:00:e0:8b:06:d9:1d(pwwn) 20:0d:00:05:30:00:95:de(fc1/13)           Yes
1       50:06:04:82:bc:01:c3:84(pwwn) 20:0c:00:05:30:00:95:de(fc1/12)           Yes
2       20:00:00:05:30:00:95:df(swwn) 20:0c:00:05:30:00:95:de(port-channel 128) Yes
3       20:00:00:05:30:00:95:de(swwn) 20:01:00:05:30:00:95:de(fc1/1)
[Total 4 entries]
```

The following example displays the wildcard fwwn port security in VSAN 1.

```
switch# show port-security database fwwn 20:85:00:44:22:00:4a:9e vsan 1
Any port can login thru' this fwwn
```

The following example displays the configured fWWN port security in VSAN 1.

```
switch# show port-security database fwwn 20:01:00:05:30:00:95:de vsan 1
20:00:00:0c:88:00:4a:e2(swwn)
```

The following example displays the interface port information in VSAN 2.

```
switch# show port-security database interface fc 1/1 vsan 2
20:00:00:0c:88:00:4a:e2(swwn)
```

The following example port security statistics.

```
switch# show port-security statistics
Statistics For VSAN: 1
-----------------------
Number of pWWN permit: 2
Number of nWWN permit: 2
Number of sWWN permit: 2
Number of pWWN deny  : 0
Number of nWWN deny  : 0
Number of sWWN deny  : 0

Total Logins permitted  : 4
Total Logins denied     : 0
Statistics For VSAN: 2
-----------------------
Number of pWWN permit: 0
Number of nWWN permit: 0
Number of sWWN permit: 2
Number of pWWN deny  : 0
Number of nWWN deny  : 0
Number of sWWN deny  : 0
...
```

The following example displays the status of the active database and the auto-learn configuration.

```
switch# show port-security status
VSAN 1 :Activated database, auto-learning is enabled
VSAN 2 :No Active database, auto-learning is disabled
...
```

The following example displays the previous 100 violations.

```
switch# show port-security violations

-------------------------------------------------------------------------------------------
VSAN    Interface      Logging-in Entity             Last-Time              [Repeat count]
-------------------------------------------------------------------------------------------
1       fc1/13         21:00:00:e0:8b:06:d9:1d(pwwn) Jul  9 08:32:20 2003   [20]
                       20:00:00:e0:8b:06:d9:1d(nwwn)
1       fc1/12         50:06:04:82:bc:01:c3:84(pwwn) Jul  9 08:32:20 2003   [1]
                       50:06:04:82:bc:01:c3:84(nwwn)
2       port-channel 1 20:00:00:05:30:00:95:de(swwn) Jul  9 08:32:40 2003   [1]
[Total 2 entries]
```

show processes

To show general information about all the processes, use the show processes command.

show processes cpu | log [details | pid *process-id* **| memory]**

Syntax Description

cpu	Shows processes CPU Info
log	Shows information about process logs
memory	Shows processes Memory Info

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following examples displays general information abut system processes.

```
switch# show process
PID    State  PC        Start_cnt    TTY   Process
-----  -----  --------  -----------  ----  -------------
  868      S  2ae4f33e            1     -  snmpd
  869      S  2acee33e            1     -  rscn
  870      S  2ac36c24            1     -  qos
  871      S  2ac44c24            1     -  port-channel
  872      S  2ac7a33e            1     -  ntp
    -     ER         -            1     -  mdog
    -     NR         -            0     -  vbuilder

PID: process ID.

State: process state

       D   uninterruptible sleep (usually IO)
       R   runnable (on run queue)
       S   sleeping
       T   traced or stopped
       Z   a defunct ("zombie") process

    NR  not-running
    ER  should be running but currently not-running

PC: Current program counter in hex format

Start_cnt: how many times a process has been started.
```

```
TTY: Terminal that controls the process. A "-" usually means a daemon not
     running on any particular tty.

Process: name of the process.

=====================================================

2. show processes cpu (new output)
Description: show cpu utilization information about the processes.

switch# show processes cpu

PID    Runtime(ms)  Invoked   uSecs  1Sec   Process
-----  -----------  --------  -----  -----  -----------
  842         3807    137001     27    0.0  sysmgr
 1112         1220     67974     17    0.0  syslogd
 1269          220     13568     16    0.0  fcfwd
 1276         2901     15419    188    0.0  zone
 1277          738     21010     35    0.0  xbar_client
 1278         1159      6789    170    0.0  wwn
 1279          515     67617      7    0.0  vsan

Runtime(ms): cpu time the process has used, expressed in milliseconds
Invoked: Number of times the process has been invoked.
uSecs:  Microseconds of CPU time in average for each process invocation.
1Sec:    CPU utilization in percentage for the last 1 second.

=====================================================
3. show processes mem
Description: show memory information about the processes.

PID    MemAlloc  StackBase/Ptr      Process
-----  --------  -----------------  ---------------
 1277    120632  7ffffcd0/7fffefe4  xbar_client
 1278     56800  7ffffce0/7ffffb5c  wwn
 1279   1210220  7ffffce0/7ffffbac  vsan
 1293    386144  7ffffcf0/7fffebd4  span
 1294   1396892  7ffffce0/7fffdff4  snmpd
 1295    214528  7ffffcf0/7ffff904  rscn
 1296     42064  7ffffce0/7ffffb5c  qos

MemAlloc: total memory allocated by the process.
StackBase/Ptr: process stack base and current stack pointer in hex format

=====================================================
3. show processes log
Description: list all the process logs

switch# show processes log
Process           PID     Normal-exit  Stack-trace  Core     Log-create-time
----------------  ------  -----------  -----------  -------  ---------------
fspf              1339              N            Y        N  Jan  5 04:25
lichen               1559              N            Y        N  Jan  2 04:49
rib               1741              N            Y        N  Jan  1 06:05

Normal-exit: whether or not the process exited normally.
Stack-trace: whether or not there is a stack trace in the log.
Core: whether or not there exists a core file.
Log-create-time: when the log file got generated.
```

The following example displays the detail log information about a particular process.

```
switch# show processes log pid 1339
Service: fspf
Description: FSPF Routing Protocol Application

Started at Sat Jan  5 03:23:44 1980 (545631 us)
Stopped at Sat Jan  5 04:25:57 1980 (819598 us)
Uptime: 1 hours 2 minutes 2 seconds

Start type: SRV_OPTION_RESTART_STATELESS (23)
Death reason: SYSMGR_DEATH_REASON_FAILURE_SIGNAL (2)
Exit code: signal 9 (no core)
CWD: /var/sysmgr/work

Virtual Memory:

    CODE      08048000 - 0809A100
    DATA      0809B100 - 0809B65C
    BRK       0809D988 - 080CD000
    STACK     7FFFFD20
    TOTAL     23764 KB

Register Set:

    EBX 00000005         ECX 7FFFF8CC         EDX 00000000
    ESI 00000000         EDI 7FFFF6CC         EBP 7FFFF95C
    EAX FFFFFDFE         XDS 8010002B         XES 0000002B
    EAX 0000008E (orig)  EIP 2ACE133E         XCS 00000023
    EFL 00000207         ESP 7FFFF654         XSS 0000002B

Stack: 1740 bytes. ESP 7FFFF654, TOP 7FFFFD20

0x7FFFF654: 00000000 00000008 00000003 08051E95 ................
0x7FFFF664: 00000005 7FFFF8CC 00000000 00000000 ................
0x7FFFF674: 7FFFF6CC 00000001 7FFFF95C 080522CD ........\....".."
0x7FFFF684: 7FFFF9A4 00000008 7FFFFC34 2AC1F18C ........4......*
```

show qos

To display the current QoS settings along with a the number of frames marked high priority, use the **show qos** command.

show qos class-map (name *class-name* **) | dwrr | policy-map (name** *policy-name* **)| service policy (interface | vsan) | statistics**

Syntax Description

class-map	Displays QoS class-maps.
name *class-name*	Assigns a class-map name that is restricted to 63 alpha-numeric characters.
dwrr	Displays DWRR queue weights.
policy-map	Displays QoS policy-maps.
name *policy-name*	Assigns a policy-map name that is restricted to 63 alpha-numeric characters.
service policy	Displays service policy associations.
interface	Displays the service policy on an interface.
vsan	Displays the service policy on a VSAN.
statistics	Displays QoS related statistics.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example displays the contents of all class maps.

```
switch# show qos class-map
qos class-map MyClass match-any
    match dest-wwn 20:01:00:05:30:00:28:df
    match src-wwn 23:15:00:05:30:00:2a:1f
    match src-intf fc2/1
qos class-map Class2 match-all
    match src-intf fc2/14
qos class-map Class3 match-all
    match src-wwn 20:01:00:05:30:00:2a:1f
```

The following example displays the contents of a specified class map.

```
switch# show qos class-map name MyClass
qos class-map MyClass match-any
    match dest-wwn 20:01:00:05:30:00:28:df
    match src-wwn 23:15:00:05:30:00:2a:1f
    match src-intf fc2/1
```

The following example displays all configured policy maps.

```
switch# show qos policy-map
qos policy-map MyPolicy
    class MyClass
    priority medium

qos policy-map Policy1
    class Class2
    priority low
```

The following example displays a specified policy map.

```
switch# show qos policy-map name MyPolicy
qos policy-map MyPolicy
    class MyClass
        priority medium
```

The following example displays scheduled DWRR configurations

```
switch# show qos dwrr
qos dwrr-q high weight 50
qos dwrr-q medium weight 30
qos dwrr-q low weight 20
```

The following example displays all applied policy maps.

```
switch# show qos service policy
qos service policy MyPolicy vsan 1
qos service policy Policy1 vsan 4
```

The following example displays applied policy maps for a specified VSAN.

```
switch# show qos class-map
qos policy-map pmap1
   class cmap1
       priority medium
   class cmap2
       priority high
```

The following example displays applied policy maps for a specified interface.

```
switch# show qos class-map
qos policy-map pmap1
   class cmap3
       priority high
   class cmap4
       priority low
```

The following example displays QoS statistics.

```
switch# show qos statistics
Total number of FC frames transmitted from the Supervisor= 301431
Number of highest-priority FC frames transmitted         = 137679
Current priority of FC control frames = 7    (0 = lowest; 7 = highest)
```

show radius-server

To display all configured RADIUS server parameters, use the **show radius-server** command.

show radius-server [groups]

Syntax Description

radius-server	Displays configured RADIUS server information.
groups	Displays configured RADIUS server group information.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Only administrators can view the RADIUS pre-shared key.

Examples

```
switch# show radius-server
Global RADIUS shared secret:Myxgqc
retransmission count:5
timeout value:10

following RADIUS servers are configured:
        myradius.cisco.users.com:
                available for authentication on port:1812
                available for accounting on port:1813
        172.22.91.37:
                available for authentication on port:1812
                available for accounting on port:1813
                RADIUS shared secret:23MHcUnD
        10.10.0.0:
                available for authentication on port:1812
                available for accounting on port:1813
               RADIUS shared secret:hostkey----> for administrators only
```

show rlir

To display the information about Registered Link Incident Report (RLIR), Link Incident Record Registration (LIRR), and Distribute Registered Link Incident Record (DRLIR) frames, use the **show rlir** command.

show rilr erl (vsan *vsan-id***) | history | recent (interface fc** *slot/port* **| portnumber** *port-number* **) | statistics (vsan** *vsan-id***)]**

Syntax Description

rlir	Displays RLIR frame information.
erl *vsan-id*	Displays Established Registration List (ERL) information.
vsan *vsan-id*	Displays VSAN-specific information. The ID ranges from 1 to 4093.
history	Displays link incident history.
recent	Displays recent link incident.
interface fc *slot/port*	Displays the Fibre Channel interface in the specified slot/port.
portnumber *port-number*	Displays the port number for the link incidents.
statistics	Displays RLIR statistics.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(2).

Usage Guidelines

If available, the host timestamp (marked by the *) is printed along with the switch timestamp. If the host timestamp is not available, only the switch timestamp is printed.

Examples

The following example displays the RLIR statistics for all VSANs.

```
switch# show rlir statistics

Statistics for VSAN: 1
------------------------

Number of LIRR received      = 0
Number of LIRR ACC sent      = 0
Number of LIRR RJT sent      = 0
Number of RLIR sent          = 0
Number of RLIR ACC received  = 0
Number of RLIR RJT received  = 0
Number of DRLIR received     = 0
Number of DRLIR ACC sent     = 0
Number of DRLIR RJT sent     = 0
Number of DRLIR sent         = 0
Number of DRLIR ACC received = 0
```

```
Number of DRLIR RJT received = 0


Statistics for VSAN: 4
------------------------

Number of LIRR received      = 0
Number of LIRR ACC sent      = 0
Number of LIRR RJT sent      = 0
Number of RLIR sent          = 0
Number of RLIR ACC received  = 0
Number of RLIR RJT received  = 0
Number of DRLIR received     = 0
Number of DRLIR ACC sent     = 0
Number of DRLIR RJT sent     = 0
Number of DRLIR sent         = 0
Number of DRLIR ACC received = 0
Number of DRLIR RJT received = 0


Statistics for VSAN: 61
------------------------

Number of LIRR received      = 0
Number of LIRR ACC sent      = 0
Number of LIRR RJT sent      = 0
Number of RLIR sent          = 0
Number of RLIR ACC received  = 0
Number of RLIR RJT received  = 0
Number of DRLIR received     = 0
Number of DRLIR ACC sent     = 0
Number of DRLIR RJT sent     = 0
Number of DRLIR sent         = 0
Number of DRLIR ACC received = 0
Number of DRLIR RJT received = 0
```

The following example displays the RLIR statistics for a specified VSAN

```
switch# show rlir statistics vsan 4

Statistics for VSAN: 4
------------------------

Number of LIRR received      = 0
Number of LIRR ACC sent      = 0
Number of LIRR RJT sent      = 0
Number of RLIR sent          = 0
Number of RLIR ACC received  = 0
Number of RLIR RJT received  = 0
Number of DRLIR received     = 0
Number of DRLIR ACC sent     = 0
Number of DRLIR RJT sent     = 0
Number of DRLIR sent         = 0
Number of DRLIR ACC received = 0
Number of DRLIR RJT received = 0
```

The following example displays the RLIR statistics for all V ERLs

```
switch# show rlir erl

Established Registration List for VSAN: 2
-------------------------------------------
FC-ID       LIRR FORMAT    REGISTERED FOR
-------------------------------------------
```

```
0x0b0200    0x18           always receive
Total number of entries = 1

Established Registration List for VSAN: 100
-------------------------------------------
FC-ID       LIRR FORMAT    REGISTERED FOR
-------------------------------------------
0x0b0500    0x18           conditional receive
0x0b0600    0x18           conditional receive
Total number of entries = 2
```

The following example displays the ERLs for the specified VSAN

```
switch# show rlir erl vsan 100
Established Registration List for VSAN: 100
-------------------------------------------
FC-ID       LIRR FORMAT    REGISTERED FOR
-------------------------------------------
0x0b0500    0x18           conditional receive
0x0b0600    0x18           conditional receive

Total number of entries = 2
```

The following example displays the RLIR history.

```
switch# show rlir history
Link incident history
-------------------------------------------------------------------------------
*Host Time Stamp
 Switch Time Stamp          Port   Interface   Link Incident
-------------------------------------------------------------------------------
*Sun Nov 30 21:47:28 2003
 Sun Nov 30 13:47:55 2003     2        fc1/2   Implicit Incident
*Sun Nov 30 22:00:47 2003
 Sun Nov 30 14:01:14 2003     2        fc1/2   NOS Received
*Sun Nov 30 22:00:55 2003
 Sun Nov 30 14:01:22 2003     2        fc1/2   Implicit Incident
*Mon Dec 1 20:14:26 2003
 Mon Dec  1 12:14:53 2003     4        fc1/4   Implicit Incident
*Mon Dec 1 20:14:26 2003
 Mon Dec  1 12:14:53 2003     4        fc1/4   Implicit Incident
*Thu Dec 4 04:43:32 2003
 Wed Dec  3 20:43:59 2003     2        fc1/2   NOS Received
*Thu Dec 4 04:43:41 2003
 Wed Dec  3 20:44:08 2003     2        fc1/2   Implicit Incident
*Thu Dec 4 04:46:53 2003
 Wed Dec  3 20:47:20 2003     2        fc1/2   NOS Received
*Thu Dec 4 04:47:05 2003
 Wed Dec  3 20:47:32 2003     2        fc1/2   Implicit Incident
*Thu Dec 4 04:48:07 2003
 Wed Dec  3 20:48:34 2003     2        fc1/2   NOS Received
*Thu Dec 4 04:48:39 2003
 Wed Dec  3 20:49:06 2003     2        fc1/2   Implicit Incident
*Thu Dec 4 05:02:20 2003
 Wed Dec  3 21:02:47 2003     2        fc1/2   NOS Received
*Thu Dec 4 05:02:29 2003
 Wed Dec  3 21:02:56 2003     2        fc1/2   Implicit Incident
*Thu Dec 4 05:02:47 2003
 Wed Dec  3 21:03:14 2003     4        fc1/4   NOS Received
*Thu Dec 4 05:02:54 2003
 Wed Dec  3 21:03:21 2003     4        fc1/4   Implicit Incident
*Thu Dec 4 05:02:54 2003
 Wed Dec  3 21:03:21 2003     4        fc1/4   Implicit Incident
...
```

The following example displays recent RLIRs for a specified interface

```
switch# show rlir recent interface fc1/1-16
Recent link incident records
-------------------------------------------------------------------------------
*Host Time Stamp
 Switch Time Stamp          Port   Interface   Link Incident
-------------------------------------------------------------------------------


*Thu Dec 4 05:02:29 2003
 Wed Dec  3 21:02:56 2003     2        fc1/2   Implicit Incident
*Thu Dec 4 05:02:54 2003
 Wed Dec  3 21:03:21 2003     4        fc1/4   Implicit Incident
switch#
```

The following example displays the recent RLIRs for a specified port number

```
switch# show rlir recent portnumber 1-16
Recent link incident records
-------------------------------------------------------------------------------
*Host Time Stamp
 Switch Time Stamp          Port   Interface   Link Incident
-------------------------------------------------------------------------------


*Thu Dec 4 05:02:29 2003
 Wed Dec  3 21:02:56 2003     2        fc1/2   Implicit Incident
*Thu Dec 4 05:02:54 2003
 Wed Dec  3 21:03:21 2003     4        fc1/4   Implicit Incident
```

show role

To display rules (and their associated rules) configured on the switch, including those roles that have not yet been committed to persistent storage, use the **show role** command.

show role [name *string*]

Syntax Description

name *string*	The name of the role for which you want to display information.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

The rules are displayed by rule number and are based on each role. All roles are displayed even if role name is not specified.

Only network-admin role can access this command.

Examples

```
switch# show role
Role: network-admin
Description: Predefined Network Admin group. This role cannot be modified
Access to all the switch commands

Role: network-operator
Description: Predefined Network Operator group. This role cannot be modified
Access to Show commands and selected Exec commands

Role: sangroup
Description: SAN management group
----------------------------------------
Rule   Type   Command-type   Feature
----------------------------------------
  1.   permit    config           *
  2.     deny    config        fspf
  3.   permit     debug        zone
  4.   permit      exec      fcping
```

show rscn

To display RSCN information, use the **show rscn** command.

show rscn [scr-table vsan *vsan-id* **| statistics vsan** *vsan-id***]**

Syntax Description

scr-table	Shows State Change Registration table.
statistics	Shows RSCN statistics.
vsan *vsan-id*	Range of the required VSANs (from 1 to 4093).

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

The SCR table cannot be configured, it is only populated if one or more Nx ports send SCR frames to register for RSCN information. If the **show rscn scr-table** command does not return any entries, no Nx port is interested in receiving RSCN information.

Examples

The following examples display RSCN information.

```
switch# show rscn scr-table vsan 1
SCR table for VSAN: 1
---------------------------------------------
FC-ID         REGISTERED FOR
---------------------------------------------
0x1b0300      fabric detected rscns

Total number of entries = 1
```

```
switch# show rscn statistics vsan 1

Statistics for VSAN: 1
-----------------------

Number of SCR received         = 0
Number of SCR ACC sent         = 0
Number of SCR RJT sent         = 0
Number of RSCN received        = 0
Number of RSCN sent            = 0
Number of RSCN ACC received    = 0
Number of RSCN ACC sent        = 0
Number of RSCN RJT received    = 0
Number of RSCN RJT sent        = 0
Number of SW-RSCN received     = 0
Number of SW-RSCN sent         = 0
Number of SW-RSCN ACC received = 0
Number of SW-RSCN ACC sent     = 0
Number of SW-RSCN RJT received = 0
Number of SW-RSCN RJT sent     = 0
```

show running-config

To view the running configuration file, use the **show running-config** command

show running-config
[diff] |
[feature | interface (cpp | fc | fc *slot/port* **| fc-tunnel** *tunnel-id* **| fcip** *interface-number* **|**
gigabitethernet *slot/port* **| iscsi** *slot/port* **|port-channel | svc | vsan** *vsan-id)]* **|**
vsan *vsan-id***]**

Syntax Description

diff	Displays the difference between the running and startup configurations.
interface *interface-range*	Displays interface specific options.
cpp	Displays the virtualization interface specific to the ASM module (see the "interface cpp" section on page 26-18)
fc *slot/port*	Displays the Fibre Channel interface in the specified slot/port.
fc-tunnel *tunnel-id*	Displays description of the specified FC tunnel from 1 to 4095.
fcip *interface-number*	Displays the description of the specified FCIP interface from 1 to 255.
gigabitethernet *slot/port*	Displays the description of the Gigabit Ethernet interface in the specified slot/ port.
iscsi *slot/port*	Displays the description of the iSCSI interface in the specified slot/ port.
mgmt	Displays the description of the management interface.
port-channel	Displays the description of the PortChannel interface.
sup-fc	Displays the inband interface details.
svc	Displays the virtualization interface specific to the CSM module (see the --section--when we add SVC--Release 1.3.1?)
vsan *vsan-id*	Displays VSAN-specific information. The ID ranges from 1 to 4093.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

If the running configuration is different from the startup configuration, issue the **show startup-config diff** command to view the differences.

Examples

The following example displays the configuration currently running on the switch.

```
switch# show running-config
Building Configuration ...
```

```
 interface fc1/1
 interface fc1/2
 interface fc1/3
 interface fc1/4
 interface mgmt0
ip address 172.22.95.112 255.255.255.0
no shutdown
vsan database
boot system bootflash:isan-237; sup-1
boot kickstart bootflash:boot-237 sup-1
callhome
ip default-gateway 172.22.95.1
switchname switch
trunk protocol enable
username admin password 5 /AFDAMD4B2xK2  role network-admin
```

The following example displays the difference between the running configuration and the startup configuration.

```
switch# show running-config diff
Building Configuration ...
*** Startup-config
--- Running-config
****************** 1,16 ****
  fcip enable

  ip default-gateway 172.22.91.1

  iscsi authentication none
  iscsi enable

! iscsi import target fc

  iscsi virtual-target name vt
    pWWN 21:00:00:04:cf:4c:52:c1
  all-initiator-permit

--- 1,20 ----
  fcip enable

+ aaa accounting logsize 500
+
+
+

  ip default-gateway 172.22.91.1

  iscsi authentication none
  iscsi enable

! iscsi initiator name junk

  iscsi virtual-target name vt
    pWWN 21:00:00:04:cf:4c:52:c1
  all-initiator-permit
```

The following example displays running configuration information for a specified interface—in this case, the management interface.

```
switch# show running-config interface mgmt0

interface mgmt0
```

```
  ip address 255.255.255.0 255.255.255.0
```

The following example displays running configuration information for a specified feature—in this case, VSANS.

```
switch# show running-config feature vsan
vsan database
vsan 2 suspend
vsan 3
vsan 4

vsan database
vsan 3 interface fc1/1
```

show scsi-target

Use the **show scsi target** command to view specific information about existing SCSI configurations.

show scsi target auto-poll | devices [vsan *vsan-range* **| fcid** *fcid-id***] | disk [vsan** *vsan-range* **| fcid** *fcid-id***] | lun { os [aix | all| hpus | linux | solaris | windows] vsan** *vsan-range* **| fcid** *fcid-id } |* **status | pwwn | tape [vsan** *vsan-range* **| fcid** *fcid-id***]**

Syntax Description

auto-poll	Shows SCSI target auto polling information.
devices	Shows discovered scsi-target devices information
disk	Shows discovered disk information.
lun	Shows discovered SCSI target LUN information.
os	Discovers the specified operating system.
aix	Discovers the AIX operating system
all	Discovers all operating systems
hpux	Discovers the HPUX operating system
linux	Discovers the Linux operating system
solaris	Discovers the Solaris operating system
windows	Discovers the Windows operating system
vsan *vsan-range*	Specifies the VSAN ID or VSAN range (from 1 to 4093).
fcid *fcid-id*	Specifies the FCID of the SCSI target to display.
status	Shows SCSI target discovery status.
tape	Shows discovered tape information
pWWN	Shows discover pWWN information for each OS.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(2a).

Usage Guidelines

Use the **show scsi-target auto-poll** command to verify automatic discovery of scsi-targets which come online.

Examples

The following example displays the status of a SCSI discovery.

```
switch# show scsi-target status
discovery completed
```

The following example displays discovered disk information.

```
switch# show scsi-target disk
--------------------------------------------------------------------------------
VSAN    FCID        PWWN                      VENDOR    MODEL             REV
--------------------------------------------------------------------------------
1       0x9c03d6    21:00:00:20:37:46:78:97   Company 4 ST318203FC        0004
1       0x9c03d9    21:00:00:20:37:5b:cf:b9   Company 4 ST318203FC        0004
1       0x9c03da    21:00:00:20:37:18:6f:90   Company 4 ST318203FC        0004
1       0x9c03dc    21:00:00:20:37:5a:5b:27   Company 4 ST318203FC        0004
1       0x9c03e0    21:00:00:20:37:36:0b:4d   Company 4 ST318203FC        0004
1       0x9c03e1    21:00:00:20:37:39:90:6a   Company 4 ST318203 CLAR18   3844
1       0x9c03e2    21:00:00:20:37:18:d2:45   Company 4 ST318203 CLAR18   3844
1       0x9c03e4    21:00:00:20:37:6b:d7:18   Company 4 ST318203 CLAR18   3844
1       0x9c03e8    21:00:00:20:37:38:a7:c1   Company 4 ST318203FC        0004
1       0x9c03ef    21:00:00:20:37:18:17:d2   Company 4 ST318203FC        0004
```

The following example displays the discovered LUNs for all OSs.

```
switch# show scsi-target lun os all

ST336607FC from SEAGATE (Rev 0006)
FCID is 0xed0001 in VSAN 7, PWWN is 21:00:00:04:cf:fb:42:f8
--------------------------------------------------------------------------------
OS  LUN    Capacity Status  Serial Number    Device-Id
           (MB)
--------------------------------------------------------------------------------
WIN 0x0    36704    Online  3JA1B9QA00007338 C:1 A:0 T:3 20:00:00:04:cf:fb:42:f8
AIX 0x0    36704    Online  3JA1B9QA00007338 C:1 A:0 T:3 20:00:00:04:cf:fb:42:f8
SOL 0x0    36704    Online  3JA1B9QA00007338 C:1 A:0 T:3 20:00:00:04:cf:fb:42:f8
LIN 0x0    36704    Online  3JA1B9QA00007338 C:1 A:0 T:3 20:00:00:04:cf:fb:42:f8
HP  0x0    36704    Online  3JA1B9QA00007338 C:1 A:0 T:3 20:00:00:04:cf:fb:42:f8
```

The following example displays the discovered LUNs. for the Solaris OS.

```
switch# show scsi-target lun os solaris

ST336607FC from SEAGATE (Rev 0006)
FCID is 0xed0001 in VSAN 7, PWWN is 21:00:00:04:cf:fb:42:f8
--------------------------------------------------------------------------------
OS  LUN    Capacity Status  Serial Number    Device-Id
           (MB)
--------------------------------------------------------------------------------
SOL 0x0    36704    Online  3JA1B9QA00007338 C:1 A:0 T:3 20:00:00:04:cf:fb:42:f8
```

The following example displays auto-polling information. Each user is indicated by the internal UUID number, which indicates that a CSM or an IPS module is in the chassis.

```
switch# show scsi-target auto-poll
auto-polling is enabled, poll_start:0 poll_count:1 poll_type:0
USERS OF AUTO POLLING
---------------------
uuid:54
```

The following example displays the port WWN that is assigned to each OS (Windows, AIX, Solaris, Linux, or HPUX).

```
switch# show scsi-target pwwn
------------------------------
OS      PWWN
------------------------------
WIN     24:91:00:05:30:00:2a:1e
AIX     24:92:00:05:30:00:2a:1e
SOL     24:93:00:05:30:00:2a:1e
LIN     24:94:00:05:30:00:2a:1e
```

```
HP      24:95:00:05:30:00:2a:1e
```

show snmp

The **show snmp** command displays the count information for all SNMP settings.

show snmp [community | host |user]

Syntax Description

community	Shows SNMP community strings.
host	Shows snmp hosts.
user	Shows SNMPv3 users.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays SNMP information.

```
switch# show snmp
sys contact:
sys location:

1631 SNMP packets input
        0 Bad SNMP versions
        0 Unknown community name
        0 Illegal operation for community name supplied
        0 Encoding errors
        64294 Number of requested variables
        1 Number of altered variables
        1628 Get-request PDUs
        0 Get-next PDUs
        1 Set-request PDUs
152725 SNMP packets output
        0 Too big errors
        1 No such name errors
        0 Bad values errors
        0 General errors

Community                     Access
---------                     ------
public                         rw

User                          Group                         Auth  Priv
____                          _____                         ____  ____
admin                         network-admin                 md5   no
```

The following example displays SNMP user details.

```
switch# show snmp user
User                           Group                          Auth  Priv
____                           _____                          ____  ____
steve                          network-admin                  md5   des
sadmin                         network-admin                  md5   des
stever                         network-operator               md5   des
```

The following example displays SNMP community information.

```
switch# show snmp community
Community                      Access
---------                      ------
private                         rw
public                          ro
v93RACqPNH                      ro
```

The following example displays SNMP host information.

```
switch# show snmp host
Host                            Port Version  Level  Type   SecName
____                            ____ _______  ______ ____   _______
171.16.126.34                   2162 v2c      noauth trap   public
171.16.75.106                   2162 v2c      noauth trap   public
171.31.124.81                   2162 v2c      noauth trap   public
171.31.157.193                  2162 v2c      noauth trap   public
171.31.157.98                   2162 v2c      noauth trap   public
171.31.49.25                    2162 v2c      noauth trap   public
171.31.49.32                    2188 v2c      noauth trap   public
171.31.49.49                    2162 v2c      noauth trap   public
171.31.49.49                    3514 v2c      noauth trap   public
171.31.49.54                    2162 v2c      noauth trap   public
171.31.58.54                    2162 v2c      noauth trap   public
171.31.58.81                    2162 v2c      noauth trap   public
171.31.58.97                    1635 v2c      noauth trap   public
171.31.58.97                    2162 v2c      auth   trap   public
171.31.58.97                    3545 v2c      auth   trap   public
172.22.00.43                    2162 v2c      noauth trap   public
172.22.00.65                    2162 v2c      noauth trap   public
172.22.05.234                   2162 v2c      noauth trap   public
172.22.05.98                    1050 v2c      noauth trap   public
```

show span session

Use the **show span session** command to view specific information about a SPAN session.

show span session [*session-id* **[brief]** | **brief]**

Syntax Description

session	Shows SPAN session configuration.
session-id	SPAN session ID (1-16).
brief	Shows SPAN session configuration in brief format.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

None.

Examples

The following example displays SPAN sessions in a brief format.

```
switch# show span session brief
-------------------------------------------------------
 Session  Admin          Oper           Destination
          State          State          Interface
-------------------------------------------------------
 7        no suspend     active         fc2/7
```

The following example displays a specific SPAN session details.

```
switch# show span session 7
Session 7 (active)
   Destination is fc2/7
   No session filters configured
   No ingress (rx) sources
   Egress (tx) sources are
     port-channel 7,
```

The following example displays all SPAN sessions.

```
switch# show span session
Session 1 (inactive as no destination)
Destination is not specified
   Session filter vsans are 1
   No ingress (rx) sources
   No egress (tx) sources

Session 2 (active)
   Destination is fc9/5
   No session filters configured
   Ingress (rx) sources are
      vsans 1
     sup-fc0,
   Egress (tx) sources are
     sup-fc0,
```

The following example displays a SPAN session mapped to a FC tunnel interface.

```
switch# show span session
Session 2 (active)
   Destination is fc-tunnel 100
   No session filters configured
   Ingress (rx) sources are
     fc2/16,
   Egress (tx) sources are
     fc2/16,
```

show sprom

To show vendor ID, product's component attributes, serial number information that can be used to track field replacable units, use the **show sprom** command.

show sprom sup

show sprom clock *clock-module-index*

show sprom backplane *backplane-index*

show sprom module *module-number sprom-index*

show sprom fan

show sprom powersupply *powersupply-index*

show sprom mgmt-module

Syntax Description

sup	Display Vendor ID, product's component attributes for the current supervisor module
module *module-number sprom-index*	Display Vendor ID, product's component attributes for the given switching module. There can be up to 4 sub-components in a module. Each of them will have a SPROM associated with it.
clock clock-module-index>	Display attributes of the clock module. There are two clock modules in a switch. This module is absent in MDS9216 type switch.
backplane <backplane-index>	Display attributes that can be used to uniquely identify a switch.
powersupply <powersupply-index>	Displays attributes of the first or the second power-supply. This contains information about the powersupply capacity in watts when it is used in 110Volts and 220Volts respectively. This information is used for power-budget allocation.
fan	Display attributes that uniquely identified fan.
mgmt-module	Display attributes of management module. This module is only present in MDS9216 type switch.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Use the **show sprom** command to get unique information about a specific module, supervisor module, switch, power-supply module, or a fan module. If the customer needs to report a problem with a module, supervisor module, switch, power-supply module, or a fan module and does not have access to management station, then he can extract serial number information from **show sprom**.

Examples

The following example displays management module information. This module and command are specific to the Cisco MDS 9216 switch.

```
switch# show sprom mgmt-module
DISPLAY SAM sprom contents:
Common block:
 Block Signature :0xabab
 Block Version   :2
 Block Length    :156
 Block Checksum  :0x1295
 EEPROM Size     :0
 Block Count     :2
 FRU Major Type  :0x0
 FRU Minor Type  :0x0
 OEM String      :Cisco Systems Inc
 Product Number  :SAM SMITH
 Serial Number   :12345678901
 Part Number     :SAM-SMITH-06
 Part Revision   :A0
 Mfg Deviation   :
 H/W Version     :1.0
 Mfg Bits        :1
 Engineer Use    :0
 snmpOID         :0.0.0.0.0.0.0.0
 Power Consump   :-200
 RMA Code        :0-0-0-0
Linecard Module specific block:
 Block Signature :0x6003
 Block Version   :2
 Block Length    :103
 Block Checksum  :0x3c7
 Feature Bits    :0x0
 HW Changes Bits :0x0
 Card Index      :9009
 MAC Addresses   :00-12-34-56-78-90
 Number of MACs  :4
 Number of EOBC links :4
 Number of EPLD  :0
 Port Type-Num   :200-16
 SRAM size       :0
 Sensor #1       :0,0
 Sensor #2       :0,0
 Sensor #3       :0,0
 Sensor #4       :0,0
 Sensor #5       :0,0
 Sensor #6       :0,0
 Sensor #7       :0,0
 Sensor #8       :0,0
```

The following command displays supervisor module information.

```
switch# show sprom sup
DISPLAY supervisor sprom contents:
Common block:
 Block Signature : 0xabab
 Block Version   : 2
 Block Length    : 156
 Block Checksum  : 0x10a8
 EEPROM Size     : 512
 Block Count     : 2
 FRU Major Type  : 0x6002
 FRU Minor Type  : 0x7d0
 OEM String      : Cisco Systems
 Product Number  : DS-X9530-SF1-K9
 Serial Number   : abcdefgh
 Part Number     : 73-7523-06
 Part Revision   : 0.0
 Mfg Deviation   : 0.0
 H/W Version     : 0.0
 Mfg Bits        : 0
 Engineer Use    : 0
 snmpOID         : 9.5.1.3.1.1.2.2000
 Power Consump   : -524
 RMA Code        : 0-0-0-0
Supervisor Module specific block:
 Block Signature : 0x6002
 Block Version   : 2
 Block Length    : 103
 Block Checksum  : 0x927
 Feature Bits    : 0x0
 HW Changes Bits : 0x0
 Card Index      : 9003
 MAC Addresses   : 00-05-30-00-18-be
 Number of MACs  : 4
 Number of EPLD  : 1
 EPLD A          : 0x0
 Sensor #1       : 75,60
 Sensor #2       : 60,55
 Sensor #3       : -127,-127
 Sensor #4       : -127,-127
 Sensor #5       : -128,-128
 Sensor #6       : -128,-128
 Sensor #7       : -128,-128
 Sensor #8       : -128,-128
```

Related Commands

Command	Description
show hardware	Displays brief information about the list of field replacable units in the switch.

show ssh

Use the **show ssh key** command to display the host key pair details for the specified key or for all keys, if no key is specified.Use the **show ssh server** command to display the status of the SSH protocol (enabled or disabled) and the versions that are enabled for that switch.show ssh key

show ssh [key [dsa | rsa | rsa1] | server]

Syntax Description

key	Shows ssh keys.
server	Shows whether ssh server is enabled or not.
dsa	Shows dsa ssh keys.
rsa	Shows rsa ssh keys.
rsa1	Shows rsa1 ssh keys.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays SSH protocol status.

```
switch# show ssh server
ssh is enabled
version 1 enabled
version 2 enabled
```

The following example displays Host Key Pair details.

```
switch# show ssh key
rsa1 Keys generated:Sun Jan 13 07:16:26 1980

1024 35

fingerprint:
1024 67:76:02:bd:3e:8d:f5:ad:59:5a:1e:c4:5e:44:03:07

could not retrieve rsa key information

dsa Keys generated:Sun Jan 13 07:40:08 1980

ssh-dss AAAAB3NzaC1kc3MAAABBAJTCRQOydNRel2v7uiO6Fix+OTn8eGdnnDVxw5eJs5OcOEXOyjaW
cMMYsEgxc9ada1NElp8Wy7GPMWGOQYj9CU0AAAAVAMCcWhNN18zFNOIPo7cU3t7d0iEbAAAAQBdQ8UAO
i/Cti84qFb3kTqXlS9mEhdQUo0lHcH5bw5PKfj2Y/dLR437zCBKXetPj4p7mhQ6Fq5os8RZtJEyOsNsA
AABAA0oxZbPyWeR5NHATXiyXdPI7j9i8fgyn9FNipMkOF2Mn75Mi/lqQ4NIq0gQNvQOx27uCeQlRts/Q
wI4q68/eaw==

fingerprint:
512 f7:cc:90:3d:f5:8a:a9:ca:48:76:9f:f8:6e:71:d4:ae
```

show startup-config

To view the startup configuration file, use the **show startup-config** command

show startup-config [log]

Syntax Description

log	Displays execution log of last used ascii startup configuration.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the switch configuration at startup.

```
switch# show startup-config
vsan database
vsan 2
vsan 3
vsan 4
vsan 5
vsan 31
vsan 32 suspend
vsan 100
vsan 300

 interface port-channel 1
switchport mode E
switchport trunk mode off

 interface port-channel 2
fspf cost 100 vsan 2
switchport mode E
no switchport trunk allowed vsan all
switchport trunk allowed vsan add 1-99
switchport trunk allowed vsan add 101-4093

 interface port-channel 3
switchport mode E
switchport trunk mode off

 interface port-channel 4
switchport mode E
no switchport trunk allowed vsan all
switchport trunk allowed vsan add 1-99
switchport trunk allowed vsan add 101-4093
```

```
 interface port-channel 5
switchport mode E
no switchport trunk allowed vsan all
switchport trunk allowed vsan add 1-10interface port-channel 5
switchport mode E
no switchport trunk allowed vsan all
switchport trunk allowed vsan add 1-10

interface port-channel 8
switchport mode E

 interface vsan1

no shutdown

snmp-server community public rw
snmp-server user admin network-admin auth md5 0xe84b06201ae3bfb726a2eab9f485eb57
 localizedkey
snmp-server host 171.69.126.34 traps version 2c public udp-port 2162
snmp-server host 171.69.75.106 traps version 2c public udp-port 2162
vsan database
vsan 3 interface fc2/9
vsan 3 interface fc2/14
vsan 5 interface fc9/11
vsan 2 interface fc9/12
vsan 3 interface port-channel 3
vsan 3 interface port-channel 4
vsan 100 interface port-channel 8

boot system bootflash:/isan-8b-u sup-1
boot kickstart bootflash:/boot-3b sup-1
boot system bootflash:/isan-8b-u sup-2
boot kickstart bootflash:/boot-3b sup-2

ip default-gateway 172.22.90.1
power redundancy-mode combined force

username admin password 5 HyLyYqb4.q74Y  role network-admin
zone name Z1 vsan 1
  member pwwn 10:00:00:00:77:99:60:2c
  member pwwn 21:00:00:20:37:a6:be:14

zone default-zone permit vsan 1
zoneset distribute full vsan 51-58

zoneset name ZS1 vsan 1
  member Z1

zoneset  activate name ZS1 vsan 1

 interface fc2/1
switchport mode E
switchport trunk mode off
no shutdown

 interface fc2/2

 interface fc2/3
channel-group 1 force
no shutdown
```

```
interface fc2/6
channel-group 2 force
no shutdown

 interface fc2/7
switchport mode E
no shutdown
no switchport trunk allowed vsan all
switchport trunk allowed vsan add 1-25

interface fc2/9
switchport mode E
switchport trunk mode off
no shutdown

 interface fc2/10
channel-group 3 force
no shutdown

 interface fc2/12
channel-group 4 force
no shutdown

 interface fc2/14
switchport mode E
no shutdown
no switchport trunk allowed vsan all
switchport trunk allowed vsan add 1-99
switchport trunk allowed vsan add 101-4093

 interface fc2/15
channel-group 6 force
no shutdown

 interface fc2/16
channel-group 6 force
no shutdown
.
.
.
interface fc9/10
switchport mode F
no shutdown

 interface fc9/11
switchport trunk mode off
no shutdown

 interface fc9/12
switchport mode E
switchport speed 1000
switchport trunk mode off
no shutdown

 interface fc9/15
no shutdown
no switchport trunk allowed vsan all
switchport trunk allowed vsan add 1-99
switchport trunk allowed vsan add 101-4093
```

```
 interface fc9/16
switchport mode FL
no shutdown

 interface mgmt0
ip address 172.22.90.38 255.255.255.0
no shutdown
```

show switchname

To view the switch's network name, use the **show switchname** command.

show switchname

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the name of the switch.

```
switch# show switchname
switch-123
```

show system

To show the system information use the **show system** command.

show system cores |default switchport | directory information |error-id [*list* | *hex***] |**
exception-info | health | redundancy status | reset-reason [module *number* **] | resources |**
uptime

Syntax Description

cores	Displays core transfer option.
default switchport	Shows system default values.
directory information	Directory information of System Manager.
error-id	Shows description about errors.
exception-info	Shows last exception log information.
health	Shows dta to reflect the health of the system.
redundancy status	Redundancy status.
reset-reason	Shows the last four reset reason codes.
module *number*	Specifies the module number to display the reset-reason codes.
resources	Show the CPU and memory statistics.
uptime	Shows how long the system has been up and running.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Use the **show system redundancy status** command to ensure that the system is ready to accept a switchover.

Examples

The following example displays the system redundancy status.

```
switch# show system redundancy status
Redundancy mode
---------------
      administrative:   HA
         operational:   None

This supervisor (sup-2)
-----------------------
    Redundancy state:   Active
    Supervisor state:   Active
      Internal state:   Active with no standby
```

```
Other supervisor (sup-1)
------------------------
    Redundancy state:   Not present
```

The following example displays the default switch port states.

```
switch# show system default switchport
System default port state is down
System default trunk mode is on
```

The following example displays error information for a specified ID.

```
switch# show system error-id 0x401D0019
Error Facility: module
Error Description: Failed to stop Linecard Async Notification.
```

The following example displays the system health information.

```
switch# show system health
System Health Services iteration frequency 5 seconds
Active SUP arbiter is Working
Active SUP bootflash is Working
```

The following example displays the system reset information.

```
switch# show system reset reason
----- reset reason for module 6 -----
1) At 520267 usecs after Tue Aug  5 16:06:24 1980
    Reason: Reset Requested by CLI command reload
    Service:
    Version: 1.2(0.73a)
2) At 653268 usecs after Tue Aug  5 15:35:24 1980
    Reason: Reset Requested by CLI command reload
    Service:
    Version: 1.2(0.45c)
3) No time
    Reason: Unknown
    Service:
    Version: 1.2(0.45c)
4) At 415855 usecs after Sat Aug  2 22:42:43 1980
    Reason: Power down triggered due to major temperature alarm
    Service:
    Version: 1.2(0.45c)
```

The following example displays system-related CPU and memory statistics.

```
switch# show system resources
Load average:   1 minute: 0.43   5 minutes: 0.17   15 minutes: 0.11
Processes   :   100 total, 2 running
CPU states  :   0.0% user,   0.0% kernel,   100.0% idle
Memory usage:   1027628K total,    313424K used,    714204K free
                   3620K buffers,   22278K cache
```

The following example displays the system uptime.

```
switch# show system uptime
Start Time: Sun Oct 13 18:09:23 2030
Up Time:    0 days, 9 hours, 46 minutes, 26 seconds
```

Use the **show system cores** command to display the currently configured scheme for copying cores.

```
switch# show system cores
Transfer of cores is enabled
```

show tacacs-server

To display configured TACACS+ servers and groups information, use the **show tacacs-server** command.

show tacacs-server [groups]

Syntax Description

tacacs-server	Displays configured TACACS+ server information.
groups	Displays configured TACACS+ server group information.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following command displays the configured TACACS+ server information

```
switch# show tacacs-server
Global TACACS+ shared secret:tacacsPword
timeout value:30
total number of servers:3

following TACACS+ servers are configured:
        171.71.58.91:
                available on port:2
        cisco.com:
                available on port:49
        171.71.22.95:
                available on port:49
                TACACS+ shared secret:MyKey
```

The following command displays the configured TACACS+ server groups

```
switch# show tacacs-server groups
total number of groups:1

following TACACS+ server groups are configured:
        group TacServer:
                server 171.71.58.91 on port 2
```

show tech-support

Use the **show tech-support** command to display information useful to TAC when reporting a problem.

show tech-support [details | interface | module | vsan *vsan-id***]**

Syntax Description

details	Provides detailed information for each **show** command
interface	Display interface status and configuration information
module	Display module status information
vsan	Display vsan status and configuration information
vsan-id	The ID of the VSAN is from 1 to 4093.

Defaults

The default displays output on a per-command basis, with each command being the title of the output that follows. A line separates the output from the next command. The software removes passwords and other security information.

Command Modes

EXEC mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

The **show tech-support** command is a compilation of several **show** commands and can be quite lengthy. For a sample display of the output of the **show tech-support** command, see the individual command explanation for the following commands.

If you enter the **show tech-support** command without arguments, the output displays the equivalent of all the following **show** commands.

- **show version**
- **show environment**
- **show module**
- **show hardware**
- **show running-config**
- **show interface**
- **show accounting log**
- **show process**
- **show process log**
- **show processes log details**
- **show flash**

Examples

switch# **show tech-support module 1**

```
'terminal length 0'

'show module '
Mod  Ports  Module-Type                      Model              Status
---  -----  -------------------------------- ------------------ ------------
1    16     1/2 Gbps FC/Supervisor           DS-X9216-K9-SUP    active *
2    32     1/2 Gbps FC Module               DS-X9032           ok

Mod  Sw           Hw      World-Wide-Name(s) (WWN)
---  -----------  ------  --------------------------------------------------
1    1.0(0.271)   0.0     20:01:00:05:30:00:21:9e to 20:10:00:05:30:00:21:9e
2    1.0(0.271)   0.0     20:41:00:05:30:00:21:9e to 20:60:00:05:30:00:21:9e

Mod  MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
1    00-05-30-00-40-b6 to 00-05-30-00-40-ba
2    00-05-30-00-11-22 to 00-05-30-00-11-26

* this terminal session

'show environment'
Clock:
----------------------------------------------------------
Clock           Model                Hw         Status
----------------------------------------------------------
A               Clock Module         --         ok/active
B               Clock Module         --         ok/standby

Fan:
-----------------------------------------------------
Fan             Model                Hw         Status
-----------------------------------------------------
Chassis         DS-2SLOT-FAN         0.0        ok
PS-1            --                   --         ok
PS-2            --                   --         absent

Temperature:
------------------------------------------------------------------
Module   Sensor   MajorThresh   MinorThres   CurTemp     Status
                  (Celsius)    (Celsius)    (Celsius)
------------------------------------------------------------------
1        1        75           60           30          ok
1        2        65           50           28          ok
1        3        -127         -127         40          ok
1        4        -127         -127         36          ok

2        1        75           60           32          ok
2        2        65           50           26          ok
2        3        -127         -127         41          ok
2        4        -127         -127         31          ok
```

```
Power Supply:
------------------------------------------------------
PS  Model                Power     Power       Status
                         (Watts)   (Amp @42V)
------------------------------------------------------
1   WS-CAC-950W          919.38    21.89       ok
2                        --        --          absent


Mod Model                Power     Power       Power     Power       Status
                         Requested Requested   Allocated Allocated
                         (Watts)   (Amp @42V)  (Watts)   (Amp @42V)
--- -------------------  -------   ----------  --------- ----------  ----------
1    DS-X9216-K9-SUP     220.08    5.24        220.08    5.24        powered-up
2    DS-X9032            199.92    4.76        199.92    4.76        powered-up

Power Usage Summary:
--------------------
Power Supply redundancy mode:                  redundant

Total Power Capacity                           919.38   W

Power reserved for Supervisor(s)[-]            220.08   W
Power reserved for Fan Module(s)[-]            47.88    W
Power currently used by Modules[-]             199.92   W

                                               -------
Total Power Available                          451.50
```

show telnet server

The **show telnet server** command displays the state of the Telnet access configuration.

show telnet server

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

```
switch# show telnet server
telnet service enabled
```

show terminal

To view the terminal information, use the **show terminal** command

show terminal

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays terminal information.

```
switch# show terminal
TTY:  Type: "vt100"
Length: 25 lines, Width: 80 columns
Session Timeout: 30 minutes
```

show tlport

To view configured TL port information, use the **show tlport** command

show tlport {discapp [fcid *fcid-id* **| verbose | vsan** *vsan-id***] | interface [all | private | proxied | topology | unsupported] | list [vsan** *vsan-id***]}**

Syntax Description

discapp	Shows private N port parameters.
fcid *fcid-id*	Specifies the FCID of the N port.
verbose	Specifies the verbose mode.
vsan *vsan-id*	Specifies the N port VSAN.
interface	Shows TL ports in the selected interface.
all	Shows all proxied & private devices on this TL Port.
private	Shows all private devices on this TL Port.
proxied	Shows all proxied devices on this TL Port.
topology	Shows loop topology for this TL Port.
unsupported	Shows all unsupported devices on this TL Port.
list	Shows TL ports in all VSANs.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

The **show tlport** command displays the TL port interface configurations. This command provides a list of all TL ports configured on a box and shows the associated VSAN, the FC ID for the port (only domain and area are valid), and the current operational state of the TL port (up or initializing).

Examples

The following example displays the TL ports in all VSANs

```
switch# show tlport list
-------------------------------
Interface Vsan FC-ID    State
------------------------ ------
fc1/16    1    0x420000 Init
fc2/26    1    0x150000 Up
```

The following example displays the detailed information for a specific TL port

```
switch# show tlport interface fc1/16 all
fc1/16 is up, vsan 1, FCID 0x420000
```

```
--------------------------------------------------------------------------------
alpa pWWN                   nWWN                   SCSI Type Device  FC-ID
--------------------------------------------------------------------------------
0x01 20:10:00:05:30:00:4a:de 20:00:00:05:30:00:4a:de Initiator Proxied 0xfffc42
0x73 22:00:00:20:37:39:ae:54 20:00:00:20:37:39:ae:54 Target    Private 0x420073
0xef 20:10:00:05:30:00:4a:de 20:00:00:05:30:00:4a:de Initiator Switch  0x0000ef
```

The following example displays TL port information for private devices

```
switch# show tlport int fc1/16 pri
fc1/16 is up, vsan 1, FCID 0x420000
------------------------------------------------------------------------
alpa pWWN                   nWWN                   SCSI Type FC-ID
------------------------------------------------------------------------
0x73 22:00:00:20:37:39:ae:54 20:00:00:20:37:39:ae:54 Target    0x420073
0x74 22:00:00:20:37:38:d3:de 20:00:00:20:37:38:d3:de Target    0x420074
```

The following example displays TL port information for proxied devices

```
switch# show tlport int fc1/16 prox
fc1/16 is up, vsan 1, FCID 0x420000
------------------------------------------------------------------------
alpa pWWN                   nWWN                   SCSI Type FC-ID
------------------------------------------------------------------------
0x01 20:10:00:05:30:00:4a:de 20:00:00:05:30:00:4a:de Initiator 0xfffc42
0x02 21:00:00:e0:8b:01:95:e7 20:00:00:e0:8b:01:95:e7 Initiator 0x420100
```

show trunk protocol

To show trunk protocol information, use the **show trunk protocol** command.

show trunk protocol

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays trunk protocol

```
switch# show trunk protocol
Trunk protocol is enabled
```

show user-account

Use the **show user-account** command to display configured information about user accounts.

show user-account [*user-name*]

Syntax Description		
	user-name	Displays the user account information for the specified user name.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays information for a specified user.

```
switch# show user-account user1
user:user1
        this user account has no expiry date
        roles:network-operator
no password set. Local login not allowed
Remote login through RADIUS is possible
```

The following example displays information for all users.

```
switch# show user-account
show user-account
user:admin
        this user account has no expiry date
        roles:network-admin

user:usam
        expires on Sat May 31 00:00:00 2003
        roles:network-admin network-operator

user:msam
        this user account has no expiry date
        roles:network-operator

user:user1
        this user account has no expiry date
        roles:network-operator
no password set. local login not allowed
Remote login through RADIUS is possible
```

show users

The **show users** command displays all users currently accessing the switch.

show users

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays all users.

```
switch# show users
switch# show users
admin    pts/7        Jan 12 20:56 (10.77.202.149)
admin    pts/9        Jan 12 23:29 (modena.cisco.com)
admin    pts/10       Jan 13 03:05 (dhcp-171-71-58-120.cisco.com)
admin    pts/11       Jan 13 01:53 (dhcp-171-71-49-49.cisco.com)
```

show version

To show the version of system software that is currently running on the switch, use the **show version** command.

show version { image [bootflash: | slot0:]*image-filename* **| [module** *module-number* **{ epld} [epld** *url* **] }**

Syntax Description

image	Shows the software version of a given image.
bootflash:	Source location for internal bootflash memory
slot0:	Source location for the CompactFlash memory or PCMCIA card.
image-filename	The name of the system or kickstart image.
module	Shows the software version of a module.
module-number	Slot number in which the required module resides.
epld	Shows all current versions of EPLDs on a specified module.
epld *url*	Shows all EPLD versions that are available at the specified URL (bootflash:, ftp:, scp:, sftp:, slot0:, tftp:, or volatile:)

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2) and modified in Release 1.0(3).

Usage Guidelines

Use the **show version image** command to verify the integrity of the image before loading the images. This command can be used for both the system and kickstart images.

Use the **show version** command to verify the version on the active and standby supervisor modules before and after an upgrade.

Examples

The following examples depict version of the system, kickstart, and failed images.

```
switch(boot)# show version image bootflash:system_image <------------system image
 image name: m9500-sf1ek9-mz.1.0.3.bin
 system:     version 1.0(3)
 compiled:   10/25/2010 12:00:00

switch(boot)# show version image bootflash:kickstart_image <-------------kickstart image
  image name: m9500-sf1ek9-kickstart-mz.1.0.3.upg.bin
  kickstart:  version 1.0(3)
  loader:     version 1.0(3)
  compiled:   10/25/2010 12:00:00

switch# show version image bootflash:bad_image <--------------failure case
Md5 Verification Failed
```

```
Image integrity check failed
```

The following example displays current EPLD versions for a specified module.

```
switch# show version module 2 epld
Module Number                       2
EPLD Device                   Version
------------------------------------
Power Manager                    0x06
XBUS IO                          0x07
UD chip Fix                      0x05
Sahara                           0x05
```

The following example displays available EPLD versions.

```
switch# show version epld scp://user@10.6.16.22/users/dino/epld.img
user@10.6.16.22's password:

Module Name                      EPLD Device         Version
------------------------------------------------------------
Supervisor/Fabric-1              XBUS 1 IO              0x09
                                 XBUS 2 IO              0x0c
                                 UD chip Fix            0x05
                                 Sahara                 0x04
1/2 Gbps FC 16 port              XBUS IO                0x08
                                 Sahara                 0x05
1/2 Gbps FC 32 port              XBUS IO                0x07
                                 Sahara                 0x05
Virtualization Linecard          XBUS IO                0x07
                                 UD chip Fix            0x05
                                 Golden Gate            0x04
IP Storage Module                XBUS IO                0x02
                                 UD chip Fix            0x05
                                 Sahara                 0x05
                                 Mainboard Bally        0x12
                                 Daughter card Bally    0x08
20/40 Port FC Fabric Switch      XBUS IO                0x03
```

The following example displays the entire output for the show version command.

```
switch# show version
Cisco Storage Area Networking Operating System (SAN-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2003, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained herein are owned by
Andiamo Systems, Inc. and/or other third parties and are used and
distributed under license. Some parts of this software are covered
under the GNU Public License. A copy of the license is available
at http://www.gnu.org/licenses/gpl.html.

Software
  BIOS:      version 1.0.8
  loader:    version 1.1(2)
  kickstart: version 2.0(1) [build 2.0(0.6)] [gdb]
  system:    version 2.0(1) [build 2.0(0.6)] [gdb]

  BIOS compile time:       08/07/03
  kickstart image file is: bootflash:///m9500-sf1ek9-kickstart-mzg.2.0.0.6.bin
  kickstart compile time:  10/25/2010 12:00:00
  system image file is:    bootflash:///m9500-sf1ek9-mzg.2.0.0.6.bin
  system compile time:     10/25/2020 12:00:00


Hardware
  RAM 1024584 kB
```

```
bootflash: 1000944 blocks (block size 512b)
slot0:           0 blocks (block size 512b)

172.22.92.181 uptime is 0 days 2 hours 18 minute(s) 1 second(s)

Last reset at 970069 usecs after Tue Sep 16 22:31:25 1980
  Reason: Reset Requested by CLI command reload
  System version: 2.0(0.6)
  Service:
```

The following examples provide a before and after comparison scenario after the loader version is updated.

```
switch# show version
Cisco Storage Area Networking Operating System (SAN-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2003 by Cisco Systems, Inc. All rights reserved.
The copyright for certain works contained herein are owned by
Andiamo Systems, Inc. and/or other third parties and are used and
distributed under license.
Software
  BIOS:      version 1.0(3)
  loader:    version 1.0(2) <----------existing version
  kickstart: version 1.0(3)
  system:    version 1.0(3)
  BIOS compile time:       11/18/02
  kickstart image file is: bootflash:/kickstart_image
  kickstart compile time:  1/20/2003 12:00:00
  system image file is:    bootflash:/system_image
  system compile time:     1/20/2003 12:00:00

switch# show version
Cisco Storage Area Networking Operating System (SAN-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2003 by Cisco Systems, Inc. All rights reserved.
The copyright for certain works contained herein are owned by
Andiamo Systems, Inc. and/or other third parties and are used and
distributed under license.
Software
  BIOS:      version 1.0(3)
  loader:    version 1.0(3) <----------new version
.....
```

The following example show the version details for a specified module.

```
switch# show ver mod 4
Mod No   Mod Type       SW Version           SW Interim Version
4        LC             1.0(3)               1.0(3)
```

show vrrp

Use the **show vrrp vr** command to display the VRRP configuration information

show vrrp [statistics | vr [*integer* **interface** *group***]**

Syntax Description

statistics	Shows cumulative vrrp statistics for this machine.
vr	Shows virtual router information.
group	The ID of the group (1-255).
interface	Enter **mgmt** for management interface, or VSAN for the IPFC VSAN interface.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays VRRP configured information.

```
switch# show vrrp vr 7 interface vsan 2 configuration
vr id 7 configuration
admin state down
priority 100
no authentication
advertisement-Interval 1
preempt yes
tracking interface vsan1 priority 2
protocol IP
```

The following example displays VRRP status information.

```
switch# show vrrp vr 7 interface vsan 2 status
vr id 7 status
MAC address 00:00:5e:00:01:07
Operational state: init
```

The following example displays VRRP statistics

```
switch# show vrrp vr 7 interface vsan 2 statistics
vr id 7 statistics
Become master 0
Advertisement 0
Advertisement Interval Error 0
Authentication Failure 0
TTL Error 0
Priority 0 Received 0
Priority 0 Sent 0
Invalid Type 0
Mismatch Address List 0
Invalid Authentication Type 0
Mismatch Authentication 0
Invalid Packet Length 0
```

The following example displays VRRP cumulative statistics.

```
switch# show vrrp statistics
Invalid checksum 0
Invalid version 0
Invalid VR ID 0
```

show vsan

Use the **show vsan** command to display information about configured VSAN.

show vsan [*vsan-range* **] | [membership interface (** **fc** *slot/port* **| fv** *slot/dpp-number/fv-port* **| portchannel** *portchannel-number. subinterface-number* **)] | usage]]**

Syntax Description

vsan *vsan-range*	The VSAN ID range (from 1 to 4093).
membership	Shows membership information.
interface	Specifies the interface type.
fc *slot/port*	Displays the Fibre Channel interface in the specified slot/port.
fv *slot/dpp-number/fv-port*	Displays the virtual F port (FV port) interface in the specified slot along with the data path processor (DPP) number and the FV port number.
port-channel *portchannel-number. subinterface-number*	Displays the PortChannel interface specified by the PortChannel number followed by a dot (.) indicator and the subinterface number.
usage	Shows VSAN usage in the system.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

For the **show vsan membership interface** command, interface information is not displayed if interfaces are not configured on this VSAN.

The interface range must be in ascending order and non-overlapping. You can specify a range using a hyphen and several interfaces using commas:

- The interface range format for a FC interface range is
  fc*slot/port - port* , fc*slot/port* , fc*slot/port*
  (For example, `show int fc1/1 - 3 , fc1/5 , fc2/5`)
- The interface range format for a FV interface range is
  fv*slot/dpp/fvport - fvport* , fv*slot/dpp/port* , fv*slot/dpp/port*
  (For example, `show int fv2/1/1 - 3 , fv2/1/5 , fv2/2/5`)
- The format for a PortChannel is
  port-channel *portchannel-number. subinterface-number*
  (For example, **show int port-channel** *portchannel-number. subinterface-number)*

Examples

The following examples displays configured VSAN information.

```
switch# show vsan 1
vsan 1 information
         name:VSAN0001  state:active
         interoperability mode:yes ß verify mode
         loadbalancing:src-id/dst-id/oxid
         operational state:up

switch# show vsan usage
4 vsan configured
configured vsans:1-4
vsans available for configuration:5-4093

switch # show vsan 1 membership
vsan 1 interfaces:
        fc1/1   fc1/2   fc1/3   fc1/4   fc1/5   fc1/6   fc1/7   fc1/9
        fc1/10  fc1/11  fc1/12  fc1/13  fc1/14  fc1/15  fc1/16  port-channel 99
```

The following example displays membership information for all VSANs

```
switch # show vsan membership
vsan 1 interfaces:
        fc2/16  fc2/15  fc2/14  fc2/13  fc2/12  fc2/11  fc2/10  fc2/9
        fc2/8   fc2/7   fc2/6   fc2/5   fc2/4   fc2/3   fc2/2   fc2/1
        fc1/16  fc1/15  fc1/14  fc1/13  fc1/12  fc1/11  fc1/10  fc1/9
        fc1/7   fc1/6   fc1/5   fc1/4   fc1/3   fc1/2   fc1/1
vsan 2 interfaces:
vsan 7 interfaces:
        fc1/8
vsan 100 interfaces:
vsan 4094(isolated vsan) interfaces:
```

The following example displays membership information for a specified interface.

```
switch # show vsan membership interface fc1/1
fc1/1
        vsan:1
        allowed list:1-4093

switch# show vsan
vsan 1 information
         name:VSAN0001  state:active
         interoperability mode:default
         loadbalancing:src-id/dst-id/oxid
         operational state:up

vsan 2 information
         name:VmVSAN  state:active
         interoperability mode:default
         loadbalancing:src-id/dst-id/oxid
         operational state:up

vsan 3 information
         name:Disk_A  state:active
         interoperability mode:default
         loadbalancing:src-id/dst-id/oxid
         operational state:up

vsan 4 information
         name:Host_B  state:active
         interoperability mode:default
         loadbalancing:src-id/dst-id/oxid
         operational state:up
```

```
vsan 4094:isolated_vsan

switch# show vsan membership interface fv 2/1/3 , fv2/1/5 - 7
fv2/1/3
        vsan:2
        allowed list:1-4093
fv2/1/5
        vsan:3
        allowed list:1-4093
fv2/1/6
        vsan:4
        allowed list:1-4093
fv2/1/7
        vsan:4
        allowed list:1-409
```

show wwn

Use the **show wwn** commands to display the status of the WWN configuration.

show wwn [status *block-id number* | **switch**]

Syntax Description

status	Shows overall WWN Usage and Alarm Status
switch	Shows switch WWN.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example displays the WWN of the switch:

```
switch# show wwn switch
Switch WWN is 20:01:ac:16:5e:52:00:01
```

show zone

To display zone information, use the **show zone** command.

show zone
active [vsan *vsan-range* **] |**
change event-history [vsan *vsan-range* **] |**
member [fcalias *alias-name* **| fcid** *fcid-id* **| pwwn** *wwn* **(lun** *lun-id)* **] [active | vsan** *vsan-range***] |**
merge event-history | [interface *interface* **vsan** *vsan-id* **] |**
name *string* **[active | vsan** *vsan-range***] |**
statistics [lun-zoning | read-only-zoning | vsan *vsan-range* **] |**
status [vsan *vsan-range* **]**
vsan *vsan-range*

Syntax Description

active	Shows zones which are part of active zoneset.
change	Shows log transaction changes.
member	Shows all zones in which the given member is part of.
merge	Shows log transaction merges.
name	Shows members of a specified zone.
statistics	Shows zone server statistics.
status	Shows zone server current status.
vsan *vsan-range*	Shows zones belonging to the specified VSAN or VSAN range for multiple VSANs (ranges from 1 to 4093).
lun *lun-id*	Shows zones belonging to the specified pWWN with the specified LUN ID>
lun-zoning	Shows LUN zoning related statistics
read-only-zoning	Shows read-only zoning related statistics

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

None.

Examples

The following example displays configured zone information.

```
switch# show zone
zone name Zone3 vsan 1
  pwwn 21:00:00:20:37:6f:db:dd
  pwwn 21:00:00:20:37:9c:48:e5
zone name Zone2 vsan 2
  fwwn 20:41:00:05:30:00:2a:1e
  fwwn 20:42:00:05:30:00:2a:1e
  fwwn 20:43:00:05:30:00:2a:1e
zone name Zone1 vsan 1
  pwwn 21:00:00:20:37:6f:db:dd
  pwwn 21:00:00:20:37:a6:be:2f
  pwwn 21:00:00:20:37:9c:48:e5
  fcalias Alias1
zone name Techdocs vsan 3
  ip-address 10.15.0.0 255.255.255.0
```

Use the **show zone vsan** command to display zone information for a specific VSAN.

```
switch# show zone vsan 1
zone name Zone3 vsan 1
  pwwn 21:00:00:20:37:6f:db:dd
  pwwn 21:00:00:20:37:9c:48:e5
zone name Zone2 vsan 1
  fwwn 20:41:00:05:30:00:2a:1e
  fwwn 20:42:00:05:30:00:2a:1e
  fwwn 20:43:00:05:30:00:2a:1e
  fwwn 20:44:00:05:30:00:2a:1e
  fwwn 20:45:00:05:30:00:2a:1e
  fwwn 20:46:00:05:30:00:2a:1e
  fwwn 20:47:00:05:30:00:2a:1e
  fwwn 20:48:00:05:30:00:2a:1e
  fwwn 20:49:00:05:30:00:2a:1e
  fwwn 20:4a:00:05:30:00:2a:1e
  fwwn 20:4b:00:05:30:00:2a:1e
  fwwn 20:4c:00:05:30:00:2a:1e
  fwwn 20:4d:00:05:30:00:2a:1e
  fwwn 20:4e:00:05:30:00:2a:1e
  fwwn 20:4f:00:05:30:00:2a:1e
  fwwn 20:50:00:05:30:00:2a:1e
  fwwn 20:51:00:05:30:00:2a:1e
  fwwn 20:52:00:05:30:00:2a:1e
  fwwn 20:53:00:05:30:00:2a:1e
  fwwn 20:54:00:05:30:00:2a:1e
  fwwn 20:55:00:05:30:00:2a:1e
  fwwn 20:56:00:05:30:00:2a:1e
  fwwn 20:57:00:05:30:00:2a:1e
  fwwn 20:58:00:05:30:00:2a:1e
  fwwn 20:59:00:05:30:00:2a:1e
  fwwn 20:5a:00:05:30:00:2a:1e
  fwwn 20:5b:00:05:30:00:2a:1e
  fwwn 20:5c:00:05:30:00:2a:1e
  fwwn 20:5d:00:05:30:00:2a:1e
  fwwn 20:5e:00:05:30:00:2a:1e
  fwwn 20:5f:00:05:30:00:2a:1e
  fwwn 20:60:00:05:30:00:2a:1e
zone name Zone1 vsan 1
  pwwn 21:00:00:20:37:6f:db:dd
  pwwn 21:00:00:20:37:a6:be:2f
  pwwn 21:00:00:20:37:9c:48:e5
  fcalias Alias1
```

Use the **show zone name** command to display members of a specific zone.

```
switch# show zone name Zone1
zone name Zone1 vsan 1
  pwwn 21:00:00:20:37:6f:db:dd
  pwwn 21:00:00:20:37:a6:be:2f
  pwwn 21:00:00:20:37:9c:48:e5
  fcalias Alias1
```

Use the **show zone member** command to display all zones to which a member belongs using the FC ID.

```
switch# show zone member pwwn 21:00:00:20:37:9c:48:e5
           VSAN: 1
zone Zone3
zone Zone1
fcalias Alias1
```

Use the **show zone statistics** command to display the number of control frames exchanged with other switches.

```
switch# show zone statistics
Statistics For VSAN: 1
**********************************
Number of Merge Requests Sent: 24
Number of Merge Requests Recvd: 25
Number of Merge Accepts Sent: 25
Number of Merge Accepts Recvd: 25
Number of Merge Rejects Sent: 0
Number of Merge Rejects Recvd: 0
Number of Change Requests Sent: 0
Number of Change Requests Recvd: 0
Number of Change Rejects Sent: 0
Number of Change Rejects Recvd: 0
Number of GS Requests Recvd: 0
Number of GS Requests Rejected: 0
Statistics For VSAN: 2
**********************************
Number of Merge Requests Sent: 4
...
Number of GS Requests Rejected: 0
```

Use the **show zone statistics lun-zoning** command to display LUN-zoning details.

```
switch# show zone statistics lun-zoning
LUN zoning statistics for VSAN: 1
************************************************************
S-ID: 0x123456, D-ID: 0x22222, LUN: 00:00:00:00:00:00:00:00
------------------------------------------------------------
Number of Inquiry commands received:         10
Number of Inquiry data No LU sent:            5
Number of Report LUNs commands received:     10
Number of Request Sense commands received:    1
Number of Other commands received:            0
Number of Illegal Request Check Condition sent: 0

S-ID: 0x123456, D-ID: 0x22222, LUN: 00:00:00:00:00:00:00:01
------------------------------------------------------------
Number of Inquiry commands received:          1
Number of Inquiry data No LU sent:            1
Number of Request Sense commands received:    1
Number of Other commands received:            0
Number of Illegal Request Check Condition sent:  0
```

Use the **show zone statistics read-only-zoning** command to display read-only zone details.

```
switch# show zone statistics read-only-zoning
Read-only zoning statistics for VSAN: 2
************************************************************
S-ID: 0x33333, D-ID: 0x11111, LUN: 00:00:00:00:00:00:00:64
------------------------------------------------------------
Number of Data Protect Check Condition Sent:  12
```

Use the **show zone status** command to display the status of configured zones.

```
switch# show zone status
VSAN: 1 default-zone: permit distribute: active only Interop: 100
Full Zoning Database :
    Zonesets:0  Zones:0 Aliases: 0
Active Zoning Database :
    Database Not Available
Status:
...
VSAN: 9 default-zone: permit distribute: active only Interop: 100
Full Zoning Database :
    Zonesets:0  Zones:0 Aliases: 0
Active Zoning Database :
    Database Not Available
Status:
```

show zoneset

Use the **show zoneset** command to view the configured zone sets.

show zoneset
active [vsan *vsan-id* **] |**
brief [active] | [vsan *vsan-id* **] |**
name [active] | [brief] [vsan *vsan-id* **]|**
vsan *vsan-id*

Syntax Description

active	Shows only active zonesets.
brief	Shows members in brief mode.
name	Shows members of a specified zoneset.
vsan	Shows zonesets belonging to the specified VSAN.
vsan-id	The ID of the VSAN is from 1 to 4093.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

None.

Examples

The following example displays configured zoneset information.

```
switch# show zoneset vsan 1
zoneset name ZoneSet2 vsan 1
  zone name Zone2 vsan 1
    fwwn 20:4e:00:05:30:00:2a:1e
    fwwn 20:4f:00:05:30:00:2a:1e
    fwwn 20:50:00:05:30:00:2a:1e
    fwwn 20:51:00:05:30:00:2a:1e
    fwwn 20:52:00:05:30:00:2a:1e
  zone name Zone1 vsan 1
    pwwn 21:00:00:20:37:6f:db:dd
    pwwn 21:00:00:20:37:a6:be:2f
    pwwn 21:00:00:20:37:9c:48:e5
    fcalias Alias1
zoneset name ZoneSet1 vsan 1
  zone name Zone1 vsan 1
    pwwn 21:00:00:20:37:6f:db:dd
    pwwn 21:00:00:20:37:a6:be:2f
    pwwn 21:00:00:20:37:9c:48:e5
    fcalias Alias1
```

The following example displays configured zone set information for a specific VSAN.

```
switch# show zoneset vsan 2-3
zoneset name ZoneSet2 vsan 1
  zone name Zone2 vsan 1
    fwwn 20:52:00:05:30:00:2a:1e
    fwwn 20:53:00:05:30:00:2a:1e
    fwwn 20:54:00:05:30:00:2a:1e
    fwwn 20:55:00:05:30:00:2a:1e
    fwwn 20:56:00:05:30:00:2a:1e
  zone name Zone1 vsan 1
    pwwn 21:00:00:20:37:6f:db:dd
    pwwn 21:00:00:20:37:a6:be:2f
    pwwn 21:00:00:20:37:9c:48:e5
    fcalias Alias1
zoneset name ZoneSet1 vsan 1
  zone name Zone1 vsan 1
    pwwn 21:00:00:20:37:6f:db:dd
    pwwn 21:00:00:20:37:a6:be:2f
    pwwn 21:00:00:20:37:9c:48:e5
    fcalias Alias1
```

T Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

tacacs+ enable

To enable TACACS+ in a switch, use the **tacacs+ enable** command in configuration mode. Use the **no** form of the command to revert to factory defaults.

tacacs+ enable

Syntax Description

tacacs+ enable	Enables the TACACS+ feature in the switch.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Further TACACS+ commands are only available when the TACACS+ feature is enabled.

Using SHA-1 as the hash algorithm may prevent RADIUS or TACACS+ usage.

Examples

```
switch## config t
switch(config)# # tacacs+ enable
switch(config)#
```

Related Commands

Command	Description
show tacacs+	Displays configured FC-SP information.

tacacs-server host

To configure TACACS+ server options in a switch, use the **tacacs-server** command in configuration mode. This command is only available when the TACACS+ feature is enabled. Use the **no** form of the command to revert to factory defaults.

tacacs-server host *server-name or ip-address*
[key [0|7] *shared-secret***] [port** *port-number***] [timeout** *seconds***]**

no tacacs-server host *server-name or ip-address*
[key [0|7] *shared-secret***] [port** *port-number***] [timeout** *seconds***]**

Syntax Description

server-name or ip-address	Enters TACACS+ server's DNS name or its IP address. The maximum character size is 256.
port *port-number*	TACACS+ server's port for authentication.
key	TACACS+ server's shared secret.
0	Configures a preshared key specified in clear text (indicated by 0) to authenticate communication between the TACACS+ client and server. This is the default.
7	Configures a preshared key specified in encrypted text (indicated by 7) to authenticate communication between the TACACS+ client and server.
shared secret	Configures a preshared key to authenticate communication between the TACACS+ client and server.
timeout	TACACS+ server timeout period in seconds.
seconds	Specifies the time (in seconds) between retransmissions to the TACACS+ server. The default is one (1) second and the valid range is 1 to 60 seconds.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following examples provide various scenarios to configure TACACS+ authentication.

```
switch# config t
switch(config)# tacacs-server host 10.10.2.3 key HostKey

switch(config)# tacacs-server host tacacs2 key 0 abcd

switch(config)# tacacs-server host tacacs3 key 7 1234
```

tacacs-server key

To configure a global RADIUS shared secret, use the **tacacs-server key** command. Use the **no** form of this command to removed a configured shared secret.

tacacs-server key [0 | 7] *shared secret*

no tacacs-server key [0 | 7] *shared secret*

Syntax Description

key	Global TACACS+ shared secret.
0	Configures a preshared key specified in clear text (indicated by 0) to authenticate communication between the TACACS+ client and server. This is the default.
7	Configures a preshared key specified in encrypted text (indicated by 7) to authenticate communication between the TACACS+ client and server.
shared secret	Configures a preshared key to authenticate communication between the TACACS+ client and server.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

You need to configure the TACAACS preshared key to authenticate the switch to the RADIUS server. The length of the key is restricted to 65 characters and can include any printable ASCII characters (white spaces are not allowed). You can configure a global key to be used for all RADIUS server configurations on the switch. You can override this global key assignment by explicitly using the **key** option in the **tacacs-server host** command.

Examples

The following examples provide various scenarios to configure RADIUS authentication.

```
switch# config t

switch(config)# tacacs-server key AnyWord

switch(config)# tacacs-server key 0 AnyWord

switch(config)# tacacs-server key 7 public
```

tacacs-server timeout

To specify the time between retransmissions to the TACACS+ servers, use the **tacacs-server timeout** command. You can revert the retransmission time to its default by issuing the **no** form of this command.

tacacs-server timeout *seconds*

notacacs-server timeout *seconds*

Syntax Description

timeout	RADIUS server timeout period in seconds.
seconds	Specifies the time (in seconds) between retransmissions to the RADIUS server. The default is one (1) second and the valid range is 1 to 60 seconds.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(2).

Usage Guidelines

None.

Examples

The following examples provide various scenarios to configure RADIUS authentication.

```
switch# config t

switch(config)# tacacs-server timeout 30
```

tail

To display the last lines (tail end) of a specified file, use the **tail** command in EXEC mode.

tail *filename* [*number-of-lines*]

Syntax Description

filename	The name of the file for which you want to view the last lines.
number-of-lines	(Optional) The number of lines you want to view. If you do not specify the number of lines, the last 10 lines are displayed.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

You need two separate CLI terminals to use this command. In one terminal, execute the run-script or any other desired command. In the other, issue the **tail** command for the mylog file. In the second terminal, you will see the last lines of the mylog file (as it grows) that is being saved in response to the command issued in the first terminal.

If you specify a long file and would like to exit in the middle, enter **Ctrl-c** to exit this command.

Examples

The following example displays the last lines (tail end) of a specified file.

```
switch# run-script slot0:test mylog
```

In another terminal, issue the **tail** command for the mylog file.

```
switch# tail mylog
config t
```

In the second CLI terminal, you see the last lines of the mylog file (as it grows) that is being saved in response to the command issued in the first terminal.

tcp-connection

To configure the number of TCP connections for the FCIP interface, use the **tcp-connection** option. To revert to the default of two attempts, use the **no** form of the option.

tcp-connection *number*

no tcp-connection *number*

Syntax Description

tcp-connection	Configures the number of TCP connection attempts.
number	Enters the number of attempts (1 or 2).

Defaults

None.

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

Use the **tcp-connection** option to specify the number of TCP connections from a FCIP link. By default, the switch tries two (2) TCP connections for each FCIP link.

Examples

```
switch# config t
switch(config)# interface fcip 50
switch(config-if)# tcp-connection 1
switch(config-if)# no tcp-connection 1
```

Related Commands

Command	Description
show interface fcip	Displays an interface configuration for a specified FCIP interface.

tcp cwm

To configure congestion window monitoring (cwm) TCP parameters in a Cisco MDS 9000 Family switch, use the **tcp cwm** command. Use the **no** form of this command to disable this feature or revert to its factory defaults.

tcp cwm (burstsize *burstsize***)**

no tcp cwm (burstsize *burstsize***)**

Syntax Description

tcp	Configures TCP parameters for the FCIP profile.
cwm	Enables congestion monitoring.
burstsize	Configures TCP burstsize.
burstsize	Specifies the burstsize ranging from 10 to 100 KB.

Defaults

None.

Command Modes

Configuration mode—fcip profile submode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Use these TCP parameters to control TCP retransmission behavior in a switch.

Examples

The following example configures a FCIP profile and enables congestion monitoring.

```
switch## config t
switch(config)# fcip profile 5
switch(config-profile)# tcp cwm
```

The following example assigns the burstsize value at 20 KB:

```
switch(config-profile)# tcp cwm burstsize 20
```

The following example disables congestion monitoring.

```
switch(config-profile)# no tcp cwm
```

The following example leaves the CWM feature in an enabled state but changes the burstsize to the default of 10 KB.

```
switch(config-profile)# no tcp cwm burstsize 25
```

tcp keepalive-timeout

To configure the interval between which the TCP connection verifies if the FCIP link is functioning, use the **tcp keepalive-timeout** command. Use the **no** form of this command to disable this feature or revert to its factory defaults.

tcp keepalive-timeout *seconds*

no tcp keepalive-timeout *seconds*

Syntax Description

tcp	Configures TCP parameters for the FCIP profile.
keepalive-timeout	Specifies the keepalive timeout interval for the TCP connection.
seconds	Specifies the time in seconds.

Defaults

None.

Command Modes

Configuration mode—fcip profile submode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

The default is 60 seconds. The range is from 1 to 7200 seconds.

This command can be used to detect FCIP link failures.

Examples

The following example configures a FCIP profile:

```
switch## config t
switch(config)# fcip profile 5
```

The following example specifies the keepalive timeout interval for the TCP connection:

```
switch(config-profile)# tcp keepalive-timeout 120
```

tcp maximum-bandwidth

To manage the window size, use the **tcp maximum-bandwidth** command. Use the **no** form of this command to disable this feature or revert to its factory defaults.

tcp max-bandwidth-mbps *bandwidth* **min-available-bandwidth-mbps** *threshold* **round-trip-time-ms** *milliseconds* **round-trip-time-us** *microeconds*

no tcp max-bandwidth-mbps *bandwidth* **min-available-bandwidth-mbps** *threshold* **round-trip-time-ms** *seconds* **round-trip-time-us** *microeconds*

Syntax Description

tcp	Configures TCP parameters for the FCIP profile.
max-bandwidth-mbps	Configures the maximum available end-to-end bandwidth in the path.
bandwidth	Specifies the Mbps bandwidth.
min-available-bandwidth-mbps	Configures the minimum slow start threshold.
threshold	Specifies the Mbps threshold.
round-trip-time-ms *milliseconds*	Configures the estimated round trip time across the IP network to reach the FCIP peer end point. in milliseconds
round-trip-time-us *microeconds*	Configures the estimated round trip time across the IP network to reach the FCIP peer end point. in microseconds

Defaults

Enabled.

Command Modes

Configuration mode—fcip profile submode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

The **maximum-bandwidth** option and the **round-trip-time** option together determine the window size.

The **minimum-available-bandwidth** option and the **round-trip-time** option together determine the threshold below which TCP aggressively increases its size. After it reaches the threshold the software uses standard TCP rules to reach the maximum available bandwidth. The defaults are max-bandwidth = 1G, min-available-bandwidth = 2 Mbps, and round-trip-time is 10ms

Examples

The following example configures a FCIP profile:

```
switch## config t
switch(config)# fcip profile 5
```

The following example configures the maximum available bandwidth at 900 Mbps, the minimum slow start threshold as 300 Mbps, and the round trip time as 10 milliseconds:

```
switch(config-profile)# tcp max-bandwidth-mbps 900 min-available-bandwidth-mbps 300
round-trip-time-ms 10
```

The following example reverts to the factory defaults. The defaults are max-bandwidth = 1G, min-available-bandwidth = 2 Mbps and round-trip-time is 10ms:

```
switch(config-profile)# no tcp max-bandwidth-mbps 900 min-available-bandwidth-mbps 300
round-trip-time-ms 10
```

The following example configures the maximum available bandwidth at 2000 Kbps, the minimum slow start threshold as 2000 Kbps, and the round trip time as 200 microseconds:

```
switch(config-profile)# tcp max-bandwidth-kbps 2000 min-available-bandwidth-kbps 2000
round-trip-time-us 200
```

tcp max-retransmissions

To specify the maximum number of times a packet is retransmitted before TCP decides to close the connection, use the **tcp max-retransmissions** command. Use the **no** form of this command to disable this feature or revert to its factory defaults.

tcp max-retransmissions *number*

no tcp max-retransmissions *number*

Syntax Description

tcp	Configures TCP parameters for the FCIP profile.
max-retransmissions	Configures the maximum number of retransmissions
number	Specifies the maximum number.

Defaults

Enabled

Command Modes

Configuration mode—fcip profile submode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

The default is 4 and the range is from 1 to 8 retransmissions.

Examples

The following example configures a FCIP profile:

```
switch## config t
switch(config)# fcip profile 5
```

The following example specifies the maximum number of retransmissions :

```
switch(config-profile)# tcp max-retransmissions 6
```

tcp minimum-retransmit time

To control the minimum amount of time TCP waits before retransmitting, use the **tcp minimum-retransmit-time** command. Use the **no** form of this command to disable this feature or revert to its factory defaults.

tcp minimum-retransmit-time *milliseconds*

no tcp minimum-retransmit-time *milliseconds*

Syntax Description

tcp	Configures TCP parameters for the FCIP profile.
minimum-retransmit-time	Controls the retransmit time for the TCP connection.
milliseconds	Specifies the time in milliseconds.

Defaults

None.

Command Modes

Configuration mode—fcip profile submode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

The default is 300 milliseconds and the range is from 250 to 5000 milliseconds.

Examples

The following example configures a FCIP profile:

```
switch## config t
switch(config)# fcip profile 5
```

The following example specifies the minimum TCP retransmit time for the TCP connection:

```
switch(config-profile)# tcp min-retransmit-time 500
```

tcp pmtu-enable

To configure path MTU (PMTU) discovery, use the **tcp pmtu-enable** command. Use the **no** form of this command to disable this feature or revert to its factory defaults.

tcp pmtu-enable [reset-timeout *seconds* **]**

no tcp pmtu-enable [reset-timeout *seconds* **]**

Syntax Description

tcp	Configures TCP parameters for the FCIP profile.
pmtu-enable	Configures PMTU discovery with the default value of 3600 seconds.
reset-timeout	Specifies the PMTU reset timeout.
seconds	Specifies the reset timeout seconds.

Defaults

Enabled

Command Modes

Configuration mode—fcip profile submode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

The default is 3600 seconds and the range is from 60 to 3600 seconds.

Examples

The following example configures a FCIP profile:

```
switch## config t
switch(config)# fcip profile 5
```

The following example disables PMTU discovery:

```
switch(config-profile)# no tcp pmtu-enable
```

The following example enables PMTU discovery with a default of 3600 seconds:

```
switch(config-profile)# tcp pmtu-enable
```

The following example specifies the PMTU reset timeout to 90 seconds:

```
switch(config-profile)# tcp pmtu-enable reset-timeout 90
```

The following example leaves the PMTU in an enabled state but changes the timeout to the default of 3600 seconds:

```
switch(config-profile)# no tcp pmtu-enable reset-timeout 600
```

tcp qos control

To specify the differentiated services code point (DSCP) value to mark all IP packets (type of service—TOS field in the IP header), use the **tcp qos control** command. Use the **no** form of this command to disable this feature or revert to its factory defaults.

tcp qos control *value* **data** *value*

no tcp qos control *value* **data** *value*

Syntax Description

tcp	Configures TCP parameters for the FCIP profile.
qos control *value*	Applies the control DSCP value to all FCIP frames in the control TCP connection.
data *value*	Applies the data DSCP value applies to all FCIP frames in the data connection.

Defaults

Enabled

Command Modes

Configuration mode—fcip profile submode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Use these TCP parameters to control TCP retransmission behavior in a switch.

Examples

The following example configures a FCIP profile:

```
switch## config t
switch(config)# fcip profile 5
```

The following example configures the control TCP connection and data connection to mark all packets on that DSCP value:

```
switch(config-profile)# tcp qos control 3 data 5
```

tcp sack-enable

To configure selective acknowledgment (SACK) to overcome the limitations of multiple lost packets during a TCP transmission, use the **tcp** command. Use the **no** form of this command to disable this feature or revert to its factory defaults.

tcp sack-enable *burstsize*

no tcp sack-enable *burstsize*

Syntax Description

tcp	Configures TCP parameters for the FCIP profile.
sack-enable	Configures the SACK mechanism.

Defaults

Enabled

Command Modes

Configuration mode—fcip profile submode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

The receiving TCP sends back SACK advertisements to the sender. The sender can then retransmit only the missing data segments.

Examples

The following example configures a FCIP profile:

```
switch## config t
switch(config)# fcip profile 5
```

The following example enables the SACJ mechanism on the switch:

```
switch(config-profile)# tcp sack-enable
```

tcp send-buffer-size

To define the required additional buffering—beyond the normal send window size —that TCP allows before flow controlling the switch's egress path for the FCIP interface, use the **tcp send-buffer-size** command. Use the **no** form of this command to disable this feature or revert to its factory defaults.

tcp send-buffer-size *buffer-size*

no tcp send-buffer-size *buffer-size*

Syntax Description

tcp	Configures TCP parameters for the FCIP profile.
send-buffer-size	Defines required additional buffering allowed by TCP.
buffer-size	Specifies the buffer size in KB.

Defaults

Enabled

Command Modes

Configuration mode—fcip profile submode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

The default buffer size is 0 and the valid range is from 0 to 8192 KB.

Examples

The following example configures a FCIP profile:

```
switch## config t
switch(config)# fcip profile 5
```

The following example configure the advertised buffer size to 5000 KB :

```
switch(config-profile)# tcp send-buffer-size 5000
```

telnet

To log in to a host that supports Telnet, use the **telnet** command in EXEC mode.

telnet [hostname | ip-address]

Syntax Description

hostname	(Optional) Host name. Maximum length is 64 characters.
ip-address	(Optional) IP address Maximum length is 64 characters.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example establishes a Telnet session to the specified IP address.

```
switch# telnet 172.22.91.153
Trying 172.22.91.153...
Connected to 172.22.91.153.
Login:xxxxxxxx
Password:xxxxxxxxx
switch#
```

telnet server enable

To enable the Telnet server if you wish to return to a Telnet connection from a secure SSH connection, use the **telnet server enable** command. To disable the Telnet server, use the **no** form of this command

telnet server enable

no telnet server enable

Syntax Description

This command has no arguments or keywords.

Defaults

Enabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example enables the Telnet server.

```
switch(config)# telnet server enable
updated

switch(config)# no telnet server enable
updated
```

Related Commands

Command	Description
telnet	Logs in to a host that supports Telnet.

terminal

To configure terminal attributes, use the **terminal** command in EXEC mode. To stop the display of syslog output, use the **no** form of the command.

terminal [length *number-of-lines* **| monitor | terminal-type | unlock | width** *integer*]

Syntax Description

length	(Optional) Sets the number of lines on the screen.
number-of-lines	(Optional) Specifies the number of lines on the screen from 0 to 512. Enter 0 to scroll continuously.
monitor	(Optional) Displays syslog output for the current terminal and session.
terminal-type	(Optional) Sets the terminal type.
width	(Optional) Sets the width of the display terminal, from 0 to 80.
integer	Sets the width of the display terminal, from 0 to 80.

Defaults

The default number of lines for the length is 24. The default width is 80 lines.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Remember that all terminal parameter-setting commands are set locally and do not remain in effect after a session is ended. You must perform this task at the EXEC prompt at each session to see the debugging messages.

If the length is not 24 and the width is not 80, then you need to set a length and width.

Examples

The following example displays debug command output and error messages during the current terminal session.

```
switch# terminal monitor
Aug  8 10:32:42 sup48 % LOG_PLATFORM-5-PLATFORM_MOD_CFG_PWRDN: Module 1 powered down
Aug  8 10:32:42 sup48 % LOG_PLATFORM-5-PLATFORM_MOD_PWRDN: Module 1 powered down
Aug  8 10:32:42 sup48 % LOG_PLATFORM-5-PLATFORM_MOD_INSERT: Module 1 has been inserted
Aug  8 10:33:12 sup48 % LOG_PLATFORM-5-PLATFORM_MOD_PWRON: Module 1 powered up
Aug  8 10:33:13 sup48 % LOG_MODULE-5-MOD_REG_OK: LCM - Registration succeeded for module 1
Aug  8 10:38:15 sup48 % LOG_PLATFORM-5-PLATFORM_MOD_CFG_PWRDN: Module 1 powered down
Aug  8 10:38:15 sup48 % LOG_PLATFORM-5-PLATFORM_MOD_INSERT: Module 1 has been inserted
Aug  8 10:38:45 sup48 % LOG_MODULE-5-MOD_REG_OK: LCM - Registration succeeded for module 1
Aug  8 10:43:10 sup48 % LOG_PLATFORM-5-PLATFORM_MOD_CFG_PWRDN: Module 1 powered down
Aug  8 10:43:10 sup48 % LOG_PLATFORM-5-PLATFORM_MOD_PWRDN: Module 1 powered down
......
```

The following example stops the current terminal monitoring session.

```
switch# terminal no monitor
```

time-stamp

To enable FCIP time stamps on a frame, use the **time-stamp** option. To disable this option for the selected interface, use the **no** form of the option.

time-stamp | acceptable-diff *number*

no time-stamp | acceptable-diff *number*

Syntax Description

time-stamp	Configures time-stamp.
acceptable-diff	Configures the acceptable time difference for time-stamps.
number	Enters the acceptable time from 1 to 60000.

Defaults

Disabled.

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

The **time-stamp** option instructs the switch to discard frames that are older than a specified time.

Examples

```
switch# config t
switch(config)# interface fcip 50
switch(config-if)# time-stamp
switch(config-if)# time-stamp acceptable-diff 4000
```

Related Commands

Command	Description
show interface fcip	Displays an interface configuration for a specified FCIP interface.

traceroute

To print the route an IP packet takes to a network host, use the **traceroute** command in EXEC mode.

traceroute {*hostname* | *ip-address*}

Syntax Description

host name	The host name.
ip-address	The IP address.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

This command traces the route an IP packet follows to an internet host by launching UDP probe packets with a small TTL (time to live) then listening for an ICMP (Internet Control Message Protocol) "time exceeded" reply from a gateway.

Note Probes start with a TTL of one and increase by one until encountering an ICMP "port unreachable." This means that the host was accessed or a maximum flag was hit. A line is printed showing the TTL, address of the gateway and round trip time of each probe. If the probe answers come from different gateways, the address of each responding system is printed.

Examples

The following example prints the route IP packets take to the network host www.cisco.com.

```
switch# traceroute www.cisco.com
traceroute to www.cisco.com (171.71.181.19), 30 hops max, 38 byte packets
 1  kingfisher1-92.cisco.com (172.22.92.2)  0.598 ms  0.470 ms  0.484 ms
 2  nubulab-gw1-bldg6.cisco.com (171.71.20.130)  0.698 ms  0.452 ms  0.481 ms
 3  172.24.109.185 (172.24.109.185)  0.478 ms  0.459 ms  0.484 ms
 4  sjc12-lab4-gw2.cisco.com (172.24.111.213)  0.529 ms  0.577 ms  0.480 ms
 5  sjc5-sbb4-gw1.cisco.com (171.71.241.174)  0.521 ms  0.495 ms  0.604 ms
 6  sjc12-dc2-gw2.cisco.com (171.71.241.230)  0.521 ms  0.614 ms  0.479 ms
 7  sjc12-dc2-cec-css1.cisco.com (171.71.181.5)  2.612 ms  2.093 ms  2.118 ms
 8  www.cisco.com (171.71.181.19)  2.496 ms *  2.135 ms
```

trunk protocol enable

To configure the trunk protocol, use the **trunk protocol enable** command in configuration mode. To disable the trunk protocol, use the **no** form of the command.

trunk protocol enable

no trunk protocol enable

Syntax Description

This command has no other arguments or keywords.

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

If the trunking protocol is disabled on a switch, no port on that switch can apply new trunk configurations. Existing trunk configurations are not affected—the TE port continues to function in trunking mode, but only supports traffic in VSANs that it negotiated previously (when the trunking protocol was enabled). Also, other switches that are directly connected to this switch are similarly affected on the connected interfaces. In some cases, you may need to merge traffic from different port VSANs across a non-trunking ISL. If so, you need to disable the trunking protocol.

Examples

The following example shows how to enable and disable the trunk protocol feature.

```
switch# config t
switch(config)# trunk protocol enable
switch(config)# no trunk protocol enable
```

CHAPTER 22

U Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

update license

To update an existing license, use the **update license** command in EXEC mode.

update license

Syntax Description

update license	Updates an installed, expiring license.
url	Specifies the license file to be uninstalled.
bootflash:	Specifies the license file location in internal bootflash memory.
slot0:	Specifies the license file in the CompactFlash memory or PCMCIA card.
volatile:	Specifies the license file in the volatile file system.

Command Modes

EXEC.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(2).

Examples

The following example updates a specific license.

```
switch# update license bootflash:sanextn2.lic sanextn1.lic
Updating sanextn1.lic:
SERVER this_host ANY
VENDOR cisco
# An example fcports license
INCREMENT SAN_EXTN_OVER_IP cisco 1.000 permanent 1 HOSTID=VDH=ABCD \
        NOTICE=<LicFileID>san_extn1.lic</LicFileID><LicLineID>0</LicLineID> \
        SIGN=33088E76F668

with bootflash:/sanextn2.lic:
SERVER this_host ANY
VENDOR cisco
# An example fcports license
INCREMENT SAN_EXTN_OVER_IP cisco 1.000 permanent 1 HOSTID=VDH=ABCD \
        NOTICE=<LicFileID>san_extn2.lic</LicFileID><LicLineID>1</LicLineID> \
        SIGN=67CB2A8CCAC2

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

use-profile

To bind a profile to the FCIP interface, use the **use-profile** option. To disable a configured profile, use the **no** form of the option.

use-profile *profile-id*

no use-profile *profile-id*

Syntax Description

use-profile	Configures the interface using an existing profile.
profile-id	Enters the profile ID to be used from 1 to 255.

Defaults

None.

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.1(1).

Usage Guidelines

Access this command from the `switch(config-if)#` submode.

Binds the profile with the FCIP interface.

Examples

```
switch# config t
switch(config)# interface fcip 50
switch(config-if)# use-profile 100
switch(config-if)# no use-profile 100
```

Related Commands

Command	Description
show interface fcip	Displays an interface configuration for a specified FCIP interface.
show fcip	Displays information about the FCIP profile.

username

To define a user, use the **username** command in configuration mode. Use the **no** form of a command to undo the configuration or revert to factory defaults.

username *name* **[expire** *date***] [iscsi] [role** *rolename***] [sshkey** *key_content***] [password [0 | 5** *user-password***] [update-snmpv3]**

no username *name* **[expire** *date***] [iscsi] [role** *rolename***] [sshkey** *key_content***] [password [0 | 5** *user-password***] [update-snmpv3]**

Syntax Description

name	Specifies the name of the user. Maximum length is 32 characters.
expire	Configures the date when this user account expires (in YYYY-MM-DD format).
date	Specifies the expiration date.
iscsi	Identifies an iSCSI user.
password	Configures a password for the user. The password is limited to 64 characters.
user-password	Enters the password. Maximum length is 32 characters.
0	Specifies a clear text password for the user.
5	Specifies a strongly encrypted password for the user.
role	Configures a role which the user is to be assigned.
rolename	Specifies the role name of the user. Maximum length is 32 characters.
sshkey	Updates the SSH key to authenticate a SSH user.
key_content	Specifies the actual contents of the SSH public key.
update-snmpv3	Updates the local CLI password and the SNMPv3 password. The password is limited to a minimum of 8 characters and a maximum of 64 characters.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

To change the SNMP password, a clear text CLI password is required. You must know the SNMPv3 password to change the password using the CLI. Use the CLI password to synchronize the SNMP password.

Examples

The following example shows how to define a user.

```
switch(config)# username knuckles password testpw role bodega
switch(config)# do show user-account
```

```
user:admin
        this user account has no expiry date
        roles:network-admin
user:knuckles
        this user account has no expiry date
        roles:bodega
```

The following example configures the name and password for a a user to login using iSCSI authentication:.

```
switch(config)# username iscsiuser password ffsffsfsffs345353554535 iscsi
```

he following example places you in the mode for the specified role (techdocs). The role submode prompt indicates that you are now in the role submode. This submode is now specific to the techdocs group.

```
switch(config)# role name techdocs
switch(config-role)#
```

The following example deletes the role called techdocs.

```
switch(config)# no role name techdocs
```

The following example assigns a description to the new role. The description is limited to one line and can contain spaces.

```
switch(config-role)# description Entire Tech. Docs. group
```

The following example resets the description for the Tech. Docs. group.

```
switch(config-role)# no description
```

The following example creates or updates the user account (usam) along with a password (abcd) that is set to expire on 2003-05-31.

```
switch(config)# username usam password abcd expire 2003-05-31
```

The following example creates or updates the user account (msam) along with a password (abcd) specified in clear text (indicated by 0).

```
switch(config)# username msam password 0 abcd role network-operator
```

The following example specifies an encrypted (specified by 5) password (!@*asdsfsdfjh!@df) for the user account (user1).

```
switch(config)# username user1 password 5 !@*asdsfsdfjh!@df
```

The following example adds the specified user (usam) to the network-admin role.

```
switch(config)# username usam role network-admin
```

The following example deletes the specified user (usam) from the vsan-admin role.

```
switch(config)# no username usam role vsan-admin
```

The following example identifies the contents of the SSH key for the specified user (usam).

```
switch(config)# username usam sshkey fsafsd2344234234ffgsdfg
```

The following example deletes the SSH key content identification for the user (usam).

```
switch(config)# no username usam sshkey fsafsd2344234234ffgsdfgffsdfsfsfssf
```

The following example updates the SNMPv3 password for the specified user (joe). The local CLI password and the SNMP password are updated. If user Joe does not exist, the command fails.

```
switch(config)# username joe password wxyz6789 update-snmpv3 abcd1234
```

V Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

vsan database

To create multiple fabrics sharing the same physical infrastructure, to assign which ports are in which VSAN, whether Interop mode is on or off, and whether load balancing is per exchange or src-dest ID., use the **vsan** command.

vsan database
vsan *vsan-id*
interface fc *slot/port* | **fv** *slot/dpp-number/fv-port* | **iscsi** *slot/port* | **port-channel** *portchannel-number. subinterface-number* |
interop *mode* | (**loadbalancing src-dst-id** | **src-dst-ox-id**) |
loadbalancing [src-dst-id | **src-dst-ox-id]** |
name *name* **[interop** (*mode*) |(**loadbalancing src-dst-id** | **src-dst-ox-id**) | **suspend** (**interop** | **loadbalancing**) |
suspend [interop (*mode*) | (**loadbalancing src-dst-id** | **src-dst-ox-id**)]

Syntax Description

vsan	Configures VSAN information or membership.
vsan-id	The ID of the VSAN is from 1 to 4093.
interface	Adds interfaces to VSAN.
fc *slot/port*	Configures the Fibre Channel interface in the specified slot/port.
fv *slot/dpp-number/fv-port*	Configures the virtual F port (FV port) interface in the specified slot along with the data path processor (DPP) number and the FV port number.
iscsi *slot/port*	Configures the iSCSI interface in the specified slot/port.
port-channel *portchannel-number. subinterface-number*	Configures the PortChannel interface specified by the PortChannel number followed by a dot (.) indicator and the subinterface number.
interop	Turns on interoperability mode.
mode	Specifies the interoperability mode (1 or 2).
loadbalancing	Configures loadbalancing scheme.
src-dst-id	Sets src-id/dst-id for loadbalancing.
src-dst-ox-id	Sets ox-id/src-id/dst-id for loadbalancing (default).
suspend	Suspends VSAN.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

Change to the VSAN database submode to issue this command.

The interface range must be in ascending order and non-overlapping. You can specify a range using a hyphen and several interfaces using commas:

- The interface range format for a FC interface range is fc*slot/port - port* , fc*slot/port* , fc*slot/port*
  (For example, `show int fc1/1 - 3 , fc1/5 , fc2/5`)
- The interface range format for a FV interface range is fv*slot/dpp/fvport - fvport* , fv*slot/dpp/port* , fv*slot/dpp/port*
  (For example, `show int fv2/1/1 - 3 , fv2/1/5 , fv2/2/5`)
- The format for a PortChannel is port-channel *portchannel-number. subinterface-number*
  (For example, **show int port-channel** *portchannel-number. subinterface-number)*

Examples

The following examples show how to create multiple fabrics sharing the same physical infrastructure and to assign which ports are in which VSAN.

```
switch# config t
switch(config)# vsan database
switch(config-db)#
switch-config-db# vsan 2
switch(config-vsan-db)#
switch(config-vsan-db)# vsan 2 name TechDoc
updated vsan 2
switch(config-vsan-db)#
switch(config-vsan-db)# vsan 2 loadbalancing src-dst-id
switch(config-vsan-db)#
switch(config-vsan-db)# vsan 2 loadbalancing src-dst-ox-id
switch(config-vsan-db)#
switch(config-vsan-db)# vsan 2 suspend
switch(config-vsan-db)#
switch(config-vsan-db)# no vsan 2 suspend
switch(config-vsan-db)#
switch(config-vsan-db)# vsan 2 interface fv2/8/2
switch(config-vsan-db)#
switch(config-vsan-db)# vsan 2 interface iscsi 2/1
switch#
```

vsan policy deny

To configure a vsan-based role, use the **vsan policy deny** command in configuration mode. Use the **no** form of this command to delete a configured role.

vsan policy deny {permit vsan vsan *vsan-id* **]**

no vsan policy deny {permit vsan vsan *vsan-id* **]**

Syntax Description

vsan policy deny	Configures VSAN based roles.
vsan-id	The ID of the VSAN is from 1 to 4093.
permit	Remove commands from the role.

Defaults

Permit.

Command Modes

Configuration mode—role name submode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

You can configure a role so that it only allows commands to be performed for a selected set of VSANs. By default, the VSAN policy of a role is **permit**. In other words, the role can perform commands configured by the **rule** command in all VSANs. In order to selectively allow VSANs for a role, the VSAN policy needs to be set to **deny** and then the appropriate VSANs need to be permitted.

Examples

The following example places you in sangroup role submode.

```
switch# config t
switch(config)# role name sangroup
switch(config-role)#
```

The following example changes the VSAN policy of this role to deny and places you in a submode where VSANs can be selectively permitted.

```
switch(config)# vsan policy deny
switch(config-role-vsan)
```

The following example deletes the configured VSAN role policy and reverts to the factory default (permit).

```
switch(config-role)# no vsan policy deny
```

The following example permits this role to perform the allowed commands for VSANs 10 through 30.

```
switch(config-role)# permit vsan 10-30
```

The following example removes the permission for this role to perform commands for vsan 15 to 20.

```
switch(config-role-vsan)# no permit vsan 15-20
```

vrrp

To enable VRRP, use the **vrrp** command in configuration mode. Use the **no** form of the command to revert to the factory defaults or to negate a command.

vrrp *vrrp-number*
[address | advertisement-interval | authentication | preempt | priority | shutdown | track]

no vrrp *vrrp-number*
[address | advertisement-interval | authentication | preempt | priority | shutdown | track]

Syntax Description

vrrp *vrrp-number*	Configures a VRRP on the selected VSAN or management interface
address	Adds or removes an IP address to the virtual router.
advertisement-interval	Sets the time interval between advertisements.
authentication	Sets the authentication method.
preempt	Enables preemption of lower priority master.
priority	[1-254] Configure the virtual router priority.
shutdown	Enables or disables a virtual router.
track	Tracks the availability of another interface.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Enter the Virtual Router configuration submode to access the options for this command. From the VSAN or mgmt0 (management) interface configuration submode, enter **vrrp** *number* to enter the `switch(config-if-vrrp)#` prompt. By default, a virtual router is always disabled (**shutdown**). VRRP can be configured only if this state is disabled. Be sure to configure at least one IP address before attempting to enable a VR.

Refer to the Cisco MDS 9000 Family Configuration Guide.

Examples

The following example enables VRRP configuration.

```
switch(config-if-vrrp)# no shutdown
```

The following example disables VRRP configuration.

```
switch(config-if-vrrp)# shutdown
```

The following example configures an IP address for the selected VRRP.

```
switch# config t
switch(config)# interface vsan 1
switch(config-if)# vrrp 250
switch(config-if-vrrp)# address 10.0.0.10
```

W Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. Please see the Command Mode section to determine the appropriate mode for each command. For more information, see the *Cisco MDS 9000 Family Configuration Guide*.

write-accelerator

To enable write acceleration for the FCIP interface, use the **write-accelerator** option. Use the **no** form of this command to disable write acceleration.

write-accelerator

no write-accelerator

Syntax Description

This command has no arguments or keywords.

Defaults

None.

Command Modes

Configuration mode

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The write acceleration feature is disabled by default and must be enabled on both sides of the FCIP link. If it is only enabled on one side of the FCIP tunnel, the tunnel will not initialize.

Examples

The following command enables write acceleration on the specified FCIP interface.

```
switch# config terminal
switch(config)# interface fcip 51
switch(config-if)# write-accelerator
```

The following command disables write acceleration on the specified FCIP interface.

```
switch# config terminal
switch(config)# interface fcip 51
switch(config-if)# no write-accelerator
```

The following command deletes the assigned peer port information.

```
switch(config-if)# no peer-info ipaddr 10.1.1.1 port 2000
```

The following command assigns the peer profile ID to connect to 20. The valid range is from 1 to 255

```
switch(config-if)# peer-info profile_id 20
```

The following command deletes the assigned peer profile ID information.

```
switch(config-if)# no peer-info profile_id 500
```

Related Commands

Command	Description
show interface fcip	Displays an interface configuration for a specified FCIP interface.

write erase

To clear a startup configuration, enter the **write erase** command from the EXEC mode prompt.

write erase [boot | debug]

Syntax Description

boot	Destroys boot configuration.
debug	Clears the existing debug configuration.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Once this command is issued, the switch's startup configuration reverts to factory defaults. The running configuration is not affected. The **write erase** command erases the entire startup configuration with the exception of any configuration that affects the loader functionality.

The **write erase boot** command only erases the configuration that affects the loader functionality. The loader functionality configuration includes the boot variables and the mgmt0 IP configuration information (IP address, netmask, and default gateway).

Examples

The following example clears the existing startup configuration completely.

```
switch# write erase
```

The following example clears the loader functionality configuration.

```
switch# write erase boot
This command will erase the boot variables and the ip configuration of interface mgmt 0
```

wwn secondary-mac

To allocate secondary MAC addresses, use the **wwn secondary-mac** command.

www secondary-mac *wwn-id* **range** *address-range*

Syntax Description

secondary-mac *wwn-id*	The secondary MAC address with the format *hh:hh:hh:hh:hh:hh*.
range *address-range*	The range for the specified WWN (64).

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

This command cannot be undone.

Changes to the worldwide names are only performed as required. They should not be changed on a daily basis. These changes should be made by an administrator or individual who is completely familiar with switch operations.

For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

Examples

```
switch(config)# wwnm secondary-mac 00:99:55:77:55:55 range 64
This command CANNOT be undone.
Please enter the BASE MAC ADDRESS again: 00:99:55:77:55:55
Please enter the mac address RANGE again: 64
From now on WWN allocation would be based on new MACs.
Are you sure? (yes/no) no
You entered: no. Secondary MAC NOT programmed
```

CHAPTER 25

Z Commands

The commands in this chapter apply to the Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode. See the "Command Modes" section to determine the appropriate mode for each command. For more information, refer to the *Cisco MDS 9000 Family Configuration Guide*.

zone copy

To copy the active zone set to the full zoneset, use the **zone copy** command in EXEC mode. Use the **no** form of the command to negate the command or revert to the factory defaults.

zone copy vsan *vsan-id* **active-zoneset bootflash: ftp: | full-zoneset | scp: | sftp: | tftp: | volatile:**

zone copy active -zoneset full-zoneset vsan *vsan-id*

Syntax Description

active-zoneset	Copies from the active zone set.
vsan	Configures to copy active zone set on a VSAN to full zone set.
vsan-id	The ID of the VSAN is from 1 to 4093.
full-zoneset	Copies the active-zone set to the full-zone set.
bootflash:	Copies the active-zone set to a location in the bootflash: directory.
ftp:	Copies the active-zone set to a remote location using the FTP protocol.
scp:	Copies the active-zone set to a remote location using the SCP protocol.
sftp:	Copies the active-zone set to a remote location using the SFTP protocol.
slot0:	Copies the active-zone set to a location in the slot0: directory.
tftp:	Copies the active-zone set to a remote location using the TFTP protocol.
volatile:	Copies the active-zone set to a location in the volatile: directory.

Defaults

None.

Command Modes

EXEC.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example copies the active zoneset to the full zoneset.

```
switch# zone copy active-zoneset full-zoneset vsan 1
```

The following example copies the active zoneset in VSAN 3 to a remote location using SCP.

```
switch# zone copy vsan 3 active-zoneset scp://guest@myserver/tmp/active_zoneset.txt
```

zone default-zone

To define whether a default zone (nodes not assigned a created zone) permits or denies access to all in the default zone, use the **zone default-zon**e command in configuration mode. Use the **no** form of the command to negate the command or revert to the factory defaults.

zone default-zone permit vsan *vsan-id*

Syntax Description

permit	Permits access to all in the default zone.
vsan	Sets default zoning behavior for the specified VSAN.
vsan-id	The ID of the VSAN is from 1 to 4093.

Defaults

All default zones are permitted access.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

None.

Examples

The following example permits default zoning in VSAN 2.

```
switch# config t
switch(config)# zone default-zone permit vsan 2
```

zone name

To create a zone, use the **zone name** command in configuration mode. Use the **no** form of the command to negate the command or revert to the factory defaults.

zone name *zone-name* **vsan** *vsan-id*
attribute read-only |
member domain-id *domain-id* **port-number** *port-number* |
fcalias *name* | **fcid** *fcid-value (* **lun** *number)* | **fwwn** *fwwn-value* |
interface fc *slot-port (* **swwn** *switch-wwn* | **domain-id** *domain-id)* |
ipaddress *ip-address* **(** *subnet-mask* **)** |
pwwn *pwwn-value (* **lun** *number)* | **symbolic-nodename** *name or ip-address* **]**

no zone name *zone-name* **vsan** *vsan-id*
attribute read-only |
member domain-id *domain-id* **port-number** *port-number* |
fcalias *name* | **fcid** *fcid-value (* **lun** *number)* | **fwwn** *fwwn-value* |
interface fc *slot-port (* **swwn** *switch-wwn* | **domain-id** *domain-id)* |
ipaddress *ip-address* **(** *subnet-mask* **)** |
pwwn *pwwn-value (* **lun** *number)* | **symbolic-nodename** *name or ip-address* **]**

Syntax Description

zone-name	Specifies the name of the zone. Maximum length is 64 characters.
vsan	Configures a zone on a VSAN.
vsan-id	The ID of the VSAN is from 1 to 4093.
attribute read-only	(Optional) Sets read-only values for the selected zone (default is read-write).
member	(Optional) Adds a member to zone.
domain-id *domain-id*	Identifies members using the domain ID.
port-number *port-number*	Identifies the port number of the domain ID -port number association.
fcalias	(Optional) Adds fcalias to zone.
fcalias-name	Specifies the name of fcalias (Max Size - 64).
fcid	Adds FCID member to zone.
fcid-value	Specifies the FCID in the format 0xhhhhhh.
fwwn	Adds fabric port WWN member to zone.
fwwn-value	Specifies fabric port WWN in the format hh:hh:hh:hh:hh:hh:hh:hh.
interface fc	Specifies the switch's Fibre Channel interface as a zone member.
slot-port	Specifies a slot number and port number.
swwn *switch-wwn*	Configures an interface member based on the specified sWWN.
ipaddress *ip-address*	Identifies members using the IP address.
subnet-mask	Specifies an optional subnet mask.
lun	Add LUN member to zone.
number	Specifies the LUN number in hex format (64 in hex format corresponds to 100 in decimal format).
pwwn	Adds port WWN member to zone.
pwwn-value	Specifies port WWN in the format hh:hh:hh:hh:hh:hh:hh:hh.

symbolic-nodename	Adds the specified node name of IP address to the zone
name	Specifies the name of the device.
ip-address	Specifies the IP address of the device.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(1).

Usage Guidelines

Zones are assigned to zone sets, zone sets are then activated from one switch and propagate across the fabric to all switches. Zones allow security by permitting and denying access between nodes (hosts and storage). **zone name** commands are issued from the configuration mode. Configure a zone for a VSAN from the config-zone submode.

Use the **show wwn switch** command to retrieve the sWWN. If you do not provide a sWWN, the software automatically uses the local sWWN.

Examples

The following example configures a member for the specified zone (Zone1) based on the type (pWWN, fabric pWWN, FC ID, or FC alias) and value specified.

```
switch# config t
switch(config)# zone name Sample vsan 1
switch(config-zone)# member <type> <value>
pWWN example:
sswitch(config-zone)# member pwwn 10:00:00:23:45:67:89:ab
Fabric pWWN example:
switch(config-zone)# member fwwn 10:01:10:01:10:ab:cd:ef
FC ID example:
switch(config-zone)# member fcid 0xce00d1
FC alias example:
switch(config-zone)# member fcalias Payroll
Domain ID example:
switch(config-zone)# member domain-id 2 portnumber 23
FC alias example:
switch(config-zone)# member ipaddress 10.15.0.0 255.255.0.0
Local sWWN interface example:
switch(config-zone)# member interface fc 2/1
Remote sWWN interface example:
switch(config-zone)# member interface fc2/1 swwn 20:00:00:05:30:00:4a:de
Domain ID interface example:
switch(config-zone)# member interface fc2/1 domain-id 25
```

zoneset

To merge zoneset databases, use the **zoneset** command in EXEC mode.

zoneset import | export interface [fc *slot-number* **| fcip** *interface-number* **| port-channel** *port-number***] vsan** *vsan-id*

Syntax Description

export	Exports the zoneset database to the adjacent switch on the specified interface. The active zone set in this switch becomes the activated zone set of the merged SAN.
import	Imports the zoneset database to the adjacent switch on the specified interface. The active zoneset in the adjacent switch becomes the activated zone set of the merged SAN.
vsan	Merges the zoneset database of a VSAN on the specified interface.
vsan-id	The ID of the VSAN is from 1 to 4093.
interface	Configures the interface.
fc *slot-number*	Configures a Fibre Channel interface for the specified slot number and port number.
fcip *interface-number*	Selects the FCIP interface to configure the specified interface from 1 to 255.
port-channel *port-number*	Specifies PortChannel interface.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(2).

Usage Guidelines

You can also issue the **zoneset import** and the **zoneset export** commands for a range of VSANs.

Examples

The following example imports the zoneset database from the adjacent switch connected through the VSAN 2 interface.

```
switch# zoneset import interface fc1/3 vsan 2
```

The following example exports the zoneset database to the adjacent switch connected through VSAN 5.

```
switch# zoneset export vsan 5
```

zoneset

To group zones under one zoneset, use the **zoneset** command in configuration mode. Use the **no** form of the command to negate the command or revert to the factory defaults.

zoneset [**activate name** *zoneset-name* **vsan** *vsan-id*] [**distribute full vsan** *vsan-id*] [**name** *zoneset-name* **vsan** *vsan-id*]

Syntax Description

activate	Activate a zoneset
name	Configures a zone set.
zoneset-name	Specifies a name for a zone set. Maximum length is 64 characters.
distribute full	Enables zone set propagation
vsan	Activates a zone set on the specified VSAN. The id of the VSAN (1-4096).
vsan-id	The ID of the VSAN is from 1 to 4093.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(2).

Usage Guidelines

Zones are activated by activating the parent zone set.

Examples

The following example activates a zoneset named gottons in VSAN 333.

```
switch# conf t
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# zoneset ?
  activate    Activates a zoneset
  distribute  Enable zoneset propagation
  name        Configures a zoneset

switch(config)# zoneset name gottons ?
  vsan  Configures a zoneset on a VSAN

switch(config)# zoneset activate name gottons vsan 333
Zoneset Activation initiated. check zone status
```

Advanced Services Module Commands

The commands in this chapter are specific to the Advanced Services Module (ASM) used in the Cisco MDS 9216 Switch and the Cisco MDS 9500 Series. All commands are shown here in alphabetical order regardless of command mode.

See the "About the CLI Command Modes" section on page 1-3 to determine the appropriate mode for each command. For more information on virtualization using the ASM, see the "Related Documentation" section on page -xiii.

attach module — show fcdd

To display the Fibre Channel Device Discovery (FCDD) information, use the **show fcdd** command.

To connect to a ASM, use the **attach module** command in EXEC mode. To disconnect, use the **exit** command at the `module-`*`number`*`#` prompt.

attach module *slot-number*

show fcdd *option*

Syntax Description

attach module *slot-number*	Attaches to the ASM module.
show fcdd	Displays FCDD information.
option	**eventlog** — Displays information of various state machines **history** — Displays FCDD history buffer **nvp** — Displays FCDD for the virtual Nx port (NVP) **pid** — Displays Path Ids **rescan** — Displays FCDD disk rescan information **target** — Displays Disk/VM VSAN FC targets

Command Modes

EXEC (attach module mode).

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

Access the ASM using the **attach module** command to obtain VEC-specific configuration information You cannot configure the ASM using this command. After you connect to the image on the module using the **attach module** command, the prompt changes to `module-`*`number`*`#`.

Examples

The following example attaches to the ASM in slot 2 and exits from the ASM debug mode.

```
switch# attach module 2
Attaching to module 1 ...
To exit type 'exit', to abort type '$.'
module-2#
```

The following example displays target FCDD information for the ASM in slot 2.

```
module-2# show fcdd history
1) Event:E_DEBUG, length:67, at 617784 usecs after Thu Sep 18 17:55:04 2003
    [103] fcdd_demux(*event=0x7ffffb90,**ret_fsm_event_list=0x7ffff920)
2) Event:E_DEBUG, length:48, at 617759 usecs after Thu Sep 18 17:55:04 2003
    [103] fcdd_mts_dequeue_event(*ret_ev=0x7ffffb90)
3) Event:E_DEBUG, length:71, at 617751 usecs after Thu Sep 18 17:55:04 2003
    [103] fcdd_get_data_from_queue(*q_entry=0x2d8ea000, *ret_ev=0x7ffffb90)
4) Event:E_DEBUG, length:52, at 617739 usecs after Thu Sep 18 17:55:04 2003
    [103] fcdd_dequeue_event: Data Rcvd, Total ticks - 0
5) Event:E_DEBUG, length:20, at 511016 usecs after Thu Sep 18 17:54:57 2003
```

```
    [103]
...

module-2# show fcdd nvp vsan 3
FCDD NVP INFO:
VSAN    pWWN                    FCID        LPI DPP SI      IF_INDEX    NUM_ZONE
--------------------------------------------------------------------------------
   3    24:0a:00:05:30:00:94:a00x650009   1   1   0x0031  0x01091000 0

ZONE_CNT    ZONE_NAME
-----------------------

module-2# show fcdd pid
CNT  PID    MINOR  VSAN  TGT_WWN                  LUN_ID                   STATE
--------------------------------------------------------------------------------
0    0x0011 272    3     21:00:00:20:37:46:78:97  00:00:00:00:00:00:00:00 INV_PD
1    0x0012 288    3     21:00:00:20:37:5b:cf:b9  00:00:00:00:00:00:00:00 INV_PD
2    0x0013 304    3     21:00:00:20:37:18:6f:90  00:00:00:00:00:00:00:00 INV_PD
3    0x0014 320    3     21:00:00:20:37:36:0b:4d  00:00:00:00:00:00:00:00 INV_PD
4    0x0015 336    3     21:00:00:20:37:39:90:6a  00:00:00:00:00:00:00:00 INV_PD
5    0x0016 352    3     21:00:00:20:37:18:d2:45  00:00:00:00:00:00:00:00 INV_PD
6    0x0017 368    3     21:00:00:20:37:38:a7:c1  00:00:00:00:00:00:00:00 INV_PD
7    0x0018 384    3     21:00:00:20:37:18:17:d2  00:00:00:00:00:00:00:00 INV_PD
8    0x0019 400    4     22:00:00:20:37:46:78:97  00:00:00:00:00:00:00:00 ACTIV
9    0x001a 416    4     22:00:00:20:37:5b:cf:b9  00:00:00:00:00:00:00:00 ACTIV
10   0x001b 432    4     22:00:00:20:37:18:6f:90  00:00:00:00:00:00:00:00 ACTIV

module-2# show fcdd target vsan 3
=====================================
All existing disks in VSAN    3:
=====================================
TGT_CNT pWWN                    FCID     SCSI_ID NUM_ZONE REDISC_TMR PERIOD(S) LAST_ACCESS
================================================================================================
0       21:00:00:20:37:18:17:d2 0x7200c9 7       0               YES 600       Thu Sep 18
18:00:32 2003

LUN_NUM LUN_ID                   MINOR  PID     TGT_WWN                 STATE    PERIOD(S)
TIMER_STARTED
------------------------------------------------------------------------------------------------
     0       00:00:00:00:00:00:00:00  384    0x0018  21:00:00:20:37:18:17:d2  ACTIVE   0
TGT_CNT pWWN                    FCID     SCSI_ID NUM_ZONE REDISC_TMR PERIOD(S) LAST_ACCESS
================================================================================================
1       21:00:00:20:37:18:d2:45 0x7200c5 5       0               YES 600       Thu Sep 18
18:00:32 2003

LUN_NUM LUN_ID                   MINOR  PID     TGT_WWN                 STATE    PERIOD(S)
TIMER_STARTED
------------------------------------------------------------------------------------------------
     0       00:00:00:00:00:00:00:00  352    0x0016  21:00:00:20:37:18:d2:45  ACTIVE   0
TGT_CNT pWWN                    FCID     SCSI_ID NUM_ZONE REDISC_TMR PERIOD(S) LAST_ACCESS
================================================================================================
2       21:00:00:20:37:5b:cf:b9 0x7200b6 1       0               YES 600       Thu Sep 18
18:00:32 2003
...
```

attach module — show npc

To display the virtual N port creator (NPC) information, use the **show npc** command.

To connect to a ASM, use the **attach module** command in EXEC mode. To disconnect, use the **exit** command at the `module-number#` prompt.

attach module *slot-number*

show npc *option*

Syntax Description

attach module *slot-number*	Attaches to the ASM module.
show npc	Displays NPC information.
option	**history** — Displays NPC history buffer **nvp** — Displays NPC information for the virtual N port

Command Modes

EXEC (attach module mode).

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

Access the ASM using the **attach module** command to obtain VEC-specific configuration information You cannot configure the ASM using this command. After you connect to the image on the module using the **attach module** command, the prompt changes to `module-number#`.

Examples

The following example attaches to the ASM in slot 2 and exits from the ASM debug mode.

```
switch# attach module 2
Attaching to module 1 ...
To exit type 'exit', to abort type '$.'
module-2#
```

The following example displays target FCDD information for the ASM in slot 2.

```
module-2# show npc history
module-2# show npc history
1) Event:E_DEBUG, length:66, at 123862 usecs after Thu Sep 18 18:24:50 2003
    [103] npc_demux(*event=0x7ffffb60,**ret_fsm_event_list=0x7ffff8f0)
2) Event:E_DEBUG, length:71, at 123849 usecs after Thu Sep 18 18:24:50 2003
    [105] 0x000000D0: 00 00 00 00 ...
3) Event:E_DEBUG, length:82, at 123818 usecs after Thu Sep 18 18:24:50 2003
    [105] 0x000000C0: 00 00 00 0C 00 00 00 00 00 00 00 00 00 00 ...
4) Event:E_DEBUG, length:82, at 123766 usecs after Thu Sep 18 18:24:50 2003
    [105] 0x000000B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ...
5) Event:E_DEBUG, length:82, at 123714 usecs after Thu Sep 18 18:24:50 2003
    [105] 0x000000A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ...

module-2# show npc nvp
```

```
COUNT VSAN pWWN                      FCID     LPI DPP SI     IF_INDEX   TCAM_TYPE
STATE       U_CNT USERS
-------------------------------------------------------------------------------
-----------------------
0        2 10:00:00:00:5e:00:01:01 0x6f0000  17   1 0x0030 0x01090000 0x0205
ESTABLISHED   1   [ 31 ]
1        2 10:00:00:05:30:00:59:20 0x6f0002  17   1 0x0030 0x01090000 0x0205
ESTABLISHED   1   [ 31 ]
2        2 23:00:00:05:30:00:59:20 0x6f000b  19   1 0x0032 0x01092000 0x0206
ESTABLISHED   1   [ 918 ]
3        2 23:02:00:05:30:00:59:20 0x6f0003  18   1 0x0031 0x01091000 0x0206
ESTABLISHED   1   [ 918 ]
4        2 23:03:00:05:30:00:59:20 0x6f0004   1   2 0x0020 0x01080000 0x0206
ESTABLISHED   1   [ 918 ]
5        2 23:04:00:05:30:00:59:20 0x6f0005   5   3 0x0024 0x01084000 0x0206
ESTABLISHED   1   [ 918 ]
6        2 23:05:00:05:30:00:59:20 0x6f0006  21   4 0x0034 0x01094000 0x0206
ESTABLISHED   1   [ 918 ]
7        2 23:06:00:05:30:00:59:20 0x6f0007  25   5 0x0038 0x01098000 0x0206
ESTABLISHED   1   [ 918 ]
8        2 23:07:00:05:30:00:59:20 0x6f0008   9   6 0x0028 0x01088000 0x0206
ESTABLISHED   1   [ 918 ]
...

module-2# show npc nvp fsm 23:08:00:05:30:00:59:20 vsan 2
>>>>FSM: <NVP_23:08:00:05:30:00:59:20> has 7 logged transitions<<<<<
1) FSM:<NVP_23:08:00:05:30:00:59:20> Transition at 839998 usecs after Thu Sep 18
 17:57:23 2003
    Previous state: [NPC_NVP_NULL]
    Triggered event: [NPC_NVP_EV_NP_CREATION_REQ]
    Next state: [NPC_NVP_GET_IFINDEX]
2) FSM:<NVP_23:08:00:05:30:00:59:20> Transition at 840179 usecs after Thu Sep 18
 17:57:23 2003
    Previous state: [NPC_NVP_GET_IFINDEX]
    Triggered event: [NPC_NVP_EV_IF_INDEX_OK]
    Next state: [NPC_NVP_FVLOGI_SENT]
...

module-2# show npc nvp vsan 2
COUNT VSAN pWWN                      FCID     LPI DPP SI     IF_INDEX   TCAM_TYPE
STATE       U_CNT USERS
-------------------------------------------------------------------------------
-----------------------
0        2 10:00:00:00:5e:00:01:01 0x6f0000  17   1 0x0030 0x01090000 0x0205
ESTABLISHED   1   [ 31 ]
1        2 10:00:00:05:30:00:59:20 0x6f0002  17   1 0x0030 0x01090000 0x0205
ESTABLISHED   1   [ 31 ]
2        2 23:00:00:05:30:00:59:20 0x6f000b  19   1 0x0032 0x01092000 0x0206
ESTABLISHED   1   [ 918 ]
3        2 23:02:00:05:30:00:59:20 0x6f0003  18   1 0x0031 0x01091000 0x0206
ESTABLISHED   1   [ 918 ]
4        2 23:03:00:05:30:00:59:20 0x6f0004   1   2 0x0020 0x01080000 0x0206
ESTABLISHED   1   [ 918 ]
...
```

attach module — show vec

To display Virtual Enclosure Client (VEC) information, use the **show vec** command.

To connect to a ASM, use the **attach module** command in EXEC mode. To disconnect, use the **exit** command at the `module-`*`number`*`#` prompt.

attach module *slot-number*

show vec *option*

Syntax Description

attach module *slot-number*	Attaches to the ASM module.
show vec	Displays configured VEC information.
option	**asm** — Displays VEC-related ASM information **dip** — Displays Distributed Instantiation Protocol (DIP) information **dpp** — Displays Data Path Processors (DPPs) State **dpp-hostmap** — Displays DPP host maps **dpp-lunmap** — Displays DPP LUN maps **error-statistics** — Displays VEC error statistics **fp-port** — Displays Front panel ports in the ASM **history** — Displays VEC internal history buffer **host** — Displays Logged in hosts **initiator-nports** — Displays Disk/VM VSAN initiator N ports **login** — Displays Disk/VM VSAN process logins **pid** — Displays Path Ids **scsi-init** — Displays SCSI initiator information **scsi-tgt** — Displays SCSI target information **target** — Displays Disk/VM VSAN FC targets **tp** — Displays Trap Port (TP) **vep** — Displays Virtual Enclosure Port (VEP) **ves** — Displays Virtual Enclosure Server(s) (VES) connected to the VEC **vlun** — Displays VLUNs **vlun-statistic** — Displays Vlun error statistics **vmvsan-login** — Displays DIOP logins **volume-owners** — Displays Volume Owners **vsans** — Displays VSANs seen by the VEC **xp-login** — Displays logins (PLOGI/PRLI) to VEPs/TPs (xPs)

Command Modes

EXEC (attach module mode).

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

Access the ASM using the **attach module** command to obtain VEC-specific configuration information You cannot configure the ASM using this command. After you connect to the image on the module using the **attach module** command, the prompt changes to `module-`*`number`*`#`.

Examples

The following example attaches to the ASM in slot 2 and exits from the ASM debug mode.

```
switch# attach module 2
Attaching to module 1 ...
To exit type 'exit', to abort type '$.'
module-2#
```

The following example displays target VEC information for the ASM in slot 2.

```
module-2# show vec target
vsan I dpp   here there pwwn                       target state
   3 A   0 72000a 720101 21:00:00:20:37:65:1c:cb  83995a8 PRLI_COMPLETE
   3 A   0 72000a 7201e8 21:00:00:20:37:65:1c:e3  839a188 PRLI_COMPLETE
   4 A   0 6b0009 7800ba 22:00:00:20:37:18:6f:90  83a7ce8 PRLI_COMPLETE
   3 A   0 72000a 7202ba 21:00:00:20:37:18:6f:90  83a5540 PRLI_COMPLETE
   4 A   0 6b0009 7800c9 22:00:00:20:37:18:17:d2  83aebd0 PRLI_COMPLETE
   3 A   0 72000a 7202c9 21:00:00:20:37:18:17:d2  83ad410 PRLI_COMPLETE
   2 A   2 6f0005 6f0005 23:04:00:05:30:00:59:20  837de70 PRLI_COMPLETE
   2 A   5 6f0008 6f0005 23:04:00:05:30:00:59:20  83866f8 PRLI_COMPLETE
   3 A   0 72000a 7201ef 21:00:00:20:37:89:ac:7f  839ad68 PRLI_COMPLETE
   4 A   0 6b0009 780100 50:06:04:82:bf:d0:cf:4b  839c998 PRLI_COMPLETE
   4 A   0 6b0009 7800bc 22:00:00:20:37:36:0b:4d  83a94a8 PRLI_COMPLETE
...
```

attach module — show ves

To display Virtual Enclosure Server (VES) information, use the **show ves** command.

To connect to a ASM, use the **attach module** command in EXEC mode. To disconnect, use the **exit** command at the `module-number#` prompt, or type **$.** to forcibly abort the attached session.

attach module *slot-number*

show ves *option*

Syntax Description

attach module *slot-number*	Attaches to the ASM module.
show ves	Displays configured VES information for the ASM.
option	**dg** — Displays VES-related Disk Group information **diop**—Displays Data-path Input Output Protocol (DIOP) information **dip** — Displays Distributed Instantiation Protocol (DIP) **history** — Displays VES internal history buffer **lunmap** — Displays VES lunmap information **pid** — Displays Path Id (PID) information **pid-evlog** — Displays PID event log information **pid_vlun_sg** — Displays PID/VLUN SG Table Information **scsi-tgt** — Displays SCSI Target Module **sg** — Displays Service Group **ve** — Displays Virtual Enclosure (VE) **vec** — Displays Virtual Enclosure Clients (VECs) connected to the VES **vep** — Displays Virtual Enclosure Port (VEP) **vlun** — Displays VLUN Table Information **vlun-counters** — Displays VLUN counters **vlun-evlog** — Displays VLUN event log **vsans** — Displays VSANs seen by the VES

Command Modes

EXEC (attach module mode).

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

Access the ASM using the **attach module** command to obtain VEC -specific configuration information You cannot configure the ASM using this command. After you connect to the image on the module using the **attach module** command, the prompt changes to `module-number#`.

Examples

The following example attaches to the ASM in slot 2 and exits from the ASM debug mode.

```
switch# attach module 2
Attaching to module 1 ...
To exit type 'exit', to abort type '$.'
```

```
module-2#
```

The following example displays the virtual enclosure server's service group information for the ASM in slot 2.

```
module-2# show ves sg

            Virtual Enclosure Server Service Group Info
 ---------------------------------------------------------------------
 No      VR-ID              IP Address
 ---------------------------------------------------------------------
 0         0                    15.0.112.2
 1         1                    15.0.0.10
 2         2                    15.0.0.11

Number of Service Groups : 3...
```

The following examples display DIOP information for the ASM in slot 2.

```
module-2# show ves diop guid
VLUN-ID                 GUID
0000000000000001        c3ef7ce8-1dd1-11b2-a8de-75d21f738aa7
module-2# show ves diop stats
DIOP COUNTER         : Success          Failed

VLUN STRATEGY        : 0x00000000       0x00000000
VLUN DONE            : 0x00000000       0x00000000
DISK REMOTE STRATEGY : 0x00000000       0x00000000
DISK REMOTE DONE     : 0x00000000       0x00000000
DISK LOCAL STRATEGY  : 0x00000000       0x00000000
DISK LOCAL DONE      : 0x00000000       0x00000000
module-2# show ves diop vsvo
vsan    : 2
fcid    : 0x6F000B
dpp     : 0
module-2# show ves diop xp
Hash    VSAN    FCID    pWWN    RefCnt
2       2       6F000B  2300000530005920        1
3       2       6F0007  2306000530005920        1
7       2       6F0008  2307000530005920        1
10      2       6F0003  2302000530005920        1
11      2       6F0009  2308000530005920        1
14      2       6F0004  2303000530005920        1
15      2       6F000A  2309000530005920        1
18      2       6F0005  2304000530005920        1
22      2       6F0006  2305000530005920        1
```

attach module — show version

To display version information for the ASM module, use the **show version** command.

To connect to a ASM, use the **attach module** command in EXEC mode. To disconnect, use the **exit** command at the `module-number#` prompt, or type **$.** to forcibly abort the attached session.

attach module *slot-number*

show version

Syntax Description

This command does not have any options.

Command Modes

EXEC (attach module mode).

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

Access the ASM using the **attach module** command to obtain VSHA-specific configuration information You cannot configure the ASM using this command. After you connect to the image on the module using the **attach module** command, the prompt changes to `module-number#`.

Use the **show version** command to verify the integrity of the image before loading the images. This command can be used for ASM images.

Examples

The following example attaches to the ASM in slot 2 and exits from the ASM debug mode.

```
switch# attach module 2
Attaching to module 1 ...
To exit type 'exit', to abort type '$.'
module-2#
```

The following example displays the ASM version in slot 2.

```
module-2# show version

Software
  BIOS:      version 1.0.7
  system:    version 1.2(2)


  BIOS compile time:       03/20/03
  system compile Time:     7/11/2003 14:00:00

Hardware
  RAM 963380 kB
  bootflash: 500736 blocks (block size 512b)

  00:05:30:00:AC:AA uptime is 0 days 21 hours 2 minute(s) 32 second(s)
```

attach module — show virt-lookup

To display virtualization lookup tables, use the **show virt-lookup** command.

To connect to a ASM, use the **attach module** command in EXEC mode. To disconnect, use the **exit** command at the `module-number#` prompt, or type **$.** to forcibly abort the attached session.

attach module *slot-number*

show virt-lookup *number* **[d_id | vol-cfg] [entries | masks | keys | stats]**

Syntax Description

attach module *slot-number*	Attaches to the ASM module.
show virt-lookup	Displays virtualization lookup tables.
number	Specifies one of four table instances of the virtualization engine (ranges from 1 to 4).
d_id	Displays DID lookup information.
vol-cfg	Displays volume lookup information.
entries	Displays lookup entries.
keys	Displays lookup keys.
masks	Displays lookup masks.
stats	Displays lookup statistics.

Command Modes

EXEC (attach module mode).

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

Access the ASM using the **attach module** command to obtain VSHA-specific configuration information You cannot configure the ASM using this command. After you connect to the image on the module using the **attach module** command, the prompt changes to `module-number#`.

Examples

The following example attaches to the ASM in slot 2 and exits from the ASM debug mode.

```
switch# attach module 2
Attaching to module 1 ...
To exit type 'exit', to abort type '$.'
module-2#
```

The following example displays virtual engine 1 details for DID entries.

```
module-2# show virt-lookup 1 d-id entries
   INDEX  V  CL  EG_IDX  RSVD  SW_INDEX  MASK
00000000  1   2     0     000  00000000  0204
00000001  1   2     1     000  00000000  0204
00000400  1   2     0     000  FFFFFFFF  0205
```

```
00000401  1   2     0     000  FFFFFFFF  0207
00000402  1   2     0     000  FFFFFFFF  0206
00000403  1   2     1     000  FFFFFFFF  0206
00000404  1   2     0     000  FFFFFFFF  0206
00000405  1   2     0     000  FFFFFFFF  0206
00000406  1   2     1     000  FFFFFFFF  0206
00000407  1   2     0     000  FFFFFFFF  0206
00000408  1   2     0     000  FFFFFFFF  0206
00000409  1   2     1     000  FFFFFFFF  0206
0000040A  1   2     0     000  FFFFFFFF  0206
```

The following example displays volume lookup mask entries for virtualization engine 2.

```
module-2# show virt-lookup 2 vol-cfg masks
BLKINDEX  FL  V  CL  RESERVED  RESERVED   D_ID    S_ID   B1  B0  IN  PI  VSAN
              1   3  00000000  00000000  FFFFFF  000000  00  00   1   3   FFF
00001C00  3F
```

The following example displays statistics for volume lookup tables.

```
module-2# show virt-lookup 3 vol-cfg stats
TOTAL   USED  USED-DPP0  USED-DPP1
 8192      6          3          3
```

attach module — show vsha

To display volume server high availability (VSHA) information, use the **show vsha** command.

To connect to a ASM, use the **attach module** command in EXEC mode. To disconnect, use the **exit** command at the `module-number#` prompt, or type **$.** to forcibly abort the attached session.

attach module *slot-number*

show vsha *option*

Syntax Description

attach module *slot-number*	Attaches to the ASM module.
show vsha	Displays configured VSHA information.
option	**dg-info** — Displays VSHA SG-Disk_group information **sg-info** — Displays VSHA SG Information **sg-log** — Displays VSHA SG Event Log

Command Modes

EXEC (attach module mode).

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

Access the ASM using the **attach module** command to obtain VSHA-specific configuration information You cannot configure the ASM using this command. After you connect to the image on the module using the **attach module** command, the prompt changes to `module-number#`.

Examples

The following example attaches to the ASM in slot 2 and exits from the ASM debug mode.

```
switch# attach module 2
Attaching to module 1 ...
To exit type 'exit', to abort type '$.'
module-2#
```

The following example displays VSHA service group information for the ASM in slot 2.

```
module-2# show vsha sg-info
 ------------------------------------------------------------------------
       VSHA SG Table
------------------------------------------------------------------------
System Variables: VmVsan=2, Real_IP=15.0.112.2     , interface_index=0x8080002
------------------------------------------------------------------------
Record:0   VR_ID:1   SG_Name:sg-1   VR_IP:15.0.0.10       Node_ID:1
Record:1   VR_ID:2   SG_Name:sg-2   VR_IP:15.0.0.11       Node_ID:2
------------------------------------------------------------------------
module-4# show vsha sg-info vr_id 1
------------------------------------------------------------------------
VSHA SG Table
------------------------------------------------------------------------
```

```
System Variables: VmVsan=2, Real_IP=18.0.0.4       , interface_index=0x8180002
Record: 0
    VR_ID: 1
    SG_Name: sg1
    VR_IP: 18.0.0.24
    Node_ID:1
    State: VSHA_STANDALONE_MASTER
    Arbitration_disk: 22000020374BB5990003.0000
    Peer_IP: INVALID
    Flags:0x0
------------------------------------------------------------------------

module-4# show vsha dg-info vr_id 1
 ------------------------------------------------------------------------
VSHA-DG info for vr_id 1
 ------------------------------------------------------------------------
Record:0       DG_Name:rahul_dg1                         DG_state:DISK_GROUP_O
NLINE
 ------------------------------------------------------------------------

module-4# show vsha sg-log vr_id 1
>>>>FSM: <VSHA_SG_1> has 35 logged transitions<<<<<

1) FSM:<VSHA_SG_1> Transition at 596109 usecs after Mon Apr  7 22:50:47 1980
    Previous state: [VSHA_NULL]
    Triggered event: [VSHA_EV_ARBITRATION_DISK_CHG]
    Next state: [VSHA_NULL]

2) FSM:<VSHA_SG_1> Transition at 163199 usecs after Mon Apr  7 22:51:13 1980
    Previous state: [VSHA_NULL]
    Triggered event: [VSHA_EV_ONLINE_SERVICE_GRP_AS_MASTER]
    Next state: [VSHA_STANDALONE_MASTER]

3) FSM:<VSHA_SG_1> Transition at 198675 usecs after Mon Apr  7 22:51:13 1980
    Previous state: [VSHA_STANDALONE_MASTER]
    Triggered event: [VSHA_EV_VX_DG_IMPORT_RESP]
    Next state: [VSHA_STANDALONE_MASTER]

4) FSM:<VSHA_SG_1> Transition at 201051 usecs after Mon Apr  7 22:51:23 1980
    Previous state: [VSHA_STANDALONE_MASTER]
    Triggered event: [VSHA_EV_RESOURCE_MONITOR]
    Next state: [VSHA_STANDALONE_MASTER]
```

attach module — terminal

To configure the terminal for the ASM, use the **terminal** command in attach module mode. Use the **no** form of the command to negate a previously-issued command or revert to factory defaults.

To connect to a ASM, use the **attach module** command in EXEC mode. To disconnect, use the **exit** command at the `module-number#` prompt, or type **$.** to forcibly abort the attach session.

attach module *slot-number*

terminal length *number-of-lines* **| session-timeout | terminal type | width** *integer*]

Syntax Description

length	(Optional) Sets the number of lines on the screen.
number-of-lines	(Optional) Specifies the number of lines on the screen from 0 to 512. Enter 0 to scroll continuously.
session-timeout	(Optional) Specifies the session time out.
terminal-type	(Optional) Sets the terminal type.
width	(Optional) Sets the width of the display terminal, from 0 to 80.
integer	Sets the width of the display terminal, from 0 to 80.

Defaults

The default number of lines for the length is 24. The default width is 80 lines.

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

Remember that all terminal parameter-setting commands are set locally and do not remain in effect after a session is ended. You must perform this task at the EXEC prompt at each session to see the debugging messages.

If the length is not 24 and the width is not 80, then you need to set a length and width.

Examples

The following example attaches to the ASM in slot 2 and exits from the ASM debug mode.

```
switch# attach module 2
Attaching to module 1 ...
To exit type 'exit', to abort type '$.'
module-2#
```

The following example enables the session timeout to 0 (will not time out) for the ASM in slot 2.

```
module-2# terminal session-timeout 0
```

attachpriv module

To connect to a ASM's Linux prompt, use the **attachpriv module** command in EXEC mode. To disconnect, use the **exit** command at the `module-number#` prompt, or type **$.** to forcibly abort the attach session.

attachpriv module *slot-number*

Syntax Description

attachpriv	Attaches to the Linux prompt.
module *slot-number*	Specifies the slot number for the ASM

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

You cannot configure the ASM using this command. After you connect to the image on the module using the **attachpriv module** command, the prompt changes to `vmroot@00:05:30:00:AC:AA:/root#`.

You can only issue Linux-specific commands at this prompt.

This command only works with the ASM, not with any other type of module.

You must log into the supervisor module with admin privileges in order to run this command.

Caution The **attachpriv module** command is for troubleshooting, and should only be used by Cisco or Veritas support personnel. Do not attempt to configure the ASM at the Linux prompt.

Examples

The following example attaches to the ASM in slot 2 and connects to the Linux mode.

```
switch# attachpriv module 2
Attaching to asm 127.1.2.2
To exit type 'exit', to abort type '$.
vmroot@00:05:30:00:AC:AA:/root#
```

asm mgmt-vsan

To assign the management VSAN for the Advanced Services Module (ASM), use the **asm mgmt-vsan** command. To revert to factory defaults or to negate a previously issued command, use the **no** form of the command.

asm mgmt-vsan *vsan-id* **module** *slot-number*

no asm mgmt-vsan *vsan-id* **module** *slot-number*

Syntax Description

asm	Configures the Advanced Services Module (ASM).
mgmt-vsan	Configures the management VSAN.
vsan-id	Specifies the ID of the management VSAN from 1 to 4093.
module *slot-number*	Specifies the slot number of the ASM.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

When you specify a management VSAN for the ASM, nine (9) fabric virtual (FV) interfaces are created

If you have configured trunking on both switches, you will see 18 FV interfaces instead of 9 FV interfaces.

After you configure the interface for a host port, you may set any other port-specific parameters, such as port type or mode.

Examples

The following example configures management VSAN 2 for the ASM in slot 2.

```
switch# config t
switch(config)# asm mgmt-vsan 2 module 2
```

Related Commands

Command	Description
show vsan	Displays all VSAN configurations.
show asm mgmt-vsan	Displays the configured management VSAN.

interface cpp

To configure a Control Plane Process (CPP) interface on the Cisco MDS 9000 Family of switches, use the **interface cpp** command. To disable a Fibre Channel interface, use the **no** form of the command.

interface cpp *slot_number/processor-number/vsan-id* **/**

Syntax Description

interface	Configures a new interface.
cpp	Specifies the new interface to be a virtualization IPFC interface.
slot-number	Specifies a slot number of the ASM.
processor-number	Specifies the processor number for the IPFC interface. The current processor number is always 1.
vsan-id	Specifies the ID of the management VSAN from 1 to 4093.

Defaults

Disabled.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

You can specify a range of interfaces by issuing a command with the following example format:

interface space fc1/1space-space5space,spacefc2/5space-space7

Examples

The following example configures an IPFC interface for the ASM in slot 2 with a processor ID 1 in management VSAN 2.

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# interface cpp 2/1/2
switch(config-if)#
```

Related Commands

Command	Description
show interface	Displays an interface configuration for a specified interface.

show asm

To displays configured information for the ASM, use the **show asm** command. To revert to factory defaults or to negate a previously issued command, use the **no** form of the command.

show asm disk-group | mgmt-vsan

Syntax Description

asm	Configures the Advanced Services Module (ASM).
mgmt-vsan	Configures the management VSAN.
vsan-id	Specifies the ID of the management VSAN from 1 to 4093.
module *slot-number*	Specifies the slot number of the ASM.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

None.

Examples

The following example displays the disk groups for the ASM in slot 2. Node refers to the ASM in slot 2 and SII refers to the SCSI index instance. When a disk group is created using the VERITAS Storage Foundation (TM) for Networks application, they are stored in the ASM.

```
switch# show asm disk-group
SII  Node   Disk Group Name
===  ====== ==========================
  3    2    dg1-114
  4    2    dg2-114
  5    2    dg1-112
  6    2    dg2-112
===  ====== ==========================

switch# show asm mgmt-vsan
Module-Id  Management VSAN
=========  ==================
  2            2
=========  ==================
```

Related Commands

Command	Description
asm mgmt-vsan	Configures the management VSAN.

show flogi database

Usage Guidelines

FV interfaces are automatically created when the ASM boots up.

You can issue this command for a specific VSAN (management VSAN or discovery VSAN, or host VSAN using the VSAN ID, or you can use the FCID to view a specific interface's port name and node name. The symbolic port names and node names can only be displayed for a local device.

Examples

The following example displays the virtualization related FV interface information in the FLOGI database.

```
switch# show flogi database vsan 2
--------------------------------------------------------------------------------
INTERFACE  VSAN    FCID           PORT NAME               NODE NAME
--------------------------------------------------------------------------------
sup-fc0    2     0x6f0001  10:00:00:05:30:00:59:1f  20:00:00:05:30:00:59:1e
fv2/1/1    2     0x6f0002  10:00:00:05:30:00:59:20  20:00:00:05:30:00:59:1e
fv2/1/2    2     0x6f0003  23:02:00:05:30:00:59:20  22:14:00:05:30:00:59:20
fv2/1/3    2     0x6f000b  23:00:00:05:30:00:59:20  22:14:00:05:30:00:59:20
fv2/1/8    2     0x6f0000  10:00:00:00:5e:00:01:02  20:00:00:05:30:00:59:1e
fv2/1/9    2     0x6f000c  10:00:00:00:5e:00:01:01  20:00:00:05:30:00:59:1e
fv2/2/1    2     0x6f0004  23:03:00:05:30:00:59:20  22:14:00:05:30:00:59:20
fv2/3/1    2     0x6f0005  23:04:00:05:30:00:59:20  22:14:00:05:30:00:59:20
fv2/4/1    2     0x6f0006  23:05:00:05:30:00:59:20  22:14:00:05:30:00:59:20
fv2/5/1    2     0x6f0007  23:06:00:05:30:00:59:20  22:14:00:05:30:00:59:20
fv2/6/1    2     0x6f0008  23:07:00:05:30:00:59:20  22:14:00:05:30:00:59:20
fv2/7/1    2     0x6f0009  23:08:00:05:30:00:59:20  22:14:00:05:30:00:59:20
fv2/8/1    2     0x6f000a  23:09:00:05:30:00:59:20  22:14:00:05:30:00:59:20
```

show interface

You can check the status of an interface at any time by using the **show interface** command.

show interface
[*interface range*]
[**brief | counters | description**]
[cpp *slot/process-number/vsan-id* **] | [fv** *slot/dpp-number/fv-port* **]**
[fc *slot/port* **] | [fc-tunnel** *tunnel-id* **] |**
[fcip *interface-number* **| gigabitethernet | iscsi] |**
mgmt | port-channel *portchannel-number. subinterface-number* **| sup-fc | transceiver | trunk**
vsan [*vsan-id*] **| vsan** *vsan-id*

Syntax Description

interface range	Displays the interfaces in the specified range.
brief	Displays brief info of interface.
counters	Displays the interface counter information.
description	Displays a description of interface.
cpp *slot/process-number/ vsan-id*	Displays the virtualization IPFC interface in the specified slot along with the processor number and the VSAN ID.
fv *slot/dpp-number/fv-port*	Displays the virtual F port (FV port) interface in the specified slot along with the data path processor (DPP) number and the FV port number.
fc *slot/port*	Displays the Fibre Channel interface in the specified slot/port.
fc-tunnel *tunnel-id*	Displays description of the specified FC tunnel from 1 to 4095.
fcip *interface-number*	Displays the description of the specified FCIP interface from 1 to 255.
gigabitethernet *slot/port*	Displays the description of the Gigabit Ethernet interface in the specified slot/port.
iscsi *slot/port*	Displays the description of the iSCSI interface in the specified slot/ port.
mgmt	Displays the description of the management interface.
port-channel *portchannel-number. subinterface-number*	Displays the PortChannel interface specified by the PortChannel number followed by a dot (.) indicator and the subinterface number.
sup-fc	Displays the inband interface details.
transceiver	Displays the transceiver information for interface.
trunk vsan	Displays the trunking status of all VSANs.
vsan-id	Displays the trunking status of the specified VSANs.
vsan *vsan-id*	Displays the VSAN interface (brief, counters, or description for a specified interface or a range of interfaces)

Defaults

None

Command Modes

EXEC

Command History

This command was modified in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

The interface range must be in ascending order and nonoverlapping. You can specify a range using a hyphen and several interfaces using commas:

- The interface range format for a FC interface range is fc*slot/port - port* , fc*slot/port* , fc*slot/port*
  (For example, **`show int fc1/1 - 3 , fc1/5 , fc2/5`**)
- The interface range format for a FV interface range is fv*slot/dpp/fvport - fvport* , fv*slot/dpp/port* , fv*slot/dpp/port*
  (For example, **`show int fv2/1/1 - 3 , fv2/1/5 , fv2/2/5`**)
- The interface range format for a CPP interface range is cpp*slot/process/vsan-id - vsan-id* , cpp*slot/process/vsan-id* , cpp*slot/process/vsan-id*
  (For example, **`show int cpp2/1/2 - 3 , cpp2/1/5 , cpp2/1/7`**)
- The format for a PortChannel is port-channel *portchannel-number. subinterface-number*
  (For example, **show int port-channel** *portchannel-number. subinterface-number)*

The CPP interface is configured when the IPFC interface is set up.

Examples

```
switch# show interface fc1/11
fc1/11 is up
    Hardware is Fibre Channel
    Port WWN is 20:0b:00:05:30:00:59:de
    Admin port mode is ST
    Port mode is ST
    Port vsan is 1
    Speed is 1 Gbps
    Rspan tunnel is fc-tunnel 100
    Beacon is turned off
    5 minutes input rate 248 bits/sec, 31 bytes/sec, 0 frames/sec
    5 minutes output rate 176 bits/sec, 22 bytes/sec, 0 frames/sec
      6862 frames input, 444232 bytes
        0 discards, 0 errors
        0 CRC, 0 unknown class
        0 too long, 0 too short
      6862 frames output, 307072 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


switch# show int fc1/1 - 3 , fc1/5 , fc2/5 brief

-------------------------------------------------------------------------------
Interface  Vsan   Admin  Admin   Status          FCOT   Oper  Oper   Port
                  Mode   Trunk                         Mode  Speed  Channel
                         Mode                          (Gbps)
-------------------------------------------------------------------------------
fc1/1      3      auto   on      up              swl    FL      1    --
fc1/2      1      auto   on      fcotAbsent      --     --           --
fc1/3      1      auto   on      fcotAbsent      --     --           --
fc1/5      3      auto   on      notConnected    swl    --           --
fc2/5      5      FX     --      up              swl    F       2    --
```

```
switch# show int sup-fc0
sup-fc0 is up
    Hardware is FastEthernet, address is 0000.0000.0000
    MTU 2596 bytes, BW 1000000 Kbit
    66 packets input, 7316 bytes
    Received 0 multicast frames, 0 compressed
    0 input errors, 0 frame, 0 overrun 0 fifo
    64 packets output, 28068 bytes, 0 underruns
    0 output errors, 0 collisions, 0 fifo
    0 carrier errors



switch# show int vsan 2
vsan2 is up, line protocol is up
    WWPN is 10:00:00:05:30:00:59:1f, FCID is 0xb90100
    Internet address is 10.1.1.1/24
    MTU 1500 bytes, BW 1000000 Kbit
    0 packets input, 0 bytes, 0 errors, 0 multicast
    0 packets output, 0 bytes, 0 errors, 0 dropped



switch# show interface description
fc1/1
    no description
fc1/2
    no description
fc1/15
fcAnl

sup-fc0 is up

mgmt0 is up

vsan1 - IPFC interface

port-channel 15
no description

port-channel 98
no description

switch# show interface fc2/1 - 5 brief
--------------------------------------------------------------------------------
Interface  Vsan   Admin  Admin   Status          Oper  Oper    Port-channel
                  Mode   Trunk                   Mode  Speed
                         Mode                          (Gbps)
--------------------------------------------------------------------------------
fc1/1      3      auto   on      up              FL    1       --
fc1/2      1      auto   on      fcotAbsent      --            --
fc1/3      1      auto   on      fcotAbsent      --            --
fc1/4      3      auto   on      up              FL    1       --
fc1/5      3      auto   on      up              F     2       --
fc1/6      1      auto   on      fcotAbsent      --            --
fc1/7      1      auto   on      fcotAbsent      --            --
fc1/8      3      auto   on      fcotAbsent      --            --
fc1/9      1      auto   on      fcotAbsent      --            --
fc1/10     1      auto   on      fcotAbsent      --            --
fc1/11     1      auto   on      fcotAbsent      --            --
fc1/12     1      auto   on      fcotAbsent      --            --
fc1/13     1      auto   on      fcotAbsent      --            --
fc1/14     1      auto   on      fcotAbsent      --            --
```

```
fc1/15      1       auto    on      fcotAbsent        --            --
fc1/16      1       auto    on      trunking          TE    2       --
fc2/1       1       FX      --      fcotAbsent        --            --
fc2/2       1       FX      --      fcotAbsent        --            --
fc2/3       1       FX      --      fcotAbsent        --            --
fc2/4       1       FX      --      fcotAbsent        --            --
fc2/5       5       FX      --      up                F     2       --
...
--------------------------------------------------------------------------------
Interface          Status                             Speed
                                                      (Gbps)
--------------------------------------------------------------------------------
sup-fc0            up                                 1

--------------------------------------------------------------------------------
Interface               Status     IP Address        Speed        MTU
--------------------------------------------------------------------------------
mgmt0                   up         172.22.36.112/23  100 Mbps     1500

--------------------------------------------------------------------------------
Interface          Status   IP Address                Speed        MTU
--------------------------------------------------------------------------------
vsan2                 up    15.0.112.0/16             1 Gbps       1500

--------------------------------------------------------------------------------
Interface          Status   IP Address                Speed        MTU
--------------------------------------------------------------------------------
cpp2/1/2              up    15.0.112.2/16             1 Gbps       1500

--------------------------------------------------------------------------------
Interface          VSAN     Status            Oper   Speed    Port-channel
                                              Mode
--------------------------------------------------------------------------------
fv2/1/1            2        up                F      auto     --
fv2/1/2            2        up                F      auto     --
fv2/1/3            2        up                F      auto     --
fv2/1/4            3        up                F      auto     --
fv2/1/5            3        up                F      auto     --
fv2/1/6            4        up                F      auto     --
...
switch# show interface fcip 3 counters
fcip3
    TCP Connection Information
      2 Active TCP connections
        Control connection: Local 43.1.1.2:3225, Remote 43.1.1.1:65532
        Data connection: Local 43.1.1.2:3225, Remote 43.1.1.1:65534
      30 Attempts for active connections, 0 close of connections
    TCP Parameters
      Path MTU 1500 bytes
      Current retransmission timeout is 300 ms
      Round trip time: Smoothed 10 ms, Variance: 5
      Advertised window: Current: 122 KB, Maximum: 122 KB, Scale: 1
      Peer receive window: Current: 114 KB, Maximum: 114 KB, Scale: 1
      Congestion window: Current: 2 KB, Slow start threshold: 1048560 KB
    5 minutes input rate 64 bits/sec, 8 bytes/sec, 0 frames/sec
    5 minutes output rate 64 bits/sec, 8 bytes/sec, 0 frames/sec
      910 frames input, 84652 bytes
         910 Class F frames input, 84652 bytes
         0 Class 2/3 frames input, 0 bytes
         0 Error frames timestamp error 0
      908 frames output, 84096 bytes
         908 Class F frames output, 84096 bytes
         0 Class 2/3 frames output, 0 bytes
         0 Error frames 0 reass frames
```

```
switch# show interface counters brief

-------------------------------------------------------------------------------
Interface          Input (rate is 5 min avg)      Output (rate is 5 min avg)
                   ----------------------------   ----------------------------
                   Rate     Total                 Rate     Total
                   MB/s     Frames                MB/s     Frames
-------------------------------------------------------------------------------
fc9/1              0        0                     0        0
fc9/2              0        0                     0        0
fc9/3              0        0                     0        0
fc9/4              0        0                     0        0
...
-------------------------------------------------------------------------------
Interface          Input (rate is 5 min avg)      Output (rate is 5 min avg)
                   ----------------------------   ----------------------------
                   Rate     Total                 Rate     Total
                   MB/s     Frames                MB/s     Frames
-------------------------------------------------------------------------------
iscsi4/1           0        0                     0        0
iscsi4/2           0        0                     0        0
iscsi4/3           0        0                     0        0
iscsi4/4           0        0                     0        0
...
vsan10 is up, line protocol is up
    WWPN is 10:00:00:05:30:00:07:23, FCID is 0xee0001
    Internet address is 10.1.1.5/24
    MTU 1500 bytes, BW 1000000 Kbit
    0 packets input, 0 bytes, 0 errors, 0 multicast
    0 packets output, 0 bytes, 0 errors, 0 dropped


-------------------------------------------------------------------------------
Interface          Input (rate is 5 min avg)      Output (rate is 5 min avg)
                   ----------------------------   ----------------------------
                   Rate     Total                 Rate     Total
                   MB/s     Frames                MB/s     Frames
-------------------------------------------------------------------------------

port-channel 100   0        0                     0        0

-------------------------------------------------------------------------------
Interface          Input (rate is 5 min avg)      Output (rate is 5 min avg)
                   ----------------------------   ----------------------------
                   Rate     Total                 Rate     Total
                   Mbits/s  Frames                Mbits/s  Frames
-------------------------------------------------------------------------------

fcip2              0        0                     0        0
fcip3              9        0                     9        0

fcip6              8        0                     8        0
fcip7              8        0                     8        0

switch# show interface fcip 3
fcip3 is trunking
    Hardware is GigabitEthernet
    Port WWN is 20:ca:00:05:30:00:07:1e
    Peer port WWN is 20:ca:00:00:53:00:18:1e
    Admin port mode is auto, trunk mode is on
    Port mode is TE
    vsan is 1
    Trunk vsans (allowed active) (1,10)
```

```
    Trunk vsans (operational)    (1)
    Trunk vsans (up)             (1)
    Trunk vsans (isolated)       (10)
    Trunk vsans (initializing)   ()
    Using Profile id 3 (interface GigabitEthernet4/3)
    Peer Information
      Peer Internet address is 43.1.1.1 and port is 3225
      Special Frame is disabled
    Maximum number of TCP connections is 2
    Time Stamp is disabled
    B-port mode disabled
    TCP Connection Information
      2 Active TCP connections
        Control connection: Local 43.1.1.2:3225, Remote 43.1.1.1:65532
        Data connection: Local 43.1.1.2:3225, Remote 43.1.1.1:65534
      30 Attempts for active connections, 0 close of connections
    TCP Parameters
      Path MTU 1500 bytes
      Current retransmission timeout is 300 ms
      Round trip time: Smoothed 10 ms, Variance: 5
      Advertized window: Current: 122 KB, Maximum: 122 KB, Scale: 1
      Peer receive window: Current: 114 KB, Maximum: 114 KB, Scale: 1
      Congestion window: Current: 2 KB, Slow start threshold: 1048560 KB
    5 minutes input rate 64 bits/sec, 8 bytes/sec, 0 frames/sec
    5 minutes output rate 64 bits/sec, 8 bytes/sec, 0 frames/sec
      866 frames input, 80604 bytes
         866 Class F frames input, 80604 bytes
         0 Class 2/3 frames input, 0 bytes
         0 Error frames timestamp error 0
      864 frames output, 80048 bytes
         864 Class F frames output, 80048 bytes
         0 Class 2/3 frames output, 0 bytes
         0 Error frames 0 reass frames

switch# show interface gigabitethernet 4/1
GigabitEthernet4/1 is up
    Hardware is GigabitEthernet, address is 0005.3000.2e12
    Internet address is 100.1.1.2/24
    MTU 1500 bytes, BW 1000000 Kbit
    Port mode is IPS
    Speed is 1 Gbps
    Beacon is turned off
    5 minutes input rate 32 bits/sec, 4 bytes/sec, 0 frames/sec
    5 minutes output rate 88 bits/sec, 11 bytes/sec, 0 frames/sec
    637 packets input, 49950 bytes
      0 multicast frames, 0 compressed
      0 input errors, 0 frame, 0 overrun 0 fifo
    659 packets output, 101474 bytes, 0 underruns
      0 output errors, 0 collisions, 0 fifo
      0 carrier errors

switch# show interface iscsi 2/1
iscsi2/1 is up
    Hardware is GigabitEthernet
    Port WWN is 20:41:00:05:30:00:50:de
    Admin port mode is ISCSI
    Port mode is ISCSI
    Speed is 1 Gbps
    iSCSI initiator is identified by name
    Number of iSCSI session: 7, Number of TCP connection: 7
    Configured TCP parameters
        Local Port is 3260
        PMTU discover is disabled
        Keepalive-timeout is 1 sec
```

```
        Minimum-retransmit-time is 300 ms
        Max-retransmissions 8
        Sack is disabled
        Minimum available bandwidth is 0 kbps
        Estimated round trip time is 0 usec
    5 minutes input rate 265184 bits/sec, 33148 bytes/sec, 690 frames/sec
    5 minutes output rate 375002168 bits/sec, 46875271 bytes/sec, 33833 frames/sec
    iSCSI statistics
      6202235 packets input, 299732864 bytes
        Command 6189718 pdus, Data-out 1937 pdus, 1983488 bytes, 0 fragments
      146738794 packets output, 196613551108 bytes
        Response 6184282 pdus (with sense 4), R2T 547 pdus
        Data-in 140543388 pdus, 189570075420 bytes

switch# show interface cpp 2/1/2
cpp2/1/2 is up, line protocol is up
    WWPN is 10:00:00:05:30:00:94:a0, FCID is 0x6d0002
    Internet address is 15.0.114.2/16
    MTU 1500 bytes, BW 1000000 Kbit
    4679361 packets input, 568734976 bytes, 0 errors, 1202625 multicast
    5000574 packets output, 584517419 bytes, 1 errors, 10 dropped

switch# show interface transceiver
fc1/1 fcot is present but not supported
    name is IBM
    part number is IBM42P21SNY
    revision is AA20
    serial number is 53P148700109D
    vendor specific data (bytes 96-127)
      0x49 0x42 0x4D 0x20 0x53 0x46 0x50 0x53
      0x20 0x41 0x52 0x45 0x20 0x43 0x4C 0x41
      0x53 0x53 0x20 0x31 0x20 0x4C 0x41 0x53
      0x45 0x52 0x20 0x53 0x41 0x46 0x45 0x20
fc1/2 fcot not present
fc1/3 fcot is present but not supported
    name is IBM
    part number is IBM42P21SNY
    revision is AA20
    serial number is 53P1487000ZXR
    vendor specific data (bytes 96-127)
      0x49 0x42 0x4D 0x20 0x53 0x46 0x50 0x53
      0x20 0x41 0x52 0x45 0x20 0x43 0x4C 0x41
      0x53 0x53 0x20 0x31 0x20 0x4C 0x41 0x53
      0x45 0x52 0x20 0x53 0x41 0x46 0x45 0x20

switch# show interface fc-tunnel 200
fc-tunnel 200 is up
Dest   IP Addr: 200.200.200.7   Tunnel ID: 200
Source IP Addr: 200.200.200.4   LSP ID: 1
Explicit Path Name: Path1

virt-112#  show interface fv 2/2/3
fv2/2/3 is up
    Hardware is Fibre Channel, WWN is 22:13:00:05:30:00:59:20
    Port mode is F
    Speed is auto
    vsan is 4
    Beacon is turned off
    0 packets input, 0 bytes, 0 discards
    0 input errors, 0 CRC, 0 invalid transmission words
        0 address id, 0 delimiter
    Received 0 runts, 0 jabber, 0 too long, 0 too short
        0 EOF abort, 0 fragmented, 0 unknown class
        0 OLS, 0 LRR, 0 NOS, 0 loop inits
```

```
    0 packets output, 0 bytes
    Transmitted 0 OLS, 0 LRR, 0 NOS, 0 loop inits


switch# show int fv2/1/2
fv2/1/2 is up
    Hardware is Fibre Channel, WWN is 22:0b:00:05:30:00:59:20
    Port mode is F
    Speed is auto
    vsan is 2
    Beacon is turned off
    0 packets input, 0 bytes, 0 discards
    0 input errors, 0 CRC, 0 invalid transmission words
        0 address id, 0 delimiter
    Received 0 runts, 0 jabber, 0 too long, 0 too short
        0 EOF abort, 0 fragmented, 0 unknown class
        0 OLS, 0 LRR, 0 NOS, 0 loop inits
    0 packets output, 0 bytes
    Transmitted 0 OLS, 0 LRR, 0 NOS, 0 loop inits
```

show fvport

You can check the status of a virtual F port (FV port) interface at any time by using the **show fvport** command.

show fvport [interface fv *slot/dpp-number/fv-port* **|** *interface range* **]**

Syntax Description

fvport	Displays all FV ports in the switch.
interface	Specifies the FV port interface.
fv *slot/dpp-number/fv-port*	Displays the FV port interface in the specified slot along with the data path processor (DPP) number and the FV port number.
interface range	Displays the interfaces in the specified range.

Defaults

None

Command Modes

EXEC

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.2(2).

Usage Guidelines

The interface range must be in ascending order and nonoverlapping. You can specify a range using a hyphen and several interfaces using commas. The interface range format for a FV interface range is fvport interface fv*slot/dpp/fvport - fvport* , fv*slot/dpp/port* , fv*slot/dpp/port*
(For example, **`show fvport int fv2/1/1 - 3 , fv2/1/5 , fv2/2/5`**)

Examples

```
switch# show fvport
fv2/1/1
        The N Port if_index is     0x01090000
        The N Port pwwn is         10:00:00:05:30:00:59:20
        The N Port nwwn is         20:00:00:05:30:00:59:1e
        The vsan is                2
        The FV Port if_index is    0x0e080000
        The FV Port pwwn is        22:0a:00:05:30:00:59:20
        The DPP id is              0
        The NV port type is        IPFC
        The State is               ACTIVE
        Number of create requests
        minus the number of
        delete requests =          1
...
```

```
switch# show fvport interface fv2/4/1 , fv2/7/1 - 3
fv2/4/1
        The N Port if_index is     0x01094000
        The N Port pwwn is         23:05:00:05:30:00:59:20
        The N Port nwwn is         23:01:00:05:30:00:59:20
        The vsan is                2
        The FV Port if_index is    0x0e08c000
        The FV Port pwwn is        23:67:00:05:30:00:59:20
        The DPP id is              3
        The NV port type is        INTERNAL PORT
        The State is               ACTIVE
        Number of create requests
        minus the number of
        delete requests =          1
fv2/7/1
        The N Port if_index is     0x0108c000
        The N Port pwwn is         23:08:00:05:30:00:59:20
        The N Port nwwn is         23:01:00:05:30:00:59:20
        The vsan is                2
        The FV Port if_index is    0x0e098000
        The FV Port pwwn is        23:6a:00:05:30:00:59:20
        The DPP id is              6
        The NV port type is        INTERNAL PORT
        The State is               ACTIVE
        Number of create requests
        minus the number of
        delete requests =          1
fv2/7/2
        The N Port if_index is     0x0108d000
        The N Port pwwn is         23:1a:00:05:30:00:59:20
        The N Port nwwn is         23:46:00:05:30:00:59:20
        The vsan is                3
        The FV Port if_index is    0x0e098001
        The FV Port pwwn is        23:58:00:05:30:00:59:20
        The DPP id is              6
        The NV port type is        INTERNAL PORT
        The State is               ACTIVE
        Number of create requests
        minus the number of
        delete requests =          1
fv2/7/3
        The N Port if_index is     0x0108e000
        The N Port pwwn is         23:2c:00:05:30:00:59:20
        The N Port nwwn is         23:2e:00:05:30:00:59:20
        The vsan is                4
        The FV Port if_index is    0x0e098002
        The FV Port pwwn is        23:61:00:05:30:00:59:20
        The DPP id is              6
        The NV port type is        INTERNAL PORT
        The State is               ACTIVE
        Number of create requests
        minus the number of
        delete requests =          1
```

Caching Services Module Commands

The commands in this chapter apply to the SAN Volume Controller (SVC) software and the Caching Services Module (CSM) in Cisco MDS 9000 Family of multilayer directors and fabric switches. All commands are shown here in alphabetical order regardless of command mode.

For more information on virtualization using the CSM, see the "Related Documentation" section on page -xiii.

cluster add

To create a cluster with a specified SVC node, use the **cluster add** command in SVC configuration mode.

cluster add *cluster-name* **ip** *ip-address* **node svc** *slot-number/node-number*

Syntax Description

cluster	Provides access to cluster commands
add *cluster-name*	Specifies a new cluster addition. The cluster name must start with an alphabet and is restricted to 15 alphanumeric characters, including dash (-) and underscore (_). The cluster name cannot be Cluster*X*, where *X* is a number.
ip *ip-address*	Specifies the IP address of the specified cluster. The IP address must be in the same subnet as the switch management IP address.
node svc	Specifies the node's SVC interface
slot-number	Specifies the slot number of the Caching Service Module (CSM).
node-number	Specifies the node number of the SVC instance running on the CSM. This number ranges from 1 to 2 nodes per module.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Enter this command while connected to the switch management IP address of a node at which the cluster is being created.

Examples

The following example enters the SVC configuration mode, verifies the status of previously-configured clusters, and adds a cluster called SampleCluster.

```
switch# svc-config

switch(svc)# show nodes local
--------------------------------------------------------------------------------
Node             cluster          config   cluster      node            sw
                                  node     status       status          version
--------------------------------------------------------------------------------
svc2/1                            No       unconfigured free            1.3(1)
svc2/2                            No       unconfigured free            1.3(1)

switch(svc)# cluster add SampleCluster ip 10.10.0.1 node svc 2/1
cluster creation going on. Please wait....
```

The status of the newly-added cluster can be verified using the **show nodes local** command.

```
switch(svc)# show nodes local
--------------------------------------------------------------------------------
Node        cluster            config  cluster        node       sw
                               node    status         status     version
--------------------------------------------------------------------------------
svc2/1      SampleCluster      Yes     active         active     1.3(1)
svc2/2                         No      unconfigured   free       1.3(1)
```

Related Commands

Command	Description
show nodes local	Displays the cluster name and status for all nodes in the switch.

cluster config

To manage cluster configurations on a specified cluster, use the **cluster config** configuration submode.

cluster config *cluster-name*

Syntax Description

cluster	Provides access to cluster commands
config *cluster-name*	Places a previously created cluster in the cluster configuration submode (`switch(svc-cluster)#`).

Defaults

None.

Command Modes

SVC configuration mode—cluster configuration submode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example enters the SVC configuration mode and adds a cluster called SampleCluster.

```
switch(svc)# cluster config SampleCluster
switch(svc-cluster)#
```

Related Commands

Command	Description
show cluster	Displays configured cluster information.

cluster name

To perform operations on a previously-configured cluster, use the **cluster name** command in SVC configuration mode.

cluster name *cluster-name* **flash-copy** *fc-grp-name* **[prepare | start | stop]**

cluster name *cluster-name* **remote-copy** *rc-grp-name* **{ failover | start [aux | clean | force] | stop aux-enable }**

cluster name *cluster-name* **shutdown [node** *node-name* **]**

cluster name *cluster-name* **start discovery**

cluster name *cluster-name* **upgrade svc-system [force] }**

Syntax Description

cluster	Provides access to cluster commands
name *cluster-name*	Identifies a previously created cluster to perform an operation.
flash-copy*fc-grp-name*	Specifies a previously-configured FlashCopy relationship.
prepare	Prepares the FlashCopy consistency group.
start	Starts the FlashCopy for the specified cluster. Starts the background copy for the specified remote copy group
stop	Stops the FlashCopy for the specified cluster. Stops the remote copy relationships for the specified remote copy group.
remote-copy *rc-grp-name*	Specifies the remote copy consistency group name.
failover	Reverses to using the auxiliary VDisks for the specified relationship.
shutdown	Shuts down the entire cluster (gracefully).
node *node-name*	Specifies a particular node for a graceful shutdown.
start discovery	Starts the background copy for the specified remote copy group.
aux	Makes the auxiliary VDisks as primary.
clean	Marks the intended secondary VDisks as clean.
upgrade svc-system	Upgrades the specified cluster. The new version of the software image is specified to the FTP:, SCP:, SFTP:, TFTP:, bootflash:, or slot0: directories
force	Permits the remote copy operation to start—even if it leads to the loss of data consistency between the primary and secondary.
aux-enable	Enables write access o the secondary (or auxiliary) VDisks.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example enters the SVC configuration mode and displays all options under the **cluster name** command.

```
switch# svc-config

switch(svc)# cluster name SampleCluster ?
  flash-copy   Flash-copy
  remote-copy  Remote copy
  shutdown     Shutdown
  start        Start discovery
  upgrade      Upgrade uri

switch(svc)# cluster name SampleCluster flash-copy f1 prepare

switch(svc)# cluster name SampleCluster flash-copy f1 start

switch(svc)# cluster name SampleCluster flash-copy f1 stop

switch(svc)# cluster name SampleCluster remote-copy f1 failover

switch(svc)# cluster name SampleCluster remote-copy f1 start

switch(svc)# cluster name SampleCluster remote-copy f1 stop

switch(svc)# cluster name SampleCluster shutdownn

switch(svc)# cluster name SampleCluster shutdown node svc2/1

switch(svc)# cluster name SampleCluster start discovery

switch(svc)# cluster name SampleCluster upgrade svc-system
bootflash:m9000-ek9-csm-svc_mz.1.3.1.bin
```

dir modflash:

To display the contents of the modflash: file system, use the **dir modflash:** command in EXEC mode.

dir modflash://*module-number***-***node-number***-***path*

Syntax Description

modflash:	Flash image that resides on the Caching Services Module (CSM).
module-number	Specifies the slot number in which the CSM resides.
node-number	Specifies one of the two nodes in the CSM (SVC node). The options are **1** or **2**.
path	Specifies the **volatile** or the **cores** paths.
volatile	Displays the /var and /tmp of the SVC node on the supervisor module and can be used to move files from/to the SVC node.
cores	Displays process, kernel crash dumps, and other trace information used to debug software issues.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example shows how to list the files on the bootflash directory.

```
switch# dir modflash://2-2-cores

switch# dir modflash://2-2-volatile
```

Related Commands

Command	Description
delete	Deletes a file on a Flash memory device.

feature enable

To enable a specified feature in a cluster, use the **feature enable** command in the cluster configuration submode.

cluster config *cluster-name*

feature enable { capacity *number* **| flash-copy | remote-copy }**

Syntax Description

cluster	Provides access to cluster commands
config *cluster-name*	Places a previously created cluster in the cluster configuration submode.
feature enable	Enables a specified feature on this cluster. Three features can be enabled: **capacity**, **flash-copy**, or **remote-copy**
capacity	Configures the virtualization capacity of this cluster.
number	Provides a range from 1- 1677215 Gigabytes.
flash-copy	Enables the flash-copy feature for this cluster.
remote-copy	Enables the remote-copy feature for this cluster.

Defaults

None.

Command Modes

SVC configuration mode—cluster configuration submode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The cluster configuration submode prompt is (`switch(svc-cluster)#`).

By default, flash-copy and remote-copy are disabled and 0 (zero) GB of virtualization capacity is enabled.

Examples

The following example enters the cluster configuration submode for the SampleCluster cluster and assigns a size of 4000 Gigabytes. The next two commands enables the flash-copy and remote-copy features for this cluster.

```
switch(svc)# cluster config SampleCluster

switch(svc-cluster)# feature enable ?
  capacity     Cluster enable feature capacity
  flash-copy   Cluster enable feature flash-copy
  remote-copy  Cluster enable feature remote-copy

switch(svc-cluster)# feature enable capacity ?
  <0-2147483647>  Enter the capacity

switch(svc-cluster)# feature enable capacity 4000
```

```
switch(svc-cluster)# feature enable flash-copy

switch(svc-cluster)# feature enable remote-copy
```

Related Commands

Command	Description
show cluster *name* **flash-copy**	Displays configured flash-copy information for a specified cluster.
show cluster *name* **remote-copy**	Displays configured remote copy information for a specified cluster.

flash-copy

To create a snapshot (or point-in-time copy) of a specified VDisk or group of VDisks, use the **flash-copy** command in the cluster configuration submode.

cluster config *cluster-name*

flash-copy add *fcopy-name*

flash-copy name *fcopy-name*
map src-vdisk *vdisk-name* **dst-vdisk** *vdisk-name* **|**
[mode copy-on-write | full rate *rate* **]**

flash-copy rename *old-name* **newname** *new-name*

Syntax Description

cluster	Provides access to cluster commands
config *cluster-name*	Places a previously created cluster in the cluster configuration submode.
flash-copy add *fcopy-name*	Creates a FlashCopy instance.
flash-copy *fcopy-name*	Enters the FlashCopy submode for an existing copy name.
map	Creating a mapping between the source and destination VDisks.
src-vdisk *vdisk-name*	Specifies the source VDisk for the flash copy.
dst-vdisk *vdisk-name*	Specifies the destination VDisk for the flash copy.
mode	Controls the FlashCopy mode.
copy-on-write	Copies to the source VDisk only if new information in written to it after FlashCopy is initiated (default).
full rate *rate*	Specifies the background copy rate (ranges from 1 to 100) at which the source VDisk is copied to the destination VDisk even if no new information is written to the source.

Defaults

None.

Command Modes

SVC configuration mode—cluster configuration submode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The cluster configuration submode prompt is (`switch(svc-cluster)#`.

The flash-copy submode prompt is `switch(svc-cluster-flash-copy)#`.

Examples

The following example enters the enters the cluster configuration mode for the SampleCluster 1 cluster.

```
switch(svc)# cluster config SampleCluster
```

```
switch(svc-cluster)# flash-copy f2
switch(svc-cluster-flash-copy)# ?
Submode Commands:
  exit  Exit from this mode
  map   Flash-copy map
  mode  Flash-copy mode
  no    Negate a command or set its defaults

switch(svc-cluster-flash-copy)# map src-vdisk VDISK1 dst-vdisk DDISK1

switch(svc-cluster-flash-copy)# mode copy-on-write
switch(svc-cluster-flash-copy)# exit

switch(svc-cluster)# flash-copy add FlashC2

switch(svc-cluster)# exit


switch(svc)# show SampleCluster flash-copy
--------------------------------------------------------------------------------
name             status
--------------------------------------------------------------------------------
fccstgrp0        idle_or_copied
f2               idle_or_copied

switch(svc)# show SampleCluster flash-copy f2
Flash-copy mapping 1:
    src vdisk is v2
    dest vdisk is v3
    state is idle_or_copied
    copy rate is 50
    progress 0% done
```

Related Commands

Command	Description
show SampleCluster *name* **flash-copy**	Displays configured flash-copy information for a specified SampleCluster.

host

To create or configure hosts, use the **host** command in the cluster configuration submode.

cluster config *cluster-name*

host add *host-name* **hostport** *port-wwn*

host name *host-name*
hostport *port-wwn* |
map vdisk *vdisk-name* **[SCSI-lun** *lun-number* **]**

Syntax Description

cluster	Provides access to cluster commands
config *cluster-name*	Places a previously created cluster in the cluster configuration submode.
host add *host-name*	Creates a host with one port and assigns the host name.
hostport *port-wwn*	Specifies a port using the port WWN
host name *host-name*	Enters the host submode for an existing host name.
map	Maps a previously configured disk to this host.
vdisk *vdisk-name*	Specifies the VDisk to be mapped to the host.
SCSI-lun *lun-number*	Specifies a LUN to map the host port. If the LUN number is not specified, the next available number is assigned automatically.

Defaults

None.

Command Modes

SVC configuration mode—cluster configuration submode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The cluster configuration submode prompt is (`switch(svc-cluster)#`).

The host submode prompt is `switch (svc-cluster-host)#`

Examples

The following example enters the cluster configuration mode for SampleCluster and creates a host called Host 1with one port, adds a second port, and maps the VDisk for Host1, and verifies the configured information for Host1.

```
switch(svc)# cluster config SampleCluster

switch(svc-cluster)# host add Host1 hostport 11:22:33:44:aa:bb:cc:dd

switch(svc-cluster)# host Host1
switch(svc-cluster-host)# ?
Submode Commands:
  exit      Exit from this mode
```

```
  hostport  Add pWWN to host
  map       Map vdisk to host
  no        Negate a command or set its defaults

switch(svc-cluster-host)# hostport 22:11:33:55:11:aa:bb:cc

switch(svc-cluster)# host add Host1 hostport 35:66:11:22:aa:bb:22:cc

switch(svc-cluster)# host Host1

switch(svc-cluster-host)# hostport 35:66:11:22:aa:bb:22:11

switch(svc-cluster-host)# map vdisk Vdisk1

switch(svc-cluster-host)# map vdisk Vdisk1 ssci-lun 10
```

Related Commands

Command	Description
show cluster *name* **host**	Displays configured host information for a specified cluster.

install module node

To install the SVC node image, use the **install module node** command.

install module *module-number* **node** *node-number* **image svc-system [bootflash: | slot0: | ftp: | sftp: | scp: |** *svc-image*]

Syntax Description

install module	Installs the specified image for the CSM.
module-number	Switching modules: From slot 1 to 4 and 7 to 9 in a Cisco MDS 9500 Series switch. For slot 2 in a Cisco MDS 9200 Series switch. Supervisor modules: Slot 5 or 6—only on the active supervisor module in a Cisco MDS 9500 Series switch. Slot 1—upgrades both the supervisor and switching parts of the module in a Cisco MDS 9200 Series switch.
node	Selects the SVC node to install the image.
node-number	Specifies the node number.
image svc-system	Specifies the file name of an SVC image.
bootflash:	Source location for internal bootflash memory
ftp	URI containing SVC Image.
scp	URI containing SVC Image.
sftp	URI containing SVC Image.
tftp	URI containing SVC Image.
slot0:	Source location for the CompactFlash memory or PCMCIA card.
svc-image	The name of the SAN Volume Controller (SVC) image.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.0(3).

Usage Guidelines

The **install module** *module-number***node** command installs the new image in the specified node on the CSM module. All previous data in that node is lost.

Examples

The following example shows how to install a new image on an SVC node.

```
switch# install module 2 node 1 image svc-system
scp://root@172.22.93.174/auto/isan-src/MAIN_1_3_0_17t/VegasSW/build/gdb.sb-svc/isan/target
fs/sb-svc.bin
```

```
SVC reimage going on. Please wait
root@172.22.93.174's password:
sb-svc.bin        100% |*****************************| 45408 KB    00:53
svc 2/1 software reimage succeeded
```

Related Commands

Command	Description
show version compatibility	Shows the system software that is currently running on the switch

interface svc

To configure a SAN Volume Controller (SVC) interface on the Cisco MDS 9000 Family of switches, use the **interface svc** command.

interface svc *slot_number/node-number*

interface svc *slot_number/node-number* **initiator | mgmt | nwwn** *nwwn-id* **target vsan** *vsan-id*

interface svc *slot_number/node-number* **switchport description | shutdown]**

Syntax Description

interface	Configures a new interface.
svc	Specifies the new interface to be a SVC interface.
slot-number	Specifies the slot number of the Caching Service Module (CSM).
node-number	Specifies the node number of the SVC instance running on the CSM. This number ranges from 1 to 2 nodes per module.
initiator	Configures the initiator or port in the specified VSAN.
mgmt	Configures the management or port in the specified VSAN.
target	Configures the target or port in the specified VSAN.
vsan *vsan-id*	Specifies the VSAN ID ranging from 1 to 4093.
shutdown	Enables or disables an interface.
nwwn *nwwn-id*	Configured a non-system allocated nWWN for SVC Node.
switchport description	Assigns a description to the switchport. Restricted to 80 alphanumeric characters.

Defaults

None.

Command Modes

Configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

By default, all three N-port types (initiator, mgmt, and target) are in VSAN 1. Explicitly remove it from VSAN 1 if this is not required by your network.

The VSAN number can be any number from 1 to 4096. Only 64 VSANs for all initiator/mgmt/target are allowed (meaning, you can have initiator in VSANs 1-30, target in VSANs 31-60, and mgmt in VSANs 61-64). If the target, initiator, and mgmt overlap in VSANs, each overlap is also included in the total VSAN count.

A mgmt N-port can only exist in 4 of these 64 VSANs.

You can specify a range of interfaces by issuing a command with the following example format:

interface svc 1/1 *space* **,** *space* **svc 2/1-2**

This command configures Slot 1 Node 1 as an SVC interface and simultaneously configures Slot 2, Nodes 1and 2 as SVC interfaces.

Place the disk, host, and other SVC nodes in the appropriate VSAN for any configuration to be completely established

Examples

The following example configures the initiator N-port on VSAN 1, the target N-port on VSAN 2, and the management N-port on VSAN 3.

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# interface svc 2/1
switch(config-if)# ?
Interface configuration commands:
    do          EXEC command
    exit        Exit from this submode
    initiator   Configure Initiator traffic for SVC Node
    mgmt        Configure traffic for communication with other SVC Nodes
    no          Negate a command or set its defaults
    nwwn        Configured a non-system allocated nWWN for SVC Node
    shutdown    Enable/disable an interface
    switchport  Configure switchport parameters
    target      Configure Target traffic for SVC Node

switch(config-if)# initiator vsan 1
switch(config-if)# target vsan 2
switch(config-if)# mgmt vsan 3
```

Related Commands

Command	Description
show interface	Displays an interface configuration for a specified interface.

iogroup

To assign a name to I/O groups, use the **iogroup** command in the cluster configuration submode. Use the **no** form of this command to delete the configured I/O group alias.

cluster config *cluster-name*

iogroup *group-id* **alias** *alias-name*

Syntax Description

cluster	Provides access to cluster commands
config *cluster-name*	Places a previously created cluster in the cluster configuration submode.
iogroup *group-id*	Identifies one of four I/O groups in the specified cluster. The ID ranges from 1 to 4.
alias *alias-name*	Assigns a name to the selected I/O group. The name is restricted to 15 alphanumeric characters.

Defaults

None.

Command Modes

SVC configuration mode—cluster configuration submode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The **no iogroup** command deletes the alias name, not the I/O group itself.

The cluster configuration submode prompt is (`switch(svc-cluster)#`).

Examples

The following example enters the cluster configuration mode for SampleCluster and configures a new I/O group. The created group is verified using the **show cluster** *name* **iogroup** command

```
switch(svc)# cluster config SampleCluster

switch(svc-cluster)# iogroup 1 alias SampleIOgroup

switch(svc-cluster)# exit
```

Related Commands

Command	Description
show cluster *name* **iogroup**	Displays configured I/O group information for a specified cluster.

ip

To modify the IP address for a cluster, use the **ip** command in the cluster configuration submode.

cluster config *cluster-name*

ip *ip-address*

Syntax Description

cluster	Provides access to cluster commands
config *cluster-name*	Places a previously created cluster in the cluster configuration submodes.
ip *ip-address*	Specifies the IP address of the cluster.

Defaults

None.

Command Modes

SVC configuration mode—cluster configuration submode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The IP address of the cluster can be changed, but not deleted. If you connect using the current cluster IP address, that session is lost when the command completes. You must then reconnect using the new IP address.

The **no** form of this command is not allowed.

The cluster configuration submode prompt is (`switch(svc-cluster)#`).

Examples

The following example enters the cluster configuration mode for SampleCluster, configures the IP address, and verifies by displaying this information

```
switch(svc)# cluster config SampleCluster

switch(svc-cluster)# ip 172.22.92.32

switch(svc)# show cluster SampleCluster ip
cluster ip address is 172.22.92.32
```

Related Commands

Command	Description
show cluster *name* **ip**	Displays configured -- information for a specified cluster.

mdisk-grp

To create and configure a mdsik group, use the **mdisk-grp** command in the cluster configuration submode.

cluster config *cluster-name*

mdisk-grp add *grp-name* **extent** *size*

mdisk-grp name *grp-name* **-> mdisk id** *mdisk-id*

Syntax Description

cluster	Provides access to cluster commands
config *cluster-name*	Places a previously created cluster in the cluster configuration submode.
mdisk-grp add *grp-name*	Adds a mdisk group.
extent *size*	Assigns the extent size of the storage allocation for MDisks in this cluster. The extent size can be 16, 32, 64, 128, 256, or 512 MB.
mdisk-grp name *grp-name*	Enters the mdisk submode of an existing MDisk group.
mdisk id *mdisk-id*	Assigns the disk ID ranging from 1 to 4096 to the mdisk in the MDisk group submode.

Defaults

None.

Command Modes

SVC configuration mode—cluster configuration submode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The cluster configuration submode prompt is (`switch(svc-cluster)#`).

The submode prompt for the MDisk group is `switch (svc-cluster-mdisk-grp)#`

Examples

The following example enters the cluster configuration mode for SampleCluster, creates an MDisk group, and adds an MDisk to the group.

```
switch(svc)# cluster config SampleCluster

switch(svc-cluster)# mdisk-grp add Mdisk1 extent 512

switch(svc-cluster)# mdisk-grp name Mdisk1

switch(svc-cluster-mdisk-grp)# mdisk id 3

switch(svc)# show cluster SampleCluster mdisk-grp
--------------------------------------------------------------------------------
name             Capacity      free     extent   number    number    status
```

```
                                        size(MB) of mdisks of vdisks
-------------------------------------------------------------------------------
finance          7.56 GB       7.56 GB  16       5          0          online
marketing        6.48 GB       6.48 GB  16       5          0          online
```

Related Commands

Command	Description
show cluster *name* **mdisk**	Displays configured MDisk group information for a specified cluster.

migrate vdisk

To configure data migration from a VDisk, use the **migrate vdisk** command in the cluster configuration submode.

cluster config *cluster-name*

migrate vdisk *vdisk-name* **new-mdisk-grp** *grp-name*

migrate vdisk *vdisk-name* **src-mdisk id** *mdisk-id* **num-extents** *number* **tgt-mdisk id** *mdisk-id*

Syntax Description

cluster	Provides access to cluster commands
config *cluster-name*	Places a previously created cluster in the cluster configuration submode.
migrate vdisk *vdisk-name*	Migrates data from the specified VDisk to a MDisk or MDisk group.
new-mdisk-grp *grp-name*	Migrates data to a newly specified MDisk group.
src-mdisk id *mdisk-id*	Specifies the source MDisk for data migration.
num-extents *number*	Specifies the extents of a VDisk for data migration.
tgt-mdisk id *mdisk-id*	Specifies the target MDisk for data migration.

Defaults

None.

Command Modes

SVC configuration mode—cluster configuration submode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The cluster configuration submode prompt is (`switch(svc-cluster)#`).

Examples

The following example enters the cluster configuration mode for SampleCluster, migrates a VDisk to a new MDisk group.

```
switch(svc)# cluster config SampleCluster

switch(svc-cluster)# migrate vdisk Vdisk2 new-mdisk-grp Group5

switch(svc-cluster)# migrate vdisk Vdisk2 src-mdisk id 3 num-extents 2 tgt-mdisk id 4
```

Related Commands

Command	Description
show cluster *name* **status migrate**	Displays configured MDisk migration status information for a specified cluster.

node

To add a node to a cluster or to assign a name to a preconfigured node, use the **node** command in the cluster configuration submode.

cluster config *cluster-name*

node name *node-name*

node nwwn *node-wwn*

node iogroup *group-id* **[alias** *alias-name* **]**

Syntax Description

cluster config	Provides access to cluster commands
node	Adds a specified node to the cluster being configured.
name *node-name*	Specifies the node using a 15 alphanumeric characters.
nwwn *node-wwn*	Specifies the node using the nWWN with the format hh:hh:hh:hh:hh:hh:hh:hh.
iogroup *group-id*	Identifies one of four I/O groups in the specified cluster. The ID ranges from 1 to 4.
alias *alias-name*	Assigns a name to the selected node. The name is restricted to 156 alphanumeric characters.

Defaults

None.

Command Modes

SVC configuration mode—cluster configuration submode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The cluster configuration submode prompt is (`switch(svc-cluster)#`).

The node must first be added before assigning an alias name.

The no form of the command deletes the node from the cluster.

Examples

The following example enters the cluster configuration mode for SampleCluster, adds a node by assigning the nWWN, and associates the node with an alias.

```
switch(svc)# cluster config SampleCluster

switch(svc-cluster)# node nwwn 20:00:00:04:cf:e6:e4:df iogroup 1

switch(svc-cluster)# node nwwn 20:00:00:04:cf:e6:e4:df alias NodeAlias
```

Related Commands

Command	Description
show cluster *name* **nodes**	Displays configured node information for a specified cluster.

node svc delete

To delete all cluster configurations from a specific node, use the **node svc delete** command in SVC configuration mode.

node svc *slot-number*/*node-number* **delete**

Syntax Description

node svc	Specifies the node's SVC interface
slot-number	Specifies the slot number of the Caching Service Module (CSM).
node-number	Specifies the node number of the SVC instance running on the CSM. This number ranges from 1 to 2 nodes per module.
delete	Deletes a cluster information from the specified node.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Use this command if the node has lost communication with a configured cluster.

Examples

The following example enters the SVC configuration mode and adds a cluster called SampleCluster.

```
switch# svc-config
switch(svc)# node svc 2/1 delete
```

Related Commands

Command	Description
show nodes local	Displays configured node information.

node svc recover

To initiate cluster recovery on a specified SVC node, use the **recover cluster** command in SVC configuration mode.

node svc *slot-number*/*node-number* **recover**

Syntax Description

node svc	Specifies the node's SVC interface
slot-number	Specifies the slot number of the Caching Service Module (CSM).
node-number	Specifies the node number of the SVC instance running on the CSM. This number ranges from 1 to 2 nodes per module.
recover	Initiates recovery for a specified node.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

Use this command to initiate cluster recovery after a failure. If the output of the **show nodes local** command displays `recovery pause` in the node status column.

Examples

The following example initiates recovery for the SVC node 1 in slot 2.

```
switch# svc-config
switch(svc)# node svc 2/1 recover
```

Related Commands

Command	Description
show nodes local	Displays configured node information.

node svc servicemode

To place a node in service mode, use the **servicemode node svc** command in SVC configuration mode. Use the **no** form of the command to remove a node from service mode.

node svc *slot-number*/*node-number* **servicemode**

Syntax Description

node svc	Specifies the node's SVC interface
slot-number	Specifies the slot number of the Caching Service Module (CSM).
node-number	Specifies the node number of the SVC instance running on the CSM. This number ranges from 1 to 2 nodes per module.
servicemode	Places a node in service mode.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example enters the SVC configuration mode and places the specified node in service mode.

```
switch# svc-config
switch(svc)# node svc 2/2 servicemode
```

Related Commands

Command	Description
show nodes local	Displays configured node information.

node svc upgrade

To upgrade the software on a specified SVC node, use the **upgrade node svc** command in SVC configuration mode.

node svc *slot-number/node-number url* **upgrade svc-system** *url*

Syntax Description

node svc	Specifies the node's SVC interface
slot-number	Specifies the slot number of the Caching Service Module (CSM).
node-number	Specifies the node number of the SVC instance running on the CSM. This number ranges from 1 to 2 nodes per module.
upgrade	Upgrades the image on the specified node.
svc-system *url*	Specifies the SVC image to be used. The new version of the software image is specified to the FTP:, SCP:, SFTP:, TFTP:, bootflash:, or slot0: directories

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

This command is valid only if the node is in service mode or the node has been shutdown.

Examples

The following example enters the SVC configuration mode and displays all options in this mode.

```
switch# svc-config
switch(svc)# node svc 2/1 upgrade svc-system ?
  bootflash:  URI containing the system image for SVC
  ftp:        URI containing the system image for SVC
  scp:        URI containing the system image for SVC
  sftp:       URI containing the system image for SVC
  slot0:      URI containing the system image for SVC
  tftp:       URI containing the system image for SVC
```

quorum

To set the quorum disk for a cluster, use the **quorum** command in the cluster configuration submode.

cluster config *cluster-name*

quorum disk [1 | 2 | 3] mdisk *disk-id*

Syntax Description

cluster	Provides access to cluster commands
config *cluster-name*	Places a previously created cluster in the cluster configuration submode.
quorum disk *id*	Configures one of three quorum disks for the specified cluster. The quorum ID ranges from 1 to 3.
mdisk *mdisk-id*	Specifies the MDisk ID (ranges form 1 to 4096).

Defaults

None.

Command Modes

SVC configuration mode—cluster configuration submode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The cluster configuration submode prompt is (`switch(svc-cluster)#`).

You can assign one of 3 possible quorum IDs in any desired order.

Examples

The following example enters the cluster configuration mode for SampleCluster and sets the quorum disk ID.

```
switch(svc)# cluster config SampleCluster

switch(svc-cluster)# quorum disk 2 mdisk 1
```

remote-copy

To create a synchronous copy of a specified VDisk or group of VDisks, use the **remote-copy** command in the cluster configuration submode.

cluster config *cluster-name*

remote-copy add *rcopy-name* **[cluster** *rcluster-name]*

remote-copy *rcopy-name*
map src-vdisk *vdisk-name* **aux-vdisk** *vdisk-name*

Syntax Description

cluster	Provides access to cluster commands
config *cluster-name*	Places a previously created cluster in the cluster configuration submode.
remote-copy add *rcopy-name*	Creates a remote copy instance and assigns a name.
remote-copy cluster *rcluster-name*	Specifies the remote cluster name for the consistency group.
remote-copy *rcopy-name*	Enters the remote-copy submode for an existing copy object.
map	Establishes a relationship between the source and destination VDisks.
src-vdisk *vdisk-name*	Specifies the source VDisk for the copy creation.
aux-vdisk *vdisk-name*	Specifies a VDisk in the remote copy cluster.

Defaults

None.

Command Modes

SVC configuration mode—cluster configuration submode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The cluster configuration submode prompt is `(switch(svc-cluster)#)`.

The remote-copy submode prompt is `switch(svc-cluster-remote-copy)#`

Examples

The following example enters the cluster configuration mode for SampleCluster and creates a synchronous copy of a specified disk.

```
switch(svc)# cluster config SampleCluster

switch(svc-cluster)# remote-copy add Rcopy1

switch(svc-cluster)# remote-copy r1
switch(svc-cluster-remote-copy)# ?
Submode Commands:
  exit  Exit from this mode
```

```
  map    Remote-copy map
  no     Negate a command or set its defaults

switch(svc-cluster-remote-copy)# map src-vdisk SrcVdisk1 aux-vdisk AuxVdisk1

switch(svc-cluster)# remote-copy add Rcopy1 cluster remote-cluster

switch(svc-cluster)# remote-copy name Rcopy1
```

Related Commands

Command	Description
show cluster *name* **remote-copy**	Displays configured remote-copy information for a specified cluster.

show cluster flash-copy

To display configured FlashCopy information for a specified cluster, use the **show cluster** *cluster-name* **flash-copy** command.

show cluster *cluster-name* **flash-copy [** *fcopy-name]*

Syntax Description

show cluster *cluster-name*	Specifies a previously created cluster name.
flash-copy *fcopy-name*	Displays FlashCopy relationships configured for the specified FlashCopy object.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following examples display configured cluster information.

```
switch(svc)# show cluster SampleCluster flash-copy
-------------------------------------------------------------------------------
name             status
-------------------------------------------------------------------------------
fccstgrp0        idle_or_copied
f2               idle_or_copied

switch(svc)# show cluster SampleCluster flash-copy f2
Flash-copy mapping 1:
    src vdisk is v2
    dest vdisk is v3
    state is idle_or_copied
    copy rate is 50
    progress 0% done
```

show cluster host

To display configured host information for a specific cluster, use the **show cluster** *cluster-name* **host** command.

show cluster *cluster-name* **host [** *host-name* **| candidate]**

Syntax Description

show cluster *cluster-name*	Specifies a previously created cluster name.
host	Displays information about hosts and host ports.
candidate	Lists all candidates that are not part of this entity but are visible to the cluster.
host-name	Displays information about the specified host.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following examples display configured cluster host information.

```
switch(svc)# show SampleCluster host
-------------------------------------------------------------------------------
name             number of ports
-------------------------------------------------------------------------------
oasis15          1
Host1            2


switch(svc)# show SampleCluster host Host1
host Host1:
    Number of port is 2
    Port WWN is 11:22:33:44:aa:bb:cc:dd
    Port WWN is 22:11:33:55:11:aa:bb:cc
    LUN 0:  vdisk V1
    LUN 10: vdisk V2

switch(svc)# show cluster SampleCluster host candidate
-------------------------------------------------------------------------------
id       pwwn
-------------------------------------------------------------------------------
1        21:00:00:e0:8b:09:e7:04
```

show cluster iogroup

To display configured I/O group information for a specified cluster, use the **show cluster** *cluster-name* **iogroup** command.

show cluster *cluster-name* **iogroup [** *group-id* **]**

Syntax Description

show cluster *cluster-name*	Specifies a previously created cluster name.
iogroup	Identifies one of four I/O groups in the specified cluster.
group-id	Specifies the iogroup ID (ranges from 1 to 4).

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following examples display configured cluster iogroup information.

```
switch(svc)# show SampleCluster iogroup
-------------------------------------------------------------------------------
ID   NAME                              NODE-COUNT       VLUN_COUNT
-------------------------------------------------------------------------------
1    Sampleio1                         2                3
2    io_grp1                           0                0
3    io_grp2                           0                0
4    io_grp3                           0                0
5    recovery_io_grp                   0                0
```

Note Only four IDs can be used, the fifth I/O group is internally created and is only used for cluster recovery.

```
switch(svc)# show SampleCluster iogroup id 2
Io group id 2:
    Node count is 0
    Host LUN count is 0
    Contains no nodes
```

show cluster ip

To displays configured ip information for a specified cluster, use the **show** *cluster-name* **ip** command.

show cluster *cluster-name* **ip**

Syntax Description

show cluster *cluster-name*	Specifies a previously created cluster name.
ip	Displays the IP address of the specified cluster.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example displays configured cluster ip information.

```
switch(svc)# show SampleCluster ip
cluster ip address is 172.22.92.32
```

show cluster mdisk

To display configured MDisk information for a specified cluster, use the **show cluster** *cluster-name* **mdisk** command.

show cluster *cluster-name* **mdisk { candidate | id** *mdisk-id* **[extent] }**

Syntax Description

show cluster *cluster-name*	Specifies a previously created cluster name.
mdisk	Displays MDisk specific information.
candidate	Displays all MDisks that are not assigned to a group.
id *mdisk-id*	Displays details of the specified MDisk ID.
extent	Displays information about the specified MDisk's extent.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following examples display configured cluster MDisk information.

```
switch(svc)# show SampleCluster mdisk
-------------------------------------------------------------------------------
id       nwwn                    mdisk-grp       capacity      status
-------------------------------------------------------------------------------
1        20:00:00:04:cf:e6:1b:5b mg1             68.37 GB      online
2        20:00:00:04:cf:e6:e5:32 mg1             68.37 GB      online
3        20:00:00:04:cf:e6:21:a2 mg1             68.37 GB      online
4        20:00:00:04:cf:e6:e1:81 mg1             68.37 GB      online
5        20:00:00:04:cf:e6:e4:df                 68.37 GB      online
6        20:00:00:04:cf:e6:1c:fb                 68.37 GB      online
7        20:00:00:04:cf:e6:1a:4c                 68.37 GB      online
8        20:00:00:04:cf:e6:e4:6b                 68.37 GB      online

switch(svc)# show SampleCluster mdisk candidate
-------------------------------------------------------------------------------
id       nwwn                    capacity
-------------------------------------------------------------------------------
5        20:00:00:04:cf:e6:e4:df 68.37 GB
6        20:00:00:04:cf:e6:1c:fb 68.37 GB
7        20:00:00:04:cf:e6:1a:4c 68.37 GB
8        20:00:00:04:cf:e6:e4:6b 68.37 GB

switch(svc)# show cluster SampleCluster mdisk id 1
mdisk id 1 is online
```

```
   Is member of mdisk-grp mg1
   Controller node WWN is 20:00:00:04:cf:e6:e4:6b
   Controller port WWN is 22:00:00:04:cf:e6:e4:6b, LUN 00:00:00:00:00:00:00:00
   Controller serial number is 3HZ0KZ8W
   Capacity is 68.37 GB
   Number of free extents is 2231

switch(svc)# show cluster SampleCluster mdisk id 1 extent
--------------------------------------------------------------------------------
vdisk            number of extents
--------------------------------------------------------------------------------
v1              2144
```

show cluster mdsik-grp

To display configured MDisk group information for a specified cluster, use the **show cluster** *cluster-name* **mdisk-grp** command.

show cluster *cluster-name* **mdisk-grp** (*grp-name*)

Syntax Description

show cluster *cluster-name*	Specifies a previously created cluster name.
mdisk-grp *grp-name*	Displays information about a specified MDisk group.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following examples display configured cluster information for a MDisk group.

```
switch(svc)# show cluster SampleCluster mdisk-grp
-------------------------------------------------------------------------------
name           Capacity       free        extent     number     number     status
                                          size(MB)   of mdisks  of vdisks
-------------------------------------------------------------------------------
mg1            410.16 GB      309.16 GB   16         6          1          online

switch(svc)# show cluster SampleCluster mdisk-grp mg1
mdisk-grp mg1 is online
   Total capacity is 410.16 GB
   Free capacity is 309.16 GB
   Extent size is 16 MB
   Number of mdisks is 6
   Number of vdisks using this group is 1
```

show cluster nodes

To display configured node information for a specified cluster, use the **show cluster** *cluster-name* **nodes** command.

show cluster *cluster-name* **nodes [candidate]**

Syntax Description

show cluster *cluster-name*	Specifies a previously created cluster name.
nodes	Displays information about nodes in this cluster.
candidate	Lists all candidates that are not part of this entity but are visible to the cluster.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example displays configured cluster information for a specified node.

```
switch(svc)# show cluster SampleCluster nodes
Node node1 is online(3)
    Node WWN is 20:06:00:0b:be:57:73:42
    Serial number is JAB072705JH
    Unique id is 01:00:07:27:30:35:4a:48
    Node is in config mode
    Node is part of iogroup id 1 name io_grp0

Node node2 is online(3)
    Node WWN is 20:08:00:0b:be:57:73:42
    Serial number is JAB076605JH
    Unique id is 01:00:07:66:30:35:4a:48
    Node is in non config mode
    Node is part of iogroup id 1 name io_grp0

switch1(svc)# show cluster SampleCluster nodes candidate
--------------------------------------------------------------------------------
NODE                              NWWN
--------------------------------------------------------------------------------
switch1.2.1                  20:06:00:05:30:00:8d:e0
```

show cluster remote-copy

To display configured remote-copy information for a specified cluster, use the **show cluster** *cluster-name* **remote-copy** command.

show cluster *cluster-name* **remote-copy [** *rcopy-name* **]**

Syntax Description

show cluster *cluster-name*	Specifies a previously created cluster name.
remote-copy	Displays remote copy relationships configured for a specified cluster.
rcopy-name	Displays the specified remote copy object.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example displays configured cluster information for the specified copy instance.

```
switch(svc)# show cluster SampleCluster remote-copy r1
Remote-copy mapping 1:
    master cluster is SampleCluster
    master vdisk is v6
    aux cluster is c1
    aux vdisk is v7
    status is inconsistent_stopped
    progress 0% done

Remote-copy mapping 2:
    master cluster is SampleCluster
    master vdisk is v8
    aux cluster is c1
    aux vdisk is v9
    status is inconsistent_stopped
    progress 0% done
```

show cluster remote-copy-cluster

To display configured remote-copy partnership information for a specified cluster, use the **show cluster** *cluster-name* **remote-copy-cluster** command.

show cluster *cluster-name* **remote-copy-cluster (** *rcopy-name* **)**

Syntax Description

show cluster *cluster-name*	Specifies a previously created cluster name.
remote-copy-cluster	Displays remote copy relationships configured for a specified cluster.
rcopy-name	Displays the specified remote copy object.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example displays configured cluster information for the specified copy instance.

```
switch(svc)# show cluster SampleCluster remote-copy-cluster
-----------------------------------------------
Cluster          Local/remote     Bandwidth
-----------------------------------------------
local-cluster    local             10
remote-cluster   remote            50
```

show cluster status

To displays progress information for a specified cluster, use the **show cluster** *cluster-name* **status** command.

show cluster *cluster-name* **status [flash-copy** *fcopy-name* **| remote-copy** *rcopy-name***]**

Syntax Description

show cluster *cluster-name*	Specifies a previously created cluster name.
status	Displays the status of a upgrade or copy process.
flash-copy	Displays FlashCopy relationships configured for the specified cluster.
fcopy-name	Displays the specified FlashCopy object.
remote-copy	Displays remote copy relationships configured for a specified cluster.
rcopy-name	Displays the specified remote copy object.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following examples display configured cluster information.

```
switch(svc)# show cluster SampleCluster status flash-copy fc1
--------------------------------------------------------------------------------
src vdisk        dest vdisk       progress
--------------------------------------------------------------------------------
v1               v2               100% done
v3               v4               100% done

switch(svc)# show cluster SampleCluster status remote-copy rc1
--------------------------------------------------------------------------------
src vdisk        aux vdisk        progress
--------------------------------------------------------------------------------
v5               v6               100% done
v7               v8               100% done
```

show cluster vdisk

To display configured VDisk information for a specified cluster, use the **show cluster** *cluster-name* **vdisk** command.

show cluster *cluster-name* **vdisk {** *vdisk-id* **[extent | mapped_hosts] }**

Syntax Description

show cluster *cluster-name*	Specifies a previously created cluster name.
vdisk	Displays configured VDisks in the cluster
vdisk-id	Displays details of the specified VDisk ID.
extent	Displays information about the specified MDisk's extent.
mapped_hosts	Displays information about which hosts are mapped to the specified VDisk.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following examples display configured cluster information for VDisks.

```
switch(svc)# show cluster SampleCluster vdisk v1 extent
--------------------------------------------------------------------------------
mdisk id  number of extents
--------------------------------------------------------------------------------
1         2144
2         2144
3         2144
5         11
6         11
7         10
switch(svc)# show cluster SampleCluster vdisk v1 mapped_hosts
--------------------------------------------------------------------------------
host             LUN
--------------------------------------------------------------------------------
oasis15          0
```

show environment battery

To display status of a battery module for the Caching Services Module (CSM), use the **show environment battery** command.

show environment battery module *slot-number* **[detail]**

Syntax Description

show environment	Displays the hardware environment in any Cisco MDS 9000 Family switch.
battery	Displays the status of the battery in a CSM.
module *slot-number*	Specifies the slot number of the CSM.
detail	Provides detailed information about the CSM battery status.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was modified in Release 1.3(1).

Usage Guidelines

None.

Examples

The following example displays the current contents of the boot variable.

```
switch# show environment battery module 2
Battery 1:
----------
Voltage             : 10.343 V
Current             : 0.000 A
Temperature         : 23.7 C
Current Capacity    : 1571 mAHr
Full Capacity       : 2057 mAHr
CySampleClustere Count         : 3
Last conditioned in : Week 22 2003
Serial Num          : AMB0722009C

Battery 2:
----------
Voltage             : 10.596 V
Current             : 0.000 A
Temperature         : 26.6 C
Current Capacity    : 1701 mAHr
Full Capacity       : 2032 mAHr
CySampleClustere Count         : 6
Last conditioned in : Week 22 2003
Serial Num          : AMB0722009R

switch## show environment battery module 2 detail
Battery 1:
```

```
----------
Voltage             : 10.338 V
Current             : 0.000 A
Temperature         : 23.7 C
Current Capacity    : 1571 mAHr
Full Capacity       : 2057 mAHr
Caching Capacity    : 6463 MB
CySampleClustere Count         : 3
Last conditioned in : Week 22 2003
Serial Num          : AMB0722009C
EEPROM version      : 1

Manufacturer Access            : 0x0
Remaining Capacity Alarm       : 0xc8
Remaining Time Alarm           : 0xa
Battery Mode                   : 0x6000
AtRate                         : 0x0
AtRate Time To Full            : 0xffff
AtRate Time To Empty           : 0xffff
AtRate OK                      : 0x1
Temperature                    : 0xb97
Voltage                        : 0x2862
Current                        : 0xd
Average Current                : 0x6
Max Error                      : 0x2
Relative State of Charge       : 0x4c
Absolute State of Charge       : 0x4f
Remaining Capacity             : 0x623
Full Charge Capacity           : 0x809
Run Time To Empty              : 0xffff
Average Time To Empty          : 0xffff
Average Time To Full           : 0x13f2
Charging Current               : 0x44c
Charging Voltage               : 0x3840
Battery Status                 : 0xc0
CySampleClustere Count                    : 0x3
Design Capacity                : 0x7d0
Design Voltage                 : 0x2580
Specification Info             : 0x21
Manufacture Date               : 0x3037
Serial Number                  : 0x0
Manufacturer Name              : 0x430a
Device Name                    : 0x4207
Device Chemistry               : 0x4e04
Manufacturer Data              : 0x7507
Pack Status & Configuration    : 0x2020
VCELL4                         : 0x0
VCELL3                         : 0x0
VCELL2                         : 0x0
VCELL1                         : 0x0
...
```

show interface svc

You can check the status of a SVC interface at any time by using the **show interface svc** command.

show interface svc *slot-number/node-number* [**brief | counters | description]**

Syntax Description

interface range	Displays the interfaces in the specified range.
brief	Displays brief info of interface.
counters	Displays the interface counter information.
description	Displays a description of interface.
svc	Displays the SAN Volume Controller (SVC) interface.
slot-number	Specifies the slot number of the Caching Service Module (CSM).
node-number	Specifies the node number of the SVC instance running on the CSM. This number ranges from 1 to 2 nodes per module.

Defaults

None

Command Modes

EXEC

Command History

This command was modified in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following examples display configured SVC interface information.

```
switch# show interface svc 2/1
svc2/1 is up
    Node WWN is 10:00:00:00:00:00:00:00
    Fabric WWN is 20:41:00:05:30:00:33:1e
    Target N-port WWN is 27:39:00:05:30:00:33:2a, vsan is 1, FCID is 0x010006
    Initiator N-port WWN is 27:3a:00:05:30:00:33:2a, vsan is 1, FCID is 0x010007
    Mgmt N-port WWN is 27:3b:00:05:30:00:33:2a, vsan is 1, FCID is 0x010008
    5 minutes input rate 16 bits/sec, 2 bytes/sec, 0 frames/sec
    5 minutes output rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
      7 frames input, 736 bytes
        0 discards, 0 errors
      3 frames output, 276 bytes
        0 discards, 0 errors

switch# show interface svc 8/1-2
svc8/1 is down (Administratively down)
    Node WWN is 23:34:00:05:30:00:00:02
    Fabric WWN is 21:c1:00:05:30:00:00:00
    Target N-port WWN is 23:2e:00:05:30:00:00:02, vsan is 1, FCID is 0x000000
    Initiator N-port WWN is 23:2f:00:05:30:00:00:02, vsan is 1, FCID is 0x000000
    Mgmt N-port WWN is 23:30:00:05:30:00:00:02, vsan is 1, FCID is 0x000000
```

```
    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 frames output, 0 bytes
        0 discards, 0 errors

svc8/2 is up
    Node WWN is 23:35:00:05:30:00:00:02
    Fabric WWN is 21:c2:00:05:30:00:00:00
    Target N-port WWN is 23:31:00:05:30:00:00:02, vsan is 1, FCID is 0x650003
    Initiator N-port WWN is 23:32:00:05:30:00:00:02, vsan is 1, FCID is 0x650004
    Mgmt N-port WWN is 23:33:00:05:30:00:00:02, vsan is 1, FCID is 0x650005
    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
      3268061 frames input, 6602103068 bytes
        0 discards, 2 errors
      3208131 frames output, 6598470800 bytes
        0 discards, 0 errors

switch# show interface brief
--------------------------------------------------------------------------------
Interface  Vsan   Admin  Admin   Status          FCOT   Oper  Oper   Port
                  Mode   Trunk                         Mode  Speed  Channel
                         Mode                                (Gbps)
--------------------------------------------------------------------------------
fc8/1      1      FX     --      fcotAbsent       --     --           --
...
fc8/32     1      FX     --      fcotAbsent       --     --           --
--------------------------------------------------------------------------------
Interface          Status                            Speed
                                                     (Gbps)
--------------------------------------------------------------------------------
sup-fc0            up                                1
--------------------------------------------------------------------------------
Interface               Status     IP Address        Speed        MTU
--------------------------------------------------------------------------------
mgmt0                   up         172.22.90.21/24   100 Mbps     1500
--------------------------------------------------------------------------------
Interface          Status
--------------------------------------------------------------------------------
svc2/1             down
svc2/2             up
svc4/1             up
svc4/2             up

switch# show interface svc 2/1 counters
svc2/1
    5 minutes input rate 0 bits/sec, 0 bytes/sec, 0 frames/sec 0 ios/sec
    5 minutes output rate 0 bits/sec, 0 bytes/sec, 0 frames/sec 0 ios/sec
    272 frames input, 89764 bytes
      39 input session management frames
        19 plogi, 1 plogi_acc, 13 prli, 1 prli_acc
        2 logo, 0 logo_acc, 0 prlo, 0 prlo_acc
        3 abts, 0 ba_acc, 0 ls_rjt
      28 input I/Os, 28 cmd complete, 0 cmd fail
        24 reads, 4 writes
        0 input errors
        0 input discards
          FCP cmd errors
            0 sess not up, 0 no resources, 0 bad frames
            0 up layer rjt, 0 out of order, 0 proc unexp exch st
            0 drop unexp exch st, 0 no exch match
          FCP Xrdy errors
```

```
            0 sess not up, 0 no resources, 0 bad frames
            0 up layer rjt, 0 out of order, 0 proc unexp exch st
            0 drop unexp exch st, 0 no exch match
          FCP status errors
            0 sess not up, 0 no resources, 0 bad frames
            0 up layer rjt, 0 out of order, 0 proc unexp exch st
            0 drop unexp exch st, 0 no exch match
          FCP Data errors
            0 sess not up, 0 no resources, 0 bad frames
            0 up layer rjt, 0 out of order, 0 proc unexp exch st
            0 drop unexp exch st, 0 no exch match
          0 Incoming Aborts
    232 frames output, 84176 bytes
      35 output session management frames
        6 plogi, 13 plogi_acc, 1 prli, 12 prli_acc
        0 logo, 0 logo_acc, 0 prlo, 0 prlo_acc
        1 abts, 2 ba_acc, 0 ls_rjt
      103 out I/Os, 103 cmd complete, 0 cmd fail
        63 reads, 4 writes
      0 output errors
      0 output discards
        0 out ls aborts
           LS requests while sess not up
             0 cmds 0 data xfers 0 status xfers 0 ds xfers

switch# show interface svc 4/2 description

--------------------------------------------------------------------------------
Interface          Description
--------------------------------------------------------------------------------
svc4/2             SampleInt1
```

show nodes

To displays configured information for the CSM, use the **show svc** command.

show nodes { local [detail] | svc *slot_number/node-number* **| version }**

Syntax Description

show nodes	Displays information about the specified nodes.
local	Displays SVC nodes in the switch.
detail	Displays detailed node information.
svc	Displays node information specific to the SVC interface.
slot-number	Specifies the slot number of the Caching Service Module (CSM).
node-number	Specifies the node number of the SVC instance running on the CSM. This number ranges from 1 to 2 nodes per module.
version	Displays software version information for each node.

Defaults

None.

Command Modes

SVC configuration mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example display configured SVC information and statistics.

```
switch(svc)# show nodes local detail
svc2/1:
  Is a config node for cluster SampleCluster
  cluster Status is active
  Node Status is active

svc2/2:
  Is member of cluster SampleCluster
  cluster Status is active
  Node Status is active

switch(svc)# show nodes ?
  local    Show nodes in the switch
  svc      SVC Interface
  version  Show node sw versions in the switch
  <cr>     Carriage Return

switch(svc)# show nodes svc 2/2
svc2/2:
  Is not a member of any cluster
  Cluster Status is unconfigured
```

```
  Node Status is free

switch(svc)# show nodes version
------------------------------------------------------
Node              sw version       state
------------------------------------------------------
svc2/1            1.3(1)       Runtime code    (5)
svc2/2            1.3(1)       Runtime code    (5)
```

Related Commands

Command	Description
svc config	Configures SVC nodes.

show svc

To displays configured information for the CSM, use the **show svc** command.

show svc
port svc *slot_number/node-number* **[detail | initiator | mgmt | target (detail | vsan** *vsan-id* **)] | session [detail | initiator | mgmt | peer-wwn** *pwwn-id* **| target (detail | vsan** *vsan-id* **)] | stats xipc [interface svc** *slot_number/node-number***] | [module** *slot-number***]**

Syntax Description

show svc	Displays configured SVC information.
port	Displays N-port specific SVC information.
svc	Specifies the new interface to be a SVC interface.
slot-number	Specifies the slot number of the Caching Service Module (CSM).
node-number	Specifies the node number of the SVC instance running on the CSM. This number ranges from 1 to 2 nodes per module.
detail	Displays detailed information for all N ports
initiator	Displays a SVC node as an initiator in the specified VSAN.
mgmt	Displays a SVC node as a management node in the specified VSAN.
target	Displays a SVC node as a target in the specified VSAN.
vsan *vsan-id*	Specifies the VSAN ID ranging from 1 to 4093.
session	Displays information specific to the SVC session.
peer-pwwn *pwwn-id*	Specifies the port WWN of the target or host, with the format hh:hh:hh:hh:hh:hh:hh:hh.
stats	Displays SVC statistical information generally used for debugging.
module *slot-number*	Specifies the slot number containing the CSM.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following examples display configured SVC information and statistics.

```
switch# show svc session svc 2/1
svc2/1:
   Target N-port WWN is 21:00:00:05:30:00:8d:e0, vsan is 2, FCID is 0x610100
     pWWN 21:00:00:e0:8b:09:f0:04, nWWN 20:00:00:e0:8b:09:f0:04, FCID 0x610000
   Initiator N-port WWN is 20:01:00:05:30:00:8d:e0, vsan is 1, FCID is 0xec0100
```

```
      pWWN 22:00:00:04:cf:e6:e4:6b, nWWN 20:00:00:04:cf:e6:e4:6b, FCID 0xec00d4
      pWWN 22:00:00:04:cf:e6:1a:4c, nWWN 20:00:00:04:cf:e6:1a:4c, FCID 0xec00d5
      pWWN 22:00:00:04:cf:e6:1c:fb, nWWN 20:00:00:04:cf:e6:1c:fb, FCID 0xec00d6
      pWWN 22:00:00:04:cf:e6:e1:81, nWWN 20:00:00:04:cf:e6:e1:81, FCID 0xec00d9
      pWWN 22:00:00:04:cf:e6:e4:df, nWWN 20:00:00:04:cf:e6:e4:df, FCID 0xec00da
      pWWN 22:00:00:04:cf:e6:21:a2, nWWN 20:00:00:04:cf:e6:21:a2, FCID 0xec00dc
      pWWN 22:00:00:04:cf:e6:e5:32, nWWN 20:00:00:04:cf:e6:e5:32, FCID 0xec00e0
      pWWN 22:00:00:04:cf:e6:1b:5b, nWWN 20:00:00:04:cf:e6:1b:5b, FCID 0xec00e1
    Mgmt N-port WWN is 21:02:00:05:30:00:8d:e0, vsan is 3, FCID is 0x7a0000
      pWWN 21:03:00:05:30:00:8d:e0, nWWN 20:07:00:05:30:00:8d:e0, FCID 0x7a0001

switch# show svc session svc 2/1 peer-pwwn 22:00:00:04:cf:e6:e4:6b detail
svc2/1:
    Initiator N-port WWN is 20:01:00:05:30:00:8d:e0, vsan is 1, FCID is 0xec0102
      pWWN 22:00:00:04:cf:e6:e4:6b, nWWN 20:00:00:04:cf:e6:e4:6b, FCID 0xec00d4
        47 frames input, 920 data bytes
          2 ELS pkts, 0 BLS pkts
          0 FCP commands, 0 FCP xfer ready
          20 FCP data frames, 25 FCP status
          0 FCP overrun, 15 FCP underrun
          0 aborts, 0 bad FC2 drops
          0 data excess
        27 frames output, 0 data bytes
          2 ELS pkts, 0 BLS pkts
          25 FCP commands, 0 FCP xfer ready
          0 FCP data frames, 0 FCP status
          0 aborts
        0 open exchanges

switch#  show svc port svc 2/1
svc2/1:
    Target N-port in vsan 2 is up
      Port WWN is 21:00:00:05:30:00:8d:e0, FCID is 0x610101
    Initiator N-port in vsan 1 is up
      Port WWN is 20:01:00:05:30:00:8d:e0, FCID is 0xec0102
    Mgmt N-port in vsan 1 is up
      Port WWN is 20:02:00:05:30:00:8d:e0, FCID is 0xec0103

switch# show svc port svc 2/1 target detail
svc2/1:
    Target N-port in vsan 1 is up
      Port WWN is 27:39:00:05:30:00:33:2a, FCID is 0x010006
      0 sessions, 0 closed, 0 in transition
        5 minutes input rate 0 bits/sec, 0 bytes/sec, 0 frames/sec 0 ios/sec
        5 minutes output rate 0 bits/sec, 0 bytes/sec, 0 frames/sec 0 ios/sec
      9 frames input, 1064 bytes
        0 input session management frames
          0 plogi, 0 prli
          0 logo, 0 logo_acc
          0 prlo, 0 prlo_acc
          0 abts, 0 ls_rjt
        0 input I/Os, 0 cmd complete, 0 cmd fail
          0 reads, 0 writes
        0 input errors
        0 input discards
      5 frames output, 388 bytes
        0 output session management frames
          0 plogi_acc, 0 prli_acc
          0 logo, 0 logo_acc
          0 prlo, 0 prlo_acc
          0 ba_acc, 0 ls_rjt
        0 output I/Os, 0 cmd complete, 0 cmd fail
        0 output errors
        0 output discards
```

```
switch# show svc session svc 2/1 peer-pwwn 27:46:00:05:30:00:33:2a detail

svc2/1:
    Mgmt N-port WWN is 27:3b:00:05:30:00:33:2a, vsan is 1, FCID is 0x010008
      pWWN 27:46:00:05:30:00:33:2a, nWWN 27:48:00:05:30:00:33:2a, FCID 0x010011
        19 frames input, 16517 data bytes
          2 ELS pkts, 0 BLS pkts
          3 FCP commands, 1 FCP xfer ready
          10 FCP data frames, 3 FCP status
          0 FCP overrun, 2 FCP underrun
          0 aborts, 0 bad FC2 drops
          0 data excess
        19 frames output, 16520 data bytes
          2 ELS pkts, 0 BLS pkts
          3 FCP commands, 1 FCP xfer ready
          10 FCP data frames, 3 FCP status
          0 aborts
        0 open exchanges
        FCP Error Stats
          FCP cmd errors
            0 sess not up, 0 no resources, 0 bad frames
            0 up layer rjt, 0 out of order, 0 proc unexp exch st
            0 drop unexp exch st, 0 no exch match
          FCP Xfer Rdy errors
            0 sess not up, 0 no resources, 0 bad frames
            0 up layer rjt, 0 out of order, 0 proc unexp exch st
            0 drop unexp exch st, 0 no exch match
          FCP Status errors
            0 sess not up, 0 no resources, 0 bad frames
            0 up layer rjt, 0 out of order, 0 proc unexp exch st
            0 drop unexp exch st, 0 no exch match
          FCP Data errors
            0 sess not up, 0 no resources, 0 bad frames
            0 up layer rjt, 0 out of order, 0 proc unexp exch st
            0 drop unexp exch st, 0 no exch match
```

svc-config

To perform SAN Volume Controller (SVC) configurations, use the **svc-config** command.

svc-config

Syntax Description

svc-config	Enters the SVC configuration mode.
cluster	Provides access to cluster commands.
node	Provides access to node commands.
show	Displays configured SVC information for the specified node.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

None.

Examples

The following example enters the SVC configuration mode and displays all options in this mode.

```
switch# svc-config
switch-sw6(svc)# ?
Submode Commands:
  cluster  Cluster commands
  exit     Exit from this mode
  no       Negate a command or set its defaults
  node     Node commands
  show     Show
```

svc-ibmcli

To perform SAN Volume Controller (SVC) configurations by using IBM's CLI, use the **svc-ibmcli** command.

svc-ibmcli { cluster-name *cluster-name* **[** *IBM-CLI-command]* **| node svc** *slot-number/node-number* **[** *IBM-CLI-command* **] }**

Syntax Description

svc-ibmcli	Enters the IBM CLI configuration mode.
cluster-name	Specifies a new cluster.
cluster-name	Specifies a cluster name.
node svc	Specifies a node in the SVC interface.
slot-number	Specifies the slot number of the Caching Service Module (CSM).
node-number	Specifies the node number of the SVC instance running on the CSM. This number ranges from 1 to 2 nodes per module.
IBM-CLI-command	Specifies the IBM TotalStorage command to be executed

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

When you enter the IBM TotalStorage shell, all future commands are interpreted directly by this shell. Type **exit** to return to the Cisco MDS switch prompt.

Examples

The following example enters the SVC configuration mode and displays all options in this mode.

```
switch# svc-ibmcli cluster-name SampleCluster
Attaching to config node for cluster SampleCluster
To exit type 'exit', to abort type '$.'
IBM_svc:admin>

switch# svc-ibmcli node svc 2/1
Attaching to node 2/1
To exit type 'exit', to abort type '$.'
IBM_svc:admin>
```

svc-purge-wwn module

To remove all configured WWNs for the CSM from the running configuration, use the **svc-purge-wwn module** command.

svc-purge-wwn module *module-number*

Syntax Description

svc-purge-wwn	Purges the WWN for the CSM.
module *module-number*	Specifies the slot number for the CSM.

Defaults

None.

Command Modes

EXEC mode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

This command also purges all system allocated pWWNs and nWWNs from the system and will never be used again (by the system or by SVC interfaces). New system values will be allocated for all pWWN/nWWNs for the module.

Examples

The following example enters the SVC configuration mode and displays all options in this mode.

```
switch# svc purge-wwn module 2
!!!WARNING!  This command will purge all SVC system allocated
    WWNs for the specified module.  These WWNs will be lost.
    All user configured WWNs will be removed from the
    running-config, but not from the startup-config.
This operation can take a long time.  Other CLI commands
    on the system may be stopped while this operation is
    in progress.
Are you sure you want to do this? [Y/N] [N] y
switch#
```

vdisk

To create a new VDisk or access a new VDisk, use the **vdisk** command in the cluster configuration submode.

cluster config *cluster-name*

vdisk add *vdisk-name* **iogroup** *group-id* **mdisk-grp** *grp-name* **capacity** *number* **| import [clean | mdisk-list | preferred-node | sequential]**

vdisk name *vdisk-name* **-> expand [capacity | extent mdisk** *disk-id* **offset** *number* **] | io-throttle** *number* **[MB] | iogroup | shrink**

Syntax Description

cluster	Provides access to cluster commands
config *cluster-name*	Places a previously created cluster in the cluster configuration submode.
vdisk add *vdisk-name*	Creates a VDisk of the specified name.
iogroup *group-id*	Identifies one of four I/O groups in the specified cluster. The ID ranges from 1 to 4. The I/O for the VDisk is serviced by node belonging to that I/O group.
mdisk-grp *grp-name*	Specifies an existing MDisk group from which the VDisk storage originates.
capacity	Configures the size of this VDisk.
number	Provides a range from 0- 1677215 Gigabytes.
import	Imports a previously unmanaged disk that contains SVC virtualization data.
clean	Clears all data in the VDisk.
mdisk-list	Specifies a list of MDisks. All disks in this list must be part of the MDisk group
preferred-node	specifies the preferred node within the two nodes in this group to send I/Os for this VDisk
sequential	Specifies a sequential virtualization policy. If this option is not specified, the striped (default) virtualization policy is used.
vdisk *vdisk-name*	Enters the VDisk submode of an existing VDisk.
expand capacity	Expands the MDisk capacity.
extent	Expands the MDisk by a single extent.
offset *number*	Offsets the extent.
io-throttle	Limits the amount of I/Os allowed for this VDisk. If MB is not specified, the unit is calculated in I/Os per second.
MB	Specifies the I/O throttling in Megabytes.
shrink	Shrinks the capacity of the VDisk as specified.

Defaults

None.

Command Modes

SVC configuration mode—cluster configuration submode.

Command History

This command was introduced in Cisco MDS SAN-OS Release 1.3(1).

Usage Guidelines

The cluster configuration submode prompt is (`switch(svc-cluster)#`).

The VDisk submode prompt is `switch (svc-cluster-vdisk)#`

Extents are allowed from all MDisks in the list

Examples

The following example enters the cluster configuration mode for SampleCluster and ---

```
switch(svc)# cluster config SampleCluster

switch(svc-cluster)# vdisk add Vdisk1 iogroup 1 mdisk-grp Mdisk1 ?
  capacity  Vdisk add name iogroup mdisk-grp
  import    Vdisk add import

switch(svc-cluster)# vdisk add Vdisk1 iogroup 1 mdisk-grp Mdisk1 capacity ?
  <0-2147483647>  Enter the capacity

switch(svc-cluster)# vdisk add Vdisk1 iogroup 1 mdisk-grp Mdisk1 capacity 5000 ?
  gb  Vdisk add name iogroup mdisk-grp capacity
  mb  Vdisk add name iogroup mdisk-grp capacity
  pb  Vdisk add name iogroup mdisk-grp capacity
  tb  Vdisk add name iogroup mdisk-grp capacity
switch(svc-cluster)# vdisk add Vdisk1 iogroup 1 mdisk-grp Mdisk1 capacity 5000 gb ?
  clean           Vdisk add clean
  mdisk-list      Vdisk add mdisk-list
  preferred-node  Vdisk add sequential mdisk
  sequential      Vdisk add sequential
  <cr>            Carriage Return

switch(svc-cluster)# vdisk add VDISK1 iogroup 1 mdisk-grp Mdisk1 capacity 0 gb
switch(svc-cluster)# vdisk VDISK1
switch(svc-cluster-vdisk)# ?
Submode Commands:
  exit         Exit from this mode
  expand       Expand
  io-throttle  Io throttle
  iogroup      Move vdisk to iogroup
  no           Negate a command or set its defaults
  shrink       Shrink capacity

switch(svc-cluster-vdisk)# expand ?
  capacity  Expand capacity
  extent    Expand extent

switch(svc-cluster-vdisk)# io-throttle 0

switch(svc-cluster-vdisk)# shrink capacity 1 ?
  gb  Expand capacity
  mb  Expand capacity
  pb  Expand capacity
  tb  Expand capacity

switch(svc-cluster-vdisk)# exit

switch(svc)# show cluster SampleCluster vdisk
--------------------------------------------------------------------------------
name             capacity     iogroup mdisk-grp name    policy      status
--------------------------------------------------------------------------------
```

```
Vdisk1           100.00 GB    1       Group1            striped     online
Vdisk2           50.00 GB     1       Group2            striped     online

switch(svc)# show cluster SampleCluster vdisk Vdisk1
vdisk Vdisk1 is online
    Capacity is 100.00 GB
    Using storage from mdisk-grp Group1
    Processed by io group 1
    Virtualization policy is striped
    Preferred node is 2

switch(svc)# show cluster SampleCluster vdisk Vdisk1 extent
-------------------------------------------------------------------------------
mdisk id  number of extents
-------------------------------------------------------------------------------
1         2134
2         2133
3         2133

switch(svc)# show cluster SampleCluster vdisk Vdisk1 mapped_hosts
-------------------------------------------------------------------------------
host             LUN
-------------------------------------------------------------------------------
Host1            0
```

Related Commands

Command	Description
show cluster *name* **vdisk**	Displays configured vdisk information for a specified cluster.