CHAPTER 3

Configuring SME Interfaces

This chapter describes how to configure and start SME interfaces using DCNM-SAN and Device Manager.

After completing the preliminary tasks, you need to configure the SME interface on a Cisco MDS switch with an installed MSM-18/4 module, SSN-16 module, or on a Cisco MDS 9222i switch.

This chapter includes the following topics:

Configuring the SME Interface

SME interfaces are configured either by using Device Manager or the CLI.

For information about creating SME interfaces using Device Manager, see "Configuring the SME Interface Using the GUI" section on page 3-5

This section includes the following topics:

Adding an SME Interface from a Local or Remote Switch

Prerequisites

- Before adding an SME interface, be sure to enable clustering, enable SME, start the SME interface on the switch, and add the interface to the cluster.

Note You can add an SME interface from a local switch or from a remote switch.

Detailed Steps

To add an SME interface from a local switch, follow these steps:

	Command	Purpose
Step 1	`switch# config t`	Enters configuration mode.
Step 2	`switch(config)# sme cluster clustername1` `switch(config-sme-cl)#`	Specifies the cluster and enters SME cluster configuration submode.
Step 3	`switch(config-sme-cl)# fabric fabricname1`	Specifies the fabric.
Step 4	`switch(config-sme-cl)# node local` `switch(config-sme-cl-node)#`	Enters the SME cluster node submode and specifies the local switch.
Step 5	`switch(config-sme-cl-node)# fabric-membership fabricname1`	Specifies the fabric membership for the cluster.
Step 6	`switch(config-sme-cl-node)# interface sme 4/1 force`	Adds the SME interface (4/1) from a local switch in fabric f1.

To add an SME interface from a remote switch, follow these steps:

	Command	Purpose
Step 1	`switch# config t`	Enters configuration mode.
Step 2	`switch(config)# sme cluster clustername1` `switch(config-sme-cl)#`	Specifies the cluster and enters SME cluster configuration submode.
Step 3	`switch(config-sme-cl)# fabric fabricname`	Specifies the fabric.
Step 4	`switch(config-sme-cl)# node` *`A.B.C.D|X:X::X|DNS name`* `switch(config-sme-cl-node)#`	Enters the SME cluster node submode and specifies a remote switch. The format is *A.B.C.D* | *X:X::X* | *DNS* name.
Step 5	`switch(config-sme-cl-node)# fabric-membership fabricname1`	Specifies the fabric membership for the cluster.
Step 6	`switch(config-sme-cl-node)# interface sme 3/1 force`	Adds the SME interface (3/1) from a remote switch in fabric f2.

Creating the SME Interface

After enabling the cluster and enabling SME, configure the SME interface on the switch.

Configure the SME interface on the MSM-18/4 module slot and port 1.

Note You must enter the **copy running-config startup-config** CLI command after adding or deleting interfaces or switches from a cluster.

Detailed Steps

To configure the SME interface, follow these steps:

	Command	Purpose
Step 1	`switch# config t`	Enters configuration mode.
Step 2	`switch(config)# interface sme` *x/y*	Configures the SME interface on slot *x*, port y where *x* is the MSM-18/4 or SSN16 module slot. For MDS 9222i, for slot 1, the port number is 1. The port *y* is 1 for MSM 18/4 and 1 to 4 for SSN-16. Enters the interface submode.
Step 3	`switch(config-if)# no shutdown`	Enables the interface on slot *x*, port *y*.

After configuring the SME interface, if you enter a **show int** command, the SME interface is displayed as down until the interface is added to a cluster.

Examples

After configuring the SME interface, a message similar to the following is displayed:

```
2007 Jun 6 21:34:14 switch %DAEMON-2-SYSTEM_MSG: <<%SME-2-LOG_WARN_SME_LICENSE_GRACE>>
No SME Licence. Feature will be shut down after a grace period of approximately 118 days.
```

Deleting the SME Interface

Prerequisites

- Before deleting the SME interface, you must remove the switch from the cluster.

Restrictions

- Deleting an SME interface that is part of a cluster is not allowed. First remove the switch from the cluster by entering the **no sme cluster** *cluster name* command, and then delete the SME interface.

Detailed Steps

To delete the SME interface, follow these steps:

	Command	Purpose
Step 1	`switch# config t`	Enters configuration mode.
Step 2	`switch(config)# no interface sme` *x/y*	Removes the SME interface from slot *x*, port y where *x* is the MSM-18/4 or SSN-16 module slot. The port *y* is 1 for MSM 18/4 and 1 to 4 for SSN-16. For MDS 9222i, for slot 1, the port number is 1.

Viewing SME Interface Information Using the CLI

Use the **show interface sme** CLI command to obtain information about the SME interface configuration and statistics.

```
switch# show interface sme 3/1
sme3/1 is up
In fabric Cisco_fabric1
    SME                      IOs        IO/s               Bytes          Rate
    ------------------------------------------------------------------------------
    Host Reads                 0           0                   0      0.00  B/s
    Host Writes        270134566           0      35407048474624      0.00  B/s
    Host Total         270134566           0      35407048474624      0.00  B/s

    Tgt Reads                  0           0                   0      0.00  B/s
    Tgt Writes         540268684           0        232408631520      0.00  B/s
    Tgt Total          540268684           0        232408631520      0.00  B/s

    Clear                    IOs        IO/s               Bytes          Rate
    ------------------------------------------------------------------------------
    Host Reads                 0           0                   0      0.00  B/s
    Host Writes             3512           0           460324864      0.00  B/s
    Host Total              3512           0           460324864      0.00  B/s

    Tgt Reads                  0           0                   0      0.00  B/s
    Tgt Writes              3512           0           460324864      0.00  B/s
    Tgt Total               3512           0           460324864      0.00  B/s

    Compression Ratio        455.11 : 1
    SME to Clear               100.00 %
    Read to Write                0.00 %

    Clear Luns 4, Encrypted Luns 1

    Error Statistics
      0 CTH, 0 Authentication 3 Compression
      69 Key Generation, 0 Incorrect Read Size
      0 Overlap Commands, 0 Stale Key Accesses
      0 Overload Condition, 0 Incompressible
      210 XIPC Task Lookup, 0 Invalid CDB
      0 Ili, 88881729 Eom, 0 Filemark, 0 Other
        last error at Wed May 18 09:41:12 2011
```

Table 3-1 shows the error statistics of the **show interface sme** command.

Table 3-1 Error Statistics

Parameters	Description
Authentication	Errors generated during the verification of the tape block integrity. These errors occur when tapes are corrupted.
Bad Target Responses	Errors generated from the target. These errors occur most of the time and include FileMark, Incorrect Length Indicators (ILI) and so on.
CTH	Errors associated with the Cisco Tape Header (CTH). The CTH resides at logical block 0 and contains media and other vendor specific information.
Incorrect Read Size	Errors generated when the write size is different from the read size.
Invalid CDB	Errors generated when there are unknown or malformed SCSI commands.The Invalid CDB counter displays read or write commands from hosts that have improper transfer sizes.
Incompressible	Errors generated when there is incompressible data.
Key Generation	Errors associated with the generation of keys.

Table 3-1 Error Statistics (continued)

Parameters	Description
Overload	Errors that occur when there are overlapping read operations from the host. Simultaneous and multiple read operations to the SME are rejected with a BUSY check condition. These instances are displayed as Overload errors.
Overlap	Errors generated when there are multiple overlapping commands to the same Initiator-Target-LUN (ITL).
Stale Key Access	Errors generated when archived keys are accessed for tape write operations. If a volume group or a cluster is deleted or imported to a new cluster, the keys become archived. These keys should not be used for writing to the tape. The Stale Key Access counter displays the occurrences of such instances.
XIPC Task Lookup	Errors associated with eXtensible Inter-Process Communication (XIPC). These errors are generated when there are exchange lookup failures.

Configuring the SME Interface Using the GUI

SME interfaces are configured by using either Device Manager or the command line interface (CLI).

For information about creating SME interfaces using the CLI, see "Configuring the SME Interface" section on page 3-1.

This section includes the following topics:

Configuring and Starting an SME Interface Using Device Manager

Detailed Steps

To configure and create an SME interface using Device Manager, follow these steps:

Step 1 Open Device Manager for the switch that needs to have the SME interface defined.

Step 2 Select **Interface > SME > Interfaces..**. The SME Interfaces appear in a new window.

Step 3 Click **Create**. A new SME Interfaces window is displayed.

Note You can create an SME interface if there is a license on the switch available for an Cisco MSM-18/4 or a SSN-16 module. One license per Cisco MSM-18/4 and up to 4 licenses for SSN-16 module and 1 license per Cisco MDS 9222i slot 1 is required for the SME feature.

You have 120 days to install the appropriate license key. However, if the switch does not have a valid license key for SME at the end of the 120 days grace period, it is automatically disabled.

Step 4 Click the **up** radio button and click **Create...**.

For a module with four interfaces, the window with the Node drop-down list appears. Select the node number from the list and click **Create**.

The node number becomes the port number. For example, for module 12 and node 2, Device Manager creates the SME12/2 interface.

Step 5 Open the DCNM-SAN Web Client window to view the configured SME interfaces.

Configuring SME Interfaces in DCNM-SAN

This section covers the following topics:

Creating SME Interfaces

Detailed Steps

To create SME interfaces, follow these steps:

Step 1 Select **Intelligent Features > SME > Interfaces** in the Physical Attributes pane. The Interfaces table appears.

Step 2 Click the **Create Row...** button. A new Interfaces window opens.

The Interfaces window with the **Module** drop-down list appears.

Step 3 Select the switch and module number from the drop-down lists. Check either the **up** or **down** check box for the Status Admin. Click **Create**.

Deleting SME Interfaces

Detailed Steps

To delete SME interfaces, follow these steps:

Step 1 Select **Intelligent Features > SME > Interfaces** in the Physical Attributes pane. The Interfaces table appears.

Step 2 Select the interface to be deleted and click the **Delete Row** button. Click **Yes** to confirm and remove the interface.

Saving Your Interface Configurations

When an SME interface is deleted on one switch in a cluster and then added back, even if the saved SME configurations were the same, the SME interface will not be added back to the cluster.

When the switch is reloaded, the SME interfaces will not be added back to the cluster due to a certificate mismatch (because the SME interface was removed and then added back). You need to delete the SME interface and add it back, and then enter the **copy running-config startup-config** CLI command.

Note You must enter the **copy running-config startup-config** CLI command after adding or deleting interfaces or switches.

Adding SME Interfaces to a SME Configuration

SME includes an Add Interface Wizard to simplify the process of adding interfaces to an existing cluster. You can add additional interfaces when you add additional Cisco MSM-18/4 modules, SSN-16 modules, and Cisco MDS 9222i switches.

Note You must enter the **copy running-config startup-config** CLI command after adding or deleting interfaces or switches.

Restrictions

After adding a SME interface on a switch that is not already part of the cluster, wait for the switch to join the cluster before attempting to add another SME interface. Adding a new switch to a cluster affects the quorum calculation of the cluster (see the "Cluster Quorum and Master Switch Election" section on page 4-1). Adding more than one switch that is not online can shut down the SME application due to a lost quorum.

Detailed Steps

To add SME interfaces to an existing SME configuration, follow these steps:

Step 1 From the SME navigation pane, click **Members** to display the switches and interfaces already configured in the cluster.

Step 2 Click **Add** to display the Add Interface Wizard.

Step 3 Select the fabrics you want to add interfaces from. Click **Next**.

Step 4 Select the SME interfaces that you would like to use. Click **Next**.

Step 5 View the interface information. Click **Confirm** to view the newly added interface.

Removing (Unbinding) SME Interfaces from a SME Cluster

Removing a SME interface from a cluster means that the interface is still up but it is not bound to a cluster.

In the existing MDS 9000 Family platform, a module can be replaced with another module and there is no change in configuration. In SME, due to security reasons, when an MSM-18/4 module or a SSN-16 module is configured as part of a cluster, it cannot be replaced with another MSM-18/4 or a SSN-16 module, otherwise, the SME interface will come up in an inactive state. The correct procedure is to remove the SME interface from the cluster and re-add the interface into the cluster. This procedure should be followed to bring a new MSM-18/4 or a SSN-16 module into the cluster.

Note You must enter the **copy running-config startup-config** CLI command after adding or deleting interfaces or switches from a cluster.

Prerequisites

Before you remove an SME interface, you must close the SME interface using the CLI or DCNM-SAN.

Detailed Steps

To remove (unbind) a SME interface from an existing SME configuration, follow these steps:

Step 1 From the SME navigation pane, click **Members** to display the switches and interfaces already configured in the cluster.

Step 2 Select a SME interface and click **Remove**.

Step 3 Click **OK** to delete (unbind) the interface.

Step 4 View the notification that the interface was removed.

Note The interface is removed while the node remains defined.

Deleting Switches From a SME Cluster

Prerequisites

- If the cluster includes more than one switch, you must delete all non-master switches first. It is not possible to delete the master switch from a cluster without first deleting all non-master switches.

Detailed Steps

To delete a switch from a cluster, follow these steps:

Step 1 Click **Members** to display the switches that are part of the cluster.

Step 2 Select the switch and click **Remove**.

Step 3 Click **OK** to delete the switch.

Step 4 View the notification that the switch was deleted.

Note The interface and the node are both removed.

Verifying SME Interface Configuration

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

Command	Purpose
show interface sme	Displays the SME interface configuration and statistics.
show int	Displays if the SME interface is down until the interface is added to a cluster.

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

Monitoring SME Interface

To view the SME interfaces, follow these steps:

Step 1 In the Physical Attributes pane, select **Intelligent Features > SME.**

Step 2 Select **Interfaces** to view the information about the SME interfaces on the right-side pane. The table lists the information of all the available SME interfaces.

Note After creating the interfaces, you must first configure a SME cluster and then add the SME interfaces to the cluster. For details on configuring clusters, see Chapter 4, “Configuring SME Cluster Management.”

Feature History for SME Interface

Table 3-2 lists the release history for this feature.

Table 3-2 Feature History for SME Interface

Feature Name	Releases	Feature Information
Software change	5.2(1)	In Release 5.2(1), Fabric Manager is changed to DCNM for SAN (DCNM-SAN).
	4.1(1c)	In Release 4.1(1b) and later, the MDS SAN-OS software is changed to MDS NX-OS software. The earlier releases are unchanged and all references are retained.
16-Port Storage Service Node (SSN-16) module	4.2(1)	The Cisco MDS 9000 Family 16-Port Storage Services Node is new hardware that provides a high-performance, unified platform for deploying enterprise-class disaster recovery and business continuance solutions with future support for intelligent fabric applications.
Configuring and starting SME interface	3.3(1c)	Users should create SME interfaces using Device Manager or the CLI, before using Fabric Manager to create the interfaces.