Discovering SCSI Targets

This chapter describes the SCSI LUN discovery feature provided in switches in the Cisco MDS 9000 Family. It includes the following sections:

Information About SCSI LUN Discovery

Small Computer System Interface (SCSI) targets include disks, tapes, and other storage devices. These targets do not register logical unit numbers (LUNs) with the name server.

The name server requires LUN information for the following reasons:

- To display LUN storage device information so an NMS can access this information.
- To report device capacity, serial number, and device ID information.
- To register the initiator and target features with the name server.

The SCSI LUN discovery feature uses the local domain controller Fibre Channel address. It uses the local domain controller as the source FC ID, and performs SCSI INQUIRY, REPORT LUNS, and READ CAPACITY commands on SCSI devices.

The SCSI LUN discovery feature is initiated on demand, through CLI or SNMP. This information is also synchronized with neighboring switches, if those switches belong to the Cisco MDS 9000 Family.

This section includes the following topics:

About Starting SCSI LUN Discovery

SCSI LUN discovery is done on demand.

Only Nx ports that are present in the name server database and that are registered as FC4 Type = SCSI_FCP are discovered.

About Initiating Customized Discovery

Customized discovery consists of a list of VSAN and domain pairs that are selectively configured to initiate a discovery. The domain ID is a number from 0 to 255 in decimal or a number from 0x0 to 0xFF in hex.

Use the **custom-list** option to initiate this discovery.

Licensing Requirements for SCSI

The following table shows the licensing requirements for this feature:

Feature	License Requirement
ENTERPRISE _PKG	The enterprise license is required to enable the SCSI flow statistics. For a complete explanation of the licensing scheme, see the *Cisco MDS 9000 Family NX-OS Licensing Guide*.
FM_SERVER_ PKG	The Cisco DCNM for SAN Package is required to enable the traffic analyzer for SCSI flow statistics. For a complete explanation of the licensing scheme, see the *Cisco MDS 9000 Family NX-OS Licensing Guide*.

Discovering SCSI Targets

This section includes the following topics:

- Starting SCSI LUN Discovery section, page 20-3
- Initiating Customized Discovery section, page 20-3

Starting SCSI LUN Discovery

To start SCSI LUN discovery, follow one of these steps:

	Command	Purpose
Step 1	switch# **discover scsi-target local os all** discovery started	Discovers local SCSI targets for all operating systems (OS). The operating system options are **aix**, **all**, **hpux**, **linux**, **solaris**, or **windows**
	switch# **discover scsi-target remote os aix** discovery started	Discovers remote SCSI targets assigned to the AIX OS.

	switch# **discover scsi-target vsan 1 fcid 0x9c03d6**
	discover scsi-target vsan 1 fcid 0x9c03d6
	VSAN: 1 FCID: 0x9c03d6 PWWN:
	00:00:00:00:00:00:00:00
	  PRLI RSP: 0x01 SPARM: 0x0012
	  SCSI TYPE: 0 NLUNS: 1
	  Vendor: Company 4 Model: ST318203FC Rev: 0004
	  Other: 00:00:02:32:8b:00:50:0a
		Discovers SCSI targets for the specified VSAN (1) and FC ID (0x9c03d6).

	switch# **discover scsi-target custom-list os linux** discovery started	Discovers SCSI targets from the customized list assigned to the Linux OS.

To begin SCSI LUN discovery using Device Manager, follow these steps:

Step 1   Choose **FC > Advanced > LUN**s.

You see the LUN Configuration dialog box.

Step 2   Set StartDiscovery to local, remote or both.

Step 3   Choose the DiscoveryType and OS.

Step 4   Click **Apply** to begin discovery.

Initiating Customized Discovery

To initiate a customized discovery, follow one of these steps:

	Command	Purpose
Step 1	switch# **discover custom-list add vsan 1 domain 0X123456**	Adds the specified entry to the custom list.
	switch# **discover custom-list delete vsan 1 domain 0X123456**	Deletes the specified domain ID from the custom list.

To initiate a customized discovery using Device Manager, follow these steps:

Step 1   From the VSAN drop-down menu, select the VSAN in which you want to initiate a customized discovery.

Step 2   Click **FC > Advanced > LUNs**.

You see the LUN Configuration dialog box.

Step 3   Set StartDiscovery to local, remote or both.

Step 4   Fill in the DiscoveryType and OS fields.

Step 5   Click **Apply** to begin discovery.

Verifying SCSI Targets Configuration

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

Command	Purpose
show scsi-target status	Displays the Discovered Targets
show fcns database	Displays the FCNS Database
show scsi-target disk	Displays the Discovered Target Disks
show scsi-target lun os all	Displays the Discovered LUNs for All Operating Systems
show scsi-target lun os solaris	Displays the Discovered LUNs for the Solaris OS
show scsi-target pwwn	Displays the pWWNs for each OS
show scsi-target custom-list	Displays Customized Discovered Targets
show scsi-target auto-poll	Displays Automatically Discovered Targets

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

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Displaying SCSI LUN Information

Use the **show scsi-target** and **show fcns database** commands to display the results of the discovery. See Examples 20-1 to 20-8.

Example 20-1   Displays the Discovered Targets

```
switch# show scsi-target status
discovery completed
```

Note   This command takes several minutes to complete, especially if the fabric is large or if several devices are slow to respond.

Example 20-2   Displays the FCNS Database

```
switch# show fcns database

VSAN 1:
--------------------------------------------------------------------------
FCID        TYPE  PWWN                    (VENDOR)        FC4-TYPE:FEATURE
```

```
-------------------------------------------------------------------------
0xeb0000    N    21:01:00:e0:8b:2a:f6:54 (Qlogic)       scsi-fcp:init
0xeb0201    NL   10:00:00:00:c9:32:8d:76 (Emulex)       scsi-fcp:init

Total number of entries = 2

VSAN 7:
-------------------------------------------------------------------------
FCID       TYPE  PWWN                     (VENDOR)      FC4-TYPE:FEATURE
-------------------------------------------------------------------------
0xed0001    NL   21:00:00:04:cf:fb:42:f8 (Seagate)      scsi-fcp:target

Total number of entries = 1

VSAN 2002:
-------------------------------------------------------------------------
FCID       TYPE  PWWN                     (VENDOR)      FC4-TYPE:FEATURE
-------------------------------------------------------------------------
0xcafe00    N    20:03:00:05:30:00:2a:20 (Cisco)        FICON:CUP

Total number of entries = 1
```

Example 20-3   Displays the Discovered Target Disks

```
switch# show scsi-target disk
--------------------------------------------------------------------------------
VSAN   FCID      PWWN                    VENDOR    MODEL          REV
--------------------------------------------------------------------------------
1      0x9c03d6  21:00:00:20:37:46:78:97 Company 4 ST318203FC     0004
1      0x9c03d9  21:00:00:20:37:5b:cf:b9 Company 4 ST318203FC     0004
1      0x9c03da  21:00:00:20:37:18:6f:90 Company 4 ST318203FC     0004
1      0x9c03dc  21:00:00:20:37:5a:5b:27 Company 4 ST318203FC     0004
1      0x9c03e0  21:00:00:20:37:36:0b:4d Company 4 ST318203FC     0004
1      0x9c03e1  21:00:00:20:37:39:90:6a Company 4 ST318203 CLAR18 3844
1      0x9c03e2  21:00:00:20:37:18:d2:45 Company 4 ST318203 CLAR18 3844
1      0x9c03e4  21:00:00:20:37:6b:d7:18 Company 4 ST318203 CLAR18 3844
1      0x9c03e8  21:00:00:20:37:38:a7:c1 Company 4 ST318203FC     0004
1      0x9c03ef  21:00:00:20:37:18:17:d2 Company 4 ST318203FC     0004
```

Example 20-4   Displays the Discovered LUNs for All Operating Systems

```
switch# show scsi-target lun os all
ST336607FC from SEAGATE (Rev 0006)
FCID is 0xed0001 in VSAN 7, PWWN is 21:00:00:04:cf:fb:42:f8
--------------------------------------------------------------------------------
OS   LUN   Capacity Status  Serial Number   Device-Id
           (MB)
--------------------------------------------------------------------------------
WIN 0x0    36704    Online  3JA1B9QA00007338 C:1 A:0 T:3 20:00:00:04:cf:fb:42:f8
AIX 0x0    36704    Online  3JA1B9QA00007338 C:1 A:0 T:3 20:00:00:04:cf:fb:42:f8
SOL 0x0    36704    Online  3JA1B9QA00007338 C:1 A:0 T:3 20:00:00:04:cf:fb:42:f8
LIN 0x0    36704    Online  3JA1B9QA00007338 C:1 A:0 T:3 20:00:00:04:cf:fb:42:f8
HP  0x0    36704    Online  3JA1B9QA00007338 C:1 A:0 T:3 20:00:00:04:cf:fb:42:f8
```

Example 20-5   Displays the Discovered LUNs for the Solaris OS

```
switch# show scsi-target lun os solaris
ST336607FC from SEAGATE (Rev 0006)
FCID is 0xed0001 in VSAN 7, PWWN is 21:00:00:04:cf:fb:42:f8
```

```
--------------------------------------------------------------------------------
OS  LUN    Capacity Status  Serial Number    Device-Id
           (MB)
--------------------------------------------------------------------------------
SOL 0x0    36704    Online  3JA1B9QA00007338 C:1 A:0 T:3 20:00:00:04:cf:fb:42:f8
```

The following command displays the port WWN that is assigned to each OS (Windows, AIX, Solaris, Linux, or HPUX)

Example 20-6   Displays the pWWNs for each OS

```
switch# show scsi-target pwwn
------------------------------
OS    PWWN
------------------------------
WIN   24:91:00:05:30:00:2a:1e
AIX   24:92:00:05:30:00:2a:1e
SOL   24:93:00:05:30:00:2a:1e
LIN   24:94:00:05:30:00:2a:1e
HP    24:95:00:05:30:00:2a:1e
```

Example 20-7   Displays Customized Discovered Targets

```
switch# show scsi-target custom-list
---------------
VSAN   DOMAIN
---------------
1      56
```

Use the **show scsi-target auto-poll** command to verify automatic discovery of SCSI targets that come online. The internal uuid number indicates that a CSM or an IPS module is in the chassis.

Example 20-8   Displays Automatically Discovered Targets

```
switch# show scsi-target auto-poll
auto-polling is enabled, poll_start:0 poll_count:1 poll_type:0
USERS OF AUTO POLLING
---------------------
uuid:54
```

To display the results of the discovery using Device Manager, follow these steps:

Step 1   Choose **FC > Advanced > LUN**s

You see the LUN Configuration dialog box.

Step 2   Click the **LUN** tab or the **Targets** tab.

Field Descriptions for SCSI Targets

The following are the field descriptions for SCSI targets.

iSCSI Connection

Field	Description
LocalAddr	The local Internet network address used by this connection.
RemoteAddr	The remote Internet network address used by this connection.
CID	The iSCSI connection ID for this connection.
State	The current state of this connection, from an iSCSI negotiation point of view. • login— The transport protocol connection has been established, but a valid iSCSI login response with the final bit set has not been sent or received. • full—A valid iSCSI login response with the final bit set has been sent or received. • logout— A valid iSCSI logout command has been sent or received, but the transport protocol connection has not yet been closed.
MaxRecvDSLen	The maximum data payload size supported for command or data PDUs in use within this connection. The size is reported in bytes even though the negotiation is in 512K blocks.
SendMarker	Indicates whether or not this connection is inserting markers in its outgoing data stream.
HeaderDigest	The iSCSI header digest scheme in use within this connection.
DataDigest	The iSCSI data digest scheme in use within this connection.

iSCSI Initiators

Field	Description
Name or IP Address	A character string that is a globally unique identifier for the node represented by this entry.
VSAN Membership	The list of configured VSANs the node represented by this entry can access.
Dynamic	If true, then the node represented by this entry is automatically discovered.
Initiator Type	Indicates whether the node is a host that participates in iSCSI load-balancing.
Persistent Node WWN	If true, then the same FC address is assigned to the node if it were to be represented again in the FC domain with the same node name. Note that the node FC address is either automatically assigned or manually configured.
SystemAssigned Node WWNN	If true, the FC address is automatically assigned to this node. If false, then the FC address has to be configured manually.
Node WWN	The persistent FC address of the node.

Field	Description
Persistent Port WWN	If true, then the same FC address is assigned to the ports of the node if it were to be represented again in the FC domain with the same node name.
Port WWN	All the FC port addresses associated with this node.
AuthUser	This is the only CHAP user name that the initiator is allowed to log in with.
Target UserName	(Optional) The user name to be used for login. If you do not supply a username, the global user name is used.
Target Password	(Optional) The password to be used for login. If you do not supply a password, the global password is used.
Load Metric	A configured load metric of this iSCSI initiator for the purpose of iSCSI load balancing.
Auto Zone Name	The zone name that is used when the system creates automatic zone for this initiator's specific list of targets.

iSCSI Targets

Field	Description
Dynamically Import FC Targets	Check this option to dynamically import FC targets into the iSCSI domain. A target is not imported if it already exists in the iSCSI domain.
iSCSI Name	The iSCSI name of the node represented by this entry.
Dynamic	Indicates if the node represented by this entry was either automatically discovered or configured manually.
Primary Port WWN	The FC address for this target.
Secondary Port WWN	The optional secondary FC address for this target. This is the FC address used if the primary cannot be reached.
LUN Map iSCSI	The configured default logical unit number of this LU.
LUN Map FC Primary	The logical unit number of the remote LU for the primary port address.
LUN Map FC Secondary	The logical unit number of the remote LU for the secondary port address.
Initiator Access All	If true, then all the initiators can access this target even those which are not in the initiator permit list of this target. If false, then only initiators which are in the permit list are allowed access to this target.
Initiator Access List	Lists all the iSCSI nodes that are permitted to access the node represented by this entry. If AllAllowed is false and the value of List is empty, then no initiators are allowed to access this target.
Advertised Interfaces	Lists all the interfaces on which the target could be advertised.

Field	Description
Trespass Mode	The trespass mode for this node. Every iSCSI target represents one or more port(s) on the FC target. If true, the node instructs the FC node to present all LUN I/O requests to secondary port if the primary port is down.
RevertToPrimaryPort	Indicates if it is required to revert back to primary port if the FC target comes back online.

iSCSI Session Initiators

Field	Description
Name or IP Address	The name or IP address of the initiator port.
Alias	The initiator alias acquired at login.

iSCSI Global

Field	Description
AuthMethod	The authentication method.
InitiatorIdleTimeout	The time for which the gateway (representing a FC target) waits from the time of last iSCSI session to a iSCSI initiator went down, before purging the information about that iSCSI initiator.
iSLB ZonesetActivate	Checking this option performs automatic zoning associated with the initiator targets
DynamicInitiator	This field determines how dynamic iSCSI initiators are created. Selecting the iSCSI option (default) creates dynamic iSCSI initiators. If you select iSLB then the an iSLB dynamic initiator is created. Selecting the deny option does not allow dynamic creation of the initiators.
Target UserName	The default user name used for login. If an initiator user name is specified, that user name is used instead.
Target Password	The default password used for login. If an initiator password is specified, that password is used instead.

iSCSI Session Statistics

Field	Description
PDU Command	The count of Command PDUs transferred on this session.
PDU Response	The count of Response PDUs transferred on this session.
Data Tx	The count of data bytes that were transmitted by the local iSCSI node on this session.

Field	Description
Data Rx	The count of data bytes that were received by the local iSCSI node on this session.
Errors Digest	Authentication errors.
Errors CxnTimeout	Connection timeouts.

iSCSI iSLB VRRP

Field	Description
VrId, IpVersion	The virtual router number and the IP version (IPv4, IPv6, or DNS).
Load Balance	Indicates whether load balancing is enabled.

iSCSI Initiator Access

Field	Description
Initiator Name	The iSCSI node name.

iSCSI Initiator PWWN

Field	Description
Port WWN	The FC address for this entry.

iSCSI Sessions

Field	Description
Type	Type of iSCSI session: • normal—Session is a normal iSCSI session • discovery—Session is being used only for discovery.
TargetName	If Direction is Outbound, this will contain the name of the remote target.
Vsan ID	The VSAN to which this session belongs to.
ISID	The initiator-defined portion of the iSCSI session ID.
TSIH	The target-defined identification handle for this session.

iSCSI Sessions Detail

Field	Description
ConnectionNumber	The number of transport protocol connections that currently belong to this session.
ImmediateData	Whether the initiator and target have agreed to support immediate data on this session.
Initial	If true, the initiator must wait for a Ready-To-Transfer before sending to the target. If false, the initiator may send data immediately, within limits set by FirstBurstSize and the expected data transfer length of the request.
MaxOutstanding	The maximum number of outstanding Ready-To-Transfers per task within this session.
First	The maximum length supported for unsolicited data sent within this session.
Max	The maximum number of bytes which can be sent within a single sequence of Data-In or Data-Out PDUs.
Sequence	If false, indicates that iSCSI data PDU sequences may be transferred in any order. If true indicates that data PDU sequences must be transferred using continuously increasing offsets, except during error recovery.
PDU	If false, iSCSI data PDUs within sequences may be in any order. If true indicates that data PDUs within sequences must be at continuously increasing addresses, with no gaps or overlay between PDUs.

Additional References

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

- Related Document section, page 20-11
- Standards section, page 20-11
- RFCs section, page 20-12
- MIBs section, page 20-12

Related Document

Related Topic	Document Title
Cisco MDS 9000 Family Command Reference	*Cisco MDS 9000 Family Command Reference*

Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	–

RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified.	–

MIBs

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