Configuring Fibre Channel Write Acceleration

This chapter describes the Fibre Channel Write Acceleration (FC-WA) feature, including how to enable the feature on Cisco NX-OS.

This chapter includes the following sections:

Information About Fibre Channel Write Acceleration

Fibre Channel Write Acceleration minimizes application latency or reduces transactions per second over long distances. For synchronous data replication, Fibre Channel Write Acceleration increases the distance of replication or reduces effective latency to improve performance. With this feature you can also configure the buffer count and change the number of 2-KB buffers reserved on the target side DPP for a SCSI flow.

To take advantage of this feature, both the initiator and target devices must be directly attached to an SSM.

The Fibre Channel Write Acceleration feature also allows the configuration of the buffer count. You can change the number of 2-KB buffers reserved on the target side DPP for a SCSI flow.

You can estimate the number of buffers to configure using the following formula:

(Number of concurrent SCSI writes * size of SCSI writes in bytes) / FCP data frame size in bytes

For example, HDS TrueCopy between HDS 9970s uses 1-KB FCP data frames. You perform an initial synchronization for a 16-LUN TrueCopy group with 15 tracks, or 768-KB per LUN, which requires approximately 16*(768*1024)/1024 or 12248 write buffers.

Note The Fibre Channel Write Acceleration feature requires the Enterprise Package license installed on both the initiator and target switches.

Note   The initiator and target cannot connect to the same Cisco MDS switch. Fibre Channel Write Acceleration requires that the initiator and target must each connect to an SSM module installed on different Cisco MDS switches.

Note   Fibre Channel Write Acceleration can only be provisioned on the entire SSM, not a group of interfaces on the SSM.

Licensing Requirements for Fibre Channel Write Acceleration

The following table shows the licensing requirements for Fibre Channel Write Acceleration:

License	License Description
ENTERPRISE_PKG	Fibre Channel Write Acceleration 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*.

Default Settings

Table 47-1 lists the default settings for Fibre Channel Write Acceleration parameters.

Table 47-1   Default Fibre Channel Write Acceleration Parameters

Parameters	Default
Fibre Channel Write Acceleration	Disabled
Fibre Channel Write Acceleration buffers	1024

Configuring Fibre Channel Write Acceleration

This section includes the following topics:

- Enabling Fibre Channel Write Acceleration section, page 47-2

Enabling Fibre Channel Write Acceleration

To enable Fibre Channel Write Acceleration, and optionally modify the number of Write Acceleration buffers, follow these steps:

	Command	Purpose

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

Step 2	`ssm enable feature scsi-flow module` *slot* **Example:** `switch(config)# ssm enable feature scsi-flow module 2`	Enables SCSI flow services on the SSM in slot 2. **Note** Fibre Channel Write Acceleration can only be configured on all interfaces on the SSM, not on groups of interfaces.
Step 3	`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.

Step 4	`scsi-flow distribute`
	Example:
	`switch(config)# scsi-flow distribute`
		Enables CFS distribution for the SCSI flow.
		
		Note No CFS configuration commit operation is required for SCSI flow. The SCSI flow manager uses CFS for target validation.

Step 5	`scsi-flow flow-id` *flow-id* `write-acceleration`
	Example:
	`switch(config)# scsi-flow flow-id 3 write-acceleration`
		Enables Fibre Channel Write Acceleration for SCSI flow identifier 3.

	`no scsi-flow flow-id 3 write-acceleration`
	Example:
	`switch(config)# no scsi-flow flow-id 3 write-acceleration`
		Disables SCSI flow Write Acceleration for SCSI flow identifier 3. The default is disabled.

Step 6	`scsi-flow flow-id` *flow-id* `write-acceleration buffer` *count* **Example:** `switch(config)# scsi-flow flow-id 3 write-acceleration buffer 2048`	Enables Fibre Channel Write Acceleration for SCSI flow identifier 3 and sets the number of buffers to 2048. The range is 1 to 40000.
	`no scsi-flow flow-id` *flow-id* `write-acceleration buffer` *count* **Example:** `switch(config)# no scsi-flow flow-id 3 write-acceleration buffer 1024`	Reverts to the default number of Write Acceleration buffers. The default is 1024.

To enable Fibre Channel Write Acceleration, and optionally modify the number of Write Acceleration buffers using the DCNM-SAN, follow these steps:

Step 1 Expand **End Devices** and then select **SSM Features** from 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 at this time by checking the **Enable Statistics** check box.

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

Step 6 Click **Create** to create this SCSI flow with Fibre Channel Write Acceleration.

Verifying Fibre Channel Write Acceleration

To display Fibre Channel Acceleration configuration information, perform one of the following tasks:

Command	Purpose
show scsi flow	Displays Fibre Channel Write Acceleration configuration for all SCSI flow identifiers.
show scsi-flow flow-id 3	Displays Fibre Channel Write Acceleration 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 Fibre Channel Write Acceleration Information

Use the **show scsi-flow** command to display information about the status of the Fibre Channel Write Acceleration configuration (see Example 47-1 and Example 47-2).

Example 47-1   Displays Fibre Channel Write Acceleration 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
          Statistics enabled
            Configuration Status:   success
```

Example 47-2   Displays Fibre Channel Write Acceleration 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 Fibre Channel Write Acceleration

This section includes the following topics:

- FCWA

- SSM

- Virtual Initiator

- FCWA Config Status

FCWA

Field	Description
Flow Id	Represents the flow identifier.
Init WWN	Represents the pWWN of the initiator in the flow.
Init VSAN	The VSAN ID of the initiator on which the flow is configured.
Target WWN	Represents the pWWN of the target in the flow.
TargetVSAN	The VSAN ID of the target on which the flow is configured.
WriteAcc	Specifies if write-acceleration feature is enabled for this flow. If set to true it is enabled. If set to false, it is disabled.
BufCount	It specifies the number of buffers to be used for write-acceleration.
Stats Enable	Specifies if the statistics gathering needs to be enabled for this flow. If set to true, then it is enabled. If it is set to false, then it is disabled.
Stats Clear	Assists in clearing the statistics for this flow.
Init Verification	The verification status of the initiator device corresponding to the SCSI flow.
Init Module	The status of the linecard where the SCSI flow initiator device is located.
Target Verification	The verification status of the target device corresponding to the SCSI flow.
Target Module	The status of the linecard where the SCSI flow target device is located.

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.

FCWA Config Status

Field	Description
Overall	The configuration status for write-acceleration feature for this flow.
Initiator	The initiator configuration status for write-acceleration feature for this flow.
Target	The target configuration status for write-acceleration feature for this flow.