Configuring Fabric Configuration Server

This chapter describes the Fabric Configuration Server (FCS) feature provided in the Cisco MDS 9000 Family of directors and switches.

Information About FCS

The Fabric Configuration Server (FCS) provides discovery of topology attributes and maintains a repository of configuration information of fabric elements. A management application is usually connected to the FCS on the switch through an N port. The FCS views the entire fabric based on the following objects:

- Interconnect element (IE) object—Each switch in the fabric corresponds to an IE object. One or more IE objects form a fabric.
- Port object—Each physical port in an IE corresponds to a port object. This includes the switch ports (xE, Fx, and TL ports) and their attached Nx ports.
- Platform object—A set of nodes may be defined as a platform object to make it a single manageable entity. These nodes are end-devices (host systems, storage subsystems) attached to the fabric. Platform objects reside at the edge switches of the fabric.

Each object has its own set of attributes and values. A null value may also be defined for some attributes.

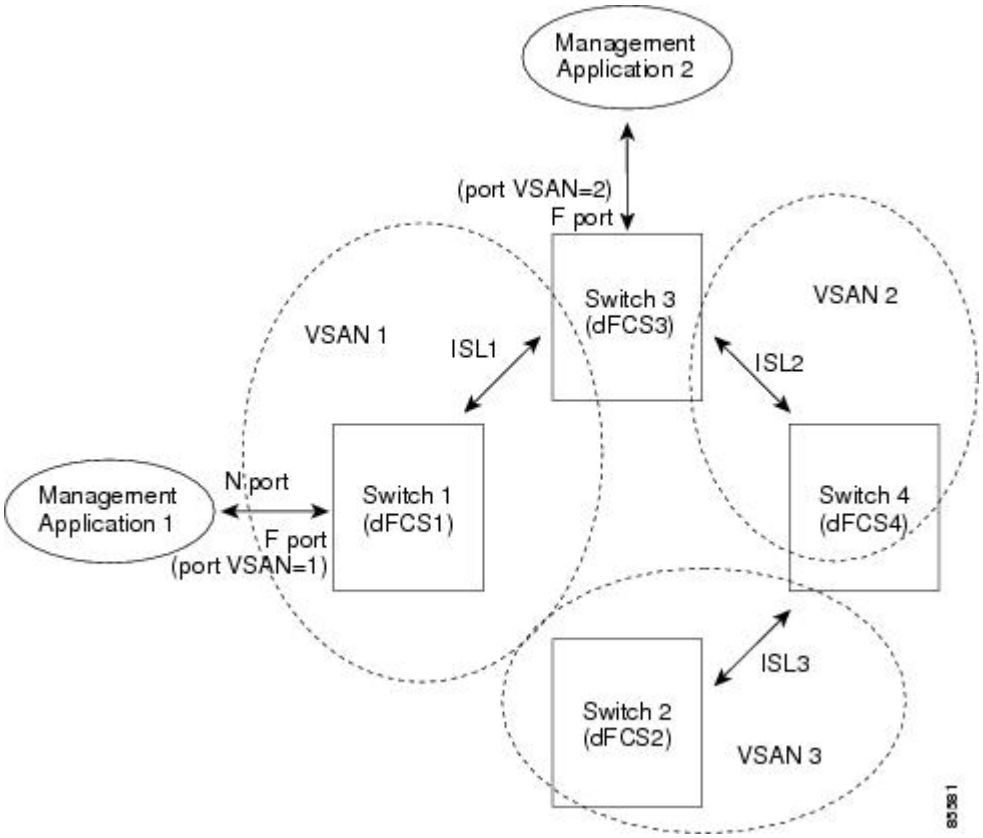
In the Cisco MDS 9000 Family switch environment, multiple VSANs constitute a fabric, where one instance of the FCS is present per VSAN.

As of Cisco NX-OS Release 4.1(1), FCS supports the discovery of virtual devices. The **fcs virtual-device-add** command, issued in FCS configuration submode, allows you to discover virtual devices in a particular VSAN or in all VSANs. The devices that are zoned for IVR must be discovered with this command and have request domain_ID (RDI) enabled, before activating the IVR zone set.

If you have attached a management application to a switch, all the frames directed towards the FCS in the switch are part of the port VSAN in the switch port (Fx port). Your view of the management application is limited only to this VSAN. However, information about other VSANs that this switch is part of can be obtained either through the SNMP or CLI.

In Figure 1: FCSs in a VSAN Environment, on page 2 Management Application 1 (M1) is connected through an F port with port VSAN ID 1, and Management Application 2 (M2) is connected through an F port with port VSAN ID 2. M1 can query the FCS information of switches S1 and S3, and M2 can query switches S3 and S4. Switch S2 information is not known to both of them. FCS operations can be done only on those switches that are visible in the VSAN. Note that M2 can send FCS requests only for VSAN 2 even though S3 is also a part of VSAN 1.

Figure 1: FCSs in a VSAN Environment



Significance of FCS

This section lists the significance of FCSs.

- FCSs support network management including the following:
  - N port management application can query and obtain information about fabric elements.
  - SNMP manager can use the FCS management information base (MIB) to start discovery and obtain information about the fabric topology.
- FCSs support TE and TL ports in addition to the standard F and E ports.
- FCS can maintain a group of modes with a logical name and management address when a platform registers with it. FCSs maintain a backup of all registrations in secondary storage and update it with every change. When a restart or switchover happens, FCSs retrieve the secondary storage information and rebuild its database.
- SNMP manager can query FCSs for all IEs, ports, and platforms in the fabric.

Default Settings

Table 1: Default FCS Settings , on page 3 lists the default FCS settings.

Table 1: Default FCS Settings

Parameters	Default
Global checking of the platform name	Disabled.
Platform node type	Unknown.

Configuring FCS

The Fabric Configuration Server (FCS) provides discovery of topology attributes and maintains a repository of configuration information of fabric elements.

Specifying a FCS Name

You can specify if the unique name verification is for the entire fabric (globally) or only for locally (default) registered platforms.

Note Set this command globally only if all switches in the fabric belong to the Cisco MDS 9000 Family.

To enable global checking of the platform name, follow these steps:

Procedure

Step 1 switch# **configure terminal**

Enters configuration mode.

Step 2 switch(config)# **fcs plat-check-global vsan 1**

Enables global checking of the platform name.

Step 3 switch(config)# **no fcs plat-check-global vsan 1**

Disables (default) global checking of the platform name.

Registering Platform Attributes

To register platform attributes, follow these steps:

Procedure

Step 1 switch# **configure terminal**

Enters configuration mode.

Step 2 switch(config)# **fcs register**

switch(config-fcs-register)#

Enters the FCS registration submode.

Step 3 switch(config-fcs-register)# **platform name SamplePlatform vsan 1**

switch(config-fcs-register-attrib)#

Enters the FCS registration attributes submode.

Step 4 switch(config-fcs-register)# **no platform name SamplePlatform vsan 1**

switch(config-fcs-register)#

Deletes a registered platform.

Step 5 switch(config-fcs-register-attrib)# **mgmt-addr 1.1.1.1**

Configures the platform management IPv4 address.

Step 6 switch(config-fcs-register-attrib)# **no mgmt-addr 1.1.1.1**

Deletes the platform management IPv4 address.

Step 7 switch(config-fcs-register-attrib)# **mgmt-addr 2001:0DB8:800:200C::417A**

Configures the platform management IPv6 address.

Step 8 switch(config-fcs-register-attrib)# **no mgmt-addr 2001:0DB8:800:200C::417A**

Deletes the platform management IPv6 address.

Step 9 switch(config-fcs-register-attrib)# **nwwn 11:22:33:44:55:66:77:88**

Configures the platform node name.

Step 10 switch(config-fcs-register-attrib)# **no nwwn 11:22:33:44:55:66:77:88**

Deletes the platform node name.

Step 11 switch(config-fcs-register-attrib)# **type 5**

Configures the fc-gs-3 defined platform type.

Step 12 switch(config-fcs-register-attrib)# **no type 5**

Deletes the configured type and reverts the switch to its factory default of unknown type.

Step 13 switch(config-fcs-register-attrib)# **exit**

Exits the FCS registration attributes submode.

Step 14 switch(config-fcs-register)# **exit**

Exits the FCS registration submode.

Verifying FCS Configuration

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

Command	Purpose
show fcs database	Displays FCS Local Database Information.
show fcs ie vsan 1	Displays a List of All IEs for a Specific VSAN.
show fcs ie nwwn 20:01:00:05:30:00:16:df vsan 1	Displays Interconnect Element Object Information for a Specific nWWN
show fcs platform name SamplePlatform vsan 1	Displays Information for a Specific Platform
show fcs platform vsan 1	Displays a List of Platforms for a Specified VSAN
show fcs port vsan 24	Displays a List of Switch Ports in a Specified VSAN
show fcs port pwwn 20:51:00:05:30:00:16:de vsan 24	Displays Port Information for a Specified pWWN
show fcs statistics	Displays FCS Statistics
show fcs vsan	Displays Platform Settings for Each VSAN

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

Displaying FCS Elements

Use the **show fcs** commands to display the status of the WWN configuration (see Example FCS Local Database Information, on page 5 to Platform Settings for Each VSAN, on page 8).

FCS Local Database Information

The following example displays FCS local database information:

```
switch# show fcs database
FCS Local Database in VSAN: 1
------------------------------
Switch WWN               : 20:01:00:05:30:00:16:df
Switch Domain Id         : 0x7f(127)
Switch Mgmt-Addresses    : snmp://172.22.92.58/eth-ip
                           http://172.22.92.58/eth-ip
Fabric-Name              : 20:01:00:05:30:00:16:df
Switch Logical-Name      : 172.22.92.58
Switch Information List  : [Cisco Systems*DS-C9509*0*20:00:00:05:30:00
```

```
Switch Ports:
-------------------------------------------------------------------
Interface  pWWN                      Type     Attached-pWWNs
-------------------------------------------------------------------
fc2/1      20:41:00:05:30:00:16:de  TE       20:01:00:05:30:00:20:de
fc2/2      20:42:00:05:30:00:16:de  Unknown  None
fc2/17     20:51:00:05:30:00:16:de  TE       20:0a:00:05:30:00:20:de
FCS Local Database in VSAN: 5
------------------------------
Switch WWN               : 20:05:00:05:30:00:12:5f
Switch Domain Id         : 0xef(239)
Switch Mgmt-Addresses    : http://172.22.90.171/eth-ip
                           snmp://172.22.90.171/eth-ip
                           http://10.10.15.10/vsan-ip
                           snmp://10.10.15.10/vsan-ip
Fabric-Name              : 20:05:00:05:30:00:12:5f
Switch Logical-Name      : 172.22.90.171
Switch Information List  : [Cisco Systems*DS-C9509**20:00:00:05:30:00:12:5e]
Switch Ports:
-------------------------------------------------------------------
Interface  pWWN                      Type     Attached-pWWNs
-------------------------------------------------------------------
fc3/1      20:81:00:05:30:00:12:5e  TE       22:01:00:05:30:00:12:9e
fc3/2      20:82:00:05:30:00:12:5e  TE       22:02:00:05:30:00:12:9e
fc3/3      20:83:00:05:30:00:12:5e  TE       22:03:00:05:30:00:12:9e
```

List of All IEs for a Specific VSAN

The following example displays list of all IEs for a specific VSAN:

```
switch# show fcs ie vsan 1
IE List for VSAN: 1
-------------------------------------------------------------------
IE-WWN                   IE-Type                          Mgmt-Id
-------------------------------------------------------------------
20:01:00:05:30:00:16:df  Switch (Local)                   0xfffc7f
20:01:00:05:30:00:20:df  Switch (Adjacent)                0xfffc64
[Total 2 IEs in Fabric]
```

Interconnect Element Object Information for a Specific nWWN

The following example displays interconnect element object information for a specific nWWN:

```
switch# show fcs ie nwwn 20:01:00:05:30:00:16:df vsan 1
IE Attributes
-------------
Domain-Id = 0x7f(127)
Management-Id = 0xfffc7f
Fabric-Name = 20:01:00:05:30:00:16:df
Logical-Name = 172.22.92.58
Management Address List =
        snmp://172.22.92.58/eth-ip
        http://172.22.92.58/eth-ip
Information List:
        Vendor-Name = Cisco Systems
        Model Name/Number = DS-C9509
        Release-Code = 0
```

Information for a Specific Platform

The following example displays information for a specific platform:

```
switch# show fcs platform name SamplePlatform vsan 1
Platform Attributes
-------------------
Platform Node Names:
        11:22:33:44:55:66:77:88
Platform Type = Gateway
Platform Management Addresses:
        1.1.1.1
```

List of Platforms for a Specified VSAN

The following example displays list of platforms for a specified VSAN:

```
switch# show fcs platform vsan 1
Platform List for VSAN: 1
Platform-Names
--------------
SamplePlatform
[Total 1 Platforms in Fabric]
```

List of Switch Ports in a Specified VSAN

The following example displays a list of switch ports in a specified VSAN:

```
switch# show fcs port vsan 24
Port List in VSAN: 24
                -- IE WWN: 20:18:00:05:30:00:16:df  --
------------------------------------------------------------------------
Port-WWN                 Type      Module-Type            Tx-Type
------------------------------------------------------------------------
20:41:00:05:30:00:16:de  TE_Port   SFP with Serial Id      Shortwave Laser
20:51:00:05:30:00:16:de  TE_Port   SFP with Serial Id      Shortwave Laser
[Total 2 switch-ports in IE]
                -- IE WWN: 20:18:00:05:30:00:20:df  --
------------------------------------------------------------------------
Port-WWN                 Type      Module-Type            Tx-Type
------------------------------------------------------------------------
20:01:00:05:30:00:20:de  TE_Port   SFP with Serial Id      Shortwave Laser
20:0a:00:05:30:00:20:de  TE_Port   SFP with Serial Id      Shortwave Laser
[Total 2 switch-ports in IE]
```

Port Information for a Specified pWWN

The following example displays port information for a specified pWWN:

```
switch# show fcs port pwwn 20:51:00:05:30:00:16:de vsan 24
Port Attributes
---------------
Port Type = TE_Port
Port Number = 0x1090000
```

```
Attached-Port-WWNs:
        20:0a:00:05:30:00:20:de
Port State = Online
```

FCS Statistics

The following example displays FCS statistics:

```
switch# show fcs statistics
FCS Statistics for VSAN: 1
---------------------------
FCS Rx Get Reqs   :2
FCS Tx Get Reqs   :7
FCS Rx Reg Reqs   :0
FCS Tx Reg Reqs   :0
FCS Rx Dereg Reqs :0
FCS Tx Dereg Reqs :0
FCS Rx RSCNs      :0
...
FCS Statistics for VSAN: 30
---------------------------
FCS Rx Get Reqs   :2
FCS Tx Get Reqs   :2
FCS Rx Reg Reqs   :0
FCS Tx Reg Reqs   :0
FCS Rx Dereg Reqs :0
FCS Tx Dereg Reqs :0
FCS Rx RSCNs      :0
FCS Tx RSCNs      :0
...
```

Platform Settings for Each VSAN

The following example displays platform settings for each VSAN:

```
switch# show fcs vsan
------------------------------
VSAN    Plat Check fabric-wide
------------------------------
0001    Yes
0010    No
0020    No
0021    No
0030    No
```

Additional References

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

Table 2: MIBs

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