



CHAPTER 46

Configuring SCSI Flow Statistics

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

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Information About SCSI Flow Statistics

This section includes the following topics:

- [SCSI Flow Statistics Overview section, page 46-1](#)
- [SCSI Flow Specification Attributes section, page 46-2](#)
- [SCSI Flow Manager section, page 46-3](#)
- [SCSI Flow Configuration Client section, page 46-3](#)
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SCSI Flow Statistics Overview

The statistics that can be collected for SCSI flows include the following:

- SCSI reads
 - Number of I/Os
 - Number of I/O blocks
 - Maximum I/O blocks
 - Minimum I/O response time
 - Maximum I/O response time

- SCSI writes
 - Number of I/Os
 - Number of I/O blocks
 - Maximum I/O blocks
 - Minimum I/O response time
 - Maximum I/O response time
- Other SCSI commands (not read or write)
 - Test unit ready
 - Report LUN
 - Inquiry
 - Read capacity
 - Mode sense
 - Request sense
- Errors
 - Number of timeouts
 - Number of I/O failures
 - Number of various SCSI status events
 - Number of various SCSI sense key errors or events

To take advantage of this feature, only the initiator must be directly attached to an SSM.

**Note**

The SCSI flow statistics feature requires the Enterprise Package license installed only on the initiator switches.

**Note**

For SCSI flow statistics, the initiator must connect to an SSM on a Cisco MDS switch while the target can connect to any other switch in the fabric. The SCSI flow initiator and target cannot connect to the same switch.

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.

Licensing Requirements for SCSI Flow Statistics

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

License	License Requirement
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 <i>Cisco NX-OS Licensing Guide</i> .
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 <i>Cisco NX-OS Licensing Guide</i> .

Default Settings

Table 46-1 lists the default settings for SCSI flow statistics parameters.

Table 46-1 Default SCSI Flow Statistics Parameters

Parameters	Default
SCSI flow statistics	Disabled

Configuring SCSI Flow Statistics

This section includes the following topics:

- [Enabling SCSI Flow Statistics section, page 46-4](#)
- [Clearing SCSI Flow Statistics section, page 46-4](#)

Enabling SCSI Flow Statistics

To enable SCSI flow statistics monitoring, follow these steps:

	Command	Purpose
Step 1	<code>config t</code> Example: switch# <code>config t</code> switch(config)#	Enters configuration mode.
Step 2	<code>scsi-flow flow-id flow-id statistics</code> Example: switch(config)# <code>scsi-flow flow-id 3 statistics</code>	Enables statistics monitoring on SCSI flow identifier 3.
	<code>no scsi-flow flow-id flow-id statistics</code> Example: switch(config)# <code>no scsi-flow flow-id 3 statistics</code>	Disables statistics monitoring on SCSI flow identifier 3. The default is disabled.

To enable SCSI flow statistics monitoring using DCNM-SAN, follow these steps:

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- Step 1** Expand **End Devices** and then select **SSM Features** in the Physical Attributes pane.
You see 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 **Enable Statistics** check box to enable SCSI flow statistics on this SCSI flow.
 - Step 4** (Optional) Enable Fibre Channel Write Acceleration on this SCSI flow at this time by checking the **WriteAcc** check box.
 - Step 5** Click **Create** to create this SCSI flow.
-

Clearing SCSI Flow Statistics

Clears SCSI flow statistics counters for SCSI flow ID.

To clear SCSI flow statistics using DCNM-SAN, follow these steps:

-
- Step 1** Expand End Devices and then select SSM Features.
 - Step 2** Check the Stats Clear check box to clear SCSI flow statistics.

Step 3 Click the Apply Changes icon to clear the SCSI flow statistics.

To clear SCSI flow statistics, follow these steps:

	Command	Purpose
Step 1	<code>config t</code> Example: switch# <code>config t</code> switch(config)#	Enters configuration mode.
Step 2	<code>clear scsi-flow statistics flow-id flow-id</code> Example: switch(config)# <code>clear scsi-flow statistics flow-id 3</code>	clears SCSI flow statistics counters for SCSI flow ID.

Verifying SCSI Flow Statistics

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

Command	Purpose
<code>show scsi-flow statistics</code>	Displays the SCSI Flow Statistics for all SCSI flow identifiers.
<code>show scsi-flow statistics flow-id 4</code>	Displays the SCSI Flow Statistics for a specific SCSI flow identifier.

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

Displaying SCSI Flow Statistics

Use the `show scsi-flow` command to display information about SCSI flow statistics (see [Example 46-1](#) to [Example 46-2](#)).

Example 46-1 Displays SCSI Flow Services Statistics for All SCSI Flow Identifiers

```
switch# show scsi-flow statistics

Stats for flow-id 4 LUN=0x0000
-----
Read Stats
  I/O Total count=2
  I/O Timeout count=0
  I/O Total block count=4
  I/O Max block count=2
  I/O Min response time=5247 usec
  I/O Max response time=10160 usec
  I/O Active Count=0

Write Stats
  I/O Total count=199935
  I/O Timeout count=0
```

```

I/O Total block count=12795840
I/O Max block count=64
I/O Min response time=492 usec
I/O Max response time=10056529 usec
I/O Active Count=16

```

Non Read-Write Stats

```

Test Unit Ready=4
Report LUN=38
Inquiry=50
Read Capacity=3
Mode Sense=0
Request Sense=0

```

Total Stats

```

Rx Frame Count=3792063
Rx Frame Byte Count=6549984752
Tx Frame Count=3792063
Tx Frame Byte Count=6549984752

```

Error Stats

```

SCSI Status Busy=0
SCSI Status Reservation Conflict=0
SCSI Status Task Set Full=0
SCSI Status ACA Active=0
Sense Key Not Ready=0
Sense Key Medium Error=0
Sense Key Hardware Error=0
Sense Key Illegal Request=0
Sense Key Unit Attention=28
Sense Key Data Protect=0
Sense Key Blank Check=0
Sense Key Copy Aborted=0
Sense Key Aborted Command=0
Sense Key Volume Overflow=0
Sense Key Miscompare=0

```

Example 46-2 Displays SCSI Flow Services Statistics for a Specific SCSI Flow Identifier

```
switch# show scsi-flow statistics flow-id 4
```

```
Stats for flow-id 4 LUN=0x0000
```

```

-----
Read Stats
I/O Total count=2
I/O Timeout count=0
I/O Total block count=4
I/O Max block count=2
I/O Min response time=5247 usec
I/O Max response time=10160 usec
I/O Active Count=0

```

Write Stats

```

I/O Total count=199935
I/O Timeout count=0
I/O Total block count=12795840
I/O Max block count=64
I/O Min response time=492 usec
I/O Max response time=10056529 usec
I/O Active Count=16

```

Non Read-Write Stats

```
Test Unit Ready=4
```

```

Report LUN=38
Inquiry=50
Read Capacity=3
Mode Sense=0
Request Sense=0

Total Stats
Rx Frame Count=3792063
Rx Frame Byte Count=6549984752
Tx Frame Count=3792063
Tx Frame Byte Count=6549984752

Error Stats
SCSI Status Busy=0
SCSI Status Reservation Conflict=0
SCSI Status Task Set Full=0
SCSI Status ACA Active=0
Sense Key Not Ready=0
Sense Key Medium Error=0
Sense Key Hardware Error=0
Sense Key Illegal Request=0
Sense Key Unit Attention=28
Sense Key Data Protect=0
Sense Key Blank Check=0
Sense Key Copy Aborted=0
Sense Key Aborted Command=0
Sense Key Volume Overflow=0
Sense Key Miscompare=0

```

Field Descriptions for SCSI Flow Statistics

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.

