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Configuring SCSI Flow Services

This chapter describes SCSI flow services which is supported on the Storage Services Module (SSM).

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- Licensing Requirements for SCSI Flow Services section, page 45-3
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Information About SCSI Flow Services

This section includes the following topics:

- SCSI Flow Services Overview section, page 45-1
- SCSI Flow Specification Attributes section, page 45-2
- SCSI Flow Manager section, page 45-3
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SCSI Flow Services Overview

An SCSI initiator and target combination is an SCSI flow. SCSI flow services provide enhanced features for SCSI flows, such as Write Acceleration and flow monitoring for statistics obtained on an SSM.
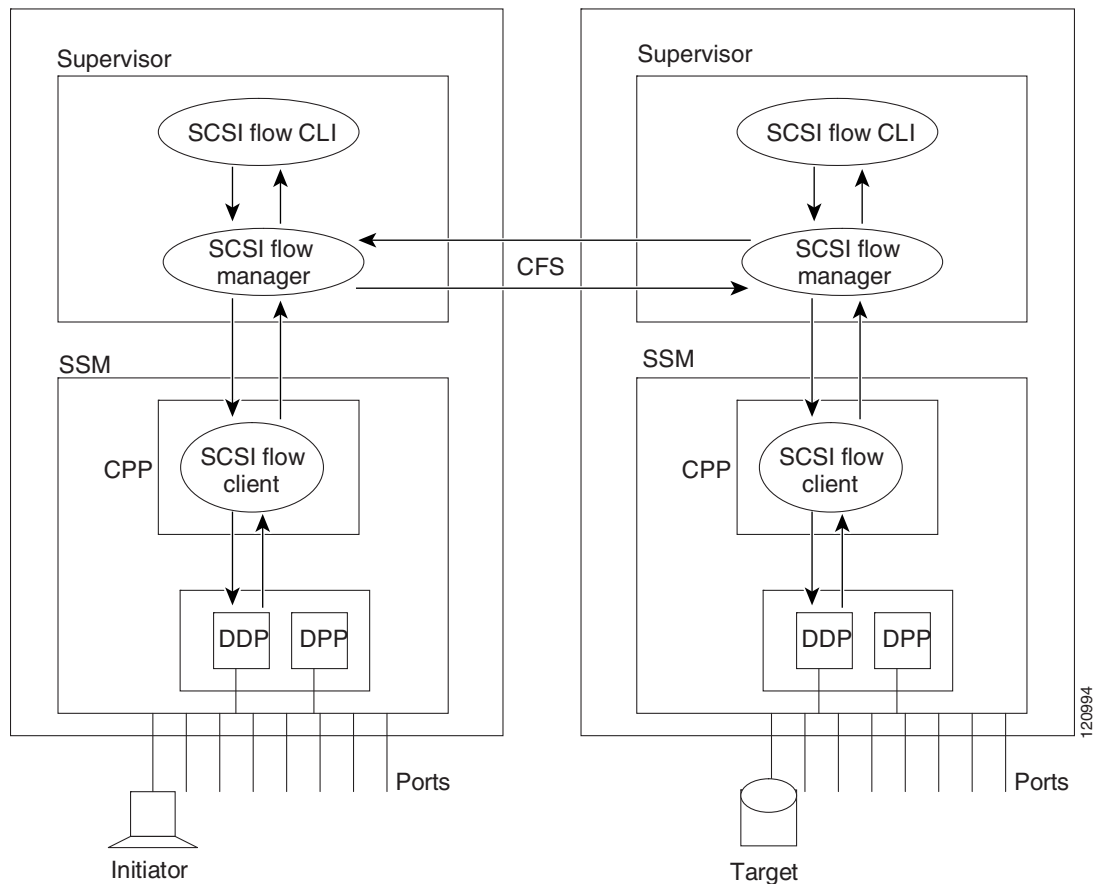
The SCSI flow services functional architecture consists of the following components:

- SCSI flow manager (SFM) on the supervisor—The SFM resides on a supervisor module and handles the configuration of SCSI flows, validating them and relaying configuration information to the appropriate SSM. It also handles any dynamic changes to the status of the SCSI flow due to external events and registers changes that occur due to various operations.

- SCSI flow configuration CLI on the supervisor—The SFCC resides on the CPP of the SSM. It receives flow configuration requests from the SFM, programs the DPP corresponding to the initiator and target port interfaces, and responds to the SFM with the status of the configuration request.

- SCSI flow configuration client on the Control Path Processor (CPP) of an SSM.

- SCSI flow feature set support on the Data Path Processor (DPP) of an SSM—The DPP on the SSM examines all the messages between the initiator and target and provides SCSI flow features, such as Fibre Channel Write Acceleration and statistics monitoring.

Figure 45-1 shows an example of the SCSI flow services functional architecture.

Figure 45-1   ***SCSI Flow Services Functional Architecture***

Note   The SCSI target and initiator must be connected to different SSMs on different switches.

Note   For statistics monitoring, the target device is not required to be connected to an SSM.

SCSI Flow Specification Attributes

A SCSI flow specification consists of the following attributes:

- SCSI flow identifier
- VSAN identifier
- SCSI initiator port WWN
- SCSI target port WWN
- Flow feature set consisting of Fibre Channel Write Acceleration and statistics monitoring.

SCSI Flow Manager

The SCSI flow manager (SFM) resides on a supervisor module and handles the configuration of SCSI flows, validating them and relaying configuration information to the appropriate SSM. It also handles any dynamic changes to the status of the SCSI flow due to external events. The SFM registers events resulting from operations, such as port up or down, VSAN suspension, and zoning that affects the SCSI flow status, and updates the flow status and configuration accordingly.

The SFM on the initiator communicates to its peer on the target side using Cisco Fabric Services (CFS). Peer communication allows the initiator SFM to validate target parameters and program information on the target side.

SCSI Flow Configuration Client

A SCSI flow configuration client (SFCC) resides on the CPP of the SSM. It receives flow configuration requests from the SFM, programs the DPP corresponding to the initiator and target port interfaces, and responds to the SFM with the status of the configuration request.

SCSI Flow Data Path Support

The DPP on the SSM examines all the messages between the initiator and target and provides SCSI flow features such as Fibre Channel Write Acceleration and statistics monitoring.

Note   For statistics monitoring, the target device is not required to be connected to an SSM.

Licensing Requirements for SCSI Flow Services

The following table shows the licensing requirements for SCSI Flow Services:

License	License Description
ENTERPRISE_PKG	SCSI flow statistics requires license. Any feature not included in a license package is bundled with the Cisco NX-OS system images and is provided at no extra charge to you. For a complete explanation of the NX-OS licensing scheme, see the *Cisco NX-OS Licensing Guide*.
FM_SERVER_PKG	Traffic Analyzer for SCSI flow statistics requires an Enterprise Services license. For a complete explanation of the NX-OS licensing scheme and how to obtain and apply licenses, see the *Cisco NX-OS Licensing Guide.*

Guidelines and Limitations

The SCSI flow specification is a distributed configuration because the SCSI initiator and the target might be physically connected to SSMs on two different switches located across the fabric. The configuration does not require information to identify either the switch name or the SSM slot location for either the initiator or the target. The manual SCSI flow configuration is performed only at the initiator side. This simplifies the configuration process. The initiator switch sends the configuration to the SFM on the target switch using CFS. No SCSI flow configuration is necessary on the target switch.

Default Settings

Table 45-1 lists the default settings for SCSI flow services parameters.

Table 45-1   Default SCSI Flow Services Parameters

Parameters	Default
SCSI flow services	Disabled
SCSI flow services distribution	Enabled

Configuring SCSI Flow Services

This section includes the following topics:

- Enabling SCSI Flow Services section, page 45-4
- Enabling Intelligent Storage Services section, page 45-5
- Configuring Fibre Channel Using DCNM-SAN section, page 45-6
- Disabling Intelligent Storage Services section, page 45-6

Enabling SCSI Flow Services

Restrictions <Optional>

Enabling SCSI flow services on interfaces has the following restrictions:

- The fewest number of interfaces that you can enable is four. You can specify fc1 through fc4, but not fc1 through fc2.
- The first interface in the group must be 1, 5, 9, 13, 17, 21, 25, or 29. You can specify fc5 through fc8, but not fc7 through fc10.
- The groups of four interfaces do not need to be consecutive. You can specify fc1 through fc8 and fc17 through fc20.

A SCSI flow identifier is unique on a switch such as VSAN identifiers and is chosen by the user. To configure a SCSI flow identifier, follow these steps:

	Command	Purpose

Step 1	`config t`
	`Example:`
	`switch# config t`
	`switch(config)#`
		Enters configuration mode.

Step 2	`scsi-flow flow-id` *flow-id* `initiator-vsan`
	vsan-id `initiator-pwwn` *wwn* `target-vsan` *vsan-id*
	`target-pwwn` *wwn*
	`Example:`
	`switch(config)# scsi-flow flow-id 3`
	`initiator-vsan 2 initiator-pwwn`
	`21:00:00:e0:8b:07:5f:aa target-vsan 4`
	`target-pwwn 2a:20:00:05:30:00:77:e0`
		Configures SCSI flow identifier 3 using the pWWNs of the initiator and the target. The flow identifier range is 1 to 65535.

	`no scsi-flow flow-id` *flow-id* `initiator-vsan`
	vsan-id
	`Example:`
	`switch(config)# no scsi-flow flow-id 3`
	`initiator-vsan 2`
		Removes SCSI flow identifier 3.

Enabling Intelligent Storage Services

Restrictions <Optional>

The port range must be a multiple of four (for example fc4/1 through fc4-12).

To configure the values to associate with the fast, medium, and slow migration rates, follow these steps:

Step 1   Expand **End Devices** and then select **SSM Features** in the Physical Attributes pane.

You see the Intelligent Storage Services configuration in the Information pane.

Step 2   Click the **SSM** tab.

You see the set of configured services in the Information pane.

Step 3   Click **Create Row** to enable a new service on an SSM.

You see the Create SSM dialog box.

Step 4   Select the switch and SSM card you want to configure.

Step 5   (Optional) Uncheck the **Use All Ports on Module** check box if you want to provision a subset of the ports on the card to use this service.

Step 6   Select the port range you want to provision for using this service (starting port and ending port).

Step 7   Select the feature you want to enable on these ports from the drop-down list of services.

Step 8   Set the PartnerImageURI field if you are enabling a third-party application that requires an image loaded onto the SSM.

Step 9   Click **Create** to create this row and enable this service.

Configuring Fibre Channel Using DCNM-SAN

To configure a Fibre Channel using DCNM-SAN, follow these steps:

Step 1   Expand **End Devices** and then select **SSM Features** in the Physical Attributes pane.

You see the Intelligent Storage Services configuration, showing the FCWA tab in the Information pane.

Step 2   Click **Create Row** in the Information pane to create a SCSI flow or click a row in the FCWA table to modify an existing SCSI flow.

You see the FC Write Acceleration dialog box.

Step 3   Select the initiator and target WWNs and VSAN IDs and check the **WriteAcc** check box to enable Fibre Channel Write Acceleration on this SCSI flow.

Step 4   (Optional) Enable SCSI flow statistics on this SCSI flow by checking the **Enable Statistics** check box.

Step 5   (Optional) Change the BufCount value to set the number of 2K buffers used by the SCSI target.

Step 6   Click **Create** to create this SCSI flow.

Disabling Intelligent Storage Services

To disable Intelligent Storage Services in DCNM-SAN for an SSM and free up a group of ports that use these services, follow these steps:

Step 1   Expand **End Devices** and then select **SSM Features** in the Physical Attributes pane.

You see the Intelligent Storage Services configuration in the Information pane.

Step 2   Click the **SSM** tab.

You see the set of configured services in the Information pane.

Step 3   Select the row in the table that you want to disable.

Step 4   (Optional) Check the **Reboot Module on Delete** check box if you want to force the card to reboot after disabling the service. This is equivalent to the CLI **force** option.

Step 5   Click **Delete Row**. The ports that were provisioned for this service become available for provisioning in another service.

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Note   If **Reboot Module on Delete** was checked, then the SSM module reboots.

Verifying SCSI Flow Services

To display SCSI Flow Services configuration information, perform one of the following tasks:

Command	Purpose
show scsi-flow	Displays the SCSI flow services configuration for all specific SCSI flow identifiers.
show ssm provisioning	Displays provisioned applications on an SSM.
show scsi-flow flow-id 3	Displays the SCSI flow services configuration for a specific SCSI flow identifiers.

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

Displaying SCSI Flow Services Information

Use the **show scsi-flow** command to display information about SCSI flow services (see Example 45-1 to Example 45-3).

Example 45-1   Displays Applications Provisioned on an SSM

```
switch# show ssm provisioning
Module    Ports        Application        Provisioning Status
----------------------------------------------------------
    4     1-32          scsi-flow           success
```

Example 45-2   Displays SCSI Flow Services Configuration for All SCSI Flow Identifiers

```
switch# show scsi-flow
Flow Id: 3
        Initiator VSAN: 101
        Initiator WWN: 21:00:00:e0:8b:05:76:28
        Target VSAN: 102
        Target WWN: 21:00:00:20:37:38:7f:7d
        Target LUN: ALL LUNs
        Flow Verification Status:
        ------------------------
          Initiator Verification Status:    success
          Target Verification Status:       success
          Initiator Linecard Status:        success
          Target Linecard Status:           success
        Feature Status:
        ---------------
          Write-Acceleration enabled
            Write-Acceleration Buffers: 1024
            Configuration Status:   success
          Statistics enabled
            Configuration Status:   success

Flow Id: 4
        Initiator VSAN: 101
        Initiator WWN: 21:00:00:e0:8b:05:76:28
        Target VSAN: 102
        Target WWN: 21:00:00:20:37:38:a7:89
```

```
        Target LUN: ALL LUNs
        Flow Verification Status:
        ------------------------
            Initiator Verification Status:    success
            Target Verification Status:       success
            Initiator Linecard Status:        success
            Target Linecard Status:           success
        Feature Status:
        ---------------
          Write-Acceleration enabled
            Write-Acceleration Buffers: 1024
            Configuration Status:  success
```

Example 45-3   Displays SCSI Flow Services Configuration for a Specific SCSI Flow Identifier

```
switch# show scsi-flow flow-id 3
Flow Id: 3
        Initiator VSAN: 101
        Initiator WWN: 21:00:00:e0:8b:05:76:28
        Target VSAN: 102
        Target WWN: 21:00:00:20:37:38:7f:7d
        Target LUN: ALL LUNs
        Flow Verification Status:
        ------------------------
            Initiator Verification Status:    success
            Target Verification Status:       success
            Initiator Linecard Status:        success
            Target Linecard Status:           success
        Feature Status:
        ---------------
          Write-Acceleration enabled
            Write-Acceleration Buffers: 1024
            Configuration Status:  success
          Statistics enabled
            Configuration Status:  success
```

Filed Description for SCSI Flow Services

This section includes the following topics:

- SSM
- Virtual Initiator

SSM

Field	Description
StartPort, EndPort, Feature	A table containing feature related information for interfaces. This table gives a list of interfaces that are assigned to different features. The interfaces supported are of the type Fibre Channel.
PartnerImageURI	A collection of objects related to SSM Feature to interface mapping.

Virtual Initiator

Field	Description
Processor Id	The DPP ID.
Control	If false, it's the data path. If true, it's the control path.