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fabric

To add a fabric to the cluster, use the fabric command in the Cisco SME cluster configuration submode.

fabric *fabric name*

Syntax Description

fabric name	Specifies the fabric name. The maximum length is 32 characters.

Command Default

None.

Command Modes

Cisco SME cluster configuration submode.

Command History

Release	Modification
3.2(2)	This command was introduced.

Usage Guidelines

None.

Examples

The following example adds a fabric named sw-xyz to a cluster:

```
switch# config terminal
switch(config)# sme cluster c1
switch(config-sme-cl)# fabric sw-xyz
```

Related Commands

Command	Description
show sme cluster	Displays information about Cisco SME cluster.

fabric-binding activate

To activate fabric binding in a VSAN, use the **fabric-binding activate** command in configuration mode. To disable this feature, use the **no** form of the command.

fabric-binding activate vsan *vsan-id* [**force**]
no fabric-binding activate vsan *vsan-id*

Syntax Description

vsan *vsan-id*	Specifies the VSAN. The ID of the VSAN is from 1 to 4093.
force	(Optional) Forces fabric binding activation.

Command Default

Disabled.

Command Modes

Configuration mode.

Command History

Release	Modification
1.3(1)	This command was introduced.
3.0(1)	Extended support for fabric binding to Fibre Channel VSANs.

Usage Guidelines

Fabric binding is configured on a per-VSAN basis and can be implemented in both FICON VSANs and Fibre Channel VSANs.

Examples

The following example activates the fabric binding database for the specified VSAN:

```
switch# config terminal
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

vsan *vsan-id*	Specifies the VSAN. The ID of the VSAN is from 1 to 4093.

Command Default

None.

Command Modes

EXEC mode.

Command History

Release	Modification
1.3(1)	This command was introduced.
3.0(1)	Extended support for fabric binding to Fibre Channel VSANs.

Usage Guidelines

Fabric binding is configured on a per-VSAN basis and can be implemented in both FICON VSANs and Fibre Channel VSANs.

If the configured database is empty, this command is not accepted.

Examples

The following example copies from the active database to the configuration 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 VSAN, use the **fabric-binding database diff** command in EXEC mode.

fabric-binding database diff {**active** | **config**} **vsan** *vsan-id*

Syntax Description

active	Provides information on the differences in the active database with respect to the configuration database.
config	Provides information on the differences in the configuration database with respect to the active database.
vsan *vsan-id*	Specifies the VSAN. The ID of the VSAN is from 1 to 4093.

Command Default

None.

Command Modes

EXEC mode.

Command History

Release	Modification
1.3(1)	This command was introduced.
3.0(1)	Extended support of fabric binding to Fibre Channel VSANs.

Usage Guidelines

Fabric binding is configured on a per-VSAN basis and can be implemented in both FICON VSANs and Fibre Channel 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 configuration fabric binding database.

fabric-binding database vsan

To configure a user-specified fabric binding list in a VSAN, use the **fabric-binding database vsan** command in configuration mode. To disable an FC alias, use the **no** form of the 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

vsan-id	Specifies the 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.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
1.3(1)	This command was introduced.
3.0(1)	Extended support of fabric binding to Fibre Channel VSANs.

Usage Guidelines

Fabric binding is configured on a per-VSAN basis and can be implemented in both FICON VSANs and Fibre Channel VSANs.

In a FICON VSAN, the fabric binding feature requires all sWWNs connected to a switch and their persistent domain IDs to be part of the fabric binding active database. In a Fibre Channel VSAN, only the sWWN is required; the domain ID is optional.

A user-specified fabric binding list contains a list of switch WWNs (sWWNs) within a fabric. If an sWWN attempts to join the fabric, and that sWWN is not on the list or the sWWN is using a domain ID that differs from the one specified in the allowed list, the ISL between the switch and the fabric is automatically isolated in that VSAN and the switch is denied entry into the fabric.

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.

Note All switches in a non-FICON VSAN must be running Cisco MDS SAN-OS Release 3.x or later.

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 terminal
```

```
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 terminal
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 terminal
switch(config)# fabric-binding database vsan 5
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 VSAN, use the **fabric-binding enable** command. To disable fabric binding, use the **no** form of the command.

fabric-binding enable
no fabric-binding enable

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled.

Command Modes

Configuration mode.

Command History

Release	Modification
1.3(1)	This command was introduced.
3.0(1)	Extended support of fabric binding to Fibre Channel VSANs.
NX-OS 4.1(1b)	This command was deprecated.

Usage Guidelines

Fabric binding is configured on a per-VSAN basis and can be implemented in both FICON VSANs and Fibre Channel VSANs.

The fabric binding feature must be enabled in each switch in the fabric that participates in the fabric binding.

Examples

The following example 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 t
switch(config)# no fabric-binding enable
```

Related Commands

Command	Description
fabric-binding activate	Activates fabric binding.
fabric-binding database	Configures a fabric binding database.

fabric-membership

To configure a node to a fabric, use the **fabric-membership** command. To remove the node from the fabric, use the **no** form of the command,

fabric-membership *fabric name*
no fabric-membership *fabric name*

Syntax Description

fabric name	Specifies the fabric name. The maximum length is 32 characters.

Command Default

None.

Command Modes

Cisco SME cluster node configuration submode.

Command History

Release	Modification
3.2(2)	This command was introduced.

Usage Guidelines

Use the **fabric-membership** command to put a node in a fabric. This command has to be configured before the interface sme slot/port [force] can be accepted. It also cannot be removed if the **interface sme** *slot/port* **[force]** command is enabled.

Examples

The following example specifies a fabric to which the node belongs:

```
switch# config t
switch(config)# sme cluster clustername1
switch(config-sme-cl)# node local
switch(config-sme-cl-node)# fabric-membership f1
```

Related Commands

Command	Description
interface sme	Configures the Cisco SME interface to a cluster.
shutdown	Enables or disables an interface.
show interface sme	Displays interface information.

fcalias clone

To clone a Fibre Channel alias, use the **fcalias clone** command.

fcalias clone *origFcalias-Name cloneFcalias-Name* **vsan** *vsan-id*

Syntax Description

origFcalias-Name *cloneFcalias-Name*	Clones a Fibre Channel alias from the current name to a new name. Maximum length of names is 64 characters.
vsan	Specifies the clone Fibre Channel alias is for a VSAN.
vsan-id	The ID of the VSAN is from 1 to 4093.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
2.1(1a)	This command was introduced.

Usage Guidelines

To disable an FC alias, use the **no** form of the **fcalias name** command.

Examples

The following examples show how to clone a fcalias named origAlias to cloneAlias on VSAN 45:

```
switch# config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcalias clone origAlias cloneAlias vsan 45
```

Related Commands

Command	Description
show fcalias	Displays the member name information in a Fibre Channel alias (fcalias).

fcalias name

To configure an FC alias, use the **fcalias name** command. To disable an FC alias, use the **no** form of the 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.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
1.0(2)	This command was introduced.

Usage Guidelines

To include multiple members in any alias, use the FCID, fWWN, or pWWN values.

Examples

The following examples show how to configure an fcalias called AliasSample on VSAN 3:

```
switch# config terminal
switch(config)# fcalias name AliasSample
vsan 3
switch(config-fcalias)#
```

Related Commands

Command	Description
member (fcalias configuration mode)	Configures alias member for a specified zone.

fcalias rename

To rename a Fibre Channel alias (fcalias), use the **fcalias rename** command.

fcalias rename *current-name* *new-name* **vsan** *vsan-id*

Syntax Description

current-name	Specifies the current fcalias name. The maximum length is 64.
new-name	Specifies the new fcalias name. The maximum length is 64.
vsan *vsan-id*	Specifies the VSAN ID. The range is 1 to 4093.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
2.0(x)	This command was introduced.

Usage Guidelines

None.

Examples

The following example shows how to rename an fcalias:

```
switch# config terminal
switch(config)# fcalias rename oldalias newalias vsan 10
```

Related Commands

Command	Description
fcalias name	Configures fcalias names.
show fcalias	Displays fcalias information.

fcanalyzer local

To configure local Cisco Fabric Analyzer, use the **fcanalyzer local** command in EXEC mode.

fcanalyzer | **ethanalyzer local** [**interface** {**inband** | **mgmt**} [**capture-filter** *expression*] [**brief**] [[**display-filter** *expression*] [[**limit-captured-frames** *number*] [[**limit-frame-size** *bytes*] [**write** *uri2*]]]] | [**interface** {**inband** | **mgmt**} [**dump-pkt**]]]

Syntax Description

interface	(Optional) Begins live capture on following interface.
inband	(Optional) Specifies an inband interface (default interface to capture on).
mgmt	(Optional) Specifies an management interface.
capture-filter	(Optional) Filters frames using a capture filter expression.
expression	Specifies capture filter expression.
brief	(Optional) Displays the protocol summary in a brief.
display-filter	(Optional) Filters frames using display filter expression.
expression	Specifies display filter expression.
limit-captured-frames *number*	(Optional) Limits the number of frames captured to 10. The range is 0 to 2147483647 frames. Use 0 if you do not want to limit the captured frames.
limit-frame-size *bytes*	(Optional) Limits the size of the frame captures. The range is 64 to 65536 bytes.
write	(Optional) Saves the captured frames to a specified file.
uri2	The filename to be written in (bootflash: or volatile:).
dump-pkt	Specifies Hex (ASCII) dumps packet, troubleshoot packet analyzer.

Command Default

Number of packets captured by default is changed from 100 to 10.

Command Modes

EXEC mode.

Command History

Release	Modification
NX-OS 4.1(1a)	Changed the display-filter syntax description.
NX-OS 4.2(2)	Moved local capture to EXEC mode, added support for capturing on mgmt interface along with inband (fc-interface). Also addded capture-filter support and support for hex dump of packets.
1.0(2)	This command was introduced.

Usage Guidelines

You can capture Fibre Channel control traffic from a switch and decode it without disrupting connectivity and without having to be local to the point of analysis.

Note When you capture on inband interface packets from the supervisor to the line card module are captured and vice versa.

Note Multiword capture and display filter expressions need to be either single-quoted or double-quoted depending on what the expression itself contains.

Note To stop capture at any time press Ctrl+C.

Examples

The following example shows how to display only protocol summary on VSAN1:

```
switch# fcanalyzer local interface inband brief

Capturing on inband interface
  0.000000     ff.fa.01 -> ff.fa.01     FC OHMS(Cisco MDS)
  0.001033     ff.fa.04 -> ff.fa.04     FC OHMS(Cisco MDS)
  4.996424     ff.fa.01 -> ff.fa.01     FC OHMS(Cisco MDS)
  4.997452     ff.fa.04 -> ff.fa.04     FC OHMS(Cisco MDS)
  9.996536     ff.fa.01 -> ff.fa.01     FC OHMS(Cisco MDS)
  9.997470     ff.fa.04 -> ff.fa.04     FC OHMS(Cisco MDS)
 14.996572     ff.fa.01 -> ff.fa.01     FC OHMS(Cisco MDS)
 14.997590     ff.fa.04 -> ff.fa.04     FC OHMS(Cisco MDS)
 19.996463     ff.fa.01 -> ff.fa.01     FC OHMS(Cisco MDS)
 19.997415     ff.fa.04 -> ff.fa.04     FC OHMS(Cisco MDS)
switch#
```

The following example shows how to display capture on inband interface:

```
switch# fcanalyzer local interface inband
Capturing on inband interface
Frame 1 (148 bytes on wire, 148 bytes captured)
    Arrival Time: Apr 15, 2010 11:20:47.577355000
    Time delta from previous packet: 0.000000000 seconds
    Time since reference or first frame: 0.000000000 seconds
    Frame Number: 1
    Packet Length: 148 bytes
    Capture Length: 148 bytes
Ethernet II, Src: 00:00:00:00:00:0a, Dst: 00:00:00:00:ee:00
    Destination: 00:00:00:00:ee:00 (00:00:00:00:ee:00)
    Source: 00:00:00:00:00:0a (00:00:00:00:00:0a)
    Type: Unknown (0xfcfc)
MDS Header(Unknown(0)/Unknown(0))
    MDS Header
        ...0 0000 0111 0110 = Packet Len: 118
        .... 0000 0000 00.. = Dst Index: 0x0000
        .... ..01 0010 0000 = Src Index: 0x0120
        .... 0000 0000 0001 = VSAN: 1
```

```
    MDS Trailer
        EOF: Unknown (0)
        CRC: 0xdeadbeef
Fibre Channel
    R_CTL: 0x20(Extended Link Services/0x0)
switch#
```

The following example shows how to display a hex dump of packets:

```
switch# fcanalyzer local interface inband dump-pkt
Warning:  Couldn't obtain netmask info (eth2: no IPv4 address assigned).
Capturing on eth2
  0.000000     ff.fa.01 -> ff.fa.01     FC OHMS(Cisco MDS)

0000  00 00 00 00 ee 00 00 00 00 00 00 0a fc fc 81 00   ................
0010  00 72 ff 00 01 20 00 01 00 00 00 10 01 00 20 ff   .r... ........ .
0020  fa 01 00 ff fa 01 01 00 00 03 00 00 00 00 ff ff   ................
0030  ff ff 00 00 00 00 00 00 00 00 00 00 03 49 00 00   .............I..
0040  00 29 f6 1f 73 d9 00 00 00 00 00 00 00 00 00 00   .)..s...........
0050  00 00 00 00 00 00 00 ff fa 01 00 ff fa 01 00 00   ................
0060  09 96 00 00 00 00 00 00 00 04 00 00 00 02 00 00   ................
0070  00 00 01 00 00 00 ff ff ff ff 00 09 f5 00 2b 99   ..............+.
0080  86 d2 8b df 4e 02 0b aa aa aa 00 00 de ad be ef   ....N...........

  0.001112 80:57:00:00:cb:07 -> 81:00:00:72:e7:00 LLC I P, N(R) = 127, N(S) = 16
; DSAP NULL LSAP Group, SSAP 68 Command

0000  81 00 00 72 e7 00 80 57 00 00 cb 07 00 10 01 68   ...r...W.......h
0010  20 ff fa 01 00 ff fa 01 01 00 00 03 00 00 00 00    ................
0020  ff ff ff ff 00 00 00 00 00 00 00 00 00 00 03 49   ...............I
0030  00 00 00 29 f6 1f 73 d9 00 00 00 29 f6 1f d4 00   ...)..s....)....
0040  00 00 00 00 00 00 00 00 00 ff fa 01 00 ff fa 01   ................
0050  00 00 09 96 00 00 00 00 00 00 00 04 00 00 00 02   ................
0060  00 00 00 00 01 00 00 00 ff ff ff ff 00 09 f5 00   ................
0070  2b 99 86 d2 8b df 4e 02 0b aa aa aa 00 00 de ad   +.....N.........
0080  4d 94                                            M.

  0.001763     ff.fa.04 -> ff.fa.04     FC OHMS(Cisco MDS)

0000  00 00 00 00 ee 00 00 00 00 00 00 0a fc fc 81 00   ................
0010  00 96 ff 80 81 20 00 01 00 00 00 10 01 00 20 ff   ..... ........ .
0020  fa 04 00 ff fa 04 01 00 00 00 00 00 00 00 ff ff   ................
0030  ff ff 00 00 00 00 00 00 00 00 00 00 03 49 00 00   .............I..
0040  00 29 f6 1f fc e2 00 00 00 00 00 00 00 00 00 00   .)..............
0050  00 00 00 00 00 00 00 ff fa 04 00 ff fa 04 00 00   ................
0060  09 96 00 00 00 00 00 00 00 00 00 00 01 00 00 00   ................
0070  00 00 06 08 20 00 06 08 20 00 00 30 d1 00 f6 cc   .... ... ..0....
0080  99 87 01 c8 72 e1 ad c5 a0 dd 09 c3 d6 2d 56 8b   ....r........-V.
0090  18 96 0a 43 2f 90 15 bb 70 63 bd 7b e1 b3 47 7a   ...C/...pc.{..Gz
00a0  3a 49 42 ac 2a ef 71 ca cd 7a 8e a3 a7 e4 00 00   :IB.*.q..z......
00b0  de ad be ef                                      ....

  0.002248 81:20:00:01:cb:07 -> 81:00:00:96:ff:80 LLC I P, N(R) = 127, N(S) = 16
; DSAP NULL LSAP Group, SSAP NetWare Command
```

The following example shows how to use a display filter on inband interface and display its summary:

```
switch# fcanalyzer local interface inband brief display-filter 'mdshdr.vsan==0x1 && (fc.d_id
 == "ff.fa.01") || (fc.s_id == "ff.fa.04")'
Capturing on inband interface
  0.000000     ff.fa.01 -> ff.fa.01     FC OHMS(Cisco MDS)
  0.001782     ff.fa.04 -> ff.fa.04     FC OHMS(Cisco MDS)
```

```
  4.996741     ff.fa.01 -> ff.fa.01     FC OHMS(Cisco MDS)
  4.997725     ff.fa.04 -> ff.fa.04     FC OHMS(Cisco MDS)
  9.996670     ff.fa.01 -> ff.fa.01     FC OHMS(Cisco MDS)
  9.997483     ff.fa.04 -> ff.fa.04     FC OHMS(Cisco MDS)
 14.996623     ff.fa.01 -> ff.fa.01     FC OHMS(Cisco MDS)
 14.997642     ff.fa.04 -> ff.fa.04     FC OHMS(Cisco MDS)
 19.996739     ff.fa.01 -> ff.fa.01     FC OHMS(Cisco MDS)
 19.997554     ff.fa.04 -> ff.fa.04     FC OHMS(Cisco MDS)
switch#
```

The following example shows how to write captured packets in PCAP format and display captures on the screen:

```
switch# fcanalyzer local interface inband display-filter 'mdshdr.vsan==0x1 && (fc.d_id ==
"ff.fa.01") || (fc.s_id == "ff.fa.04")' limit-captured-frames 2 write bootflash:fc_cap
Frame 2 (160 bytes on wire, 160 bytes captured)
    Arrival Time: May  6, 2010 09:53:38.020767000
    Time delta from previous packet: 0.000000000 seconds
    Time since reference or first frame: 0.000000000 seconds
    Frame Number: 2
    Packet Length: 160 bytes
    Capture Length: 160 bytes
Ethernet II, Src: 00:00:00:00:00:0a, Dst: 00:00:00:00:ee:00
    Destination: 00:00:00:00:ee:00 (00:00:00:00:ee:00)
    Source: 00:00:00:00:00:0a (00:00:00:00:00:0a)
    Type: Unknown (0xfcfc)
MDS Header(Unknown(0)/Unknown(0))
    MDS Header
        ...0 0000 1000 0010 = Packet Len: 130
        .... 0000 0000 00.. = Dst Index: 0x0000
        .... ..01 0010 0000 = Src Index: 0x0120
        .... 0000 0000 0001 = VSAN: 1
    MDS Trailer
        EOF: Unknown (0)
        CRC: 0xdeadbeef
Fibre Channel
    R_CTL: 0x20(Extended Link Services/0x0)
    Dest Addr: ff.fa.01
    CS_CTL: 0x00
    Src Addr: ff.fa.01
    Type: Ext Link Svc (0x01)
    F_CTL: 0x000000  Exchange Originator, Seq Initiator, CS_CTL, Last Data Frame
 - No Info, ABTS - Abort/MS,
        0... .... .... .... .... .... = ExgRpd: Exchange Originator
        .0.. .... .... .... .... .... = SeqRec: Seq Initiator
        ..0. .... .... .... .... .... = ExgFst: NOT exchg first
        ...0 .... .... .... .... .... = ExgLst: NOT exchg last
        .... 0... .... .... .... .... = SeqLst: NOT seq last
        .... ..0. .... .... .... .... = Pri: CS_CTL
        .... ...0 .... .... .... .... = TSI: NOT transfer seq initiative
        .... .... 00.. .... .... .... = LDF: Last Data Frame - No Info (0x000000
)
        .... .... ..00 .... .... .... = A01: no ack required (0x000000)
        .... .... .... ..0. .... .... = RetSeq: NOT retransmitted sequence
        .... .... .... .... ..00 .... = AA: ABTS - Cont (0x000000)
        .... .... .... .... .... 0... = RelOff: rel offset NOT set
    SEQ_ID: 0x00
    DF_CTL: 0x00
    SEQ_CNT: 0
    OX_ID: 0xffff
    RX_ID: 0xffff
    Parameter: 0x00000000
Data (106 bytes)
```

```
0000  01 00 00 00 00 00 04 1a 00 00 00 34 19 a0 be 60   ...........4...`
0010  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0020  00 ff fa 01 00 ff fa 01 00 00 09 96 00 00 00 00   ................
0030  00 00 00 04 00 00 00 02 00 00 00 00 01 00 00 00   ................
0040  ff ff ff ff 00 1c c0 00 c1 24 50 6e 4d aa 55 a6   .........$PnM.U.
0050  19 81 9c d3 6d b2 58 34 8a 30 6a e6 d6 cf 31 ff   ....m.X4.0j...1.
0060  ca cd 83 0e 00 00 de ad be ef                     ..........
switch#
```

The following example shows how to use capture filter on the mgmt interface and redirect the console output to a file:

```
switch# fcanalyzer local interface mgmt capture-filter "arp" > mgmt_capture.txt
Capturing on mgmt interface
switch#
```

Related Commands

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

fcanalyzer remote

To configure remote Cisco Fabric Analyzer, use the **fcanalyzer remote** command in configuration mode. To disable this command, use the **no** form of the command.

no fcanalyzer remote *ip address* [**active** *[port-number]*]

Syntax Description

ip-address	Maximum length is 1024 characters.
active	(Optional) Enables active mode (passive is the default) with the remote host.
port-number	(Optional) Specifies the port number.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
1.0(2)	This command was introduced.

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 example shows how to configure remote Cisco Fabric analyzer:

```
switch(config)# fcanalyzer remote 1.1.1.1
switch(config)#
```

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.

filter

To specify the fields of the certificate map, use the **filter** command in configuration mode. The CA certificate or certificate chain is assumed to already be available in Privacy Enhanced Mail (PEM) (base-64) encoded format.

filter {**altname-email** *email-id* | **altname-upn** *username* | **subject-name** *subject-name*}

Syntax Description

altname-email *email-id*	Specifies an Email ID as an alternate name. The maximum size is 64 characters.
altname-upn *username*	Specifies user principal name as an alternate name. The maximum size is 64 characters.
subject-name *subject-name*	Specifies subject name of the certificate. The maximum size is 64 characters

Command Default

None.

Command Modes

Configuration submode.

Command History

Release	Modification
NX-OS 5.0(1a)	This command was introduced.

Usage Guidelines

%username% substitutes the user's login name.

%hostname% substitute the peer hostname.

Note Two maps currently can be configured for a given issuer name. The certificate will be filtered based on these two configured maps. If a default configuration is provided then the certificates are filtered against the default map in case if there is no map for that particular issuer name.

Examples

The following example shows how to configure an Email ID as an alternate name:

```
switch(config)# crypto certificatemap mapname map1
switch(config-certmap-filter)# filter subject-name cn=%username%,ou=PKI,o=Cisco Systems,c=US

switch(config-certmap-filter)#
```

The following example shows how to configure the user principal as an alternate name:

```
switch(config-certmap-filter)# filter altname-email %username%@cisco.com
switch(config-certmap-filter)#
```

The following example shows how to configure the subject name as an certificate:

```
switch(config-certmap-filter)# filter altname-upn%username%@%hostname%
switch(config-certmap-filter)#
```

Related Commands

Command	Description
show crypto ssh-auth-map	Displays mapping filters applied for SSH authentication.

fcc enable

To enable Fibre Channel Congestion Control (FCC), use the **fcc enable** command in configuration mode. To disable this feature, use the **no** form of the command.

fcc enable
no fcc enable

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled.

Command Modes

Configuration mode.

Command History

Release	Modification
NX-OS 5.0(1a)	This command was deprecated.
1.0(2)	This command was introduced.

Usage Guidelines

This command is not supported on the Cisco MDS 9124 switch, the Cisco Fabric Switch for HP c-Class BladeSystem, and the Cisco Fabric Switch for IBM BladeCenter.

Examples

The following example shows how to enable FCC:

```
switch# config terminal
switch(config)# fcc enable
```

The following example shows how to disable FCC:

```
switch# config terminal
switch(config)#  no fcc enable
```

Related Commands

Command	Description
show fcc	Displays FCC settings.

fc-management database

To configure the Fibre Channel Common Transport (FC-CT) Management Security database, use the **fc-management database** command.

fc-management database vsan *vsan-id*

Syntax Description

vsan	Specifies the VSAN.
vsan-id	Specifies the VSAN ID. The range is from 1 to 4093.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
NX-OS 6.2(9)	This command was introduced.

Usage Guidelines

None.

Examples

The following example shows how to configure the management security database:

```
switch(config)# fc-management database vsan 1
switch(config-fc-mgmt)#
```

Related Commands

Command	Description
fc-management enable	Enables the FC-CT Management Security.

fc-management enable

To enable the Fibre Channel Common Transport (FC-CT) Management Security, use the **fc-management enable** command. To disable this feature command, use the **no** form of the command.

fc-management enable
no fc-management enable

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled.

Command Modes

Configuration mode.

Command History

Release	Modification
NX-OS 6.2(9)	This command was introduced.

Usage Guidelines

None.

Examples

The following example shows how to enable the FC-CT management security:

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

Related Commands

Command	Description
show fc-management	Displays the FC-CT management security information.

fcc priority

To assign the FCC priority to the entire switch, use the **fcc priority** command in configuration mode. To revert to the default, use the **no** form of the command.

fcc priority *number*
no fcc priority *number*

Syntax Description

number	The FCC priority threshold. The range is 0 to 7, where 0 is the lowest priority and 7 the highest priority.

Command Default

The default priority is 4.

Command Modes

Configuration mode.

Command History

Release	Modification
1.0(2)	This command was introduced.
5.0(1a)	This command was deprecated.

Usage Guidelines

FCC reduces the congestion in the traffic without interfering with the standard Fibre Channel protocol.

Note This command is not supported on the Cisco MDS 9124 switch, the Cisco Fabric Switch for HP c-Class BladeSystem, and the Cisco Fabric Switch for IBM BladeCenter.

Examples

The following example shows how to configure the FCC priority threshold as 2:

```
switch# config terminal
switch(config)# fcc priority 2
```

Related Commands

Command	Description
show fcc	Displays FCC settings.

fcdomain

To enable domain selection on the switch and participation in the Fibre Channel fabric topology, use the **fcdomain** command. To disable the domain and withdraw from the Fibre Channel fabric, use the **no** form of this command.

fcdomain vsan *ID*
no fcdomain vsan *ID*

Syntax Description

vsan *ID*	Specifies the VSAN ID. Range is 1–4093.

Command Default

Fibre Channel domains are enabled for all VSANs.

Command Modes

Configuration mode (config)

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

If you disable a Fibre Channel domain on a switch, that switch has no identity in the VSAN. It can neither communicate with other switches in the fabric nor allocate FCIDs to attached edge devices.

This command is not available on N Port Virtualization (NPV) enabled switches as they do not require this functionality. Functions requiring FC domains are handled by the upstream NPIV enabled switch instead.

Examples

The following example displays how to enable the Fibre Channel domain in VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcdomain vsan 10
```

The following example displays how to disable the Fibre Channel domain in VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# no fcdomain vsan 10
```

Related Commands

Command	Description
show fcdomain	Displays the Fibre Channel domain information.

fcdomain abort

To discard pending changes to the domain configuration in a VSAN and release the Cisco Fabric Services (CFS) lock, use the **fcdomain abort** command.

fcdomain abort vsan *ID*

Syntax Description

vsan *id*	Specifies a VSAN ID. The range is 1 to 4093.

Command Default

None.

Command Modes

Configuration mode (config)

Command History

Release	Modification
3.0(1)	This command was introduced.

Usage Guidelines

The pending changes to the domain configuration are cached until the changes are committed. Discarding pending configuration changes should normally be done using the **no fcdomain commit** command. However, when another user has left pending configuration changes without committing them, use this command to force the changes to be abandoned and the session lock to be released. Ensure to check that the other user is no longer logged in to the switch and making changes first.

Examples

The following example displays how to discard pending changes to the domain configuration in VSAN 10 and release the CFS lock:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcdomain abort vsan 10
```

Related Commands

Command	Description
fcdomain commit	Commits pending changes to the domain configuration in VSAN and releases the CFS lock.
show cfs lock	Displays currently held CFS locks.
show fcdomain pending-diff	Displays pending configuration changes.
show fcdomain	Displays the Fibre Channel domain information.
show users	Displays currently logged in users.

fcdomain allowed

To configure a set of domain IDs that are allowed in a VSAN, use the **fcdomain allowed** command. To remove this configuration, use the **no** form of this command.

fcdomain allowed *domain-IDs* **vsan** *ID*

no fcdomain allowed *domain-IDs* **vsan** *ID*

Syntax Description

domain-IDs	Specifies a set of domain IDs. Two domain IDs separated by a '-' denotes a range of consecutive domain IDs. Nonconsecutive domain IDs are separated by ','. Range is 1–239.
vsan *ID*	Specifies the VSAN ID. Range is 1–4093.

Command Default

All domain IDs are allowed.

Command Modes

Configuration mode (config)

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

A set of allowed domain IDs must satisfy the following conditions:

- If this switch is a principal switch, all the currently assigned domain IDs must be in the allowed set.
- If this switch is a subordinate switch, the local runtime domain ID must be in the allowed set.
- The locally configured domain ID of the switch must be in the allowed set.
- The intersection of the assigned domain IDs with other already configured domain ID sets must not be empty.

If you configure an allowed set on one switch in a fabric, we recommend that you configure the same set in all other switches in the fabric to ensure consistency or use CFS to distribute the configuration.

Examples

The following example displays how to configure set of allowed domain IDs to 2-10,20,30 in VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcdomain allowed 2-10,20,30 vsan 10
```

If CFS distribution for fcdomain is enabled, the following command is required for the allowed list configuration to take effect:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
```

```
switch(config)# fcdomain commit vsan 10
```

The following example displays how to reset the set of allowed domain IDs list back to default for VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# no fcdomain allowed 2-10,20,30 vsan 10
```

Related Commands

Command	Description
fcdomain abort	Discards pending changes to the domain configuration in a VSAN and releases the CFS lock.
fcdomain commit	Commits pending changes to the domain configuration in VSAN and releases the CFS lock.
show fcdomain	Displays the Fibre Channel domain information.
show fcdomain allowed	Displays the allowed domain IDs.

fcdomain auto-reconfigure

To enable the automatic reconfiguration of FC domains in the event of overlap during a fabric merge in a VSAN or range of VSANs, use the **fcdomain auto-reconfigure** command. To disable the automatic reconfiguration option, use the **no** form of this command.

fcdomain auto-reconfigure vsan *ID*

no fcdomain auto-reconfigure vsan *ID*

Syntax Description

vsan *ID*	Specifies the VSAN ID. Range is 1–4093.

Command Default

Automatic reconfiguration is disabled.

Command Modes

Configuration mode (config)

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

Duplicate domains refer to multiple switches selecting the same domain ID in the same VSAN. When connected together, switches with such a configuration will fail to merge and become isolated in the affected VSAN.

Enabling automatic reconfiguration on switches with a duplicate domain IDs before connecting their fabrics together causes a disruptive domain reconfiguration (RCF) to be automatically triggered immediately when they are connected. This will cause the switches with duplicate domain IDs to reselect a domain. Switches that change their domain ID will cause all attached end devices to log out and log in again. This will cause traffic disruption on those devices.

Enabling automatic reconfiguration on switches after they are isolated does not trigger a reconfiguration. The fabrics remains isolated. You can initiate a reconfiguration by manually changing the configured domain ID on one of the switches and thus eliminating the domain overlap and allowing the fabrics to merge.

Examples

The following example displays how to enable the automatic reconfiguration option in VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcdomain auto-reconfigure vsan 10
```

The following example displays how to disable the automatic reconfiguration option in VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# no fcdomain auto-reconfigure vsan 10
```

Related Commands

Command	Description
fcdomain domain	Configures a domain manually for the local switch.
show fcdomain	Displays the Fibre Channel domain information.
show fcdomain domain-list	Displays the allocated domain IDs.

fcdomain commit

To commit pending changes to the domain configuration in a VSAN and release the CFS lock, use the **fcdomain commit** command.

fcdomain commit vsan *ID*

Syntax Description

vsan *ID*	Specifies the VSAN ID. Range is 1–4093.

Command Default

The pending changes to the domain configuration are cached until the changes are committed.

Command Modes

Configuration mode (config)

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

This command may be used on the switch that has the CFS lock. This will be the switch where the fcdomain configuration changes for the session were started. A session commit is successful after the pending configuration changes are distributed to each MDS switch in the VSAN, the configuration changes are applied to the configuration by each switch, and the session lock is released.

Examples

The following example displays how to commit pending changes to the domain configuration in VSAN 10 and release the CFS lock:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcdomain commit vsan 10
```

Related Commands

Command	Description
fcdomain abort	Discards pending changes to the domain configuration in a VSAN and releases the CFS lock.
show fcdomain	Displays the Fibre Channel domain information.
show fcdomain pending-diff	Displays pending configuration changes.

fcdomain contiguous-allocation

To assign contiguous domain IDs to subordinate switches by a principle switch in a VSAN or range of VSANs, use the **fcdomain contiguous-allocation** command. To disable the contiguous domain ID assignment by the principle switch, use the **no** form of this command.

fcdomain contiguous-allocation vsan *ID*

no fcdomain contiguous-allocation vsan *ID*

Syntax Description

vsan *ID*	Specifies the VSAN ID. Range is 1–4093.

Command Default

The contiguous allocation option is disabled.

Command Modes

Configuration mode (config)

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

The contiguous allocation option takes immediate effect at runtime. You need not restart the Fibre Channel domain.

Examples

The following example displays how to enable the contiguous allocation option in VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcdomain contiguous-allocation vsan 10
```

The following example displays how to disable the contiguous allocation option in VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# no fcdomain contiguous-allocation vsan 10
```

Related Commands

Command	Description
show fcdomain	Displays the Fibre Channel domain information.
show fcdomain domain-list	Displays the allocated domain IDs.

fcdomain distribute

To enable Fibre Channel domain configuration distribution using CFS, use the **fcdomain distribute** command. To disable Fibre Channel domain configuration distribution, use the **no** form of this command.

fcdomain distribute
no fcdomain distribute

Command Default

Fibre Channel domain configuration distribution is disabled.

Command Modes

Configuration mode (config)

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

You must enable distribution on all switches on which you want to distribute Fibre Channel domain configuration to.

Examples

The following example displays how to enable Fibre Channel domain configuration distribution using CFS:

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

The following example displays how to disable Fibre Channel domain configuration distribution:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# no fcdomain distribute
```

Related Commands

Command	Description
fcdomain abort	Discards pending changes to the domain configuration in a VSAN and releases the CFS lock.
fcdomain commit	Commits pending changes to the domain configuration in VSAN and releases the CFS lock.
show cfs application	Displays the CFS distribution and transport configuration of applications on a switch.

fcdomain domain

To configure a static or preferred domain ID for a switch, use the **fcdomain domain** command. To remove this configuration, use the **no** form of this command.

fcdomain domain *dID* { **preferred** | **static** } **vsan** *vID*
`no fcdomain domain` *dID* { `preferred` | `static` } `vsan` *vID*

dID	Specifies the domain ID in decimal or hexadecimal. Range is 0–239 in decimal and 0x0–0xef in hexadecimal.
preferred	Assigns a specific domain ID but the switch will accept a different domain ID if the specified ID is unavailable.
static	Assigns a specific domain ID but the switch will isolate itself if the specified domain ID is unavailable.
vsan *vID*	Specifies the VSAN ID. Range is 1–4093.

Command Default

None.

Command Modes

Configuration mode (config)

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

When you assign a static domain ID, you are requesting a specific domain ID for the switch in the VSAN. If the switch does not get the requested ID, it will isolate itself from the fabric. When you specify a preferred domain ID, you are also requesting a particular domain ID, however, if the requested domain ID is unavailable, then the switch will accept another domain ID.

While the static option can be applied at runtime after a disruptive or non-disruptive restart, the preferred option is applied at runtime only after a disruptive restart.

Note Within a VSAN all switches should have the same domain ID type (either static or preferred). If a configuration is mixed with some switches with static domain types and others with preferred, then switches with static domain configuration may unexpectedly be isolated if their domain was allocated to a switch with a preferred domain configuration first.

Examples

The following example displays how to configure the switch in VSAN 8 to request a preferred domain ID 3 but accept any value assigned by the principal switch if the domain ID is unavailable:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcdomain domain 3 preferred vsan 8
```

The following example displays how to configure the switch in VSAN 237 to accept only a specific value and moves the local interfaces in VSAN 237 to an isolated state if the requested domain ID is unavailable:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcdomain domain 2 static vsan 237
```

Related Commands

Command	Description
show fcdomain	Displays the Fibre Channel domain information.
show fcdomain domain-list	Displays the allocated domain IDs.

fcdomain fabric-name

To set the fabric name of a VSAN, use the **fcdomain fabric-name** command. To revert to the default fabric name, use the **no** form of this command.

fcdomain fabric-name *name* **vsan** *ID*

no fcdomain fabric-name *name* **vsan** *ID*

Syntax Description

name	Specifies a fabric name. The fabric name is in the format hh:hh:hh:hh:hh:hh:hh:hh.
vsan *ID*	Specifies the VSAN ID. Range is 1–4093.

Command Default

The default fabric name is built from the VSAN number and the switch WWN.

Command Modes

Configuration mode (config)

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

The fabric name is a local configuration on the switch and is passed as a parameter in some frames (for example, FAN) to edge devices to identify the fabric it is connected to.

Examples

The following example displays how to set a fabric name for VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcdomain fabric-name 20:1:ac:16:5e:0:21:01 vsan 10
```

The following example displays how to revert to the default fabric name in VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# no fcdomain fabric-name 20:1:ac:16:5e:0:21:01 vsan 10
```

Related Commands

Command	Description
show fcdomain	Displays the Fibre Channel domain information.

fcdomain fcid database

To modify the persistent FCID database, use the **fcdomain fcid database** command.

fcdomain fcid database

Command Default

None.

Command Modes

Configuration mode (config)

Command History

Release	Modification
1.1(1)	This command was introduced.

Examples

The following example displays how to configure a new FCID with a whole area allocation in VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcdomain fcid database
switch(config-fcid-db)# vsan 10 wwn 50:05:08:b2:00:71:c8:c2 fcid 0x6fee00 area
```

Related Commands

Command	Description
vsan wwn fcid	Configures an FCID for a WWN.

fcdomain fcid persistent

To enable the persistent FCID feature, use the **fcdomain fcid persistent** command. To disable this feature, use the **no** form of this command.

fcdomain fcid persistent vsan *ID*

no fcdomain fcid persistent vsan *ID*

Syntax Description

vsan *ID*	Specifies the VSAN ID. Range is 1–4093.

Command Default

The persistent FCID feature is enabled.

Command Modes

Configuration mode (config)

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

It is recommended to not disable the persistent FCID feature in VSANs with any AIX or HP-UX hosts connected. These devices may lose connectivity if the FCID assigned to them changes at the next fabric login.

A device with a persistent FCID assigned may be moved between F port interfaces. They will maintain the same FCID. Loop-attached devices (FL ports) must remain connected to the same port to which they initially logged in to.

Examples

The following example displays how to enable the persistent FCID feature in VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcdomain fcid persistent vsan 10
```

The following example displays how to disable the persistent FCID feature in VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# no fcdomain fcid persistent vsan 10
```

Related Commands

Command	Description
show fcdomain	Displays the Fibre Channel domain information.

fcdomain optimize

To enable restart optimization algorithms, use the **fcdomain optimize** command. To disable these algorithms, use the no form of this command.

fcdomain optimize { **fast-restart** | **selective-restart** | **scale-restart** | **all** } **vsan** *ID*

no fcdomain optimize { **fast-restart** | **selective-restart** | **scale-restart** | **all** } **vsan** *ID*

Syntax Description

fast-restart	Enables domain manager fast restart.
selective-restart	Enables domain manager selective restart.
scale-restart	Enables domain manager scale restart.
all	Enables all domain manager optimizations.
vsan *ID*	Specifies the VSAN ID. Range is 1–4093.

Command Default

Scale restart optimization is enabled by default.

Command Modes

Configuration mode (config)

Command History

Release	Modification
6.2(9)	Added the **all** and **scale-restart** keywords to the syntax description.
3.0(2)	Added the **fast-restart** keyword to the syntax description.
1.1(1)	This command was introduced.

Usage Guidelines

In the Fibre Channel protocol, fabric reconfiguration starts with flooding of reconfigure fabric (RCF) or build fabric (BF) frames which indicates to all the switches in the VSAN that the fabric is changing. This process is followed by principal switch selection and domain ID allocation phases. Fibre Channel domains can be started disruptively or nondisruptively. A disruptive restart sends RCF frames to the other switches in the VSAN and data traffic is disrupted on all the switches in the VSAN (including remotely segmented ISLs). A nondisruptive restart sends BF frames to the other switches in the fabric and data traffic is disrupted only on the local switch. The MDS platform has a number of optimizations available to increase scaling and the completion speed of this process.

When fast restart is enabled and a backup link is available, the domain manager needs only a few milliseconds to select a new principal link to replace the one that failed. Also, the operation to select the new principal link is only executed by the two switches that are directly attached to the failed link, not all switches in the VSAN. When a backup link is not available, the domain manager reverts to the default behavior and starts a normal build fabric phase followed by a principal switch selection phase.

When selective restart is enabled, the domain manager sends BF frames on only one peer switch link if there are multiple links between them. This benefits scaling. During the build fabric phase, frames are normally flooded on all links. A switch may have more than one link to a peer switch. In such cases, the BF frame can

be sent to only one of the links to the peer switch. This configuration reduces the number of BF frames that are to be exchanged during the build fabric phase of fabric reconfiguration.

When scale restart is enabled, a single consolidated Exchange Fabric Parameter (EFP) request will be flooded by the principal switch after the domain identifier allocation phase is completed. Normally, when principal switch assigns a domain ID to a switch (including itself) during the fabric reconfiguration phase, it transmits an Exchange Fabric Parameter (EFP) request. This request carries the domain list information of the fabric. Whenever the domain list changes, an EFP frame is flooded to the fabric. This option reduces the number of EFP requests each switch must process. Scale restart is enabled by default in all native VSANs. This option is not supported in interoperability mode and thus is not enabled in interoperability VSANs.

We recommend using the **fast-restart** option on most fabrics, especially those with many logical ports (3200 or more), where a logical port is an instance of a physical port in a VSAN.

Examples

The following example displays how to enable domain manager fast restart on VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcdomain optimize fast-restart vsan 10
```

The following example displays how to disable domain manager fast restart on VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# no fcdomain optimize fast-restart vsan 10
```

The following example displays how to enable all domain manager optimizations on VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcdomain optimize all vsan 10
```

The following example displays how to disable all domain manager optimizations on VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# no fcdomain optimize all vsan 10
```

Related Commands

Command	Description
show fcdomain	Displays the Fibre Channel domain information.

fcdomain priority

To configure the priority of the local switch in a VSAN, use the **fcdomain priority** command. To revert to the default priority, use the **no** form of this command.

fcdomain priority *value* **vsan** *ID*

no fcdomain priority *value* **vsan** *ID*

Syntax Description

value	Specifies the priority value. Range is 1–254.
vsan *ID*	Specifies the VSAN ID. Range is 1–4093.

Command Default

The default priority value is 128.

Command Modes

Configuration mode (config)

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

The priority of a switch is used during the principle switch selection process. During principal switch selection, the switch with the highest priority becomes the principal switch. If two switches have the same priority, the switch with the lower WWN becomes the principal switch.

1 is the highest priority and 255 is the lowest. 255 is accepted from other switches but cannot be configured on an MDS switch.

Any new switch should not be allowed to become the principal switch when it joins an existing fabric. It may cause traffic disruption when it becomes the principal switch as it may assign different domain IDs than the previous principal switch. If it has a lower switch WWN than the existing principal switch, then it can be assigned a lower priority so that it loses the principal switch selection process.

Examples

The following example displays how to configure a priority of 25 for the local switch in VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcdomain priority 25 vsan 10
```

The following example displays how to revert the priority to the factory default (128) in VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# no fcdomain priority 25 vsan 10
```

Related Commands

Command	Description
show fcdomain	Displays the Fibre Channel domain information.

fcdomain restart

To force the principal switch selection process to be restarted in a VSAN, use the **fcdomain restart** command.

fcdomain restart vsan *ID*

Syntax Description

vsan *ID*	Specifies the VSAN ID. Range is 1–4093.

Command Default

Fabric restart is nondisruptive across all switches in the specified VSAN.

Command Modes

Configuration mode (config)

Command History

Release	Modification
6.x	The **disruptive** keyword was removed.
5.x	The **disruptive** keyword was added.
1.1(1)	This command was introduced.

Usage Guidelines

Issue the **fcdomain restart** command if you want to apply the configured domain changes to the runtime domain.

Examples

The following example displays how to force VSAN 10 to reconfigure without traffic disruption:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# fcdomain restart vsan 10
```

Related Commands

Command	Description
show fcdomain	Displays the Fibre Channel domain information.

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 the command.

fcdroplatency {**network** *milliseconds* [**vsan** *vsan-id*] | **switch** *milliseconds*}
no fcdroplatency {**network** *milliseconds* [**vsan** *vsan-id*] | **switch** *milliseconds*}

Syntax Description

network *milliseconds*	Specifies network latency. The range is 500 to 60000.
vsan *vsan-id*	Specifies a VSAN ID. The range is 1 to 4093.
switch *milliseconds*	Specifies switch latency. The range is 0 to 60000 milliseconds.

Command Default

2000 millisecond network latency.

500 millisecond switch latency.

Command Modes

Configuration mode.

Command History

Release	Modification
1.0(2)	This command was introduced.
8.2(1)	The **switch** keyword was deprecated.

Usage Guidelines

None.

Examples

The following example shows how to configure the network latency to 5000 milliseconds:

```
switch# config terminal
switch(config)#
switch(config)# fcdroplatency network 5000
switch(config)#
```

The following example shows how to revert to the default network latency:

```
switch(config)# no fcdroplatency network 5000
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 revert to the default switch latency:

```
switch(config)# no fcdroplatency switch 4000
switch(config)#
```

Related Commands

Command	Description
show fcdroplatency	Displays the configured FC drop latency parameters.

fcflow stats

To configure FC flow statistics, use the **fcflow stats** command in configuration mode. To disable the counter, use the **no** form of the command.

fcflow stats {**aggregated module** *module-number* **index** *flow-number* **vsan** *vsan-id* | **module** *module-number* **index** *flow-number flow-numberdestination-fcid source-fcid netmask* **vsan** *vsan-id*}
no fcflow stats {**aggregated module** *module-number* **index** *flow-number* | **module module-number index** *flow-number*}

Syntax Description

aggregated	Configures aggregated FC flow statistics.
module *module-number*	Configures FC flow statistics on a module.
index *flow-number*	Specifies a flow index. The range is 1 to 2147483647.
vsan *vsan-id*	Specifies a VSAN ID. The range is 1 to 4093.
destination-fcid	The destination FCID in hexadecimal format.
source-fcid	The source FCID in hexadecimal format.
netmask	The mask for the source and destination FCID (restricted to 6 hexadecimal characters ranging from 0xff0000 to 0xffffff).

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
1.0(2)	This command was introduced.

Usage Guidelines

If you enable flow counters, you can enable a maximum of I K 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
```

The following example enables the flow counter for module 1:

```
switch(config)# fcflow stats module 1 index 1 0x145601 0x5601 0xffffff vsan 1
```

The following example disables the flow counter for module 1.

```
switch(config)# no fcflow stats module 2 index 1001
```

Related Commands

Command	Description
show fcflow stats	Displays the configured FC drop latency parameters.

fcid-allocation

Use the **fcid-allocation** command to manually add a FCID to the default area company ID list. Use the **no** form of the command to remove a FCID from the default area company ID list.

fcid-allocation area company-id *company-id*
no fcid-allocation area company-id *company-id*

Syntax Description

area	Modifies the auto area list of company IDs.
company-id *company-id*	Configures the company IDs.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
2.0	This command was introduced.

Usage Guidelines

Fibre Channel standards require a unique FCID to be allocated to an N port attached to a Fx port in any switch. To conserve the number of FCIDs used, Cisco MDS 9000 Family switches use a special allocation scheme.

Some HBAs do not discover targets that have FCIDs with the same domain and area. Prior to Cisco MDS SAN-OS Release 2.0, the Cisco MDS SAN-OS software maintained a list of tested company ID (also know as Organizational Unit Identifier, or OUI) which do not exhibit this behavior. These Host Bus Adapters (HBAs) were allocated with single FCIDs, and for others a full area was allocated.

The FCID allocation scheme available in Release 1.3 and earlier, allocates a full area to these HBAs. This allocation isolates them to that area and are listed with their pWWN during a fabric login. The allocated FCIDs are cached persistently and are still available in Cisco MDS SAN-OS Release 2.0 (see the "FCID Allocation for HBAs" section on page 38-22).

As of Cisco MDS SAN-OS Release 2.0, to allow further scalability for switches with numerous ports, the Cisco MDS SAN-OS software is maintaining a list of HBAs exhibiting this behavior. Each HBA is identified by its company ID used in the pWWN during a fabric log in. A full area is allocated to the N ports with company IDs that are listed and for the others a single FCID is allocated. Irrespective of the kind (whole area or single) of FCID allocated, the FCID entries remain persistent.

Examples

The following example adds a new company ID to the default area company ID list:

```
switch# config terminal
switch(config)# fcid-allocation area company-id 0x003223
```

Related Commands

Command	Description
show fcid-allocation	Displays the configured company IDs.

fcid-last-byte

Use the **fcid-last-byte** command to allocate the last byte FCID 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*
no fcid-last-byte *last-byte-id*

Syntax Description

last-byte-fcid	Specifies the last-byte FCID range from 0 to 250.

Command Default

None.

Command Modes

FICON configuration submode.

Command History

Release	Modification
1.3(1)	This command was introduced.
3.0(1)	This command was deprecated.

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 FCID for the fabric address:

```
switch# config terminal
switch(config)# ficon vsan 2
switch(config-ficon)# fcid-last-byte 12
```

The following example removes the configured last byte FCID for the fabric address and reverts to the default:

```
switch# config terminal
switch(config)# ficon vsan 2
switch(config-ficon)# no fcid-last-byte 3
```

Related Commands

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

fcinterop fcid-allocation

To allocate FCIDs on the switch, use the **fcinterop fcid-allocation** command in configuration mode. To disable FCIDs 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

auto	Assigns single FCID to compatible HBAs.
flat	Assigns single FCID.
none	Assigns FCID range.

Command Default

The default is **fcinterop fcid-allocation auto.**

Command Modes

Configuration mode.

Command History

Release	Modification
1.0(2)	This command was introduced.

Usage Guidelines

This command defines how the switch assigns FCIDs.

Examples

The following example shows how to allocate FCIDs on the switch:

```
switch# config terminal
switch(config)# fcinterop fcid-allocation none
switch(config)# fcinterop fcid-allocation flat
switch(config)# fcinterop fcid-allocation auto
```

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 the command.

fcinterop loop-monitor
no fcinterop loop-monitor

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled.

Command Modes

Configuration mode.

Command History

Release	Modification
1.0(2)	This command was introduced.

Usage Guidelines

This command detects devices that are removed from a looped port:

Examples

The following example shows how to enable monitoring of NL ports in a loop:

```
switch# config terminal
switch(config)# fcinterop loop-monitor
```

The following example shows how to disable monitoring of NL ports in a loop:

```
switch# config terminal
switch(config)# no fcinterop loop-monitor
```

Related Commands

Command	Description
show flogi database	Verifies if a storage device is displayed in the Fabric login (FLOGI) table.

fcip-enhanced

To set the same hashing algorithm between MDS switches for write acceleration, use the **fcip-enhanced** command. To remove write acceleration support on port channels of FCIP interfaces, use the **no** form of this command.

fcip-enhanced
no fcip-enhanced

Command Default

Disabled

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
7.3(1)DY(1)	This command was introduced.

Usage Guidelines

Cisco MDS 9250i and MDS 9220i switches use different hashing algorithm than the hashing algorithm used in Cisco MDS 24/10 port SAN Extension Module on MDS 9700 switches. For the write acceleration feature to work, the hashing algorithm must be same on both the switches. The **fcip-enhanced** command sets the hashing algorithm in MDS 9220i or MDS 9250i same as Cisco MDS 24/10 port SAN Extension Module and this command must be used only for write acceleration.

- This command can be issued only on Cisco MDS 9250i Switches running on Cisco MDS NX-OS Release 7.3(1)DY(1) or later.
- This command can be issued only on Cisco MDS 9220i Switches running on Cisco MDS NX-OS Release 8.5(1) or later.
- This command can be issued only for port channels on FCIP interfaces.
- This command should be issued only between Cisco MDS 9220i and MDS 9250i switches and a Cisco MDS 24/10 port SAN Extension Module (on Cisco MDS 9700 Directors).
- The port channel mode must be set to **active** on both peers before issuing this command.
- This command must be issued before a member is added to a port channel. If an interface is already added as a member, remove the interface before issuing the command.

Example

The following example shows how to enable write acceleration support on port channels of FCIP interfaces:

```
switch# configure terminal
switch(config)# interface port-channel 1
switch(config-if)# channel mode active
switch(config-if)# fcip-enhanced
FCIP enhanced will be enabled. Please ensure the peer link is connected to m97xx
switch(config-if)# end
```

Related Commands

Command	Description
interface port-channel *number*	Configures the specified port channel using the default **on** mode.
show port-channel database	Displays the port channel configured in the default **on** mode and **active** mode.

fcip enable

To enable the FCIP feature in any switch in the Cisco MDS 9000 Family, use the **fcip enable** command.

fcip enable
no fcip enable

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled.

Command Modes

Configuration mode.

Command History

Release	Modification
1.3(1)	This command was introduced.
NX-OS 4.1(1b)	This command was deprecated.

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.

Note This command is not supported on the Cisco MDS 9124 switch, the Cisco Fabric Switch for HP c-Class BladeSystem, and the Cisco Fabric Switch for IBM BladeCenter.

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
```

Related Commands

Command	Description
show fcip	Displays FCIP information.

fcip profile

To create and configure an FCIP profile, use the **fcip profile** command. To remove an FCIP profile, use the **no** form of the command.

fcip profile *profile-id*
no fcip profile *profile-id*

Syntax Description

profile-id	Specifies a ID range from 1 to 255.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

When you perform this command, the CLI enters FCIP profile configuration mode.

Note This command is not supported on the Cisco MDS 9124 switch, the Cisco Fabric Switch for HP c-Class BladeSystem, and the Cisco Fabric Switch for IBM BladeCenter.

Examples

The following example shows how to configure an FCIP profile:

```
switch## config terminal
switch(config)# fcip profile 5
switch(config-profile)#
```

Related Commands

Command	Description
interface fcip interface_number use-profile profile-id	Configures the interface using an existing profile ID from 1 to 255.
show fcip profile	Displays information about the FCIP profile.
show interface fcip	Displays an interface configuration for a specified FCIP interface.

fcns bulk-notify

To enable transmission of multiple name server entry change notifications in one Messaging and Transaction Services (MTS) payload, use the **fcns bulk-notify** command. To disable bulk notify, use the **no** form of this command.

fcns bulk-notify
no fcns bulk-notify

Syntax Description

This command has no keywords or arguments.

Command Default

Bulk notification from the name server is disabled by default. For 6.2(9) and later releases, bulk notification from the name server is enabled by default.

Command Modes

Configuration mode.

Command History

Release	Modification
6.2(7)	This command was introduced.
6.2(9)	This command was deprecated.

Usage Guidelines

Enabling the **fcns bulk-notify** command would improve the performance of the components like Zone, IVR, QOS, IPS.

Note Run the **show fcns internal info global** command to determine if the bulk notification is enabled.

Examples

The following example shows how to enable transmission of multiple name server entry change notifications in one MTS payload:

```
switch# config terminal
switch(config)# fcns bulk-notify
switch(config)#
```

Related Commands

Command	Description
show fcns internal info global	Displays the FCNS global configuration.

fcns no-bulk-notify

To disable transmission of multiple name server entry change notifications in one MTS payload, use the **fcns no-bulk-notify** command. To re-enable bulk notification once it is disabled, use the **no** form of this command.

fcns no-bulk-notify
no fcns no-bulk-notify

Syntax Description

This command has no keywords or arguments.

Command Default

Bulk notification from the name server is disabled by default. For 6.2(9) and later releases, bulk notification from the name server is enabled by default.

Command Modes

Configuration mode.

Command History

Release	Modification
6.2(9)	This command was introduced.

Usage Guidelines

None.

Examples

The following example shows how to disable transmission of multiple name server entry change notifications in one MTS payload:

```
switch# config terminal
switch(config)# fcns no-bulk-notify
switch(config)#
```

The following example shows how to re-enable bulk notification once it has been disabled:

```
switch# config terminal
switch(config)# no fcns no-bulk-notify
switch(config)#
```

Related Commands

Command	Description
fcns bulk-notify	Available until Release 6.2(7) only. Enables transmission of multiple name server entry change notifications in one MTS payload.

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*
no fcns proxy-port *wwn-id* **vsan** *vsan-id*

Syntax Description

wwn-id	Specifies the port WWN, with the format hh:hh:hh:hh:hh:hh:hh:hh.
vsan *vsan-id*	Specifies a VSAN ID. The range is 1 to 4093.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
1.0(2)	This command was introduced.

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 Cisco Fabric Manager.

All name server registration requests come from the same port whose parameter is registered or changed. If it does not, then the request is rejected.

Examples

The following example shows configuring a proxy port for VSAN 2:

```
switch# config terminal
switch(config)# fcns proxy-port 21:00:00:e0:8b:00:26:d vsan 2
```

Related Commands

Command	Description
show fcns	Displays the name server database and statistical information for a specified VSAN or for all VSANs.

fcns reject-duplicate-pwwn vsan

To reject the same pwwn from logging in the different switch, use the **fcns reject-duplicate-pwwn vsan** command in configuration mode.

fcns reject-duplicate-pwwn vsan *vsan-id*
no fcns reject-duplicate-pwwn vsan *vsan-id*

Syntax Description

vsan-id	Specifies a VSAN ID. The range is 1 to 4093.

Command Default

Enabled.

Command Modes

Configuration mode.

Command History

Release	Modification
2.0(x)	This command was introduced.

Usage Guidelines

None.

Examples

The following example rejects duplicate FCNS pWWNs for VSAN 2:

```
switch# configure terminal
switch(config)# fcns reject-duplicate-pwwn vsan 2
```

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 FCID, use the **fcping fcid** command in EXEC mode.

fcping {**device-alias** *aliasname* | **fcid** {*fc-portdomain-controller-id*} | **pwwn** *pwwn-id*} **vsan** *vsan-id* [**count** *number* [**timeout** *value* [**usr-priority** *priority*]]]

Syntax Description

device-alias *aliasname*	Specifies the device alias name. Maximum length is 64 characters.
fcid	The FCID of the destination N port.
fc-port	The port FCID with the format 0xhhhhhh.
domain-controller-id	Verifies connection to the destination switch.
pwwn *pwwn-id*	Specifies the port WWN of the destination N port, with the format hh:hh:hh:hh:hh:hh:hh:hh.
vsan *vsan-id*	Specifies the VSAN ID of the destination N port. The range is 1 to 4093.
count *number*	(Optional) Specifies the number of frames to send. A value of 0 sends forever. The range is 0 to 2147483647.
timeout *value*	(Optional) Specifies the timeout value in seconds. The range is 1 to 10.
usr-priority *priority*	(Optional) Specifies the priority the frame receives in the switch fabric. The range is 0 to 1.

Command Default

None.

Command Modes

EXEC mode.

Command History

Release	Modification
1.0(2)	This command was introduced.
1.2(1)	Allowed the domain controller ID as an FCID.
2.0(x)	Added the **device-alias** *aliasname* option.

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
```

The following example displays fcping operation for the device alias of the specified destination:

```
switch# fcping device-alias x vsan 1
28 bytes from 21:01:00:e0:8b:2e:80:93 time = 358 usec
28 bytes from 21:01:00:e0:8b:2e:80:93 time = 226 usec
28 bytes from 21:01:00:e0:8b:2e:80:93 time = 372 usec
```

fc-redirect version2 enable

To enable FC redirect version2 mode, use the **fc-redirect version2 enable** command in configuration mode. To disable this feature, use the **no** form of the command.

fc-redirect version2 enable
no fc-redirect version2 enable

Syntax Description

This command has no arguments or keywords.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
NX-OS 5.0(1a)	This command was introduced.

Usage Guidelines

AAM mode can be enabled in version1 mode also.

Examples

The following example shows how to enable FC redirect version2 mode:

```
switch# config terminal
switch(config)# fc-redirect version2 enable

Please make sure to read and understand the following implications
before proceeding further:

   1) This is a Fabric wide configuration. All the switches in the
      fabric will be configured in Version2 mode.Any new switches
      added to the fabric will automatically be configured in version2
      mode.

   2) SanOS 3.2.x switches CANNOT be added to the Fabric after Version2
      mode is enabled. If any 3.2.x switch is added when Version2 mode
      is enabled, all further FC-Redirect Configuration changes will Fail
      across the fabric. This could lead to traffic disruption for
      applications like SME.

   3) If enabled, Version2 mode CANNOT be disabled till all FC-Redirect
      configurations are deleted. FC-Redirect configurations can be
      deleted ONLY after all the relevant application configurations
      are deleted. Please use the command 'show fc-redirect configs'
      to see the list of applications that created FC-Redirect
      configurations.

   4) 'write erase' will NOT disable this command. After 'write erase'
      on ANY switch in the fabric, the user needs to do:
                'clear fc-redirect decommission-switch'
      on that that switch. Without that, if the user moves the switch
      to a different fabric it will try to convert all the switches
      in the fabric to Version2 mode automatically. This might lead
      to Error conditions and hence Traffic disruption.
```

```
Do you want to continue? (Yes/No) [No]
isola-77(config)#
```

The following example shows how to disable FC redirect version2 mode:

```
switch# config terminal
switch(config)# no fc-redirect version2 enable
WARNING: This command will disable Version2 mode throughout the fabric.
         This is NOT a recommended step.
Do you want to continue? (Yes/No) [No]
switch(config)#
```

Related Commands

Command	Description
show fc-redirect-active configs	Displays all active configurations on a switch.

fc-redirect ivr-support enable

To enable FC redirect IVR support, use the **fc-redirect ivr-support enable** command in configuration mode. To disable this feature, use the **no** form of the command.

fc-redirect ivr-support enable
no fc-redirect ivr-support enable

Syntax Description

This command has no arguments or keywords.

Command Default

None.

Command Modes

configuration mode.

Command History

Release	Modification
NX-OS 5.0(1a)	This command was introduced.

Usage Guidelines

None.

Examples

The following example shows how to enable FC redirect IVR support:

```
switch# config terminal
switch(config)# fc-redirect ivr-support enable
switch(config)#
```

The following example shows how to disable FC redirect IVR support:

```
switch# config terminal
switch(config)# no fc-redirect ivr-support enable
switch(config)#
```

Related Commands

Command	Description
show fc-redirect-active configs	Displays all active configurations on a switch.

fcroute

To configure Fibre Channel routes and to activate policy routing, use the **fcroute** command. To remove a configuration or revert to factory defaults, use the **no** form of the command.

fcroute {*fcid network-mask* **interface** {**fc** *slot/port* | **port-channel** *port*} **domain** *domain-id* {**metric** *number* | **remote** | **vsan** *vsan-id*} | *policy fcroute-map* **vsan** *vsan-id* [*route-map-identifier*]}
no fcroute {*fcid network-mask* **interface** {**fc** *slot/port* | **port-channel** *port*} **domain** *domain-id* {**metric** *number* | **remote** | **vsan** *vsan-id*} | *policy fcroute-map* **vsan** *vsan-id* [*route-map-identifier*]}

Syntax Description

fcid	Specifies the FC ID. The format is **0x***hhhhhh*.
network-mask	Specifies the network mask of the FC ID. The format is **0x***0* to **0x***ffffff*.
interface	Specifies an interface.
fc *slot*/*port*	Specifies a Fibre Channel interface.
port-channel *port*	Specifies a PortChannel interface.
domain *domain-id*	Specifies the route for the domain of the next hop switch. The range is 1 to 239.
metric *number*	Specifies the cost of the route. The range is 1 to 65535. Default cost is 10.
remote	Configures the static route for a destination switch remotely connected.
vsan *vsan-id*	Specifies a VSAN ID. The range is 1 to 4093.
policy fcroute-map	Activates policy routing.
route-map-identifier	(Optional) Specifies the route map identifier. The range is 1 to 65535.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
6.2(9)	This command was deprecated.
1.0(2)	This command was introduced.
3.0(3)	Added the **policy** option.

Usage Guidelines

Use this command to assign forwarding information to the switch and to activate a preferred path route map.

Examples

The following example specifies the Fibre Channel interface and the route for the domain of the next hop switch for VSAN 2:

```
switch# config terminal
switch(config)# fcroute 0x111211 interface fc1/1 domain 3 vsan 2
```

The following example removes this configuration:

```
switch(config)# no fcroute 0x111211 interface fc1/1 domain 3 vsan 2
```

The following example specifies the PortChannel interface and the route for the domain of the next hop switch for VSAN 4:

```
switch# config terminal
switch(config)# fcroute 0x111211 interface port-channel 1 domain 3 vsan 4
```

The following example removes this configuration:

```
switch(config)# no fcroute 0x111211 interface port-channel 1 domain 3 vsan 4
```

The following example specifies the Fibre Channel interface, the route for the domain of the next hop switch, and the cost of the route for VSAN 1:

```
switch# config terminal
switch(config)# fcroute 0x031211 interface fc1/1 domain 3 metric 1 vsan 1
```

The following example removes this configuration:

```
switch(config)# no fcroute 0x031211 interface fc1/1 domain 3 metric 1 vsan 1
```

The following example specifies the Fibre Channel interface, the route for the domain of the next hop switch, the cost of the route, and configures the static route for a destination switch remotely connected for VSAN 3:

```
switch# config terminal
switch(config)# fcroute 0x111112 interface fc1/1 domain 3 metric 3 remote vsan 3
```

The following example removes this configuration:

```
switch(config)# no fcroute 0x111112 interface fc1/1 domain 3 metric 3 remote vsan 3
```

Related Commands

Command	Description
fcroute-map	Specifies a preferred path Fibre Channel route map.
fcroute policy fcroute-map	Activates the preferred path Fibre Channel route map.
show fcroute	Displays Fibre Channel routes.
show fcroute-map	Displays the preferred path route map configuration and status.

fcroute-map vsan

To configure a preferred path Fibre Channel route map, use the **fcroute-map vsan** command. To remove a configuration, use the **no** form of the command.

fcroute-map vsan *vsan-id route-map-identifier*
no fcroute-map vsan *vsan-id route-map-identifier*

Syntax Description

vsan *vsan-id*	Specifies a VSAN ID. The range is 1 to 4093.
route-map-identifier	Specifies the route map identifier. The range is 1 to 65535.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
3.0(3)	This command was introduced.

Usage Guidelines

As of Cisco MDS SAN-OS Release 3.0(3) and later, you can use preferred path routes for Fibre Channel to route traffic over selected paths that are not necessarily the shortest path as chosen by routing protocols such as FSPF. This kind of control allows you to choose paths based on characteristics such as frames received on a selected interface or frames with a selected source FC ID. This ensures path separation between a host and a target.

Examples

The following example specifies a Fibre Channel route map and places you in the Fibre Channel route map configuration submode.

```
switch# config terminal
switch(config)# fcroute-map vsan 2 12
switch(config-fcroute-map)#
```

The following example removes the Fibre Channel route map.

```
switch(config)# no fcroute-map vsan 2 12
```

Related Commands

Command	Description
fcroute	Specifies Fibre Channel routes and activates policy routing.
show fcroute-map	Displays the preferred path route map configuration and status.
match (fcroute-map configuration submode)	Specifies the source and destination FC ID match criteria.

Command	Description
set (fcroute-map configuration submode)	Specifies the interface, the preference level for this interface, and the IVR next hop VSAN ID for this interface.

fcrxbbcredit extended enable

To enable Fibre Channel extended buffer-to-buffer credits (BB_credits), use the **fcrxbbcredit extended enable** command **in configuration mode.** To disable the feature, use the **no** form of the command.

fcrxbbcredit extended enable
no fcrxbbcredit extended enable

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled.

Command Modes

Configuration mode.

Command History

Release	Modification
2.0(x)	This command was introduced.

Usage Guidelines

Use the **fcrxbbcredit extended enable** command to enable the **switchport fcrxbbcredit extended** command.

The **fcrxbbcredit extended enable** command is not supported on the following switches:

- Cisco MDS 9124 Multilayer Fabric Switch
- Cisco Fabric Switch for HP c-Class BladeSystem
- Cisco Fabric Switch for IBM BladeCenter
- Cisco MDS 9134 Multilayer Fabric Switch
- Cisco MDS 9148 Multilayer Fabric Switch
- Cisco MDS 9148S 16G Multilayer Fabric Switch
- Cisco MDS 9250i Multiservice Fabric Switch

The following example shows how to enable Fibre Channel extended BB_credits:

```
switch# config terminal
switch(config)# fcrxbbcredit extended enable
```

The following example shows how to disable Fibre Channel extended BB_credits:

```
switch# config terminal
switch(config)# no fcrxbbcredit extended enable
```

Related Commands

Command	Description
show interface	Displays interface information and status.
switchport fcrxbbcredit extended	Configures Fibre Channel extended BB_credits on an interface.

fcs plat-check-global vsan

To enable FCS platform and node name checking fabric-wide, use the **fcs plat-check-global vsan** command in configuration mode. To disable this feature, use the **no** form of the command.

fcs plat-check-global vsan *vsan-id*
no fcs plat-check-global vsan *vsan-id*

Syntax Description

vsan-id	Specifies the VSAN ID for platform checking, which is from 1 to 4096.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
1.0(2)	This command was introduced.

Usage Guidelines

None.

Examples

```
switch# config terminal
switch(config)# fcs plat-check-global vsan 2
```

Related Commands

Command	Description
show fcs	Displays fabric configuration server information.

fcs register

To register FCS attributes, use the **fcs register** command in configuration mode. To disable this feature, use the **no** form of the command.

fcs register platform name *name* **vsan** *vsan-id*
no fcs register platform name *name* **vsan** *vsan-id*

Syntax Description

platform name *name*	Specifies the name of the platform to register. Maximum size is 255 characters.
vsan *vsan-id*	Specifies the VSAN ID. The range is 1 to 4096.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
1.0(2)	This command was introduced.

Usage Guidelines

None.

Examples

The following example shows how to register FCS attributes:

```
switch# config terminal
switch(config)# fcs register
switch(config-fcs-register)# platform Platform1 vsan 10
```

Related Commands

Command	Description
show fcs	Displays fabric configuration server information.

fcs virtual-device-add

To include a virtual device in a query about zone information from an FCS, use the **fcs virtual-device-add** command in configuration mode. To remove a virtual device, use the **no** form of the command.

fcs virtual-device-add [**vsan-ranges** *vsan-ids*]
no fcs virtual-device-add [**vsan-ranges** *vsan-ids*]

Syntax Description

vsan-ranges *vsan-ids*	(Optional) Specifies one or multiple ranges of VSANs. The range is 1 to 4093.

Command Default

Disabled.

Command Modes

Configuration mode.

Command History

Release	Modification
3.1(2)	This command was introduced.

Usage Guidelines

VSAN ranges are entered as *vsan-ids*-*vsan-ids*. When you specify more than one range, separate each range with a comma. If no range is specified, the command applies to all VSANs.

Examples

The following example shows how to add to one range of VSANs:

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# fcs virtual-device-add vsan-ranges 2-4
```

The following example shows how to add to more than one range of VSANs:

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# fcs virtual-device-add vsan-ranges 2-4,5-8
```

Related Commands

Command	Description
show fcs	Displays fabric configuration server information.

fcsp

To configure a Fibre Channel Security Protocol (FC-SP) authentication mode for a specific interface in an FC-SP-enabled switch, use the **fcsp** command. To disable an FC-SP on the interface, use the **no** form of the command.

fcsp {**auto-active** | **auto-passive** | **esp manual** | **off** | **on**} [*timeout-period*]
no fcsp {**auto-active** | **auto-passive** | **esp manual** | **off** | **on**} [*timeout-period*]

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.
esp	Configures the Encapsulating Security Payroll for an interface.
manual	Configures the Encapsulating Security Payroll in manual mode.
on	Configures the auto-active mode to authenticate the specified interface.
off	Configures the auto-active mode to authenticate the specified interface.
timeout-period	(Optional) Specifies the timeout period to reauthenticate the interface. The time ranges from 0 (the default where no authentication is performed) to 100,000 minutes.

Command Default

Auto-passive.

Command Modes

Configuration mode.

Command History

Release	Modification
6.2(1)	Fibre Channel Security Protocol (FC-SP) is currently not supported on MDS 9710, but targeted for a future release.
NX-OS 4.2(1)	Added esp keyword for the syntax description.
1.3(1)	This command was introduced.

Usage Guidelines

To use this command, FC-SP must be enabled using the **feature fcsp** command.

Examples

The following example shows how to configure the ESP in manual mode:

```
switch# config terminal
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# interface fc 2/1 - 3
switch(config-if)# fcsp esp manual
switch(config-if-esp)#
```

The following example turns on the authentication mode for ports 1 to 3 in Fibre Channel interface 2:

```
switch# config terminal
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 Fibre Channel interfaces:

```
switch(config-if)# no fcsp
```

The following example changes these Fibre Channel interfaces to initiate FC-SP authentication, but does not permit reaunthentication:

```
switch(config-if)# fcsp auto-active 0
```

The following example changes these Fibre Channel interfaces to initiate FC-SP authentication and permits reaunthentication within two hours (120 minutes) of the initial authentication attempt:

```
switch(config-if)# fcsp auto-active 120
```

Related Commands

Command	Description
fcsp enable	Enables FC-SP.
show fcsp interface	Displays FC-SP-related information for a specific interface.

fcsp dhchap devicename

Asymmetric DHCHAP secrets may be used on FC-SP links. To populate the FC-SP DHCHAP secret database on the local switch with the secrets used by remote switches use the **fcsp dhchap devicename** command. To remove these entries use the **no** form of the command.

fcsp dhchap devicename *remote-switch-wwn* **password** [**0** | **7**] *remote-secret*
no fcsp dhchap devicename *remote-switch-wwn* **password** [**0** | **7**] *remote-secret*

Syntax Description

remote-switch-wwn	Switch World Wide Name (WWN) of the remote device. The WWN format is *hh:hh:hh:hh:hh:hh:hh:hh*.
password	Configures the DHCHAP secret for the remote device.
0	(Optional) Specifies that the secret is in cleartext.
7	(Optional) Specifies that the secret is in encrypted text. This is the default value.
remote-secret	DHCHAP secret. Maximum of 64 alphanumeric characters.

Command Default

The default entry format for the secret is encrypted.

Command Modes

Global configuration (config)

Command History

Release	Modification
1.3 (1)	This command was introduced.

Usage Guidelines

The **fcsp dhchap devicename** command is available only when the FC-SP feature is enabled.

Example

The following example shows how to configure an encrypted secret of a remote switch:

```
switch(config)# fcsp dhchap devicename 00:11:22:33:44:aa:bb:cc password mypassword
```

The following example shows how to remove the remote switch secret of the previous example from the local switch DHCHAP secret database:

```
switch(config)# no fcsp dhchap devicename 00:11:22:33:44:aa:bb:cc password mypassword
```

The following example shows an asymmetric secret configuration for a link between the local switch and a remote switch with switch WWN of *01:01:01:01:01:01:01:01*. The secret on the local switch is 'local_secret' and the remote switch has a secret of 'far_secret'. The configuration is for the local switch and the secrets:

```
switch(config)# fcsp dhchap password 0 local_secret 01:01:01:01:01:01:01:01
switch(config)# fcsp dhchap devicename 01:01:01:01:01:01:01:01 password 0 far_secret
```

Related Commands

Command	Description
fcsp enable	Enables FC-SP.
fcsp dhchap dhgroup	Configure FC-SP group priority list.
fcsp dhchap hash	Configure FC-SP hash priority list.
fcsp dhchap password	Configure FC-SP link secrets.
show fcsp	Displays configured FC-SP information.

fcsp dhchap dhgroup

To change the FC-SP DHCHAP group priority list, use the **fcsp dhchap dhgroup** command in global configuration mode. To revert to the default group priority list, use the **no** form of this command. .

fcsp dhchap dhgroup *group-id* [*group-id* [*group-id* [*group-id* [*group-id*]]]]
no fcsp dhchap dhgroup *group-id* [*group-id* [*group-id* [*group-id* [*group-id*]]]]

Syntax Description

group-id	**0**|**1**|**2**|**3**|**4** Specifies an FC-SP DHCHAP group priority list entry.

Command Default

The default DH group priority list, from highest to lowest is **0 4 1 2 3**.

Command Modes

Global configuration (config)

Command History

Release	Modification
1.3(1)	This command was introduced.

Usage Guidelines

The **fcsp dhchap dhgroup** command is available only when the FC-SP feature is enabled.

There must be at least one member in the DH group priority list. Each group may only be specified once.

If you change the default FC-SP DH group priority list, ensure that you change it globally for all the switches in the fabric.

The following table maps the Cisco Group Number with the corresponding RFC Group Number and Modular Exponentiation (MODP) Group:

Table 1: Cisco Group Number with Corresponding RFC Group Number and MODP Group

Cisco Group Number	RFC Group Number	MODP Group
0	null	null DH algorithm
1	2	1024
2	—	1280
3	5	1536
4	14	2048

Example

The following example shows how to configure the used DH group list to only groups 2, 3, and 4, in the same order of priority:

```
switch(config)# fcsp dhchap dhgroup 2 3 4
```

The following example shows how to revert a previously configured DH group priority list of the 'null' group only back to the default priority list:

```
switch(config)# no fcsp dhchap dhgroup 0
```

Related Commands

Command	Description
fcsp enable	Enables FC-SP.
fcsp dhchap devicename	Configure FC-SP asymmetric secrets.
fcsp dhchap hash	Configure FC-SP hash priority list.
fcsp dhchap password	Configure FC-SP link secrets.
show fcsp	Displays configured FC-SP information.

fcsp dhchap hash

To configure the hash algorithm priority list for FC-SP DHCHAP authentication use the **fcsp dhchap hash** command. To return to the default hash algorithm priority list use the **no** form of the command.

fcsp dhchap hash {**md5 [sha1]** | **sha1 [md5]**}
no fcsp dhchap hash {**md5 [sha1]** | **sha1 [md5]**}

Syntax Description

md5	(Optional) Specifies the MD5 hash algorithm.
sha1	(Optional) Specifies the SHA-1 hash algorithm.

Command Default

The default FC-SP DHCHAP hash algorithm priority list has the following order:

- MD5
- SHA-1

Command Modes

Global configuration (config)

Command History

Release	Modification
1.3(1)	This command was introduced.

Usage Guidelines

The **fcsp dhchap hash** command is available only when the FC-SP feature is enabled.

If you change the default hash algorithm list order, then change it in all switches in the fabric.

Warning If FC-SP DHCHAP authentication via AAA is enabled, the MD5 hash algorithm must be set if the AAA authentication uses RADIUS or TACACS+. This is because RADIUS and TACACS+ applications do not support other hash algorithms.

Example

The following example shows how to configure the DHCHAP authentication hash priority list to be SHA-1 followed by MD5:

```
switch(config)# fcsp dhchap hash sha1 md5
```

The following example shows how to configure the use of the SHA-1 hash algorithm only:

```
switch(config)# fcsp dhchap hash sha1
```

The following example shows how to revert the previous example to the default priority list:

```
switch(config)# no fcsp dhchap hash sha1
```

Related Commands

Command	Description
fcsp enable	Enables FC-SP.
fcsp dhchap devicename	Configure FC-SP asymmetric secrets.
fcsp dhchap dhgroup	Configure FC-SP group priority list.
fcsp dhchap password	Configure FC-SP link secrets.
show fcsp	Displays configured FC-SP information.

fcsp dhchap password

To configure the FC-SP DHCHAP secret database used for FC-SP peer switch link authentication via DHCHAP use the **fcsp dhchap password** command. To remove secrets from the FC-SP DHCHAP database use the **no** form of the command.

fcsp dhchap password [**0** | **7**] *secret* [*remote-switch-wwn*]
no fcsp dhchap password [**0** | **7**] *secret* [*remote-switch-wwn*]

Syntax Description

secret	DHCHAP secret. Maximum of 64 alphanumeric characters.
remote-switch-wwn	(Optional) Switch World Wide Name of the remote switch to use this secret with. The WWN format is *hh:hh:hh:hh:hh:hh:hh:hh*.

Command Default

The default entry format for the secret is encrypted.

Command Modes

Global configuration (config)

Command History

Release	Modification
1.3(1)	This command was introduced.

Usage Guidelines

The **fcsp dhchap password** command is available only when the FC-SP feature is enabled.

Be sure to configure an FC-SP DHCHAP database on each switch in the fabric when this facility is being used.

To configure a fabric-wide global FC-SP DHCHAP secret use the command without any switch WWN specifier. There can be only a single global FC-SP DHCHAP secret in a fabric. Additionally, switch specific secrets may be configured. To configure these specify the switch WWN.

Example

The following example show how to configure the global FC-SP DHCHAP secret in cleartext:

```
switch(config)# fcsp dhchap password 0 mypassword
```

The following example show how to configure a secret to be used with the specified peer switch in cleartext:

```
switch(config)# fcsp dhchap password 0 mypassword 30:11:bb:cc:dd:33:11:22
```

The following example show how to remove a secret to be used with the specified peer switch by entering the secret in cleartext, even though the configuration is stored in the configuration in encrypted form:

```
switch(config)# no fcsp dhchap password 0 mypassword 30:11:bb:cc:dd:33:11:22
```

The following example shows how to configure symmetric secrets on a link between switch1 with sWWN of *01:01:01:01:01:01:01:01* and switch2 with sWWN of *02:02:02:02:02:02:02:02*. The FC-SP DHCHAP secret is in cleartext format:

```
switch1(config)# fcsp dhchap password 0 very_secret 02:02:02:02:02:02:02:02
switch2(config)# fcsp dhchap password 0 very_secret 01:01:01:01:01:01:01:01
```

Related Commands

Command	Description
fcsp enable	Enables FC-SP.
fcsp dhchap devicename	Configure asymmetric secrets.
fcsp dhchap dhgroup	Configure FC-SP group priority list.
fcsp dhchap hash	Configure FC-SP hash priority list.
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. Additional FC-SP commands are available when the FC-SP feature is enabled. To disable FC-SP, use the **no** form of the command.

fcsp enable
no fcsp enable

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled.

Command Modes

Configuration mode.

Command History

Release	Modification
1.3(1)	This command was introduced.
NX-OS 4.1(1b)	This command was deprecated.

Usage Guidelines

None.

Examples

The following example enables FC-SP:

```
switch# config terminal
switch(config)# fcsp enable
switch(config)#
```

Related Commands

Command	Description
show fcsp	Displays configured FC-SP information.

fcsp esp sa

To configure the parameters for the Security Association (SA), use the **fcsp esp sa** command. To delete the SA between the switches, use the **no** form of the command.

fcsp esp sa *spi-number*
no fcsp esp sa *spi-number*

Syntax Description

spi-number	Configures the Security Protocol Interface (SPI) of the Security Association. The range is from 256 to 4294967295.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
NX-OS 5.2(1)	The spi-number range has been reduced from 256 4294967295 to 256 65536.
NX-OS 4.2(1)	This command was introduced.

Usage Guidelines

None.

Examples

The following example shows how to configure the command for ESP:

```
switch(config)# fcsp esp sa 257
This is a Early Field Trial (EFT) feature.  Please do not use this in a producti
on environment. Continue Y/N ? [no] y
switch(config-sa)#
```

Related Commands

Command	Description
fcsp enable	Enables FC-SP.
show fcsp interface	Displays FC-SP related information for a specific interface.

fcsp timeout

To configure the timeout value for FC-SP message, use the **fcsp timeout** command in configuration mode. Use the **no** form of the command to revert to factory defaults.

fcsp timeout *timeout-period*
no fcsp timeout *timeout-period*

Syntax Description

timeout-period	Specifies the timeout period. The time ranges from 20 to 100 seconds. The default is 30 seconds.

Command Default

30 seconds.

Command Modes

Configuration mode.

Command History

Release	Modification
1.3(1)	This command was introduced.

Usage Guidelines

You can only see the **fcsp timeout** command if you enter the **fcsp enable** command.

Examples

The following example configures the FCSP timeout value:

```
switch# config terminal
switch(config)# fcsp enable
switch(config)# fcsp timeout 60
```

Related Commands

Command	Description
fcsp enable	Enables FC-SP.
show fcsp	Displays configured FC-SP information.

fctimer

To change the default Fibre Channel timers, use the **fctimer** command in configuration mode. To revert to the default values, use the **no** form of the command.

fctimer {**d_s_tov** *milliseconds* [**vsan** *vsan-id*] | **e_d_tov** *milliseconds* [**vsan** *vsan-id*] | **r_a_tov** *milliseconds* [**vsan** *vsan-id*]}
no 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 *milliseconds*	Specifies the distributed services time out value. The range is 5000 to 10,000 milliseconds, with a default of 5000.
vsan *vsan-id*	(Optional) Specifies the VSAN ID. The range is 1 to 4096.
e_d_tov *milliseconds*	Specifies the error detect time out value. The range is 1000 to 4,000 milliseconds, with a default of 2000.
r_a_tov *milliseconds*	Specifies the resolution allocation time out value. The range is 5000 to 10,000 milliseconds, with a default of 10,000.

Command Modes

Configuration mode.

Command History

Release	Modification
1.0(2)	This command was introduced.

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 the fabric.

Use the **vsan** option to configure different TOV values for VSANs with special types of links such as FC or IP tunnels.

Examples

The following example shows how to change the default Fibre Channel timers:

```
switch# config terminal
switch(config)# fctimer e_d_tov 3000
switch(config)# fctimer r_a_tov 7000
```

Related Commands

Command	Description
show fctimer	Displays the configured Fibre Channel timer values.

fctimer abort

To discard a Fibre Channel timer (fctimer) Cisco Fabric Services (CFS) distribution session in progress, use the **fctimer abort** command in configuration mode.

fctimer abort

Syntax Description

This command has no arguments or keywords.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
2.0(x)	This command was introduced.

Usage Guidelines

None.

Examples

The following example shows how to discard a CFS distribution session in progress:

```
switch# config terminal
switch(config)# fctimer abort
```

Related Commands

Command	Description
fctimer distribute	Enables CFS distribution for fctimer.
show fctimer	Displays fctimer information.

fctimer commit

To apply the pending configuration pertaining to the Fibre Channel timer (fctimer) Cisco Fabric Services (CFS) distribution session in progress in the fabric, use the **fctimer commit** command in configuration mode.

fctimer commit

Syntax Description

This command has no arguments or keywords.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
2.0(x)	This command was introduced.

Usage Guidelines

None.

Note After the FC timer commit is completed the running configuration has been modified on all switches participating in fctimer distribution. You can then use the copy running-config startup-config fabric command to save the running configuration to the startup configuration on all the switches in the fabric.

Examples

The following example shows how to commit changes to the active Fibre Channel timer configuration:

```
switch# config terminal
switch(config)# fctimer commit
```

Related Commands

Command	Description
fctimer distribute	Enables CFS distribution for fctimer.
show fctimer	Displays fctimer information.

fctimer distribute

To enable Cisco Fabric Services (CFS) distribution for Fibre Channel timer (fctimer), use the **fctimer distribute** command. To disable this feature, use the **no** form of the command.

fctimer distribute
no fctimer distribute

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled.

Command Modes

Configuration mode.

Command History

Release	Modification
1.0(2)	This command was introduced.

Usage Guidelines

Before distributing the Fibre Channel timer changes to the fabric, the temporary changes to the configuration must be committed to the active configuration using the **fctimer commit** command.

Examples

The following example shows how to change the default Fibre Channel timers:

```
switch# config terminal
switch(config)# fctimer distribute
```

Related Commands

Command	Description
fctimer commit	Commits the Fibre Channel timer configuration changes to the active configuration.
show fctimer	Displays fctimer information.

fctrace

To trace the route to an N port, use the **fctrace** command in EXEC mode.

fctrace {**device-alias** *aliasname* | **fcid** *fcid* **vsan** *vsan-id* [**timeout** *value*] | **pwwn** *pwwn-id* [**timeout** *seconds*]}

Syntax Description

device-alias *aliasname*	Specifies the device alias name. Maximum length is 64 characters.
fcid *fcid*	The FCID of the destination N port, with the format **0x**hhhhhh
vsan *vsan-id*	Specifies a VSAN ID. The range is 1 to 4093.
timeout *value*	(Optional) Configures the timeout value. The range is 1 to 10.
pwwn *pwwn-id*	The PWWN of the destination N port, with the format hh**:**hh**:**hh**:**hh**:**hh**:**hh**:**hh**:**hh.

Command Default

By default, the period to wait before timing out is 5 seconds.

Command Modes

EXEC mode.

Command History

Release	Modification
1.0(2)	This command was introduced.
2.0(x)	Added the **device-alias** *aliasname* option.

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)
```

The following example traces a route to the specified device alias in VSAN 1:

```
switch# fctrace device-alias x vsan 1
Route present for : 21:01:00:e0:8b:2e:80:93
20:00:00:05:30:00:4a:e2(0xfffc67)
```

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* | **tunnel-id-map** *tunnel-id*}

Syntax Description

enable	Enables the FC tunnel feature.
explicit-path *name*	Specifies an explicit path. Maximum length is 16 characters.
next-address *ip-address*	(Optional) 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 *tunnel-id*	Specifies FC tunnel ID to an outgoing interface. The range is 1 to 255.
interface fc *slot/port*	Configures the Fiber Channel interface in the destination switch.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
6.2(5)	All the fc-tunnel commands are not supported in Cisco MDS 9250i Multiservice Fabric Switch.
6.2(1)	Added the output for remote span configuration on local and remote switches.
1.2(1)	This command was introduced.

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.

Note This command is not supported on the Cisco MDS 9124 switch, the Cisco Fabric Switch for HP c-Class BladeSystem, and the Cisco Fabric Switch for IBM BladeCenter.

Examples

The following example enables the FC tunnel feature:

```
switch# config terminal
switchS(config)# fc-tunnel enable
```

The following example displays remote SPAN configuration on a local switch:

```
switch(config)# fc-tunnel enable
switch(config)# interface vsan 1
switch(config)# ip address 10.10.10.66 255.255.254.0
switch(config)# no shut
switch(config)# interface fc-tunnel 102
switch(config)# source 10.10.10.66
switch(config)# destination 10.10.10.77
switch(config)# no shut
```

The following example displays remote SPAN Configuration on a remote switch:

```
switch(config)# fc-tunnel enable
switch(config)# interface  vsan 1
switch(config)# ip address 10.10.10.77 255.255.254.0
switch(config)# no shut
switch(config)# interface fc1/16
switch(config)# switchport mode sd
switch(config)# fc-tunnel tunnel-id-map 102 interface fc1/16
```

The following example places you at the explicit path prompt for the path named Path and specifies that the next hop VSAN interface IP addresses:

```
switch# config terminal
switchS(config)# fc-tunnel explicit-path Path1
switchS(config-explicit-path)# next-address 209.165.200.226
switchS(config-explicit-path)# next-address 209.165.200.227
switchS(config-explicit-path)# next-address 209.165.200.228
```

The following example places you at the explicit path prompt for the path named Path 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 209.165.200.226 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 209.165.200.226
switchS(config-explicit-path)# next-address 209.165.200.227
switchS(config-explicit-path)# next-address 209.165.200.228
switchS(config-explicit-path)# exit
switchS(config)# fc-tunnel explicit-path Path3
```

```
switchS(config-explicit-path)# next-address 209.165.200.226 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
```

feature

To enable a feature or service on the switch, use the **feature** command. To disable a feature or service on the switch, use the **no** form of the command.

feature {**cimserver** | **cluster** | **crypto** {**ike** | **ipsec**} **dpvm** | **fport-channel-trunk** | **fabric-binding** | **fcip** | **fcrxbbcredit extended fcsp** | **ficon** | **fport-channel-trunk** | **http-server** | **ioa** | **iscsi** | **ivr** | **npiv** | **npv** | **nxapi** | **port-security** | **privilege** | **port-track** | **san-ext-turner** | **scheduler** | **sdv** | **sme** | **ssh** | **tacacs+** | **telnet**}
no feature {**cimserver** | **cluster** | **crypto** {**ike** | **ipsec**} **dpvm** | **fport-channel-trunk** | **fabric-binding** | **fcip** | **fcrxbbcredit extended fcsp** | **ficon** | **fport-channel-trunk** | **http-server** | **ioa** | **iscsi** | **ivr** | **npiv** | **npv** | **nxapi** | **port-security** | **privilege** | **port-track** | **san-ext-turner** | **scheduler** | **sdv** | **sme** | **ssh** | **tacacs+** | **telnet**}

Syntax Description

cimserver	Enables or disables CIM server.
cluster	Enables or disables cluster.
crypto	Sets crypto settings.
ike	Enables or disables IKE.
ipsec	Enables or disables IPsec.
dpvm	Enables or disables the Dynamic Port VSAN Membership.
fport-channel-trunk	Enables or disables the F port channel trunking feature.
fabric-binding	Enables or disables fabric binding.
fcip	Enables or disables FCIP.
fcrxbbcredit	Enables or disables the extended rx b2b credit configuration.
extended	Sets extended settings.
fcsp	Enables or disables FCSP.
ficon	Enables or disables the FICON.
http-server	Enables or disables the HTTP server.
ioa	Enables or disables I/O Accelerator.
iscsi	Enables or disables ISCSI.
ivr	Enables or disables inter-VSAN routing.
npiv	Enables or disables the NX port ID virtualization.
npv	Enables or disables the Fibre Channel N port virtualizer.
nxapi	Enables or disables NX-API.
port-security	Enables or disables the port security.

privilege	Enables or disables Cisco IOS type privilege level support.
port-track	Enables or disables the port track feature.
san-ext-turner	Enables or disables the SAN Extension Turner Tool.
scheduler	Enables or disables scheduler.
sdv	Enables or disables the SAN Device Virtualization.
sme	Enables or disables the Storage Media Encryption.
ssh	Enables or disables SSH.
tacacs+	Enables or disables TACACS+.
telnet	Enables or disables Telnet.

Command Default

Disabled.

Command Modes

Configuration mode.

Command History

Release	Modification
NX-OS 5.0(1a)	Added keyword privilege to the syntax description.
NX-OS 4.2(1)	Added keyword ioa to the syntax description.
NX-OS 4.1(3)	Added features fport-channel-trunk, npiv and npv to the syntax description.
NX-OS 4.1(1b)	This command was introduced.

Usage Guidelines

None.

Examples

The following example shows how to enable a feature on the switch :

```
switch(config)# feature privilege
switch(config)# feature fcip
switch(config)# feature cluster
switch(config)# feature ioa
switch(config)# feature fcsp
switch(config)# feature sdv
switch(config)# feature cimserver
switch(config)# feature scheduler
switch(config)# feature fport-channel-trunk
switch(config)# feature http-server
switch(config)# feature npv
switch(config)# feature npiv
```

Related Commands

Command	Description
show fcip	Displays FCIP information.

feature analytics

To enable the SAN Analytics feature on a switch, use the **feature analytics** command. To disable this feature, use the **no** form of this command.

feature analytics
no feature analytics

Syntax Description

This command has no arguments or keywords.

Command Default

This feature is disabled by default.

Command Modes

Configuration mode (config)

Command History

Release	Modification
8.2(1)	This command was introduced.

Usage Guidelines

To use the SAN Analytics feature, you must install an appropriate license package using the **install license** command. For more information, see the "Cisco MDS 9000 Series Licensing Guide."

Examples

The following example shows how to enable the SAN Analytics feature on a switch:

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

The following example shows how to disable the SAN Analytics feature on a switch:

```
switch# configure terminal
switch(config)# no feature analytics
```

Related Commands

Command	Description
analytics query	Installs a push analytics query.
show analytics query	Displays the SAN analytics query information.
show analytics type	Displays the SAN analytics type.
ShowAnalytics	Displays the SAN analytics information in a tabular format.

feature congestion-isolation

To enable the Congestion Isolation feature, use the **feature congestion-isolation** command. To disable this feature, use the **no** form of this command.

feature congestion-isolation
no feature congestion-isolation

Syntax Description

This command has no arguments or keywords.

Command Default

This feature is disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
8.5(1)	This command was deprecated.
8.1(1)	This command was introduced.

Usage Guidelines

Note From Cisco MDS NX-OS Release 8.5(1), use the **feature fpm** command instead of this command.

Enable Enhanced Receiver Ready (ER_RDY) must be enabled before enabling the Congestion Isolation feature.

Examples

The following example shows how to enable the Congestion Isolation feature:

```
switch# configure terminal
switch(config)# feature congestion-isolation
Flap the ISLs to activate ER_RDY mode on E ports.Use the CLI show flow-control r_rdy to
list the ports that are still in R_RDY mode
```

The following example shows the output when you are trying to enable the Congestion Isolation feature when ER_RDY flow-control mode is disabled:

```
switch# configure terminal
switch(config)# feature congestion-isolation
Error: Flow-control disabled. Please enable.
```

Related Commands

Command	Description
congestion-isolation	Manually configures a device as slow device or excludes a device that was detected as slow device by the port monitor.
feature fpm	Enables Fabric Performance Monitor (FPM).

Command	Description
show congestion-isolation	Displays information about the devices that are configured for congestion isolation.
system fc flow-control	Enables or disables system flow-control mode.

feature ficon

To enable the FICON feature on a switch, use the **feature ficon** command in configuration mode. To disable the feature or to revert to factory defaults, use the **no** form of the command.

feature ficon
no feature ficon

Syntax Description

This command has no arguments or keywords.

Command Default

The FICON feature is disabled.

Command Modes

Configuration mode.

Command History

Release	Modification
NX-OS 4.1(1b)	This command was introduced.

Usage Guidelines

The effects of enabling the FICON feature in a Cisco MDS switch are as follows:

- You cannot disable in-order delivery for the FICON-enabled VSAN.
- You cannot disable fabric binding or static domain ID configurations for the FICON-enabled VSAN.
- The load balancing scheme is changed to Source ID (SID)—Destination ID (DID). You cannot change it back to SID—DID—OXID.
- The IPL configuration file is automatically created.

When FICON is enabled on a VSAN, it is implicitly enabled everywhere. However, when FICON is disabled on a VSAN, it remains globally enabled. You must explicitly disable FICON to disable it throughout the fabric.

Note This command is not supported on the Cisco MDS 9124 switch, the Cisco Fabric Switch for HP c-Class BladeSystem, and the Cisco Fabric Switch for IBM BladeCenter.

Examples

The following example enables FICON on the switch:

```
switch# configure
switch(config)# feature ficon enable
```

The following example disables FICON on the switch:

```
switch# configure
switch(config)# no feature ficon
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.

feature fpm

To enable Fabric Performance Monitor (FPM), use the **feature fpm** command. To disable FPM, use the **no** form of the command.

feature fpm
no feature fpm

Command Default

FPM is disabled.

Command Modes

Configuration mode (config)

Command History

Release	Modification
8.5(1)	This command was introduced.

Usage Guidelines

See the "Guidelines and Limitations for Fabric Notifications" section in Cisco MDS 9000 Series Interfaces Configuration Guide, Release 8.x.

Examples

The following example shows how to enable FPM:

```
switch# configure
switch(config)# feature fpm
```

The following example shows how to disable FPM:

```
switch# configure
switch(config)# no feature fpm
```

Related Commands

Command	Description
show fpm	Displays FPM information.

feature intersight

To enable the Intersight feature (Device Connector) on a switch, use the **feature intersight** command. To disable this feature, use the **no** form of this command.

feature intersight
no feature intersight

Syntax Description

This command has no arguments or keywords.

Command Default

This feature is disabled by default.

Command Modes

Configuration mode (config)

Command History

Release	Modification
9.3(2)	This command was introduced.

Usage Guidelines

None

Examples

The following example shows how to enable the Intersight feature on a switch:

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

The following example shows how to disable the Intersight feature on a switch:

```
switch# configure terminal
switch(config)# no feature intersight
```

Related Commands

Command	Description
intersight proxy	Configures the proxy server for the intersight connection.
intersight connection	Configures the DNS name for the intersight connection.
intersight trustpoint	Configures the certificates for the intersight connection.
show system internal intersight info	Displays the device connector information.
show system internal intersight connection state	Displays the status of the connection of the devices.

feature telemetry

To enable the SAN Telemetry Streaming feature on a switch, use the **feature analytics** command. To disable this feature, use the **no** form of this command.

feature telemetry

no feature telemetry

Syntax Description

This command has no arguments or keywords.

Command Default

The SAN Telemetry Streaming feature is disabled.

Command Modes

Configuration mode (config)

Command History

Release	Modification
8.3(1)	This command was introduced.

Usage Guidelines

The SAN Telemetry Streaming feature does not work if this command is disabled. To use the SAN Telemetry Streaming feature, you must install a PAK license using the **install license** command. For more information, see the Cisco MDS 9000 Series Licensing Guide.

Examples

The following example shows how to enable the SAN Telemetry Streaming feature on a switch:

```
switch# configure
switch(config)# feature telemetry
```

The following example shows how to disable the SAN Telemetry Streaming feature on a switch:

```
switch# configure
switch(config)# no feature telemetry
```

Related Commands

Command	Description
show running-config telemetry	Displays the existing telemetry configuration.
show telemetry	Displays telemetry configuration.
telemetry	Enters SAN Telemetry Streaming configuration mode.

feature vmis

To enable the Virtual Machine Identifier (VMID) feature, use the **feature vmis** command. To disable this feature, use the **no** form of this command.

feature vmis
no feature vmis

Syntax Description

This command has no arguments or keywords.

Command Default

This feature is disabled by default.

Command Modes

Configuration mode (config)

Command History

Release	Modification
8.2(1)	This command was introduced.

Usage Guidelines

There is no mechanism in the VMID protocol for the VMIS to notify the attached hypervisor HBA driver clients of a new VE ID range. For clients to detect a new range, they must query the VMIS again. To force the clients to query again after a range modification, the user must manually log the FCIDs out and back in to the fabric. Therefore, local clients continue to tag the VM traffic with the previous range until this occurs. This restriction applies when enabling and disabling VMID, and changing the VE ID range of a VSAN.

The VMID feature is not supported in VSANs that have interoperability enabled. For more information about interoperability modes, see the "Cisco MDS 9000 Series Switch-to-Switch Interoperability Configuration Guide."

Examples

The following example shows how to enable the VMID feature:

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

The following example shows how to disable the VMID feature:

```
switch# configure terminal
switch(config)# no feature vmis
```

Related Commands

Command	Description
show feature	Displays status of features.
show vmis database	Displays all the entries in the VMIS database.

ficon distribute

To enable Cisco Fabric Services (CFS) distribution on a FICON switch so that the switch can communicate with other FICON switches and IBM z/OS, use the **ficon distribute** command. To disable the CFS distribution, use the **no** form of this command.

ficon distribute
no ficon distribute

Command Default

The CFS distribution for FICON switches is enabled by default for all VSANs.

Command Modes

Configuration mode (config)

Command History

Release	Modification
8.4(2b)	This command was introduced.

Usage Guidelines

The **ficon distribute** and **ficon vsan diagnostics** commands are used by IBM z/OS to learn about the FICON fabric path details across a SAN for a specific device. For more information, see the appropriate IBM z/OS documentation.

If you are upgrading to Cisco MDS NX-OS Release 8.4(2b) or later release from an earlier release, the CFS distribution is enabled by default on the FICON switch. If you are downgrading from Cisco MDS NX-OS Release 8.4(2b) or later release, ensure that you disable the CFS distribution on the switch before downgrading.

Examples

The following example displays how to enable the CFS distribution on a FICON switch:

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

The following example displays how to disable the CFS distribution on a FICON switch:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# no ficon distribute
```

Related Commands

Command	Description
ficon vsan diagnostics	Enables FICON diagnostics in a VSAN.
show ficon vsan diagnostics	Displays the status of the FICON diagnostics.

ficon logical-port assign port-numbers

To reserve FICON port numbers for logical interfaces on the switch, use the **ficon logical-port assign port-numbers** command in configuration mode. To release the port numbers, use the **no** form of the command.

ficon logical-port assign port-numbers *[port-numbers]*
no ficon logical-port assign port-numbers *[port-numbers]*

Syntax Description

port-numbers	(Optional) Specifies the range of port numbers to assign. The range can be 0 through 153 or 0x0 through 0x99.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
3.0(1)	This command was introduced.

Usage Guidelines

You must reserve port numbers for logical interfaces, such as FCIP and PortChannels, if you plan to use them.

You cannot change or release port numbers for interfaces that are active. You must disable the interfaces using the shutdown command.

Note This command is not supported on the Cisco MDS 9124 switch, the Cisco Fabric Switch for HP c-Class BladeSystem, and the Cisco Fabric Switch for IBM BladeCenter.

Examples

The following example reserves port numbers 230 through 249 for FCIP and PortChannel interfaces:

```
switch(config)# ficon logical-port assign port-numbers 230-249
```

The following example reserves port numbers 0xe6 through 0xf9 for FCIP and PortChannel interfaces:

```
switch(config)#  ficon logical-port assign port-numbers 0xe6-0xf9
```

The following example releases the port numbers:

```
switch(config)# no ficon logical-port assign port-numbers 230-249
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.

ficon port default-state prohibit-all

To set the FICON port default state to prohibit all, use the **ficon port default-state prohibit-all** command in configuration mode. To disable the feature or to revert to factory defaults, use the **no** form of the command.

ficon port default-state prohibit-all
no ficon port default-state prohibit-all

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled.

Command Modes

Configuration mode.

Command History

Release	Modification
3.0(2)	This command was introduced.

Usage Guidelines

You can change the default port prohibiting state to enabled in VSANs that you create and then selectively disable port prohibiting on implemented ports, if desired. Only the FICON configuration files created after you change the default have the new default setting.

Note This command is not supported on the Cisco MDS 9124 switch, the Cisco Fabric Switch for HP c-Class BladeSystem, and the Cisco Fabric Switch for IBM BladeCenter.

Examples

The following example enables port prohibiting as the default for all implemented interfaces on the switch:

```
switch(config)# ficon port default-state prohibit-all
```

The following example disables port prohibiting as the default for all implemented interfaces on the switch:

```
switch(config)# no port default-state prohibit-all
```

Related Commands

Command	Description
show ficon port default-state	Displays default FICON port prohibit state.

ficon slot assign port-numbers

To reserve FICON port numbers for a slot on the switch, use the **ficon slot assign port-numbers** command in configuration mode. To release the port numbers, use the **no** form of the command.

ficon slot *slot* **assign port-numbers** *[port-numbers]*
no ficon slot *slot* **assign port-numbers** *[port-numbers]*

Syntax Description

slot	Specifies the slot number, 1 through 6.
port-numbers	Specifies the range of port numbers to assign. The range can be 0 through 153, or 0x0 through 0x99. For 9513, the port numbers can be between 0 through 249, or 0x0 through 0xf9.

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
3.0(1)	This command was introduced.

Usage Guidelines

A range of 255 port numbers are available for you to assign to all the ports on a switch. You can have more than 255 physical ports on a switch and the excess ports do not have ports numbers in the default numbering scheme. When you have more than 255 physical ports on your switch, you can assign unimplemented port numbers to the ports, or assign duplicate port numbers if they are not used in the same FICON VSAN. For example, you can configure port number 1 on interface fc1/1 in FICON VSAN 10 and fc10/1 in FICON VSAN 20.

FICON port numbers are not changed for ports that are active. You must first disable the interfaces using

the shutdown command.

You can configure port numbers even when no module is installed in the slot, and before FICON is enabled on any VSAN.

Note This command is not supported on the Cisco MDS 9124 switch, the Cisco Fabric Switch for HP c-Class BladeSystem, and the Cisco Fabric Switch for IBM BladeCenter.

Examples

The following example reserves FICON port numbers 0 through 15 and 48 through 63 for up to 32 interfaces in slot 3:

```
swich# config terminal
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# ficon slot 3 assign port-numbers 0-15, 48-63
```

The following example reserves FICON port numbers 0 through 15 for the first 16 interfaces and 0 through 15 for the second 32 interfaces in slot 3:

```
switch(config)# ficon slot 3 assign port-numbers 0-15, 0-15
```

The following example changes the reserved FICON port numbers for up to 24 interfaces in slot 3:

```
switch(config)# ficon slot 3 assign port-numbers 0-15, 56-63
```

The following example releases the port numbers:

```
switch(config)# no ficon slot 3 assign port-numbers 0-15, 56-63
```

The following example shows the switch output when there are duplicate port numbers:

```
switch(config)
switch(config)# no ficon slot 1 assign port-numbers
switch(config)# ficon slot 1 assign port-numbers 0-14, 0
WARNING: fc1/16 and fc1/1 have duplicated port-number 0 in port VSAN 99
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.

ficon swap

To enable the FICON feature in a specified VSAN, use the **ficon swap** command in configuration mode.

ficon swap {**interface fc** *slot* **fc** *slot* | **portnumber** *port-number port-number*} [**after swap noshut**]

Syntax Description

interface	Configures the interfaces to be swapped.
fc	Specifies the Fibre Channel interface.
slot	Specifies the slot number, 1 through 6.
portnumber	Configures the FICON port number for this interface.
port-number	Specifies the port numbers that must be swapped
after swap noshut	(Optional) Initializes the port shut down after the ports are swapped.

Command Default

None.

Command Modes

EXEC mode.

Command History

Release	Modification
1.3(1)	This command was introduced.
3.0(1)	Added the **interface** option.

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 enter this VSAN-independent command from the EXEC mode.

If you specify the **ficon swap portnumber after swap noshut** command, the ports are automatically initialized.

The **ficon swap interface** *old-interface new-interface* command allows you to swap physical Fibre Channel ports, including port numbers, when there are duplicate port numbers on the switch.

If you specify the **ficon swap interface** *old-interface new-interface* **after swap noshut** command, the ports are automatically initialized.

Note This command is not supported on the Cisco MDS 9124 switch, the Cisco Fabric Switch for HP c-Class BladeSystem, and the Cisco Fabric Switch for IBM BladeCenter.

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
```

The following example swaps port 1 with port 6:

```
switch# ficon swap interface fc1/1 fc1/6
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.

ficon-tape-read-accelerator

To enable FICON tape read acceleration for the FCIP interface, use the **ficon-tape-read-accelerator** command in interface configuration submode. To disable FICON tape read acceleration for the FCIP interface, use the **no** form of the command.

ficon-tape-read-accelerator
no ficon-tape-read-accelerator

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled.

Command Modes

Interface configuration submode.

Command History

Release	Modification
NX-OS 5.0(1a)	This command was introduced.

Usage Guidelines

None.

Examples

The following example shows how to enable FICON tape read acceleration on the FCIP interface:

```
switch# config terminal
switch(config)# interface fcip 2
switch(config-if)# ficon-tape-read-accelerator
switch(config-if)#
```

The following example shows how to disable FICON tape read acceleration on the FCIP interface:

```
switch# config terminal
switch(config)# interface fcip 2
switch(config-if)#  no ficon-tape-read-accelerator
switch(config-if)#
```

Related Commands

Command	Description
show fcip	Displays FCIP profile information.

ficon-tape-accelerator vsan

To enable FICON tape acceleration for the FCIP interface, use the **ficon-tape-accelerator vsan** command in interface configuration submode. To disable FICON tape acceleration for the FCIP interface, use the **no** form of the command.

ficon-tape-accelerator vsan vsan-id
no ficon-tape-accelerator vsan vsan-id

Syntax Description

vsan-id	Specifies the VSAN ID. The range is 1 to 4093.

Command Default

Disabled.

Command Modes

Interface configuration submode.

Command History

Release	Modification
3.0(1)	This command was introduced.

Usage Guidelines

Cisco MDS NX-OS software provides acceleration for FICON tape write operations over FCIP for the IBM VTS and tape libraries that support the 3490 command set. FICON tape read acceleration over FCIP is not supported.

FICON tape acceleration will not work if multiple inter-switch links (ISLs) are present in the VSAN.

FICON write acceleration and tape acceleration can be enabled at the same time on the FCIP interface.

Note This command is not supported on the Cisco MDS 9124 switch, the Cisco Fabric Switch for HP c-Class BladeSystem, and the Cisco Fabric Switch for IBM BladeCenter.

Examples

The following example enables FICON tape acceleration on the FCIP interface:

```
switch# config terminal
switch(config)# interface fcip 2
switch(config-if)# ficon-tape-accelerator vsan 100
This configuration change will disrupt all traffic on the FCIP interface in all
VSANs.  Do you wish to continue? [no] y
```

The following example disables FICON tape acceleration on the FCIP interface:

```
switch(config-if)# no ficon-tape-accelerator vsan 100
This configuration change will disrupt all traffic on the FCIP interface in all
VSANs.  Do you wish to continue? [no] y
```

Related Commands

Command	Description
show fcip	Displays FCIP profile information.
write-accelerator	Enables write acceleration and tape acceleration for the FCIP interface.

ficon vsan (EXEC mode)

To configure FICON related parameters in EXEC mode, use the **ficon vsan** command. To remove the configuration or revert to the default values, use the **no** form of the command.

ficon vsan *vsan-id* | **apply file** *file-name* | **copy file** *old-file-name new-file-name* | **offline** | **online**

vsan-id	The FICON configuration mode for the specified VSAN (from 1 to 4096).
apply file *file-name*	Specifies the existing FICON configuration file-name after switch initialization. Maximum length is 80 characters.
copy file	Copies 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	Logs out all ports in the VSAN that needs to be suspended.
online	Removes the offline condition to allow ports to log on again.

Command Default

None.

Command Modes

EXEC mode.

Command History

Release	Modification
1.3(1)	This command was introduced.

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 NX-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.

Note This command is not supported on the Cisco MDS 9124 switch, the Cisco Fabric Switch for HP c-Class BladeSystem, and the Cisco Fabric Switch for IBM BladeCenter.

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 (configuration mode)

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*
no ficon vsan *vsan-id*

Syntax Description

vsan *vsan-id*	Enters the FICON configuration mode for the specified VSAN (from 1 to 4096).

Command Default

None.

Command Modes

Configuration mode.

Command History

Release	Modification
1.3(1)	This command was introduced.

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.

Note This command is not supported on the Cisco MDS 9124 switch, the Cisco Fabric Switch for HP c-Class BladeSystem, and the Cisco Fabric Switch for IBM BladeCenter.

Examples

The following example enables FICON on VSAN 2:

```
switch(config)# ficon vsan 2
```

The following example disables FICON on VSAN 6:

```
switch(config)# no ficon vsan 6
```

Related Commands

Command	Description
show ficon	Displays configured FICON details.

ficon vsan diagnostics

To enable FICON diagnostics in a specified VSAN, use the **ficon vsan diagnostics** command. To disable this feature, use the **no** form of the command.

ficon vsan *ID* **diagnostics**
no ficon vsan *ID* **diagnostics**

Syntax Description

vsan *ID*	Specifies the VSAN ID. Range is 1–4093.

Command Default

FICON diagnostics is enabled by default.

Command Modes

Configuration mode (config)

Command History

Release	Modification
8.4(2b)	This command was introduced.

Usage Guidelines

The **ficon vsan diagnostics** and **ficon distribute** commands are used by IBM z/OS to learn about the FICON fabric path details across a SAN for a specific device.

All switches must have FICON diagnostics enabled with a nonzero interval for the IBM z/OS to display useful data. The interval, in seconds, is the performance interval for gathering of performance and health information for all the FICON ports in the fabric. For more information, see the appropriate IBM z/OS documentation.

Examples

The following example displays how to enable FICON diagnostics on VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# ficon vsan 10 diagnostics
```

The following example displays how to disable FICON diagnostics on VSAN 10:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# no ficon vsan 10 diagnostics
```

Related Commands

Command	Description
ficon distribute	Enables Cisco Fabric Services (CFS) distribution on a FICON switch.
show ficon vsan diagnostics	Displays the status of the FICON diagnostics.

file

To access FICON configuration files in a specified VSAN, use the **file** command. To disable the feature or to revert to factory defaults, use the **no** form of the command.

file *file-name*
no file *file-name*

Syntax Description

file-name	The FICON configuration file in the specified VSAN

Command Default

None.

Command Modes

FICON configuration submode.

Command History

Release	Modification
1.3(1)	This command was introduced.

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 terminal
switch(config)# ficon vsan 2
switch(config-ficon)# file IplFile1
switch(config-ficon-file)#
```

The following example deletes a previously created FICON configuration file:

```
switch(config-ficon)# no file IplFileA
```

Related Commands

Command	Description
ficon vsan	Enables FICON for a VSAN.
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	Specifies a search string to match to the files in the default directory. Maximum length is 64 characters.

Command Default

None.

Command Modes

EXEC mode.

Command History

Release	Modification
1.0(2)	This command was introduced.

Usage Guidelines

Use the **find** (Flash file system) command to display more details 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.

flex-attach virtual-pwwn

To map the real port WWN (pWWN) and a user-specific virtual pWWN, use the**flex-attach virtual-pwwn** command. To disable the mapping, use the **no** form of the command.

flex-attach virtual-pwwn *vpwwn* **pwwn** *pwwn*
no flex-attach virtual-pwwn *vpwwn* **pwwn** *pwwn*

Syntax Description

vpwwn	Specifies the virtual pWWN chosen by the user.
pwwn *pwwn*	Specifies the pWWN to be mapped to the user-specific virtual pWWN. **Note** pWWN must not be logged in.

Command Default

None.

Command Modes

Configuration mode

Command History

Release	Modification
3.3(1a)	This command was introduced.

Usage Guidelines

None.

Examples

The following example shows how to map the real pWWN and a user-specific virtual pWWN on an interface:

```
switch# config
Enter configuration commands, one per line.  End with CNTL/Z.
switch# (config) flex-attach virtual-pwwn 20:04:00:a0:b8:16:92:18 pwwn 21:03:00:a0:b9:16:92:16
```

Related Commands

Command	Description
flex-attach virtual-pwwn auto	Enables the FlexAttach virtual pWWN on a specific interface.
flex-attach virtual-pwwn interface	Sets the user-specific FlexAttach virtual pWWN.

flex-attach virtual-pwwn auto

To enable the FlexAttach virtual port WWN (pWWN) on a specific interface, use the **flex-attach virtual-pwwn** auto command. To disable the virtual pWWN, use the **no** form of the command.

flex-attach virtual-pwwn auto [**interface auto** *interface-list*]
no flex-attach virtual-pwwn auto [**interface auto** *interface-list*]

Syntax Description

interface auto *interface-list*	Specifies the interface list on which FlexAttach virtual pWWN should be enabled. **Note** All interfaces in the interface-list value must be in the shut mode. If the interface-list value is not provided, then all ports must be in the shut mode.

Command Default

None.

Command Modes

Configuration mode

Command History

Release	Modification
3.3(1a)	This command was introduced.

Usage Guidelines

The NPV switch assigns the virtual pWWNs to the interface on which FlexAttach is enabled.

Examples

The following example shows how to enable FlexAttach virtual pWWN on a interface:

```
switch# config
Enter configuration commands, one per line. End with CNTL/Z.
switch#(config)# flex-attach virtual-pwwn auto interface fc 1/1
```

Related Commands

Command	Description
flex-attach virtual-pwwn interface	Sets the user-specific FlexAttach virtual pWWN.

flex-attach virtual-pwwn interface

To set the user-specific FlexAttach virtual port WWN (pWWN) on an interface, use the **flex-attach virtual-pwwn interface** command. To disable the virtual pWWN, use the **no** form of the command.

flex-attach virtual-pwwn *vpwwn* **interface** *interface* [**vsan** *vsan*]
no flex-attach virtual-pwwn *vpwwn* **interface** *interface* [**vsan** *vsan*]

Syntax Description

vpwwn	Specifies the virtual pWWN chosen by the user.
interface	Specifies the interface on which the FlexAttach virtual port has to be enabled. **Note** The interface must be in the shut state.
vsan *vsan*	(Optional) Specifies the VSAN on which FlexAttach should be enabled.

Command Default

None.

Command Modes

Configuration mode

Command History

Release	Modification
3.3(1a)	This command was introduced.

Usage Guidelines

None.

Examples

The following example shows how to set the user-specific virtual pWWN on an interface:

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

Related Commands

Command	Description
flex-attach virtual-pwwn auto	Enables the FlexAttach virtual pWWN on a specific interface.

flogi scale enable

To enable FLOGI scale optimization by increasing chassis-wide FLOGI scale limits, use the **flogi scale enable** command in global configuration mode. To disable FLOGI scale optimization, use the **no** form of this command.

flogi scale enable
no flogi scale enable

Command Default

Enabled

Command Modes

Global configuration

Command History

Release	Modification
8.1(1)	This command was introduced.

Usage Guidelines

This command is applicable only to Cisco MDS 9718 Directors with Fibre Channel Switching Modules.

Example

The following example shows how to enable FLOGI scale optimization:

```
switch# configure terminal
switch(config)# flogi scale enable
```

Related Commands

Command	Description
flogi quiesce timeout	Configures the FLOGI quiesce timeout value.

flogi quiesce timeout

To set the FLOGI quiesce timeout duration so that the device login information can be retained in the Fibre Channel Name Server (FCNS) if the device logs in again within the specified duration, use the **flogi quiesce timeout** command.

flogi quiesce timeout *milliseconds*

Syntax Description

milliseconds	Specifies the timeout in milliseconds. Range is 0–20000.

Command Default

Cisco MDS NX-OS Release 8.1(x) and Release 8.2(x): 2000 milliseconds

Cisco MDS NX-OS Release 8.3(1) and later releases: 0 milliseconds

Command Modes

Configuration mode (config)

Command History

Release	Modification
8.3(1)	Changed the default FLOGI quiesce timeout value from 2000 to 0 milliseconds.
8.1(1)	This command was introduced.

Usage Guidelines

See the "FLOGI Quiesce Timeout" section in the *Cisco MDS 9000 Series Fabric Configuration Guide, Release 8.x*.

Examples

The following example displays how to enable FLOGI scale optimization and set the quiesce timeout value to 2000 milliseconds:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# flogi scale enable
switch(config)# flogi quiesce timeout 2000
```

The following example displays how to disable FLOGI scale optimization by setting the quiesce timeout value to 0 milliseconds:

```
switch# configure
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# flogi scale enable
switch(config)# flogi quiesce timeout 0
```

Related Commands

Command	Description
flogi scale enable	Enables FLOGI scale optimization by increasing chassis-wide FLOGI scale limits.
show flogi database	Lists all the FLOGI sessions through all interfaces across all VSANs.

flowgroup

To configure an IOA flow group, use the **flowgroup** command.

flowgroup *{name}*
no flowgroup *{name}*

Syntax Description

name	Specifies an IOA flow group name. The maximum size is 31 characters.

Command Default

None.

Command Modes

Configuration submode.

Command History

Release	Modification
NX-OS 4.2(1)	This command was introduced.

Usage Guidelines

None.

Examples

```
The following example shows how to configure the IOA flow group:
switch# conf t
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# ioa cluster tape_vault
switch(config-ioa-cl)# flowgroup tsm
switch(config-ioa-cl)#
```

Related Commands

Command	Description
interface ioa	Configures the IOA interface.

format

To erase all the information on a module, use the **format** command in EXEC mode.

format {**bootflash :** | **logflash :** | **slot0 :** | **usb1 :** | **usb2 :** }

Syntax Description

bootflash:	Specifies bootflash: memory.
logflash:	Specifies logflash: memory.
slot0:	Specifies the flash device in slot 0.
usb1:	Specifies the USB memory in host1.
usb2:	Specifies the USB memory in host 2.

Command Default

None.

Command Modes

EXEC mode.

Command History

Release	Modification
1.0(2)	This command was introduced.
3.3(1a)	Added the USB1 and USB 2 parameters.

Usage Guidelines

The SAN-OS and NX-OS software supports Cisco-certified CompactFlash devices that are formatted using Cisco MDS 9000 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 the bootflash memory.

```
switch# format bootflash:
This command is going to erase the contents of your bootflash:.
Do you want to continue? (y/n)  [n]
```

The following example erases all information on the logflash memory.

```
switch# format logflash:
This command is going to erase the contents of your logflash:.
Do you want to continue? (y/n)  [n]
The following example erases all information on slot0.
switch# format
slot0:
This command is going to erase the contents of your slot0:
Do you want to continue? (y/n)  [n]
```

The following example erases all information on usb1:

```
switch# format
usb1:
This command is going to erase the contents of your usb1:.
Do you want to continue? (y/n)  [n]
```

The following example erases all information on usb2:.

```
switch# format
usb2:
This command is going to erase the contents of your usb2:.
Do you want to continue? (y/n)  [n]
```

fpm congested device

To configure a congested device, use the **fpm congested device** command. To remove the configuration, use the **no** form of the command.

fpm congested device { **exclude** | **static** } **list**
no fpm congested device { **exclude** | **static** } **list**

Syntax Description

exclude	Specifies to exclude a device from being detected as a congested device.
static	Specifies to explicitly configure a device as a congested device.
list	Specifies the list of devices.

Command Default

Congested devices are not configured.

Command Modes

Configuration mode (config)

Command History

Release	Modification
8.5(1)	This command was introduced.

Examples

This example shows how to manually configure a device as a congested device. The configured device will be permanently treated as a congested device until it is removed from congestion isolation. All traffic to this device traversing the device's ISLs that are in ER_RDY flow-control mode will be routed to the low-priority VL (VL2).

```
switch# configure
switch(config)# fpm congested-device static list
switch(config-congested-dev-static)# member pwwn 10:00:00:00:c9:f9:16:8d vsan 4 credit-stall
```

This example shows how to configure a device that is to be excluded from automatic congestion isolation by the port monitor. Even when the rising threshold of a port-monitor counter is reached and the portguard action is set to cong-isolate, this device will not be isolated as a congested device, and traffic to this device traversing the device's ISLs that are in ER_RDY flow-control mode will not be routed to the low-priority VL (VL2).

```
switch# configure terminal
switch(config)# fpm congested-device exclude list
switch(config-congested-dev-exc)# member pwwn 10:00:00:00:c9:f9:16:8d vsan 4
```

Related Commands

Command	Description
feature fpm	Enables Fabric Performance Monitor (FPM).

Command	Description
member pwwn	Explicitly includes or excludes a congested device.
show fpm	Displays FPM information.

fpm congested device recover

To recover a device from congestion, use the **fpm congested device recover** command. To remove the configuration, use the **no** form of the command.

fpm congested device recover pwwn *pwwn* **vsan** *id*
no fpm congested device recover pwwn *pwwn* **vsan** *id*

Syntax Description

pwwn *pwwn*	Specifies the pWWN of the device to be recovered.
vsan *id*	Specifies a VSAN.

Command Default

Congested devices are not configured.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
8.5(1)	This command was introduced.

Examples

This example shows how to recover the device with pWWN 10:00:00:00:c9:f9:16:8d in VSAN 2 from congestion actions:

```
switch# fpm congested-device recover pwwn 10:00:00:00:c9:f9:16:8d vsan 2
```

Related Commands

Command	Description
feature fpm	Enables Fabric Performance Monitor (FPM).
show fpm	Displays FPM information.

fpm congestion-signal

To specify the EDC switch-side period for sending congestion signal, use the **fpm congestion-signal** command. To revert to the default period, use the **no** form of the command.

fpm congestion-signal period *seconds*
no fpm congestion-signal period *seconds*

Syntax Description

period *seconds*	Specifies the EDC switch-side period for sending congestion signal.

Command Default

The switch-side congestion signal period is set to 1 second.

Command Modes

Configuration mode (config)

Command History

Release	Modification
8.5(1)	This command was introduced.

Examples

This example shows how to configure the EDC interval for sending congestion signal every 30 seconds:

```
switch# configure
switch(config)# fpm congestion-signal period 30
```

Related Commands

Command	Description
feature fpm	Enables Fabric Performance Monitor (FPM).
show fpm	Displays FPM information.

fpm dirl

To configure Dynamic Ingress Rate Limiting (DIRL), use the **fpm dirl** command. To revert to the default configuration, use the **no** form of the command.

fpm dirl { **exclude list** | **reduction** *percentage* **recovery** *percentage* }
no fpm dirl { **exclude list** | **reduction** *percentage* **recovery** *percentage* }

Syntax Description

exclude list	Specifies the list of interfaces that are excluded from DIRL.
reduction *percentage*	Specifies the ingress rate limit reduction rate percentage.
recovery *percentage*	Specifies the congestion recovery rate percentage.

Command Modes

Configuration mode (config)

Command History

Release	Modification
8.5(1)	This command was introduced.

Examples

This example shows how to configure DIRL to specify the ingress reduction rate to 50 percent and ingress recovery rate to 30 percent:

```
switch# configure
switch(config)# fpm dirl reduction 50 recovery 30
```

This example shows how to exclude DIRL based on interface:

```
switch# configure
switch(config)# fpm dirl exclude list
switch(config-dirl-excl)# member interface fc 1/1
switch(config-dirl-excl)# member interface fc 1/1
```

This example shows how to include FC4-type target connected device interface in DIRL:

```
switch# configure
switch(config)# fpm dirl exclude list
switch(config-dirl-excl)# fc4-feature target
```

Related Commands

Command	Description
feature fpm	Enables Fabric Performance Monitor (FPM).
fpm dirl recover	Recovers interface from DIRL rate reduction.

Command	Description
show fpm	Displays FPM information.

fpm fpin

To change FPIN notification interval, use the **fpm fpin** command. To revert to the default interval, use the **no** form of the command.

fpm fpin period *seconds*
no fpm fpin period *seconds*

Syntax Description

period *seconds*	Specifies the FPIN notification interval.

Command Default

The FPIN notification interval is negotiated between the switch and end devices.

Command Modes

Configuration mode (config)

Command History

Release	Modification
8.5(1)	This command was introduced.

Examples

This example shows how to configure an FPIN notification interval of 30 seconds:

```
switch# configure
switch(config)# fpm fpin period 30
```

Related Commands

Command	Description
feature fpm	Enables Fabric Performance Monitor (FPM).
show fpm	Displays FPM information.

fspf config vsan

To configure an FSPF feature for the entire VSAN, use the **fspf config vsan** command in configuration mode. To delete FSPF configuration for the entire VSAN, use the **no** form of the command.

fspfconfigvsan*vsan-id***min-ls-arrival***ls-arrival-time***min-ls-interval***ls-interval-time***region***region-id***spf** {**hold-time***spf-holdtime* | **static**}
nofspfconfigvsan*vsan-id***min-ls-arrivalmin-ls-intervalregionspf** {**hold-time** | **static**}

Syntax Description

vsan-*id*	Specifies a VSAN ID. The range is 1 to 4093.
min-ls-arrival *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 specifying time in milliseconds. The range is 0 to 65535.
min-ls-interval *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 specifying time in milliseconds. The range is 0 to 65535.
region *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	Specifies parameters related to SPF route computation.
hold-time *spf-holdtime*	Specifies 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. The parameter spf-holdtime is an integer specifying time in milliseconds. The range is 0 to 65535.
static	Forces static SPF computation.

Command Default

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

Release	Modification
1.0(2)	This command was introduced.

Usage Guidelines

This command configures FSPF on VSANs globally.

For the commands entered 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 terminal
switch(config)##
switch(config)# fspf config vsan 1
switch-config-(fspf-config)# spf static
switch-config-(fspf-config)# exit
switch(config)#
switch(config)# no fspf config vsan 3
switch(config)#
```

Related Commands

Command	Description
fspf cost	Configures the cost for the selected interface in the specified VSAN (from the switch(config-if)# prompt).
fspf enable	Enables FSPF routing protocol 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).
show fspf interface	Displays information for each selected interface.

fspf cost

To configure FSPF link cost for a Fibre Channel interface, use the **fspf cost** command. To revert to the default value, use the **no** form of the command.

fspfcost*link-cost***vsan***vsan-id*
nofspfcost*link-cost***vsan***vsan-id*

Syntax Description

link-cost	Enters FSPF link cost. The range is 1 to 30000.
vsan *vsan-id*	Specifies a VSAN ID. The range is 1 to 4093.

Command Default

1000 for 1 Gbps

500 for 2 Gbps

250 for 4 Gbps

250 for 4 Gbps

125 for 8 Gbps

100 for 10 Gbps

62 for 16 Gbps

Command Modes

Interface configuration submode.

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

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

FSPF tracks the state of links on all switches in the fabric, associates a cost with each link in its database, and then chooses the path with a minimal cost. The cost associated with an interface can be changed using the **fspf cost** command to implement the FSPF route selection.

Examples

The following example configures the FSPF link cost on an Fibre Channel interface:

```
switch# config terminal
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 revert to the default value, use the **no** form of the command.

fspfdead-interval*seconds***vsan***vsan-id*
nofspfdead-interval*seconds***vsan***vsan-id*

Syntax Description

seconds	Specifies the FSPF dead interval in seconds. The rage is 2 to 65535.
vsan *vsan-id*	Specifies a VSAN ID. The range is 1 to 4093.

Command Default

80 seconds.

Command Modes

Interface configuration submode.

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

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

Note This value must be the same in the ports at both ends of the ISL.

Caution An error is reported at the command prompt if the configured dead time interval is less than the hello time interval.

Examples

The following example configures the maximum interval of 400 seconds for a hello message before the neighbor is considered lost:

```
switch# config terminal
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 enable vsan

To enable FSPF for a VSAN, use the **fspf enable** command in configuration mode. To disable FSPF routing protocols, use the **no** form of the command.

fspfenablevsan*vsan-id*
nofspfenablevsan*vsan-id*

Syntax Description

vsan-id	Specifies a VSAN ID. The range is 1 to 4093.

Command Default

Enabled.

Command Modes

Configuration mode.

Command History

Release	Modification
1.0(2)	This command was introduced.

Usage Guidelines

This command configures FSPF on VSANs globally.

Examples

The following example enables FSPF in VSAN 5 and disables FSPF in VSAN 7:

```
switch## config terminal
switch(config)# fspf enable vsan 5
switch(config)# no fspf enable vsan 7
```

Related Commands

Command	Description
fspf config vsan	Configures FSPF features for a VSAN.
show fspf interface	Displays information for each selected interface.

fspf hello-interval

To verify the health of the link, use the **fspf hello-interval** command. To revert to the default value, use the **no** form of the command.

fspfhello-interval*seconds***vsan***vsan-id*
nofspfhello-interval*seconds* **vsan***vsan-id*

Syntax Description

seconds	Specifies the FSPF hello-interval in seconds. The rage is 1 to 65534.
vsan *vsan-id*	Specifies a VSAN ID. The range is 1 to 4093.

Command Default

20 seconds.

Command Modes

Interface configuration submode.

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

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

This command configures FSPF for the specified FCIP interface.

Note This value must be the same in the ports at both ends of the ISL.

Examples

The following example configures a hello interval of 3 seconds on VSAN 1:

```
switch# config terminal
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 revert to the default state, use the **no** form of the command.

fspf passive vsan *vsan-id*
no fspf passive vsan *vsan-id*

Syntax Description

vsan *vsan-id*	Specifies a VSAN ID. The range is 1 to 4093.

Command Default

FSPF is enabled.

Command Modes

Interface configuration submode.

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

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

By default, FSPF is enabled on all E ports and TE ports. FSPF can be disabled by setting the interface as passive using the **fspf passive** command.

Note FSPF must be enabled on the ports at both ends of the ISL for the protocol to operate correctly.

Examples

The following example disables the FSPF protocol for the selected interface on VSAN 1:

```
switch# config terminal
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 revert to the default value, use the **no** form of the command.

fspf retransmit-interval *seconds* **vsan** *vsan-id*
no spf retransmit-interval *seconds* **vsan** *vsan-id*

Syntax Description

seconds	Specifies FSPF retransmit interval in seconds. The range is 1 to 65535.
vsan *vsan-id*	Specifies a VSAN ID. The range is 1 to 4093.

Command Default

5 seconds.

Command Modes

Interface configuration submode.

Command History

Release	Modification
1.1(1)	This command was introduced.

Usage Guidelines

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

Note This value must be the same in the ports at both ends of the ISL.

Examples

The following example specifies a retransmit interval of 6 seconds after which an unacknowledged link state update should be transmitted on the interface for VSAN 1:

```
switch# config terminal
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.