C H A P T E R 23

Managing FLOGI, Name Server, FDMI, and RSCN Databases

This chapter describes the fabric login (FLOGI) database, the name server features, the Fabric-Device Management Interface, and Registered State Change Notification (RSCN) information provided in the Cisco MDS 9000 Family Switches. It includes the following sections:

- Information About FLOGI section, page 23-1
- Default Settings section, page 23-5
- Registering Name Server Proxies section, page 23-5
- Verifying the Database Configuration section, page 23-10
- Field Descriptions for Databases section, page 23-17
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Information About FLOGI

In a Fibre Channel fabric, each host or disk requires an FC ID. If the required device is displayed in the FLOGI table, the fabric login is successful. Examine the FLOGI database on a switch that is directly connected to the host HBA and connected ports. See the "Default Company ID List" section on page 27-4 and the "Switch Interoperability" section on page 27-5.

In a Fibre Channel fabric, each host or disk requires an FC ID. Use the **show flogi** command to verify if a storage device is displayed in the FLOGI table as in the next section. If the required device is displayed in the FLOGI table, the fabric login is successful. Examine the FLOGI database on a switch that is directly connected to the host HBA and connected ports.

This section includes the following topics:

- Name Server Proxy section, page 23-2
- About Registering Name Server Proxies section, page 23-2
- About Rejecting Duplicate pWWN section, page 23-2
- About Name Server Database Entries section, page 23-2
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Name Server Proxy

The name server functionality maintains a database containing the attributes for all hosts and storage devices in each VSAN. Name servers allow a database entry to be modified by a device that originally registered the information.

The proxy feature is useful when you want to modify (update or delete) the contents of a database entry that was previously registered by a different device.

About Registering Name Server Proxies

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.

This authorization enables WWNs to register specific parameters for another node.

About Rejecting Duplicate pWWN

You can prevent a malicious or accidental login when using another device's pWWN by enabling the **reject-duplicate-pwwn** option. If you disable this option, these pWWNs are allowed to log in to the fabric and replace the first device in the name server database.

You can prevent a malicious or accidental login when using another device's pWWN. These pWWNs are allowed to log in to the fabric and replace the first device in the name server database.

About Name Server Database Entries

The name server stores name entries for all hosts in the FCNS database. The name server permits an Nx port to register attributes during a PLOGI (to the name server) to obtain attributes of other hosts. These attributes are deregistered when the Nx port logs out either explicitly or implicitly.

In a multiswitch fabric configuration, the name server instances running on each switch shares information in a distributed database. One instance of the name server process runs on each switch.

FDMI

Cisco MDS 9000 Family switches provide support for the Fabric-Device Management Interface (FDMI) functionality, as described in the FC-GS-4 standard. FDMI enables management of devices such as Fibre Channel host bus adapters (HBAs) through in-band communications. This addition complements the existing Fibre Channel name server and management server functions.

Using the FDMI functionality, the NX-OS software can extract the following management information about attached HBAs and host operating systems without installing proprietary host agents:

- Manufacturer, model, and serial number
- Node name and node symbolic name

- Hardware, driver, and firmware versions
- Host operating system (OS) name and version number

All FDMI entries are stored in persistent storage and are retrieved when the FDMI process is started.

RSCN

The Registered State Change Notification (RSCN) is a Fibre Channel service that informs hosts about changes in the fabric. Hosts can receive this information by registering with the fabric controller (through SCR). These notifications provide a timely indication of one or more of the following events:

- Disks joining or leaving the fabric.
- A name server registration change.
- A new zone enforcement.
- IP address change.
- Any other similar event that affects the operation of the host.

Apart from sending these events to registered hosts, a switch RSCN (SW-RSCN) is sent to all reachable switches in the fabric.

> **Note** The switch sends an RSCN to notify registered nodes that a change has occurred. It is up to the nodes to query the name server again to obtain the new information. The details of the changed information are not delivered by the switch in the RSCN sent to the nodes.

About the multi-pid Option

If the RSCN **multi-pid** option is enabled, then RSCNs generated to the registered Nx ports may contain more than one affected port IDs. In this case, zoning rules are applied before putting the multiple affected port IDs together in a single RSCN. By enabling this option, you can reduce the number of RSCNs. For example, suppose you have two disks (D1, D2) and a host (H) connected to switch 1. Host H is registered to receive RSCNs. D1, D2, and H belong to the same zone. If disks D1 and D2 are online at the same time, then one of the following applies:

- The **multi-pid** option is disabled on switch 1— Two RSCNs are generated to host H, one for the disk D1 and another for disk D2.
- The **multi-pid** option is enabled on switch 1— A single RSCN is generated to host H, and the RSCN payload lists the affected port IDs (in this case, both D1 and D2).

Some Nx ports might not support multi-pid RSCN payloads. If this situation occurs, disable the RSCN **multi-pid** option.

RSCN Timer Configuration Distribution Using CFS

Because the timeout value for each switch is configured manually, a misconfiguration occurs when different switches time out at different times. This means different N ports in a network can receive RSCNs at different times. Cisco Fabric Services (CFS) alleviates this situation by automatically distributing configuration information to all switches in a fabric. This also reduces the number of SW-RSCNs.

RSCN supports two modes, distributed and nondistributed. In distributed mode, RSCN uses CFS to distribute configuration to all switches in the fabric. In nondistributed mode, only the configuration commands on the local switch are affected.

Note All configuration commands are not distributed. Only the **rscn event-tov** *tov* **vsan** *vsan* command is distributed.

The RSCN timer is registered with CFS during initialization and switchover. For high availability, if the RSCN timer distribution crashes and restarts or a switchover occurs, it resumes normal functionality from the state prior to the crash or switchover.

Note Before performing a downgrade, make sure that you revert the RCSN timer value in your network to the default value. Failure to do so will disable the links across your VSANs and other devices.

Compatibility across various Cisco MDS NX-OS releases during an upgrade or downgrade is supported by **conf-check** provided by CFS. If you attempt to downgrade from Cisco MDS SAN-OS Release 3.0, you are prompted with a **conf-check** warning. You are required to disable RSCN timer distribution support before you downgrade.

By default, the RSCN timer distribution capability is disabled and is therefore compatible when upgrading from any Cisco MDS SAN-OS release earlier than Release 3.0.

RSCN Timer Configuration Distribution

Because the timeout value for each switch is configured manually, a misconfiguration occurs when different switches time out at different times. This means different Nports in a network can receive RSCNs at different times. Cisco Fabric Services (CFS) infrastructure alleviates this situation by automatically distributing the RSCN timer configuration information to all switches in a fabric. This action also reduces the number of SW-RSCNs. Refer to the *Cisco MDS 9000 Family NX-OS System Management Configuration Guide*.

RSCN supports two modes, distributed and nondistributed. In distributed mode, RSCN uses CFS to distribute configuration to all switches in the fabric. In nondistributed mode, only the configuration commands on the local switch are affected.

Note All configuration commands are not distributed. Only the **rscn event-tov** *tov* **vsan** *vsan* command is distributed.

Note Only the RSCN timer configuration is distributed.

The RSCN timer is registered with CFS during initialization and switchover. For high availability, if the RSCN timer distribution crashes and restarts or a switchover occurs, it resumes normal functionality from the state prior to the crash or switchover.

Note You can determine the compatibility when downgrading to an earlier Cisco MDS NX-OS release using **show incompatibility system** command. You must disable RSCN timer distribution support before downgrading to an earlier release.

Note   By default, the RSCN timer distribution capability is disabled and is compatible when upgrading from any Cisco MDS SAN-OS release earlier than 3.0.

Note   For CFS distribution to operate correctly for the RSCN timer configuration, all switches in the fabric must be running Cisco SAN-OS Release 3.0(1) or later, or Cisco NX-OS 4.1(1b).

Locking the Fabric

The first action that modifies the database creates the pending database and locks the feature in the VSAN. Once you lock the fabric, the following situations apply:

- No other user can make any configuration changes to this feature.
- A copy of the configuration database becomes the pending database along with the first active change.

Default Settings

Table 23-1 lists the default settings for RSCN.

Table 23-1   Default RSCN Settings

Parameters	Default
RSCN timer value	2000 milliseconds for Fibre Channel VSANs 1000 milliseconds for FICON VSANs
RSCN timer configuration distribution	Disabled

Registering Name Server Proxies

This section includes the following topics:

- Registering Name Server Proxies section, page 23-6
- Rejecting Duplicate pWWNs section, page 23-6
- Configuring the multi-pid Option section, page 23-6
- Suppressing Domain Format SW-RSCNs section, page 23-7
- Clearing RSCN Statistics section, page 23-7
- Configuring the RSCN Timer with CFS section, page 23-8
- Configuring the RSCN Timer section, page 23-8
- Enabling RSCN Timer Configuration Distribution section, page 23-9
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- Clearing a Locked Session section, page 23-10

Registering Name Server Proxies

To register the name server proxy, follow these steps:

	Command	Purpose
Step 1	switch# **config t** switch(config)#	Enters configuration mode.
Step 2	switch(config)# **fcns proxy-port 21:00:00:e0:8b:00:26:d0 vsan 2**	Configures a proxy port for the specified VSAN.

To register the name server proxy, follow these steps:

Step 1   Expand a fabric, expand a VSAN, and then select **Advanced**.

You see the VSAN advanced configuration in the Information pane.

Step 2   Click the **NS Proxies** tab.

You see the existing name server proxy for the selected VSAN.

Step 3   Double-click the PortName field to register a new name server proxy.

Step 4   Click **Apply Changes** to save these changes, or click **Undo Changes** to cancel any unsaved changes.

Rejecting Duplicate pWWNs

To reject duplicate pWWNs, follow these steps:

	Command	Purpose
Step 1	switch# **config t** switch(config)#	Enters configuration mode.
Step 2	switch(config)# **fcns reject-duplicate-pwwn vsan 1**	Logs out devices when they log into the fabric if the pWWNs already exist.
	switch(config)# **no fcns reject-duplicate-pwwn vsan 1**	Overwrites the first device entry in the name server database with the new device having the same pWWN (default).

Configuring the multi-pid Option

To configure the **multi-pid** option, follow these steps:

	Command	Purpose
Step 1	switch# **config t** switch(config)#	Enters configuration mode.
Step 2	switch(config)# **rscn multi-pid vsan 105**	Sends RSCNs in a multi-pid format for VSAN 105.

To configure the **multi-pid** option, follow these steps:

Step 1   Expand a fabric, expand a VSAN, and then select **Advanced**.

You see the VSAN advanced configuration in the Information pane.

Step 2   Click the **RSCN Multi-PID** tab.

Step 3   Check the **Enable** check box.

Step 4   Click **Apply Changes** to save these changes, or click **Undo Changes** to cancel any unsaved changes.

Suppressing Domain Format SW-RSCNs

A domain format SW-RSCN is sent whenever the local switch name or the local switch management IP address changes. This SW-RSCN is sent to all other domains and switches over the ISLs. The remote switches can issue GMAL and GIELN commands to the switch that initiated the domain format SW-RSCN to determine what changed. Domain format SW-RSCNs can cause problems with some non-Cisco MDS switches (refer to the *Cisco MDS 9000 Family Switch-to-Switch Interoperability Configuration Guide*).

Detailed Steps

To suppress the transmission of these SW RSCNs over an ISL, follow these steps:

	Command	Purpose
Step 1	switch# **config t** switch(config)#	Enters configuration mode.
Step 2	switch(config)# **rscn suppress domain-swrscn vsan 105**	Suppresses transmission of domain format SW-RSCNs for VSAN 105.

Note   You cannot suppress transmission of port address or area address format RSCNs.

Clearing RSCN Statistics

You can clear the counters and later view the counters for a different set of events. For example, you can keep track of how many RSCNs or SW-RSCNs are generated on a particular event (such as ONLINE or OFFLINE events). You can use these statistics to monitor responses for each event in the VSAN.

Use the **clear rscn statistics** command to clear the RSCN statistics for the specified VSAN.

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

After clearing the RSCN statistics, you can view the cleared counters by issuing the **show rscn** command.

```
switch# show rscn statistics vsan 1
Statistics for VSAN: 1
------------------------
Number of SCR received        = 0
Number of SCR ACC sent        = 0
Number of SCR RJT sent        = 0
Number of RSCN received       = 0
Number of RSCN sent           = 0
Number of RSCN ACC received   = 0
```

```
Number of RSCN ACC sent       = 0
Number of RSCN RJT received    = 0
Number of RSCN RJT sent        = 0
Number of SW-RSCN received     = 0
Number of SW-RSCN sent         = 0
Number of SW-RSCN ACC received = 0
Number of SW-RSCN ACC sent     = 0
Number of SW-RSCN RJT received = 0
Number of SW-RSCN RJT sent     = 0
```

Configuring the RSCN Timer with CFS

To configure the RSCN timer with CFS, follow these steps:

Step 1   Expand a fabric, expand a VSAN, and then select **Advanced** in the Logical Domains pane.

Step 2   Click the **RSCN Event** tab.

You see the VSAN advanced configuration in the Information pane.

Step 3   Double-click the **TimeOut** value to change the value (in milliseconds) for the selected VSAN.

Step 4   Click **Apply Changes** to save these changes, or click **Undo Changes** to cancel any unsaved changes.

Configuring the RSCN Timer

RSCN maintains a per-VSAN event list queue, where the RSCN events are queued as they are generated. When the first RSCN event is queued, a per VSAN timer starts. Upon time-out, all the events are dequeued and coalesced RSCNs are sent to registered users. The default timer values minimize the number of coalesced RSCNs sent to registered users. Some deployments require smaller event timer values to track changes in the fabric.

Note   The RSCN timer value must be the same on all switches in the VSAN. See the "RSCN Timer Configuration Distribution Using CFS" section on page 23-3.

Note   Before performing a downgrade, make sure that you revert the RCSN timer value in your network to the default value. Failure to do so will disable the links across your VSANs and other devices.

To configure the RSCN timer, follow these steps:

	Command	Purpose
Step 1	switch# **config t** switch(config)#	Enters configuration mode.
Step 2	switch(config)# **rscn distribute**	Enables RSCN timer configuration distribution.

	Command	Purpose
Step 3	switch(config)# **rscn event-tov 300 vsan 10**	Sets the event time-out value in milliseconds for the selected VSAN. In this example, the event time-out value is set to 300 milliseconds for VSAN 12. The range is 0 to 2000 milliseconds. Setting a zero (0) value disables the timer.
	switch(config)# **no rscn event-tov 300 vsan 10**	Reverts to the default value (2000 milliseconds for Fibre Channel VSANs or 1000 milliseconds for FICON VSANs).
Step 4	switch(config)# **rscn commit vsan 10**	Commits the RSCN timer configuration to be distributed to the switches in VSAN 10.

Enabling RSCN Timer Configuration Distribution

To enable RSCN timer configuration distribution, follow these steps:

	Command	Purpose
Step 1	switch# **config t** switch(config)#	Enters configuration mode.
Step 2	switch(config)# **rscn distribute**	Enables RSCN timer distribution.
	switch(config)# **no rscn distribute**	Disables (default) RSCN timer distribution.

Committing the RSCN Timer Configuration Changes

If you commit the changes made to the active database, the configuration is committed to all the switches in the fabric. On a successful commit, the configuration change is applied throughout the fabric and the lock is released.

To commit RSCN timer configuration changes, follow these steps:

	Command	Purpose
Step 1	switch# **config t** switch(config)#	Enters configuration mode.
Step 2	switch(config)# **rscn commit vsan 10**	Commits the RSCN timer changes.

Discarding the RSCN Timer Configuration Changes

If you discard (abort) the changes made to the pending database, the configuration database remains unaffected and the lock is released.

To discard RSCN timer configuration changes, follow these steps:

	Command	Purpose
Step 1	switch# **config t** switch(config)#	Enters configuration mode.
Step 2	switch(config)# **rscn abort vsan 10**	Discards the RSCN timer changes and clears the pending configuration database.

Clearing a Locked Session

If you have changed the RSCN timer configuration and have forgotten to release the lock by either committing or discarding the changes, an administrator can release the lock from any switch in the fabric. If the administrator performs this task, your changes to the pending database are discarded and the fabric lock is released.

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

To use administrative privileges and release a locked DPVM session, use the **clear rscn session vsan** command in EXEC mode.

```
switch# clear rscn session vsan 10
```

Verifying the Database Configuration

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

Command	Purpose
show flogi database	Displays Details on the FLOGI Database
show flogi database interface fc1/11	Displays the FLOGI Database by Interface
show flogi database vsan 1	Displays the FLOGI Database by VSAN
show flogi database fcid 0xef02e2	Displays the FLOGI Database by FC ID
show fcns database	Displays the Name Server Database
show fcns database vsan 1	Displays the Name Server Database for the Specified VSAN
show fcns database detail	Displays the Name Server Database Details
show fcns statistics	Displays the Name Server Statistics
show fdmi database	Displays All HBA Management Servers
show fdmi database detail vsan 1	Displays HBA Details for a Specified VSAN
show fdmi database detail hba-id 21:01:00:e0:8b:2a:f6:54 vsan 1	Displays Details for the Specified HBA Entry
show rscn scr-table vsan 1	Displays Register Device Information
show rscn statistics vsan 1	Displays RSCN Counter Information

Command	Purpose
show cfs application name rscn	Displays RSCN Configuration Distribution Information
show rscn session status vsan 1	Displays session status information for RSCN configuration distribution
show rscn pending	Display the set of configuration commands
show rscn pending-diff	Displays the difference between pending and active configurations

For detailed information about the fields in the output from these commands, refer to the *Cisco MDS 9000 Family Command Reference*.

This section includes the following topics:

Displaying FLOGI Details

To view the FLOGI database details, use the **show flogi database** command. See Examples 23-1 to 23-4.

Example 23-1   Displays Details on the FLOGI Database

```
switch# show flogi database
-------------------------------------------------------------------------------
INTERFACE  VSAN   FCID        PORT NAME              NODE NAME
-------------------------------------------------------------------------------
sup-fc0    2      0xb30100    10:00:00:05:30:00:49:63  20:00:00:05:30:00:49:5e
fc9/13     1      0xb200e2    21:00:00:04:cf:27:25:2c  20:00:00:04:cf:27:25:2c
fc9/13     1      0xb200e1    21:00:00:04:cf:4c:18:61  20:00:00:04:cf:4c:18:61
fc9/13     1      0xb200d1    21:00:00:04:cf:4c:18:64  20:00:00:04:cf:4c:18:64
fc9/13     1      0xb200ce    21:00:00:04:cf:4c:16:fb  20:00:00:04:cf:4c:16:fb
fc9/13     1      0xb200cd    21:00:00:04:cf:4c:18:f7  20:00:00:04:cf:4c:18:f7

Total number of flogi = 6.
```

Example 23-2   Displays the FLOGI Database by Interface

```
switch# show flogi database interface fc1/11
INTERFACE  VSAN   FCID       PORT NAME               NODE NAME
----------  ------  ---------  ----------------------  ---------------------
fc1/11     1      0xa002ef   21:00:00:20:37:18:17:d2  20:00:00:20:37:18:17:d2
fc1/11     1      0xa002e8   21:00:00:20:37:38:a7:c1  20:00:00:20:37:38:a7:c1
fc1/11     1      0xa002e4   21:00:00:20:37:6b:d7:18  20:00:00:20:37:6b:d7:18
fc1/11     1      0xa002e2   21:00:00:20:37:18:d2:45  20:00:00:20:37:18:d2:45
fc1/11     1      0xa002e1   21:00:00:20:37:39:90:6a  20:00:00:20:37:39:90:6a
fc1/11     1      0xa002e0   21:00:00:20:37:36:0b:4d  20:00:00:20:37:36:0b:4d
fc1/11     1      0xa002dc   21:00:00:20:37:5a:5b:27  20:00:00:20:37:5a:5b:27
```

```
fc1/11    1      0xa002da    21:00:00:20:37:18:6f:90    20:00:00:20:37:18:6f:90
fc1/11    1      0xa002d9    21:00:00:20:37:5b:cf:b9    20:00:00:20:37:5b:cf:b9
fc1/11    1      0xa002d6    21:00:00:20:37:46:78:97    0:00:00:20:37:46:78:97

Total number of flogi = 10.
```

Example 23-3   Displays the FLOGI Database by VSAN

```
switch# show flogi database vsan 1
---------------------------------------------------------------------------
INTERFACE   VSAN    FCID        PORT NAME              NODE NAME
---------------------------------------------------------------------------
fc1/3     1      0xef02ef    22:00:00:20:37:18:17:d2    20:00:00:20:37:18:17:d2
fc1/3     1      0xef02e8    22:00:00:20:37:38:a7:c1    20:00:00:20:37:38:a7:c1
fc1/3     1      0xef02e4    22:00:00:20:37:6b:d7:18    20:00:00:20:37:6b:d7:18
fc1/3     1      0xef02e2    22:00:00:20:37:18:d2:45    20:00:00:20:37:18:d2:45
fc1/3     1      0xef02e1    22:00:00:20:37:39:90:6a    20:00:00:20:37:39:90:6a
fc1/3     1      0xef02e0    22:00:00:20:37:36:0b:4d    20:00:00:20:37:36:0b:4d
fc1/3     1      0xef02dc    22:00:00:20:37:5a:5b:27    20:00:00:20:37:5a:5b:27
fc1/3     1      0xef02da    22:00:00:20:37:18:6f:90    20:00:00:20:37:18:6f:90
fc1/3     1      0xef02d9    22:00:00:20:37:5b:cf:b9    20:00:00:20:37:5b:cf:b9
fc1/3     1      0xef02d6    22:00:00:20:37:46:78:97    20:00:00:20:37:46:78:97

Total number of flogi = 10.
```

Example 23-4   Displays the FLOGI Database by FC ID

```
switch# show flogi database fcid 0xef02e2
---------------------------------------------------------------------------
INTERFACE   VSAN    FCID        PORT NAME              NODE NAME
---------------------------------------------------------------------------
fc1/3     1      0xef02e2    22:00:00:20:37:18:d2:45    20:00:00:20:37:18:d2:45

Total number of flogi = 1.
```

For more information, see the "Default Company ID List" section on page 27-4 and refer to the "Loop Monitoring" section in the *Cisco MDS 9000 Family Troubleshooting Guide*.

To verify that a storage device is in the fabric login (FLOGI) table, follow these steps:

Step 1   Expand **Switches**, expand **Interfaces,** and then select **FC Physical**.

You see the interface configuration in the Information pane.

Step 2   Click the **FLOGI** tab.

You see all end devices that are logged into the fabric.

Viewing Name Server Database Entries

To view the name server database using Device Manager, follow these steps:

Step 1   Select **FC > Name Server**.

You see the Name Server dialog box.

The General tab is the default tab; you see the name server database.

Step 2   Click the **Statistics** tab.

You see the name server statistics.

Step 3   Click **Close** to close the dialog box.

Displaying Name Server Database Entries

Use the **show fcns** command to display the name server database and statistical information for a specified VSAN or for all VSANs (see Examples 23-5 to 23-8).

Example 23-5   Displays the Name Server Database

```
switch# show fcns database
-------------------------------------------------------------------------
FCID        TYPE  PWWN                    (VENDOR)        FC4-TYPE:FEATURE
-------------------------------------------------------------------------
0x010000    N     50:06:0b:00:00:10:a7:80                 scsi-fcp fc-gs
0x010001    N     10:00:00:05:30:00:24:63 (Cisco)         ipfc
0x010002    N     50:06:04:82:c3:a0:98:52 (Company 1)     scsi-fcp 250
0x010100    N     21:00:00:e0:8b:02:99:36 (Company A)     scsi-fcp
0x020000    N     21:00:00:e0:8b:08:4b:20 (Company A)
0x020100    N     10:00:00:05:30:00:24:23 (Cisco)     ipfc
0x020200    N     21:01:00:e0:8b:22:99:36 (Company A)     scsi-fcp
```

Example 23-6   Displays the Name Server Database for the Specified VSAN

```
switch# show fcns database vsan 1
VSAN 1:
-------------------------------------------------------------------------
FCID        TYPE  PWWN                    (VENDOR)        FC4-TYPE:FEATURE
-------------------------------------------------------------------------
0x030001    N     10:00:00:05:30:00:25:a3 (Cisco)         ipfc
0x030101    NL    10:00:00:00:77:99:60:2c (Interphase)
0x030200    N     10:00:00:49:c9:28:c7:01
0xec0001    NL    21:00:00:20:37:a6:be:14 (Seagate)       scsi-fcp

Total number of entries = 4
```

Example 23-7   Displays the Name Server Database Details

```
switch# show fcns database detail
-----------------------
VSAN:1     FCID:0x030001
-----------------------
port-wwn (vendor)     :10:00:00:05:30:00:25:a3 (Cisco)
node-wwn              :20:00:00:05:30:00:25:9e
class                 :2,3
node-ip-addr          :0.0.0.0
ipa                   :ff ff ff ff ff ff ff ff
fc4-types:fc4_features:ipfc
symbolic-port-name    :
symbolic-node-name    :
port-type             :N
port-ip-addr          :0.0.0.0
fabric-port-wwn       :00:00:00:00:00:00:00:00
```

```
hard-addr             :0x000000
-----------------------
VSAN:1      FCID:0xec0200
-----------------------
port-wwn (vendor)     :10:00:00:5a:c9:28:c7:01
node-wwn              :10:00:00:5a:c9:28:c7:01
class                 :3
node-ip-addr          :0.0.0.0
ipa                   :ff ff ff ff ff ff ff ff
fc4-types:fc4_features:
symbolic-port-name    :
symbolic-node-name    :
port-type             :N
port-ip-addr          :0.0.0.0
fabric-port-wwn       :22:0a:00:05:30:00:26:1e
hard-addr             :0x000000
Total number of entries = 2
```

Example 23-8   Displays the Name Server Statistics

```
switch# show fcns statistics
registration requests received = 27
deregistration requests received = 0
queries received = 57
queries sent = 10
reject responses sent = 14
RSCNs received = 0
RSCNs sent = 0
```

Displaying FDMI

Use the **show fdmi** command to display the FDMI database information (see Examples 23-9 to 23-11).

Example 23-9   Displays All HBA Management Servers

```
switch# show fdmi database
Registered HBA List for VSAN 1
  10:00:00:00:c9:32:8d:77
  21:01:00:e0:8b:2a:f6:54
switch# show fdmi database detail
Registered HBA List for VSAN 1
-------------------------------
HBA-ID: 10:00:00:00:c9:32:8d:77
-------------------------------
Node Name       :20:00:00:00:c9:32:8d:77
Manufacturer    :Emulex Corporation
Serial Num      :0000c9328d77
Model           :LP9002
Model Description:Emulex LightPulse LP9002 2 Gigabit PCI Fibre Channel Adapter
Hardware Ver    :2002606D
Driver Ver      :SLI-2 SW_DATE:Feb 27 2003, v5-2.20a12
ROM Ver         :3.11A0
Firmware Ver    :3.90A7
OS Name/Ver     :Window 2000
CT Payload Len  :1300000
  Port-id: 10:00:00:00:c9:32:8d:77
-------------------------------
HBA-ID: 21:01:00:e0:8b:2a:f6:54
```

```
--------------------------------
Node Name         :20:01:00:e0:8b:2a:f6:54
Manufacturer      :QLogic Corporation
Serial Num        :\74262
Model             :QLA2342
Model Description:QLogic QLA2342 PCI Fibre Channel Adapter
Hardware Ver      :FC5010409-10
Driver Ver        :8.2.3.10 Beta 2 Test 1 DBG (W2K VI)
ROM Ver           :1.24
Firmware Ver      :03.02.13.
OS Name/Ver       :500
CT Payload Len     :2040
  Port-id: 21:01:00:e0:8b:2a:f6:54
```

Example 23-10 Displays HBA Details for a Specified VSAN

```
switch# show fdmi database detail vsan 1
Registered HBA List for VSAN 1
--------------------------------
HBA-ID: 10:00:00:00:c9:32:8d:77
--------------------------------
Node Name         :20:00:00:00:c9:32:8d:77
Manufacturer      :Emulex Corporation
Serial Num        :0000c9328d77
Model             :LP9002
Model Description:Emulex LightPulse LP9002 2 Gigabit PCI Fibre Channel Adapter
Hardware Ver      :2002606D
Driver Ver        :SLI-2 SW_DATE:Feb 27 2003, v5-2.20a12
ROM Ver           :3.11A0
Firmware Ver      :3.90A7
OS Name/Ver       :Window 2000
CT Payload Len     :1300000
  Port-id: 10:00:00:00:c9:32:8d:77
--------------------------------
HBA-ID: 21:01:00:e0:8b:2a:f6:54
--------------------------------
Node Name         :20:01:00:e0:8b:2a:f6:54
Manufacturer      :QLogic Corporation
Serial Num        :\74262
Model             :QLA2342
Model Description:QLogic QLA2342 PCI Fibre Channel Adapter
Hardware Ver      :FC5010409-10
Driver Ver        :8.2.3.10 Beta 2 Test 1 DBG (W2K VI)
ROM Ver           :1.24
Firmware Ver      :03.02.13.
OS Name/Ver       :500
CT Payload Len     :2040
  Port-id: 21:01:00:e0:8b:2a:f6:54
```

Example 23-11 Displays Details for the Specified HBA Entry

```
switch# show fdmi database detail hba-id 21:01:00:e0:8b:2a:f6:54 vsan 1

Node Name         :20:01:00:e0:8b:2a:f6:54
Manufacturer      :QLogic Corporation
Serial Num        :\74262
Model             :QLA2342
Model Description:QLogic QLA2342 PCI Fibre Channel Adapter
Hardware Ver      :FC5010409-10
Driver Ver        :8.2.3.10 Beta 2 Test 1 DBG (W2K VI)
```

```
ROM Ver         :1.24
Firmware Ver    :03.02.13.
OS Name/Ver     :500
CT Payload Len  :2040
  Port-id: 21:01:00:e0:8b:2a:f6:54
```

To display the FDMI database information using Device Manager, choose **FC > Advanced > FDMI**. You see the FDMI dialog box.

Displaying RSCN Information

Use the **show rscn** command to display RSCN information (see Examples 23-12 and 23-13).

Example 23-12 Displays Register Device Information

```
switch# show rscn scr-table vsan 1
SCR table for VSAN: 1
---------------------------------------------
FC-ID          REGISTERED FOR
---------------------------------------------
0x1b0300       fabric detected rscns
Total number of entries = 1
```

Note   The SCR table is not configurable. It is populated when hosts send SCR frames with RSCN information. If hosts do not receive RSCN information, then the **show rscn scr-table** command will not return entries.

Example 23-13 Displays RSCN Counter Information

```
switch# show rscn statistics vsan 1
Statistics for VSAN: 1
-----------------------
Number of SCR received        = 8
Number of SCR ACC sent        = 8
Number of SCR RJT sent        = 0
Number of RSCN received       = 0
Number of RSCN sent           = 24
Number of RSCN ACC received   = 24
Number of RSCN ACC sent       = 0
Number of RSCN RJT received   = 0
Number of RSCN RJT sent       = 0
Number of SW-RSCN received    = 6
Number of SW-RSCN sent        = 15
Number of SW-RSCN ACC received = 15
Number of SW-RSCN ACC sent    = 6
Number of SW-RSCN RJT received = 0
Number of SW-RSCN RJT sent    = 0
```

To display RSCN information, follow these steps:

Step 1   Expand a fabric, expand a VSAN, and then select **Advanced**.

You see the VSAN advanced configuration in the Information pane.

Displaying RSCN Configuration Distribution Information

Use the **show cfs application name rscn** command to display the registration status for RSCN configuration distribution.

```
switch# show cfs application name rscn

 Enabled       : Yes
 Timeout       : 5s
 Merge Capable : Yes
 Scope         : Logical
```

Use the **show rscn session status vsan** command to display session status information for RSCN configuration distribution.

Note   A merge failure results when the RSCN timer values are different on the merging fabrics.

```
switch# show rscn session status vsan 1
Session Parameters for VSAN: 1
------------------------------
Last Action                : Commit
Last Action Result         : Success
Last Action Failure Reason : None
```

Use the **show rscn pending** command to display the set of configuration commands that would take effect when you commit the configuration.

Note   The pending database includes both existing and modified configuration.

```
switch# show rscn pending
rscn event-tov 2000 ms vsan 1
rscn event-tov 2000 ms vsan 2
rscn event-tov 300 ms vsan 10
```

Use the **show rscn pending-diff** command to display the difference between pending and active configurations. The following example shows the time-out value for VSAN 10 was changed from 2000 milliseconds (default) to 300 milliseconds.

```
switch# show rscn pending-diff
- rscn event-tov 2000 ms vsan 10
+ rscn event-tov 300 ms vsan 10
```

Field Descriptions for Databases

This setion contains the field descriptions for this feature.

FC Interfaces FLOGI

Field	Description
FcId	The address identifier that has been assigned to the logged-in Nx_Port.
PortName	The world wide name of the logged-in Nx_Port.
NodeName	The world wide name of the Remote Node the logged-in Nx_Port belongs to.
Original PWWN	The original port WWN for this interface.
Version	The version of FC-PH that the Fx_Port has agreed to support from the Fabric Login.
BBCredit Rx	The maximum number of receive buffers available for holding Class 2, Class 3 received from the logged-in Nx_Port. It is for buffer-to-buffer flow control in the incoming direction from the logged-in Nx_Port to FC-port.
BBCredit Tx	The total number of buffers available for holding Class 2, Class 3 frames to be transmitted to the logged-in Nx_Port. It is for buffer-to-buffer flow control in the direction from FC-Port to Nx_Port. The buffer-to-buffer flow control mechanism is indicated in the respective BbCreditModel.
CoS	The classes of services that the logged-in Nx_Port has requested the FC-Port to support and the FC-Port has granted the request.
Class2 RxDataSize	The Class 2 Receive Data Field Size of the logged-in Nx_Port. Specifies the largest Data Field Size for an FT_1 frame that can be received by the Nx_Port.
Class2 SeqDeliv	Whether the FC-Port has agreed to support Class 2 sequential delivery during the Fabric Login. This is meaningful only if Class 2 service has been agreed. This is applicable only to Fx_Ports.
Class3 RxDataSize	The Class3 Receive Data Field Size of the logged-in Nx_Port. Specifies the largest Data Field Size for an FT_1 frame that can be received by the Nx_Port.
Class3 SeqDeliv	Whether the FxPort has agreed to support Class 3 sequential delivery during the Fabric Login. This is meaningful only if Class 3 service has been agreed. This is applicable only to Fx_Ports.

FDMI HBAs

Field	Description
Sn	The serial number of this HBA.
Model	The model of this HBA.
ModelDescr	The model description.

Field	Description
OSInfo	The type and version of the operating system controlling this HBA.
MaxCTPayload	The maximum size of the Common Transport (CT) payload including all CT headers but no FC frame header(s), that may be send or received by application software resident in the host containing this HBA.

FDMI Ports

Field	Description
SupportedFC4Type	The supported FC-4 types attribute registered for this port on this VSAN.
SupportedSpeed	The supported speed registered for this port on this VSAN.
CurrentSpeed	The current speed registered for this port on this VSAN.
MaxFrameSize	The maximum frame size attribute registered for this port on this VSAN.
OsDevName	The OS Device Name attribute registered for this port on this VSAN.
HostName	The name of the host associated with this port.

FDMI Versions

Field	Description
Hardware	The hardware version of this HBA.
DriverVer	The version level of the driver software controlling this HBA.
OptROMVer	The version of the Option ROM or the BIOS of this HBA.
Firmware	The version of the firmware executed by this HBA.

RSCN Nx Registrations

Field	Description
RegType	Indicates the type of registration desired by the subscriber. • 'fromFabricCtrlr' indicates RSCNs generated by the Fabric Controller. • 'fromNxPort' indicates RSCNs generated by Nx_Ports. • 'fromBoth' indicates RSCNs generated by Fabric Controller and Nx_Ports.

RSCN Multi-PID Support

Field	Description
Enable	Specifies whether the multi-pid option is enabled on this VSAN.

RSCN Event

Field	Description
TimeOut (msec)	The time (in seconds) before the RSCN event times out.

RSCN Statistics

Field	Description
SCR Rx	The number of SCRs received from Nx_Ports on this VSAN.
SCR RJT	The number of SCR rejected on this VSAN.
RSCN Rx	The number of RSCNs from Nx_Ports received on this VSAN.
RSCN Tx	The total number of RSCNs transmitted on this VSAN.
RSCN RJT	The number of RSCN requests rejected on this VSAN.
SW-RSCN Rx	The number of Inter-Switch Registered State Change Notifications (SW_RSCN) received on this VSAN from other switches.
SW-RSCN Tx	The number of Inter-Switch Registered State Change Notifications (SW_RSCN) transmitted on this VSAN to other switches.
SW-RSCN RJT	The number of SW_RSCN requests rejected on this VSAN.

Name Server General

Field	Description
Type	The port type of this port.
PortName	The fibre channel Port_Name (WWN) of this Nx_port.
NodeName	The fibre channel Node_Name (WWN) of this Nx_port.
FC4Type/Features	The FC-4 Features associated with this port and the FC-4 Type. Refer to FC-GS3 specification for the format.
SymbolicPortName	The user-defined name of this port.
SymbolicNodeName	The user-defined name of the node of this port.
FabricPortName	The fabric port name (WWN) of the Fx_port to which this Nx_port is attached.

Name Server Advanced

Field	Description
ClassOfSvc	The class of service indicator.
PortIpAddress	Contains the IP address of the associated port.
NodeIpAddress	The IP address of the node of this Nx_port, as indicated by the Nx_Port in a GS3 message that it transmitted.
SymbolicPortName	The user-defined name of this port.
SymbolicNodeName	The user-defined name of the node of this port.
HardAddress	Extended Link Service (FC-PH-2). Hard Address is the 24-bit NL_Port identifier which consists of - the 8-bit Domain Id in the most significant byte - the 8-bit Area Id in the next most significant byte - the 8-bit AL-PA(Arbitrated Loop Physical Address) which an NL_port attempts acquire during FC-AL initialization in the least significant byte. If the port is not an NL_Port, or if it is an NL_Port but does not have a hard address, then all bits are reported as 0s.
ProcAssoc	The Fibre Channel initial process associator (IPA).
PermanentPortName	The permanent port name of this Nx port. If multiple port names are associated with this Nx port via FDISC (Discover F Port Service Parameters), the permanent port name is the original port name associated with this Nx port at login.

Name Server Proxy

Field	Description
PortName	Name of the proxy port which can register or deregister for other ports on this VSAN. Users can enable third-party registrations by setting this value.

Name Server Statistics

Field	Description
Queries Rx	The total number of Get Requests received by the local switch on this VSAN.
Queries Tx	The total number of Get Requests sent by the local switch on this VSAN.
Requests Rx Reg	The total number of Registration Requests received by the local switch on this VSAN.
Requests Rx DeReg	The total number of De-registration Requests received by the local switch on this VSAN.

Field	Description
RSCN Rx	The total number of RSCN commands received by the local switch on this VSAN.
RSCN Tx	The total number of RSCN commands sent by the local switch on this VSAN.
Rejects Tx	The total number of requests rejected by the local switch on this VSAN.

Additional References

For additional information related to implementing VSANs, see the following section:

Related Document

Related Topic	Document Title
Cisco MDS 9000 Family Command Reference	*Cisco MDS 9000 Family Command Reference*

Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	–

RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified.	–

MIBs

MIBs	MIBs Link
• CISCO-FDMI-MIB • CISCO-FDMI-CAPABILITY	To locate and download MIBs, go to the following URL: http://www.cisco.com/en/US/products/ps5989/prod_technical_reference_list.html