Getting Started

The chapter explains the tasks required to set up and configure each building block of your system to run SVC for Switches. You will be performing these tasks using one or more Cisco MDS 9000 Family switches for setup and configuration. You may wish to have your Cisco and IBM documentation handy for reference to more detailed procedures.

This chapter includes the following sections:

Preparing the Cisco MDS Switch

To prepare for both hardware and software setup, be sure you have the following in place before getting started:

- Installed and functioning Cisco MDS 9000 Family switch fabric. Each Cisco MDS 9000 Family switch needs a switch IP (mgmt0, one for each switch).

✎
Note Refer to the *Cisco MDS [9216 Switch* or the *Cisco MDS 9500] Series Hardware Installation Guide*s, and the *Cisco MDS 9000 Family Configuration Guide*.

- One IP address for each SVC cluster for management purposes. This should be in the same subnet as the management IP address of the switches across which the cluster spans.

Setting Up the Cisco MDS Switch

This section explains the process to set up a new, or update an existing MDS 9000 Family switch in preparation for the SVC.

Before setting up your hardware, ensure you have correctly installed the Cisco MDS chassis and its components as specified in "Chapter 2: Installing the Cisco MDS 9000 Family Switch" in the *Cisco MDS [9216 Switch* or the *Cisco MDS 9500] Series Hardware Installation Guide*s.

⚠
Caution Be sure to save your work frequently using the **copy running-config startup-config** command.

⚠
Warning **The SVC functionality is only available when CSM modules are present in the switch. If you issue a copy running startup command when all CSM modules are removed (or powered-down), then SVC supervisor configurations associated with the CSM module, including world wide name (WWNs), may be discarded.**

Setting Up a New Cisco MDS Switch

To set up a new Cisco MDS 9000 Family switch, follow these steps.

Step 1 Follow instructions for preinstallation, installing the chassis in the rack, grounding the chassis, installing modules, installing CompactFlash cards, installing Power Supplies, and installing the Fan Assembly as specified in the *Cisco MDS [9216 Switch* or the *Cisco MDS 9500] Series Hardware Installation Guide*s.

Step 2 Connect to the supervisor module as specified in "Chapter 3: Connecting the Cisco MDS 9000 Family Switch" in the *Cisco MDS [9216 Switch* or the *Cisco MDS 9500] Series Hardware Installation Guide*s.

Step 3 Login to the Cisco MDS 9000 Family switch using the Cisco MDS 9000 Family CLI.

Step 4 Configure the switch as specified in "Chapter 3: Initial Configuration" in the *Cisco MDS 9000 Family Configuration Guide*.

    a. Perform the initial setup routine.

    b. Assign a switch name.

c. Access the switch.

After reviewing the default configuration, you can change it or perform other configuration or management tasks. The initial setup can only be performed at the Command-Line Interface (CLI). However, you can continue to configure other software features, or access the switch after initial configuration by using either the CLI, or the Fabric Manager GUIs.

Tip The Cisco Fabric Manager provides an alternative to the CLI for most switch configuration commands. To use the Cisco MDS 9000 Fabric Manager, refer to the *Cisco MDS 9000 Family Fabric Manager User Gui*de. To use the CLI, refer to the *Cisco MDS 9000 Family Configuration Gui*de.

Note The rest of this procedure uses the Cisco CLI to configure the switch.

Step 5 Verify the module status as specified in "Chapter 3: Initial Configuration" in the *Cisco MDS 9000 Family Configuration Guid*e.

Step 6 Configure the management port as specified in "Chapter 3: Initial Configuration" in the *Cisco MDS 9000 Family Configuration Guid*e.

Updating an Existing Cisco MDS Switch

Note These steps assume you have a remote FTP, TFTP, SFTP, or SCP server that contains the SVC image.

Caution Be sure to save your work frequently using the **copy running-config startup-config** command.

To update a existing Cisco MDS switch, follow these steps.

Step 1 Login to the Cisco MDS switch using the Cisco MDS 9000 Family CLI.

Note Refer to the *www.cisco.com* web site to verify compatibility issues, or the appropriate MDS 9000 Family release notes to ensure your system and setup meets the minimum requirements, or images will not install properly.

Step 2 Install the new image on each SVC node in each module in the fabric. Each module has two nodes.

```
switch# install module 2 node 1 image svc-system
ftp://171.71.188.111/m9000-ek9-csm-svc-mz.1.3.1.bin
For ftp://171.71.188.111, please enter user name:user
For ftp://user@171.71.188.111, please enter password:
SVC reimage going on. Please wait
m9000-ek9-csm-svc-mz.1.3.1.bin     100% |****************************| 45408 KB    00:53
svc 2/1 software reimage succeeded

switch# install module 2 node 2 image svc-system
ftp://171.71.188.111/m9000-ek9-csm-svc-mz.1.3.1.bin
For ftp://171.71.188.111, please enter user name:user
```

```
For ftp://user@171.71.188.111, please enter password:
SVC reimage going on. Please wait
m9000-ek9-csm-svc-mz.1.3.1.bin    100% |****************************| 45408 KB    00:55
svc 2/2 software reimage succeeded
```

All prior information on the node is lost with each install.

Step 3   Verify that the CSM node booted successfully, by issuing the **show module** command.

```
switch# show module
Mod  Ports  Module-Type                     Model              Status
---  -----  ------------------------------- ------------------ ------------
2    0      Caching Services Module         DS-X9560-SMC   ok  <---------- CSM
4    8      IP Storage Services Module      DS-X9308-SMIP      ok
5    0      Supervisor/Fabric-1             DS-X9530-SF1-K9    active *
6    0      Supervisor/Fabric-1             DS-X9530-SF1-K9    ha-standby


Mod  Sw          Hw      World-Wide-Name(s) (WWN)
---  ----------- ------  ---------------------------------------------------
2    1.3(1)      0.3     --
4    1.3(1)      0.206   20:c1:00:05:30:00:a7:9e to 20:c8:00:05:30:00:a7:9e
5    1.3(1)      0.0     --
6    1.3(1)      0.0     --


Mod      Application Image Description     Application Image Version
-------- ----------------------------     ------------------------
2        svc-node1                        1.3(1) <-------Node one on the CSM
2        svc-node2                        1.3(1) <-------Node two on the CSM


Mod  MAC-Address(es)                       Serial-Num
---  ------------------------------------- ----------
2    00-05-30-00-93-e2 to 00-05-30-00-93-e6  JAB06xxxx10
4    00-05-30-00-9d-de to 00-05-30-00-9d-ea  JAB064605aa
5    00-05-30-00-52-f2 to 00-05-30-00-52-f6
6    00-05-30-00-53-3e to 00-05-30-00-53-42

* this terminal session
```

Tip   The initial setup can only be performed at the CLI. You can continue to configure other software features, or access the switch after initial configuration by using either the CLI or the Device Manager and Fabric Manager GUIs. To use the Cisco MDS 9000 Fabric Manager, refer to the *Cisco MDS 9000 Family Fabric Manager User Guide*.

SVC Role Authorization

By default, two roles exist in all Cisco MDS switches:

- SVC administrator (**svc-admin**)— Has permission to view the entire configuration and make SVC-specific configuration changes within the `switch(svc)` prompt.

- SVC operator (**svc-operator**)—Has permission to view the entire configuration. The operator cannot make any configuration changes.

The two default roles cannot be changed or deleted.

Understanding SVC Terminology

This section defines frequently-used SVC terms that are necessary to proceed with the configuration process (see).

Figure 2-1   Graphical Representation of SVC Terms
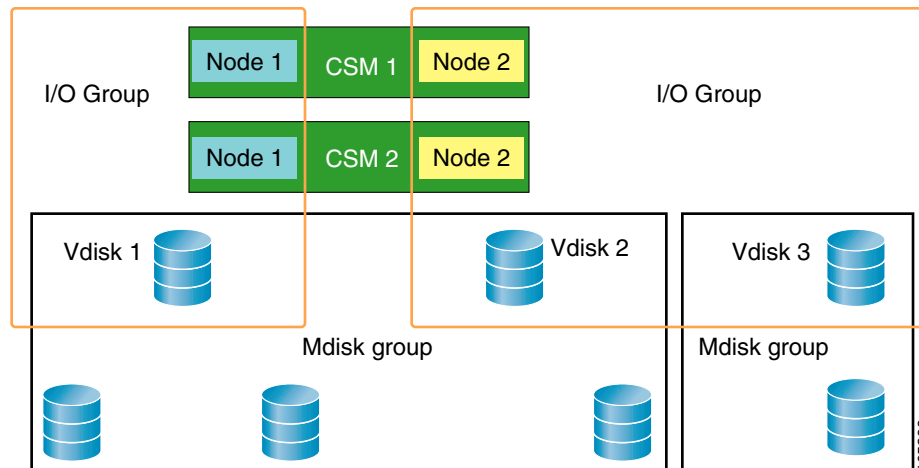
Node

An instance of SVC that is running in the CSM. A CSM consists of two completely independent nodes. Each node is represented by an interface.

I/O group

SVC nodes are always used in pairs. A pair of SVC nodes is called an I/O group. The nodes in a given I/O group must reside in two separate CSMs. An I/O group acts as a storage controller in the fabric.

Cluster

A cluster can contain multiple I/O groups. All nodes in the cluster must run the same SVC image version. The IP address for a cluster must be assigned in the same subnet as the management interface.

MDisk

A representation of back end storage. Each cluster is configured so all the nodes in a cluster see the same set of MDisks.

VDisk

A virtual representation of a LUN that is exposed by the cluster to the hosts in a SAN. Each VDisk is independently associated with a single I/O group.

MDisk Group

A set of MDisks form a MDisk group. Storage for a VDisk originates from MDisks in a single MDisk group.

Host

One of more initiator Fibre Channel ports (pWWNs) form a host. A host is mapped to one or more VDisks. Hosts cannot directly access a MDisk.

Separating Hosts and Storage Devices

In order for SVC to virtualize the back-end storage to hosts, you must ensure that the hosts do not directly access the storage. You can separate hosts or disks using the concept of VSANs. The VSAN feature is specific to Cisco MDS 9000 Family switches. Alternatively, you can also use zones to separate hosts or disks.

Refer to the *Cisco MDS 9000 Family Configuration Guide* for further information on VSANs or zones.

Each SVC interface is assigned a nWWN. A SVC interface consists of three N-ports:

- Target N-ports: used for traffic between SVC nodes and hosts.
- Initiator N-ports: used for traffic between SVC nodes and disks
- Management N-ports: used for traffic to and from other SVC nodes.

Each N-port within an SVC interface is assigned a port World Wide Name (pWWN). The pWWNs and node World Wide Names (nWWNs) are preserved across switch reboots (see Figure 2-2).
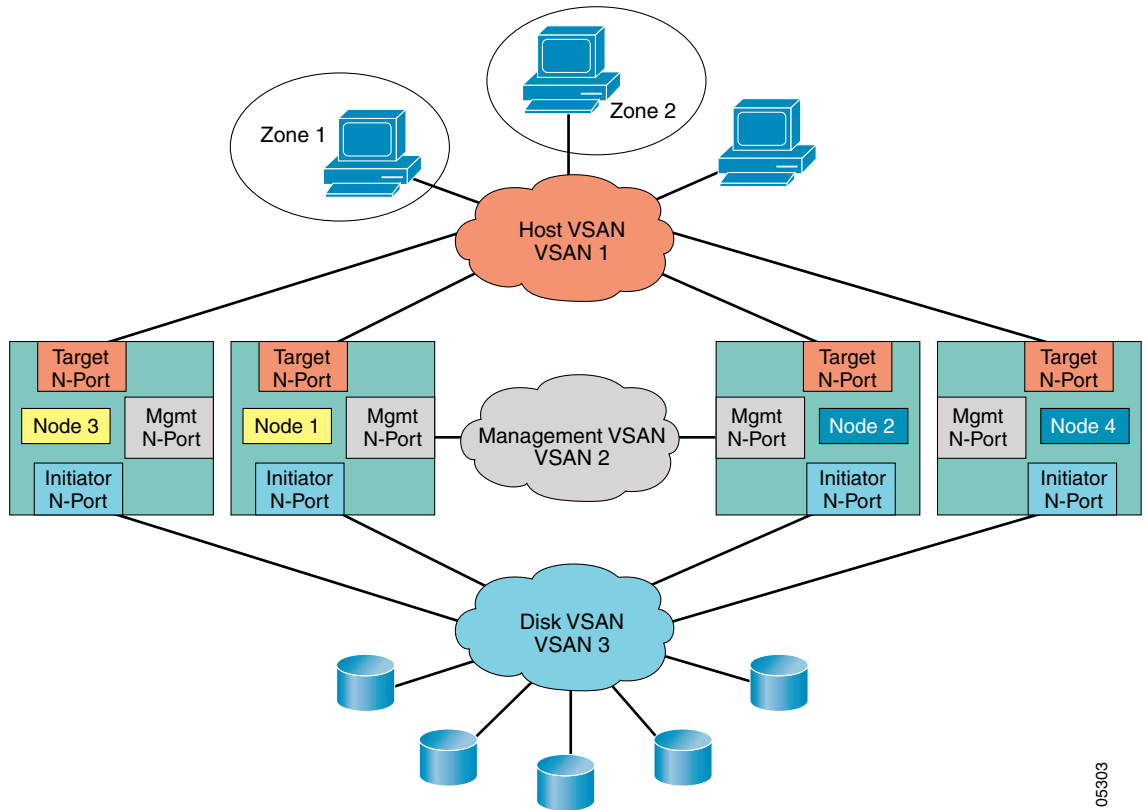
Figure 2-2   Logical Representation of an SVC Interface
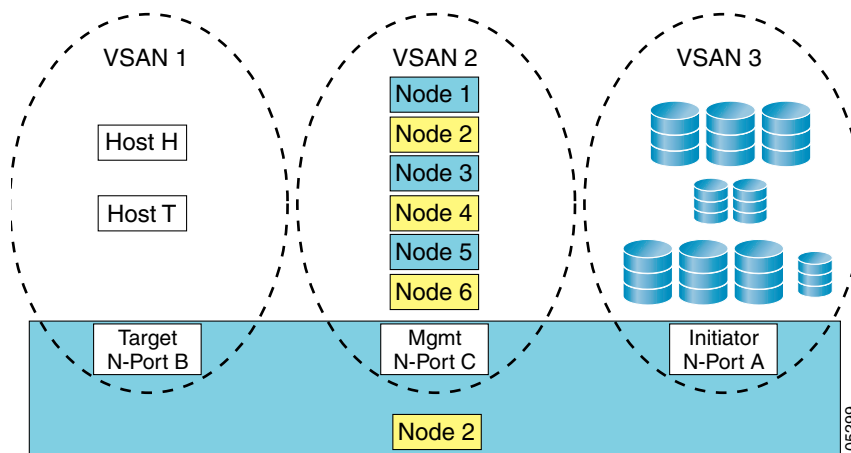
In Figure 2-3, provides a logical view of four SVC nodes in a SAN. These nodes are configured so the hosts do not have direct access to the disks.

By default, all N-ports reside in VSAN 1. You must explicitly remove them when necessary.

Figure 2-3   Logical Representation of a SAN

To configure a SVC interface and N-port VSANs in a Cisco MDS switch, follow these steps:

	Command	Purpose
Step 1	switch# **config t** switch(config)#	Enters configuration mode.
Step 2	switch(config)# **interface svc 2/1** switch(config-if)#	Enters the configuration mode for SVC interface 2/1.
Step 3	switch(config-if)# **initiator vsan 3**	Configures the initiator VSAN 3 for disks.
	switch(config-if)# **no initiator vsan 1**	Removes VSAN 1
Step 4	switch(config-if)# **target vsan 1**	Configures the target VSAN 1 for hosts.
Step 5	switch(config-if)# **mgmt vsan 2**	Configures the management VSAN 2 for nodes.
Step 6	switch(config-if)# **no mgmt vsan 1**	Removes VSAN 1.
Step 7	switch(config-if)# **no shutdown**	Enables the SVC interface.

Verifying Interface Connectivity

This section lists the show commands that help verify the SVC interface state and the N-port association with the SVC interface.

Example 2-1   Displays Information for A Specified SVC Interface

```
switch# show interface svc 2/1
svc2/1 is up
    Node WWN is 2e:ab:00:05:30:00:1a:e0
    Fabric WWN is 20:01:00:05:30:00:1a:de
    Target N-port WWN is 2e:a5:00:05:30:00:1a:e0, vsan is 1, FCID is 0xe80003
    Initiator N-port WWN is 21:2e:00:05:30:00:00:21, vsan is 3, FCID is 0xea0004
    Mgmt N-port WWN is 2f:af:00:05:30:00:1a:e0, vsan is 2, FCID is 0xe80000
    5 minutes input rate 2392 bits/sec, 299 bytes/sec, 0 frames/sec
    5 minutes output rate 2240 bits/sec, 280 bytes/sec, 0 frames/sec
      272 frames input, 89764 bytes
        0 discards, 0 errors
      232 frames output, 84176 bytes
        0 discards, 0 errors
```

Example 2-2   Displays N-port Connections for a Specified SVC Interface

```
switch# show svc session svc 2/1
svc2/1:
    Target N-port WWN is 2e:a5:00:05:30:00:1a:e0, vsan is 1, FCID is 0xe80003
      pWWN 21:01:00:e0:8b:31:20:31, nWWN 20:01:00:e0:8b:31:20:31, FCID 0xe80200
      pWWN 21:00:00:e0:8b:11:29:31, nWWN 20:00:00:e0:8b:11:29:31, FCID 0xe80300
    Initiator N-port WWN is 21:2e:00:05:30:00:00:21, vsan is 3, FCID is 0xea0004
      pWWN 50:05:07:63:00:c8:9c:f9, nWWN 50:05:07:63:00:c0:9c:f9, FCID 0xea0000
      pWWN 50:05:07:63:00:c8:9c:fa, nWWN 50:05:07:63:00:c0:9c:fa, FCID 0xea0001
    Mgmt N-port WWN is 2f:af:00:05:30:00:1a:e0, vsan is 2, FCID is 0xe80000
      pWWN 2f:b9:00:05:30:00:1a:e0, nWWN 2f:b7:00:05:30:00:1a:e0, FCID 0xe80002
      pWWN 2f:ba:00:05:30:00:1a:e0, nWWN 2e:b3:00:05:30:00:1a:e0, FCID 0xe80003
      pWWN 2f:b8:00:05:30:00:1a:e0, nWWN 2e:ac:00:05:30:00:1a:e0, FCID 0xe80001
```

Example 2-3   Displays the FCNS Database

```
switch# show fcns database
VSAN 1:
--------------------------------------------------------------------------
FCID         TYPE  PWWN                    (VENDOR)        FC4-TYPE:FEATURE
--------------------------------------------------------------------------
0xe80000     N    2e:a8:00:05:30:00:1a:e0 (Cisco)         scsi-fcp:target svc
0xe80003     N    2e:a5:00:05:30:00:1a:e0 (Cisco)         scsi-fcp:target svc
0xe80200     N    21:01:00:e0:8b:31:20:31 (QLogic)        scsi-fcp:init
0xe80300     N    21:00:00:e0:8b:11:29:31 (QLogic)        scsi-fcp:init
Total number of entries = 4

VSAN 2:
--------------------------------------------------------------------------
FCID         TYPE  PWWN                    (VENDOR)        FC4-TYPE:FEATURE
--------------------------------------------------------------------------
0xe80000     N    2f:af:00:05:30:00:1a:e0 (Cisco)         scsi-fcp:both svc
0xe80001     N    2f:b8:00:05:30:00:1a:e0 (Cisco)         scsi-fcp:both svc
Total number of entries = 2

VSAN 3:
--------------------------------------------------------------------------
FCID         TYPE  PWWN                    (VENDOR)        FC4-TYPE:FEATURE
```

```
----------------------------------------------------------------------
0xea0000   N     50:05:07:63:00:c8:9c:f9 (IBM)        scsi-fcp:target fc..
0xea0001   N     50:05:07:63:00:c8:9c:fa (IBM)        scsi-fcp:target fc..
0xea0002   N     21:2e:00:05:30:00:00:23 (Cisco)      scsi-fcp:init svc
Total number of entries = 3
```
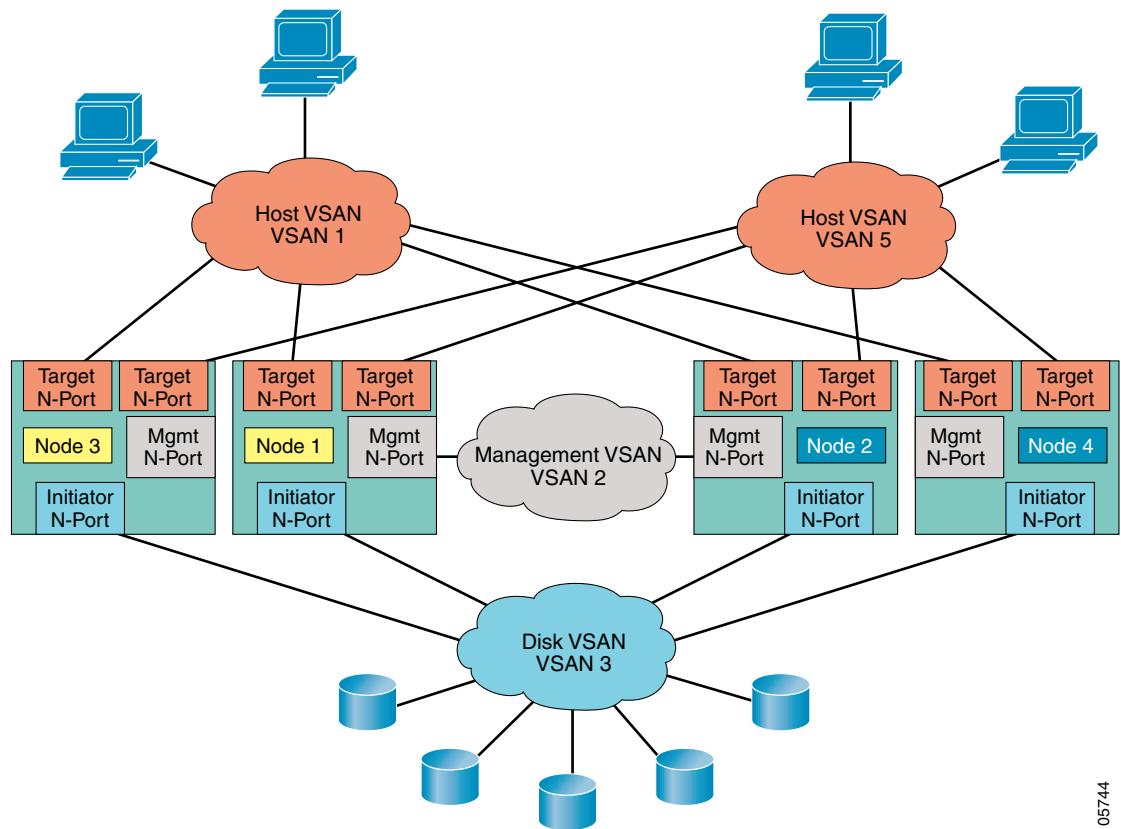
Assigning VSAN Numbers

When configuring SVC interfaces and N-port VSANs, the VSAN number can be any number from 1 to 4096. Only 64 VSANs for all initiator/mgmt/target (in total) are allowed—you can have initiator in VSANs 1-30, target in VSANs 31-60, and mgmt in VSANs 61-64). If the target, inititator, and mgmt overlap in any VSAN, each overlap is also included in the total VSAN count. A mgmt N-port can only exist in 4 of these 64 VSANs.

Multiple Initiators and Targets

You can create multiple N-ports for any SVC interface in different VSANs (see Figure 2-1).

Figure 2-4   Graphical Representation of SVC Terms