

CHAPTER 3

MDS 9000 Core with Brocade Edge Topology (Interop Mode 1)

This chapter describes how to set up a basic core-edge topology with two MDS 9000 switches configured for interop mode 1 at the core and three Brocade switches at the edge. All devices are connected to the edge switches. However, all traffic must flow through the core switch to reach its destination.

This chapter includes the following sections:

- Specifications, page 3-1
- Expected Topology Behavior, page 3-2
- Configuration, page 3-4
- Verification, page 3-9
- Zoning, page 3-20

Specifications

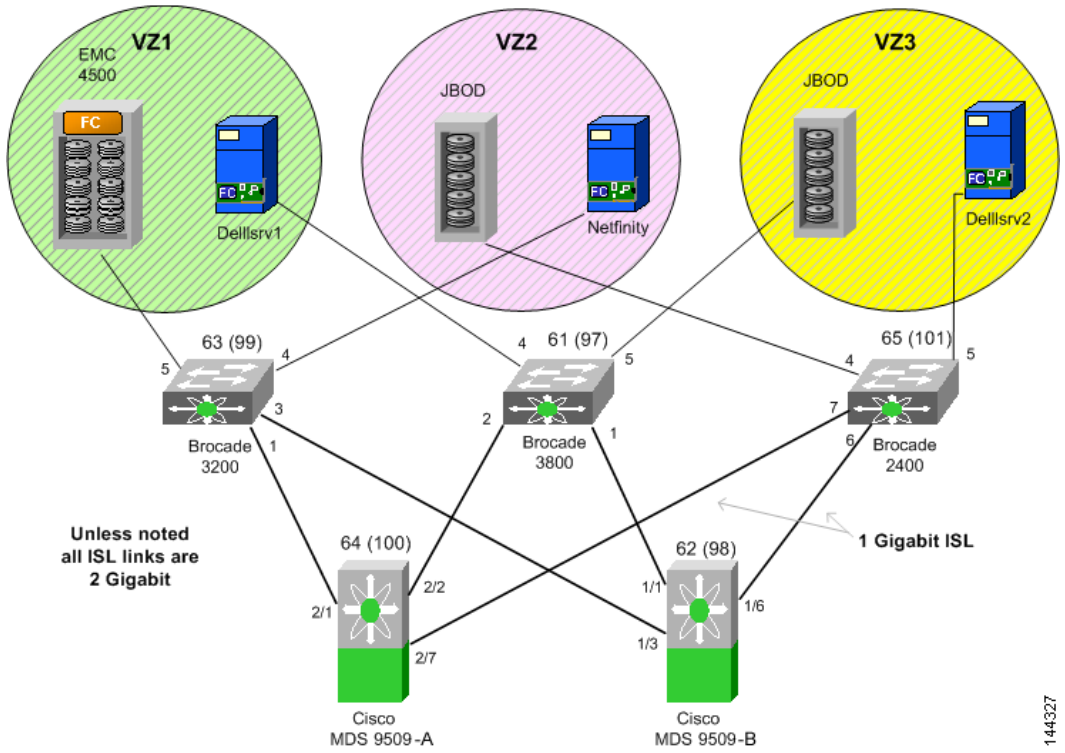
The following switches and code levels were used for this example configuration:

- MDS 9509 running SAN-OS Release 1.0(1)
- Brocade 3800 Version 3.0.2
- Brocade 3200 Version 3.0.2
- Brocade 2400 Version 2.4.1h

Figure 3-1 shows the topology used for this example configuration.

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Figure 3-1 Dual MDS 9509 Core with Brocade Edge Topology



Expected Topology Behavior

This section covers the Fibre Channel services and features that act differently in this topology (Figure 3-1) as compared to a homogeneous, single-vendor implementation. It covers the specifics that relate to this topology as outlined in the Fibre Channel Features Affected by Interoperability section in Chapter 1, "Interoperability Overview" on page 1-2.

This section includes the following topics:

- Zoning, page 3-2
- FSPF, page 3-3
- Trunking and PortChannels, page 3-3
- Domain IDs, page 3-3

Zoning

All zone members will be pWWNs in the core-edge topology using standard interop mode because the Brocade domain/port nomenclature is not a valid form (per the FC standard). When a zone set (or configuration in Brocade terminology) is made at the core, the zone merge request reaches all switches at the same time because all the switches are one hop away (except for the other core switch which is two hops away).

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The Brocade edge switches provide all of the zone security because the MDS 9000 switch does not check the source or destination of the frame when traversing E ports. Brocade switches only check the zoning information on the egress port of the fabric.

Note After two active zone sets successfully merge, always copy the active zone set to the full zone set database prior to modifying it on the MDS 9000 switch.

FSPF

All links within the topology appear with the link cost of 500, except for the two paths leading to the Brocade 2400. These paths are running at 1 Gbps and appear with a cost of 1000.

The Brocade switches load balance their routes using source/destination; the ingress edge switch uses the same core switch for all traffic that has the same source/destination pair. If the Brocade switch could load balance using source/destination/ox-id, then it could choose either of the two core switches for the route through the fabric. The two-level core does not allow the MDS 9000 switch, which can load balance using source/destination/ox-id, to load balance across multiple edge switches.

Trunking and PortChannels

The lack of MDS 9000 switch-to-MDS 9000-switch connections prohibit the topology from containing TE ports or PortChannels. While in interop mode, the Brocade switches do not support trunked ports of any type. Only standard E ports are used for the ISLs.

Domain IDs

The domain IDs are restricted to the 97 to 127 range to reflect McData's inability to use IDs outside of that range. A McData switch is not present in this configuration, but the decision to have a single interoperability mode for the Brocade and MDS 9000 switch causes this side effect. While Brocade switches and MDS 9000 switches can handle domain IDs outside of this range, their implementation of interoperability mode includes this limitation.

Domain ID modifications can be handled in two ways, disruptively or nondisruptively:

- **Disruptive**—This event impacts the entire switch. When changing domain IDs, Brocade requires the entire switch to be taken offline and/or rebooted.
- **Nondisruptive**—This event is limited to the VSAN where the event is taking place. Only the MDS 9000 switch can perform this action, as the domain manager process for this VSAN is restarted and not the entire switch. This restart requires any devices logged into the VSAN to log into the fabric again to obtain a new FC ID.

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Configuration

This section describes the configuration process and includes the following topics:

- Configuring the MDS 9509 Switch, page 3-4
- Configuring the Brocade 3800 Switch, page 3-5
- Configuring the Brocade 3200 Switch, page 3-6
- Configuring the Brocade 2400 Switch, page 3-8

Configuring the MDS 9509 Switch

Follow these steps to configure the first MDS 9509 switch (MDS 9509-A) in the example.

Step 1 Place the VSAN of the E port(s) that connects to the OEM switch in interoperability mode.

```
MDS9509# config t
MDS9509(config)# vsan database
MDS9509(config-vsan-db)# vsan 1 interop
```

Step 2 Assign a domain ID in the range of 97 (0x61) through 127 (0x7F). This is a limitation imposed by the McData switches. In interop mode, the fabric is limited to a total of 31 switches. In the MDS 9509 switch, the default is to request an ID from the principal switch. If the preferred keyword is used, the MDS 9509 switch requests a specific ID, but still joins the fabric if the principal switch assigns a different ID. If the static keyword is used, the MDS 9509 switch does not join the fabric unless the principal switch agrees and assigns the requested ID.

```
MDS9509# config t
MDS9509(config)# fcdomain domain 100 preferred vsan 1
```

Step 3 Change the Fibre Channel timers if they have been changed from the system defaults. The FC error detect (ED_TOV) and resource allocation (RA_TOV) timers for MDS 9000 switches, Brocade, and McData switches, default to the same values. The RA_TOV defaults to 10 seconds, and the ED_TOV defaults to 2 seconds. These values can be changed. According to the FC-SW2 standard, these timer values must be the same on each switch in the fabric.

```
MDS9509# config t
MDS9509(config)# fctimer e_d_tov ?
  <1000-100000>  E_D_TOV in milliseconds(1000-100000)

MDS9509(config)# fctimer r_a_tov ?
  <5000-100000>  R_A_TOV in milliseconds(5000-100000)
```

Step 4 After making changes to the domain, restart the MDS 9000 switch domain manager function for the altered VSAN. To do this, suspend and then resume the VSAN:

```
MDS9509(config)# vsan database
MDS9509(config-vsan-db)# vsan 1 suspend
MDS9509(config-vsan-db)# no vsan 1 suspend
```

Configuring the second MDS 9509 switch (MDS 9509-B) in interoperability mode follows the same procedure as the first with the exception of choosing a different preferred domain ID.

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Follow these steps to configure the second MDS 9509 switch (MDS 9509-B) in the example.

Step 1 Place the VSAN of the E port(s) that connects to the OEM switch in interoperability mode.

```
MDS9509B# config t
MDS9509B(config)# vsan database
MDS9509B(config-vsan-db)# vsan 1 interop
```

Step 2 Assign a domain ID in the range of 97 (0x61) through 127 (0x7F).

```
MDS9509B# config t
MDS9509B(config)# fcdomain domain 98 preferred vsan 1
```

Step 3 Change the Fibre Channel timers if they have been changed from the system defaults. According to the FC-SW2 standard, these values must be the same on each switch in the fabric.

```
MDS9509B# config t
MDS9509B(config)# fctimer e_d_tov ?
  <1000-100000>  E_D_TOV in milliseconds(1000-100000)

MDS9509B(config)# fctimer r_a_tov ?
  <5000-100000>  R_A_TOV in milliseconds(5000-100000)
```

Step 4 Restart the MDS 9000 switch domain manager function for the altered VSAN. To do this, suspend and then resume the VSAN.

```
MDS9509(config)# vsan database
MDS9509(config-vsan-db)# vsan 1 suspend
MDS9509(config-vsan-db)# no vsan 1 suspend
```

Configuring the Brocade 3800 Switch

Follow these steps to configure the Brocade 3800 switch in interoperability mode.

Step 1 Disable the switch. This is a disruptive process.

```
B3800_IBM_SAN:admin> switchdisable
```

Step 2 Enter the configuration dialog.

```
B3800_IBM_SAN:admin> configure

Configure...

Fabric parameters (yes, y, no, n): [no] y

Domain: (1..239) [1] 97  <==== Assign domain id in the 97-127 range
BB credit: (1..27) [16]
R_A_TOV: (4000..120000) [10000]  <==== Must match other switches in the fabric
E_D_TOV: (1000..5000) [2000]  <==== Must match other switches in the fabric
WAN_TOV: (0..2000) [0]
MAX_HOPS: (7..13) [7]
WAN_RTT_DLY_MAX: (0..9500) [200]
Data field size: (256..2112) [2112]
Sequence Level Switching: (0..1) [0]
Disable Device Probing: (0..1) [0]
Suppress Class F Traffic: (0..1) [0]
SYNC IO mode: (0..1) [0]
VC Encoded Address Mode: (0..1) [0]
Core Switch PID Format: (0..1) [0]
```

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```
Per-frame Route Priority: (0..1) [0]
Long Distance Fabric: (0..1) [0]

Virtual Channel parameters (yes, y, no, n): [no]
Zoning Operation parameters (yes, y, no, n): [no]
RSCN Transmission Mode (yes, y, no, n): [no]
NS Operation Parameters (yes, y, no, n): [no] y

Pre-zoned responses Mode
(0 = Standard Mode, 1 = Pre-zoning On): (0..1) [0]  <==== Confirm standard mode

  Arbitrated Loop parameters (yes, y, no, n): [no]
  System services (yes, y, no, n): [no]
  Portlog events enable (yes, y, no, n): [no]
Committing configuration...done.
```

Step 3 Disable platform management services. Failure to disable this service isolates E ports that connect to non-Brocade switches:

```
B3800_IBM_SAN:admin> msPlMgmtDeactivate
This will erase all Platform entries. Are you sure?  (yes, y, no, n): [no] y
Committing configuration...done.
Request Fabric to Deactivate Platform Management services....
Done.
```

Step 4 Set interoperability mode to on at the command line and then reboot.

```
B3800_IBM_SAN:admin> interopmode 1 <==== Set interop mode on
Committing configuration...done.
interopMode is 1
NOTE: It is recommended that you boot this switch for this change to take effect
```

Note Do not ignore this warning message. Anomalies were experienced that required a switch reboot.

```
B3800_IBM_SAN:admin> fastboot
```

To return to non-interop mode, you must disable the switch. Reconfigure the switch and set interoperability mode equal to 0, and then reboot.

Configuring the Brocade 3200 Switch

Follow these steps to configure the Brocade 3200 switch in interoperability mode.

Step 1 Disable the switch. This is a disruptive process.

```
3200_TOP:admin> switchdisable
```

Step 2 Enter the configuration dialog.

```
3200_TOP:admin> configure

Configure...

Fabric parameters (yes, y, no, n): [no] y

Domain: (1..239) [1] 99   <==== Assign domain id in the 97-127 range
BB credit: (1..27) [16]
```

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```
R_A_TOV: (4000..120000) [10000]  <==== Must match other switches in the fabric
E_D_TOV: (1000..5000) [2000]  <==== Must match other switches in the fabric
WAN_TOV: (0..2000) [0]
 MAX_HOPS: (7..13) [7]
WAN_RTT_DLY_MAX: (0..9500) [200]
Data field size: (256..2112) [2112]
Sequence Level Switching: (0..1) [0]
Disable Device Probing: (0..1) [0]
Suppress Class F Traffic: (0..1) [0]
SYNC IO mode: (0..1) [0]
VC Encoded Address Mode: (0..1) [0]
Core Switch PID Format: (0..1) [0]
Per-frame Route Priority: (0..1) [0]
Long Distance Fabric: (0..1) [0]

Virtual Channel parameters (yes, y, no, n): [no]
Zoning Operation parameters (yes, y, no, n): [no]
RSCN Transmission Mode (yes, y, no, n): [no]
NS Operation Parameters (yes, y, no, n): [no] y
Pre-zoned responses Mode
(0 = Standard Mode, 1 = Pre-zoning On): (0..1) [0]  <==== Confirm standard mode

  Arbitrated Loop parameters (yes, y, no, n): [no]
  System services (yes, y, no, n): [no]
  Portlog events enable (yes, y, no, n): [no]
Committing configuration...done.
```

Step 3 Disable platform management services. Failure to disable this service isolates E ports that connect to non-Brocade switches.

```
3200_TOP:admin> msPlMgmtDeactivate
This will erase all Platform entries. Are you sure?  (yes, y, no, n): [no] y
Committing configuration...done.
Request Fabric to Deactivate Platform Management services....
Done.
```

Step 4 Set interoperability mode to on at the command line and then reboot.

```
3200_TOP:admin> interopmode 1  Set interop mode on
Committing configuration...done.
interopMode is 1
NOTE: It is recommended that you boot this switch to make this change take effect
```

Note Do not ignore the warning message. Anomalies were experienced that required a switch reboot.

```
3200_TOP:admin> fastboot
```

To return to non-interop mode, disable the switch. Reconfigure the switch, set interoperability mode equal to 0, and then reboot.

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Configuring the Brocade 2400 Switch

Follow these steps to configure the Brocade 2400 switch in interoperability mode.

Step 1 Disable the switch. This is a disruptive process.

```
B2400_IBM_SAN:admin> switchdisable
```

Step 2 Enter into the configuration dialog.

```
B2400_IBM_SAN:admin> configure

Configure...

  Fabric parameters (yes, y, no, n): [no] y

  Domain: (1..239) [97] 101 <==== Assign domain id in the 97-127 range
  BB credit: (1..27) [16]
  R_A_TOV: (4000..120000) [10000]  <==== Must match other switches in the fabric
  E_D_TOV: (1000..5000) [2000]  <==== Must match other switches in the fabric
  Data field size: (256..2112) [2112]
  Sequence Level Switching: (0..1) [0]
  Disable Device Probing: (0..1) [0]
  Suppress Class F Traffic: (0..1) [0]
  SYNC IO mode: (0..1) [0]
  VC Encoded Address Mode: (0..1) [0]
  Core Switch PID Format: (0..1) [0]
  Per-frame Route Priority: (0..1) [0]
  Long Distance Fabric: (0..1) [0]

  Virtual Channel parameters (yes, y, no, n): [no]
  Switch Operating Mode (yes, y, no, n): [no] y

    Interoperability Mode: (0..1) [0] 1 <==== Set interopmode on

  Zoning Operation parameters (yes, y, no, n): [no] y

    Standard Mode: (0..1) [0] 1  <==== Set standard mode on
    Enable TransactZoneManagement: (0..1) [1]
    Disable NodeName Zone Checking: (0..1) [0]
  Arbitrated Loop parameters (yes, y, no, n): [no]
  System services (yes, y, no, n): [no]
  Portlog events enable (yes, y, no, n): [no]
Committing configuration...done.
```

Step 3 Disable platform management services. Failure to disable this service isolates E ports that connect to non-Brocade switches.

```
B2400_IBM_SAN:admin> msPlMgmtDeactivate
This will erase all Platform entries. Are you sure?  (yes, y, no, n): [no] y
Committing configuration...done.
Request Fabric to Deactivate Platform Management services....
Done.
```

Step 4 Reboot the switch.

```
B2400_IBM_SAN:admin> fastboot
```

To return to non-interop mode, you must disable the switch. Reconfigure the switch, set interoperability mode equal to 0, and then reboot.

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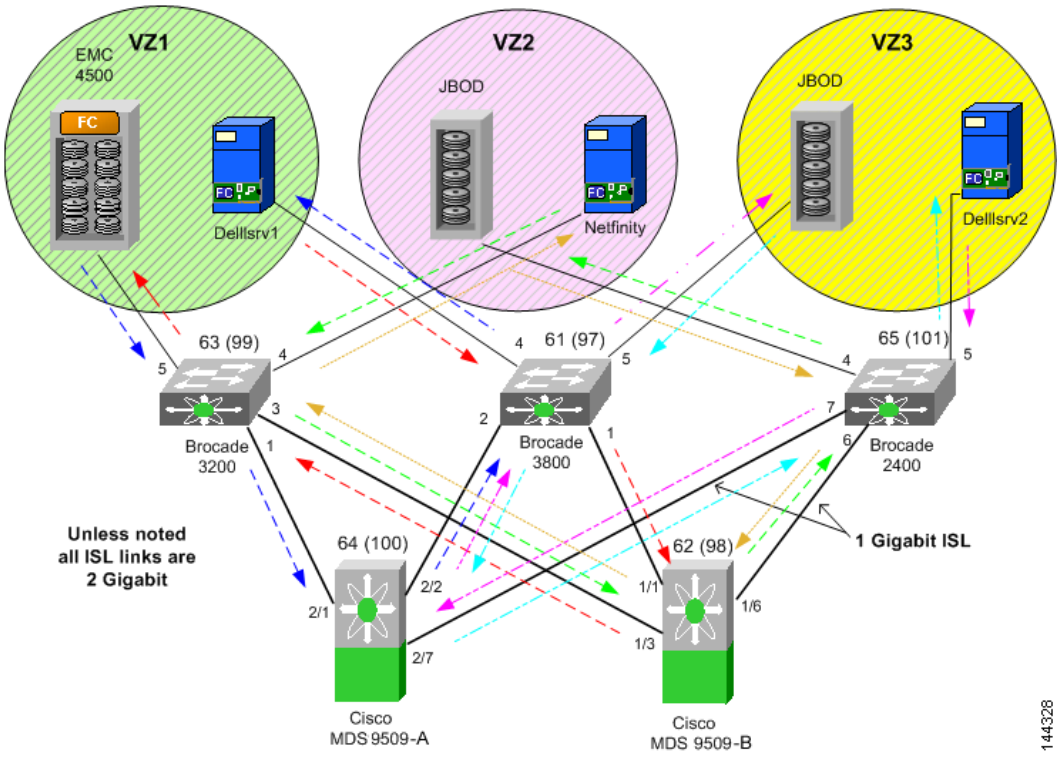
Verification

This section highlights the commands used to verify that the fabric is up and running in interoperability mode, and it includes the following topics:

- Verifying the MDS 9509 Switch, page 3-10
- Verifying the Brocade 3800 Switch, page 3-15
- Verifying the Brocade 3200 Switch, page 3-17
- Verifying the Brocade 2400 Switch, page 3-18

The example configuration now includes the paths for frame flow as a result of the FSPF algorithm. (See Figure 3-2.)

Figure 3-2 Data Flow of Dual MDS 9509 Core with Brocade Edge Topology



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Verifying the MDS 9509 Switch

The following examples show the configuration for the first MDS 9509 switch (MDS (9509-A).

```
MDS9509# show version
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Software
  kickstart: version 1.0(1) [build 1.0(0.253e)] [gdb]
  System:    version 1.0(1) [build 1.0(0.253e)] [gdb]

Hardware
  RAM 1932864 kB

  bootflash: 503808 blocks (block size 512b)
  slot0:          0 blocks (block size 512b)

  Compile Time: 10/26/2002 2:00:00

MDS9509# show interface brief

Interface  Vsan   Admin  Admin   Status           Oper  Oper   Port-channel
                  Mode   Trunk                    Mode  Speed
                         Mode                           (Gbps)
--------------------------------------------------------------------------
fc2/1      1      auto   on      up               E     2      --
fc2/2      1      auto   on      up               E     2      --
fc2/3      1      auto   on      fcotAbsent       --    --     --
fc2/4      1      auto   on      down             --    --     --
fc2/5      1      auto   on      down             --    --     --
fc2/6      1      auto   on      down             --    --     --
fc2/7      1      auto   on      up               E     1      --
fc2/8      1      auto   on      fcotAbsent       --    --     --
fc2/9      1      auto   on      down             --    --     --
fc2/10     1      auto   on      down             --    --     --

MDS9509# show run

Building Configuration ...

 interface fc2/1
no shutdown

 interface fc2/2
no shutdown

 interface fc2/3
 interface fc2/4
 interface fc2/5
 interface fc2/6
 interface fc2/7
no shutdown

 interface fc2/8
 interface fc2/9
 interface fc2/10

<snip>

interface fc2/32

 interface mgmt0
```

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```
ip address 6.1.1.96 255.255.255.0
switchport encap default
no shutdown

vsan database
vsan 1 interop

boot system bootflash:/m9500-isan-253e.bin sup-1
boot kickstart bootflash:/m9500-kickstart-253e.bin sup-1
boot system bootflash:/m9500-isan-253e.bin sup-2
boot kickstart bootflash:/m9500-kickstart-253e.bin sup-2
callhome

fcdomain domain 100 preferred vsan 1

ip route 6.1.1.0 255.255.255.0 6.1.1.1
ip routing
line console
  databits 5
  speed 110
logging linecard
ssh key rsa 512 force
ssh server enable
switchname MDS9509
username admin password 5 $1$Li8/fBYX$SNc72.xt4nTXpSnR9OUFB/  role network-admin

MDS9509# show vsan 1
vsan 1 information
         name:VSAN0001  state:active
         interoperability mode:yes  <==== verify mode
         loadbalancing:src-id/dst-id/oxid
         operational state:up

MDS9509# show fcdomain vsan 1
The local switch is a Subordinated Switch.

Local switch run time information:
        State: Stable
        Local switch WWN:    20:01:00:05:30:00:51:1f
        Running fabric name: 10:00:00:60:69:22:32:91
        Running priority: 128
        Current domain ID: 0x64(100)  <==== verify domain id

Local switch configuration information:
        State: Enabled
        Auto-reconfiguration: Disabled
        Contiguous-allocation: Disabled
        Configured fabric name: 41:6e:64:69:61:6d:6f:21
        Configured priority: 128
        Configured domain ID: 0x64(100) (preferred)

Principal switch run time information:
        Running priority: 2

Interface              Role          RCF-reject
----------------    -------------    ------------
fc2/1               Downstream       Disabled
fc2/2               Downstream       Disabled
fc2/7               Upstream         Disabled
----------------    -------------    ------------
```

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```
MDS9509# show fcdomain domain-list vsan 1

Number of domains: 5
Domain ID              WWN
---------    -----------------------
 0x61(97)    10:00:00:60:69:50:0c:fe
 0x62(98)    20:01:00:05:30:00:47:9f
 0x63(99)    10:00:00:60:69:c0:0c:1d
0x64(100)    20:01:00:05:30:00:51:1f [Local]
0x65(101)    10:00:00:60:69:22:32:91 [Principal]
---------    -----------------------

MDS9509# show fspf internal route vsan 1

FSPF Unicast Routes
---------------------------
 VSAN Number  Dest Domain   Route Cost    Next hops
-----------------------------------------------
           1     0x61(97)          500      fc2/2
           1     0x62(98)         1000      fc2/1
                                          fc2/2
           1     0x63(99)          500      fc2/1
           1    0x65(101)         1000      fc2/7

MDS9509# show fcns data vsan 1

VSAN 1:
------------------------------------------------------------------------
FCID    TYPE  PWWN                    (VENDOR) FC4-TYPE:FEATURE
------------------------------------------------------------------------
0x610400    N     10:00:00:00:c9:24:3d:90 (Emulex)     scsi-fcp
0x6105dc    NL    21:00:00:20:37:28:31:6d (Seagate)    scsi-fcp
0x6105e0    NL    21:00:00:20:37:28:24:7b (Seagate)    scsi-fcp
0x6105e1    NL    21:00:00:20:37:28:22:ea (Seagate)    scsi-fcp
0x6105e2    NL    21:00:00:20:37:28:2e:65 (Seagate)    scsi-fcp
0x6105e4    NL    21:00:00:20:37:28:26:0d (Seagate)    scsi-fcp
0x630400    N     10:00:00:00:c9:24:3f:75 (Emulex)     scsi-fcp
0x630500    N     50:06:01:60:88:02:90:cb              scsi-fcp
0x6514e2    NL    21:00:00:20:37:a7:ca:b7 (Seagate)    scsi-fcp
0x6514e4    NL    21:00:00:20:37:a7:c7:e0 (Seagate)    scsi-fcp
0x6514e8    NL    21:00:00:20:37:a7:c7:df (Seagate)    scsi-fcp
0x651500    N     10:00:00:e0:69:f0:43:9f (JNI)

Total number of entries = 12
```

Note The MDS 9509 switch name server shows both local and remote entries and does not time out the entries.

The following example shows the configuration for the second MDS 9509 switch (MDS 9509-B).

```
MDS9509B# show ver
Copyright (c) 2001-2005
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Software
  kickstart: version 1.0(1) [build 1.0] [gdb]
  System:    version 1.0(1) [build 1.0] [gdb]

Hardware
  RAM 963116 kB

  bootflash: 503808 blocks (block size 512b)
  slot0:          0 blocks (block size 512b)
```

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```
  Compile Time: 10/26/2002 2:00:00

MDS9509B# show int brief

-------------------------------------------------------------------
Interface  Vsan   Admin  Admin   Status          Oper  Oper   Port-channel
                  Mode   Trunk                   Mode  Speed
                         Mode                          (Gbps)
-------------------------------------------------------------------
fc1/1      1      auto   on      up              E     2      --
fc1/2      1      auto   on      fcotAbsent      --    --     --
fc1/3      1      auto   on      up              E     2      --
fc1/4      1      auto   on      down            --    --     --
fc1/5      1      auto   on      down            --    --     --
fc1/6      1      auto   on      up              E     1      --
fc1/7      1      auto   on      fcotAbsent      --    --     --
fc1/8      1      auto   on      fcotAbsent      --    --     --
fc1/9      1      auto   on      down            --    --     --

MDS9509B# show run

Building Configuration ...

 interface fc1/1
no shutdown

 interface fc1/2

 interface fc1/3
switchport speed 2000
no shutdown

 interface fc1/4
 interface fc1/5
 interface fc1/6
switchport speed 1000
no shutdown

 interface fc1/7
 interface fc1/8
 interface fc1/9

<snip>

 interface mgmt0
ip address 6.1.1.95 255.255.255.0
no shutdown

vsan database
vsan 1 interop

boot system bootflash:/m9500-isan.bin
boot kickstart bootflash:/m9500-kickstart.bin
callhome

fcdomain domain 98 preferred vsan 1

line console
  databits 5
  speed 110
logging linecard
switchname MDS9509B
username admin password 5 MF7UQdWLEqUFE  role network-admin
```

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```
MDS9509B# show vsan 1
vsan 1 information
         name:VSAN0001  state:active
         interoperability mode:yes  <==== verify interoperability
         loadbalancing:src-id/dst-id/oxid
         operational state:up

MDS9509B# show fcdomain vsan 1
The local switch is a Subordinated Switch.

Local switch run time information:
        State: Stable
        Local switch WWN:    20:01:00:05:30:00:47:9f
        Running fabric name: 10:00:00:60:69:22:32:91
        Running priority: 128
        Current domain ID: 0x62(98)  <==== verify domain

Local switch configuration information:
        State: Enabled
        Auto-reconfiguration: Disabled
        Contiguous-allocation: Disabled
        Configured fabric name: 41:6e:64:69:61:6d:6f:21
        Configured priority: 128
        Configured domain ID: 0x62(98) (preferred)

Principal switch run time information:

        Running priority: 2

Interface               Role          RCF-reject
----------------    -------------    ------------
fc1/1               Upstream         Disabled
fc1/3               Non-principal    Disabled
fc1/6               Non-principal    Disabled
----------------    -------------    ------------

MDS9509B# show fcdomain domain-list vsan 1

Number of domains: 5
Domain ID              WWN
---------    -----------------------
 0x61(97)    10:00:00:60:69:50:0c:fe
 0x62(98)    20:01:00:05:30:00:47:9f [Local]
 0x63(99)    10:00:00:60:69:c0:0c:1d
0x64(100)    20:01:00:05:30:00:51:1f
0x65(101)    10:00:00:60:69:22:32:91 [Principal]
---------    -----------------------

MDS9509B# show fspf internal route vsan 1

FSPF Unicast Routes
---------------------------
 VSAN Number  Dest Domain   Route Cost    Next hops
-----------------------------------------------
           1    0x61(97)           500        fc1/1
           1    0x63(99)           500        fc1/3
           1    0x64(100)         1000        fc1/1
                                             fc1/3
           1    0x65(101)         1000        fc1/6
```

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```
MDS9509B# show fcns data vsan 1

VSAN 1:
-----------------------------------------------------------------------
FCID    TYPE  PWWN                    (VENDOR)  FC4-TYPE:FEATURE
-----------------------------------------------------------------------
0x610400    N     10:00:00:00:c9:24:3d:90 (Emulex)     scsi-fcp
0x6105dc    NL    21:00:00:20:37:28:31:6d (Seagate)    scsi-fcp
0x6105e0    NL    21:00:00:20:37:28:24:7b (Seagate)    scsi-fcp
0x6105e1    NL    21:00:00:20:37:28:22:ea (Seagate)    scsi-fcp
0x6105e2    NL    21:00:00:20:37:28:2e:65 (Seagate)    scsi-fcp
0x6105e4    NL    21:00:00:20:37:28:26:0d (Seagate)    scsi-fcp
0x630400    N     10:00:00:00:c9:24:3f:75 (Emulex)     scsi-fcp
0x630500    N     50:06:01:60:88:02:90:cb              scsi-fcp
0x6514e2    NL    21:00:00:20:37:a7:ca:b7 (Seagate)    scsi-fcp
0x6514e4    NL    21:00:00:20:37:a7:c7:e0 (Seagate)    scsi-fcp
0x6514e8    NL    21:00:00:20:37:a7:c7:df (Seagate)    scsi-fcp
0x651500    N     10:00:00:e0:69:f0:43:9f (JNI)

Total number of entries = 12
```

Verifying the Brocade 3800 Switch

The following examples show the configuration for the Brocade 3800 switch.

```
B3800_IBM_SAN:admin> version
Kernel:     5.3.1
Fabric OS:  v3.0.2
Made on:    Thu Jan 10 17:41:15 PST 2002
Flash:      Thu Jan 10 17:42:37 PST 2002
BootProm:   Wed May 23 12:37:30 PDT 2001

B3800_IBM_SAN:admin> licenseshow
R99yydyQzcSAAzz1:
    Web license
    Zoning license
    Fabric license
SSbdSSQRR9TTceT8:
    QuickLoop license
B3800_IBM_SAN:admin> switchshow
switchName:B3800_IBM_SAN
switchType:9.1
switchState:Online
switchMode:Interop  <==== verify mode
switchRole:Subordinate
switchDomain:97  <==== verify domain
switchId:fffc61
switchWwn:10:00:00:60:69:50:0c:fe
switchBeacon:OFF
Zoning:      OFF
port  0: -- N2 No_Module
port  1: id 2G Online       E-Port 20:01:00:05:30:00:47:9f (downstream)
port  2: id 2G Online       E-Port 20:01:00:05:30:00:51:1f (upstream)
port  3: id 1G No_Light
port  4: id N1 Online       F-Port 10:00:00:00:c9:24:3d:90
port  5: id N1 Online       L-Port 5 private, 1 phantom
port  6: -- N2 No_Module
port  7: -- N2 No_Module
port  8: id N2 No_Light
port  9: -- N2 No_Module
port 10: id N2 No_Light
```

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```
port 11: id N2 No_Light
port 12: -- N2 No_Module
port 13: -- N2 No_Module
port 14: id N2 No_Light
port 15: id N2 No_Light

B3800_IBM_SAN:admin> topologyshow

5 domains in the fabric; Local Domain ID: 97

Domain   Metric   Hops  Out Port  In Ports   Flags  Bandwidth   Name
------------------------------------------------------------------------
98        500     1       1     0x00000034    D     2 (Gbs)   Unreachable
99       1000     2       2     0x00000020    D     2 (Gbs)   "3200_TOP"
                          1     0x00000010    D     2 (Gbs)
100       500     1       2     0x00000032    D     2 (Gbs)   Unreachable
101      1500     2       2     0x00000020    D     2 (Gbs)  "BR2400_IBM_SAN"
                          1     0x00000010    D     2 (Gbs)

B3800_IBM_SAN:admin> interopmode
interopMode is 1

B3800_IBM_SAN:admin> nsshow
{
 Type Pid    COS     PortName                NodeName                 TTL(sec)
 N    610400;    2,3;10:00:00:00:c9:24:3d:90;20:00:00:00:c9:24:3d:90; na
    FC4s: FCP
    Fabric Port Name: 20:04:00:60:69:50:0c:fe
 NL   6105dc;      3;21:00:00:20:37:28:31:6d;20:00:00:20:37:28:31:6d; na
    FC4s: FCP [SEAGATE ST118202FC      FDF6]
    Fabric Port Name: 20:05:00:60:69:50:0c:fe
 NL   6105e0;      3;21:00:00:20:37:28:24:7b;20:00:00:20:37:28:24:7b; na
    FC4s: FCP [SEAGATE ST118202FC      FDF6]
    Fabric Port Name: 20:05:00:60:69:50:0c:fe
 NL   6105e1;      3;21:00:00:20:37:28:22:ea;20:00:00:20:37:28:22:ea; na
    FC4s: FCP [SEAGATE ST118202FC      FDF6]
    Fabric Port Name: 20:05:00:60:69:50:0c:fe
 NL   6105e2;      3;21:00:00:20:37:28:2e:65;20:00:00:20:37:28:2e:65; na
    FC4s: FCP [SEAGATE ST118202FC      FDF6]
    Fabric Port Name: 20:05:00:60:69:50:0c:fe
 NL   6105e4;      3;21:00:00:20:37:28:26:0d;20:00:00:20:37:28:26:0d; na
    FC4s: FCP [SEAGATE ST118202FC      FDF6]
    Fabric Port Name: 20:05:00:60:69:50:0c:fe

The Local Name Server has 6 entries }

B3800_IBM_SAN:admin> nsallshow
{
  610400 6105dc 6105e0 6105e1 6105e2 6105e4 630400 630500
  6514e2 6514e4 6514e8 651500
12 Nx_Ports in the Fabric }
```

Note The Brocade remote name server entries time out of the cache after 900 seconds (15 minutes).

```
B3800_IBM_SAN:admin> urouteshow

Local Domain ID: 97

In Port  Domain   Out Port  Metric Hops    Flags    Next (Dom, Port)
-------------------------------------------------------------------
```

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```
  1 100       2        500    1       D          100,65793
  2  98       1        500    1       D           98,65536
  4  98       1        500    1       D           98,65536
     99       1       1000    2       D           98,65536
    100       2        500    1       D          100,65793
    101       1       1500    2       D           98,65536
  5  98       1        500    1       D           98,65536
     99       2       1000    2       D          100,65793
    100       2        500    1       D          100,65793
    101       2       1500    2       D          100,65793
```

Verifying the Brocade 3200 Switch

The following examples show the configuration for the Brocade 3200 switch.

```
3200_TOP:admin> version
Kernel:     5.3.1
Fabric OS:  v3.0.2
Made on:    Thu Jan 10 17:41:15 PST 2002
Flash:      Thu Jan 10 17:42:37 PST 2002
BootProm:   Tue Oct 30 10:24:38 PST 2001

3200_TOP:admin> licenseshow
R9bdbybzSQSAcecJ:
    Web license
bQyecQdSbScRzfd7:
    Zoning license
RbbSed9RRSSccTfd:
    QuickLoop license
b99dde9cSdcAAeer:
    Fabric license

3200_TOP:admin> switchshow
switchName:3200_TOP
switchType:16.2
switchState:Online
switchMode:Interop  <==== Verify mode
switchRole:Subordinate
switchDomain:99  <==== Verify domain
switchId:fffc63
switchWwn:10:00:00:60:69:c0:0c:1d
switchBeacon:OFF
Zoning:      OFF
port  0: id N2 No_Light
port  1: id N2 Online       E-Port 20:01:00:05:30:00:51:1f (upstream)
port  2: id N2 No_Light
port  3: id 2G Online       E-Port 20:01:00:05:30:00:47:9f
port  4: id N1 Online       F-Port 10:00:00:00:c9:24:3f:75
port  5: id N1 Online       F-Port 50:06:01:60:88:02:90:cb
port  6: id N2 No_Light
port  7: -- N2 No_Module

3200_TOP:admin> topologyshow

5 domains in the fabric; Local Domain ID: 99

Domain   Metric  Hops  Out Port  In Ports   Flags   Bandwidth   Name
-----------------------------------------------------------------
97        1000    2          1   0x00000020    D      2 (Gbs)   "B3800_IBM_SAN"
                             3   0x00000010    D      2 (Gbs)
98         500    1          3   0x00000032    D      2 (Gbs)   Unreachable
```

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```
100        500    1          1   0x00000038    D      2 (Gbs)   Unreachable
101       1500    2          1   0x00000020    D      2 (Gbs)  "BR2400_IBM_SAN"
                             3   0x00000010    D      2 (Gbs)

3200_TOP:admin> interopmode
interopMode is 1

3200_TOP:admin> nsallshow
{  610400 6105dc 6105e0 6105e1 6105e2 6105e4 630400 630500
  6514e2 6514e4 6514e8 651500
12 Nx_Ports in the Fabric }
```

Note The Brocade remote name server entries time out of the cache after 900 seconds (15 minutes).

```
3200_TOP:admin> urouteshow

Local Domain ID: 99

In Port  Domain  Out Port  Metric  Hops    Flags    Next (Dom, Port)
-------------------------------------------------------------------
   1  98      3       500     1      D           98,65538
   3 100      1       500     1      D          100,65792
   4  97      3      1000     2      D           98,65538
      98      3       500     1      D           98,65538
     100      1       500     1      D          100,65792
     101      3      1500     2      D           98,65538
   5  97      1      1000     2      D          100,65792
      98      3       500     1      D           98,65538
     100      1       500     1      D          100,65792
     101      1      1500     2      D          100,65792
```

Verifying the Brocade 2400 Switch

The following examples show the configuration for the Brocade 2400 switch.

```
BR2400_IBM_SAN:admin> version
Kernel:     5.3.1
Fabric OS:  v2.4.1h
Made on:    Fri Dec 7 15:14:10 PST 2001
Flash:      Fri Dec 7 15:15:10 PST 2001
BootProm:   Thu Jun 17 15:20:39 PDT 1999

BR2400_IBM_SAN:admin> licenseshow
R9dedRQRyRSAefek:
    Fabric license
yzbyzbccSz0cB1Z:
    Release v2.2 license
SccydbdycSTddzet:
    Web license
    Zoning license
    SES license
bdzzdeyRdcce00e1:
    QuickLoop license

BR2400_IBM_SAN:admin> switchshow
switchName:BR2400_IBM_SAN
switchType:3.4
switchState:Online
```

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```
switchRole:Principal
switchDomain:101       <==== verify domain
switchId:fffc65
switchWwn:10:00:00:60:69:22:32:91
switchBeacon:OFF
port  0: id  No_Light
port  1: sw  No_Light
port  2: --  No_Module
port  3: sw  No_Light
port  4: cu  Online        L-Port  3 public
port  5: sw  Online        F-Port  10:00:00:e0:69:f0:43:9f
port  6: id  Online        E-Port  20:01:00:05:30:00:47:9f
port  7: sw  Online        E-Port  20:01:00:05:30:00:51:1f (downstream)

BR2400_IBM_SAN:admin> topologyshow

5 domains in the fabric; Local Domain ID: 101

Domain    Metric  Hops  Out Port  In Ports    Flags    Name
-----------------------------------------------------------------
  97      1500     2       7      0x00000020  D      "B3800_IBM_SAN"
                           6      0x00000010  D
  98      1000     1       6      0x000000b0  D      Unreachable
  99      1500     2       7      0x00000020  D      "3200_TOP"
                           6      0x00000010  D
 100      1000     1       7      0x00000070  D      Unreachable

BR2400_IBM_SAN:admin> interopmode
interopMode is 1

BR2400_IBM_SAN:admin> nsshow
The Local Name Server has 4 entries {
 Type Pid    COS     PortName               NodeName                 TTL(sec)
 NL   6514e2;      3;21:00:00:20:37:a7:ca:b7;20:00:00:20:37:a7:ca:b7; na
    FC4s: FCP [SEAGATE ST318451FC      0001]
    Fabric Port Name: 20:04:00:60:69:22:32:91
 NL   6514e4;      3;21:00:00:20:37:a7:c7:e0;20:00:00:20:37:a7:c7:e0; na
    FC4s: FCP [SEAGATE ST318451FC      0001]
    Fabric Port Name: 20:04:00:60:69:22:32:91
 NL   6514e8;      3;21:00:00:20:37:a7:c7:df;20:00:00:20:37:a7:c7:df; na
    FC4s: FCP [SEAGATE ST318451FC      0001]
    Fabric Port Name: 20:04:00:60:69:22:32:91
 N    651500;      3;10:00:00:e0:69:f0:43:9f;10:00:00:e0:69:f0:43:9f; na
    Fabric Port Name: 20:05:00:60:69:22:32:91
}

BR2400_IBM_SAN:admin> nsallshow
36 Nx_Ports in the Fabric {
  610400 610400 610400 6105dc 6105dc 6105dc 6105e0 6105e0
  6105e0 6105e1 6105e1 6105e1 6105e2 6105e2 6105e2 6105e4
  6105e4 6105e4 630400 630400 630400 630500 630500 630500
  6514e2 6514e2 6514e2 6514e4 6514e4 6514e4 6514e8 6514e8
  6514e8 651500 651500 651500
}
```

Note Due to a display anomaly, the Brocade 2400 switch in this example shows each edge device three times.

Note The Brocade remote name server entries time out of the cache after 900 seconds (15 minutes).

```
BR2400_IBM_SAN:admin> urouteshow
```

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```
Local Domain ID: 101

In Port    Domain    Out Port    Metric    Hops    Flags    Next (Dom, Port)
--------------------------------------------------------------------------
   4         97          6        1500       2       D           98,65541
             98          6        1000       1       D           98,65541
             99          6        1500       2       D           98,65541
            100          7        1000       1       D          100,65798

   5         97          7        1500       2       D          100,65798
             98          6        1000       1       D           98,65541
             99          7        1500       2       D          100,65798
            100          7        1000       1       D          100,65798
   6        100          7        1000       1       D          100,65798
   7         98          6        1000       1       D           98,65541
```

Zoning

In this example, the zone is created on the MDS 9509 switch and the zone set is activated. After activation, the verification process confirms that the Brocade switches properly learn the zones and zone sets. In Brocade terminology, the zone set is known as the configuration. On Brocade switches, the MDS 9509 switch *active zone set* is known as the *effective configuration*.

The example shows how to use the name server database as a tool when building the zones. When predefining zones, you may use pWWNs of equipment not attached, or in the name server database.

Zones that are defined while the switch is in interop mode *must* be zoned by pWWN. Zoning by alias or FC ID is not permitted while the Brocade switch is operating in interop mode. This limits the Brocade 2100, 2400, 2800 and 3800 switches to soft zoning. The Brocade 3900 and 12000 switches continue to implement hardware enforced zoning. The MDS 9509 switch always implements hardware enforced zoning.

Creating Zones on the MDS 9509 Switch

Follow these steps to create zones on the MDS 9509 switch.

Step 1 Display the name server database to see the pWWN information.

```
MDS9509# show fcns data vsan 1

VSAN 1:
--------------------------------------------------------------------------
FCID        TYPE  PWWN                    (VENDOR)     FC4-TYPE:FEATURE
--------------------------------------------------------------------------
0x610400    N     10:00:00:00:c9:24:3d:90 (Emulex)        scsi-fcp
0x6105dc    NL    21:00:00:20:37:28:31:6d (Seagate)       scsi-fcp
0x6105e0    NL    21:00:00:20:37:28:24:7b (Seagate)       scsi-fcp
0x6105e1    NL    21:00:00:20:37:28:22:ea (Seagate)       scsi-fcp
0x6105e2    NL    21:00:00:20:37:28:2e:65 (Seagate)       scsi-fcp
0x6105e4    NL    21:00:00:20:37:28:26:0d (Seagate)       scsi-fcp
0x630400    N     10:00:00:00:c9:24:3f:75 (Emulex)        scsi-fcp
0x630500    N     50:06:01:60:88:02:90:cb                 scsi-fcp
0x6514e2    NL    21:00:00:20:37:a7:ca:b7 (Seagate)       scsi-fcp
0x6514e4    NL    21:00:00:20:37:a7:c7:e0 (Seagate)       scsi-fcp
0x6514e8    NL    21:00:00:20:37:a7:c7:df (Seagate)       scsi-fcp
```

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```
0x651500    N     10:00:00:e0:69:f0:43:9f (JNI)

Total number of entries = 12
MDS9509#
```

Step 2 Now that the pWWNs are visible, use tools like cut and paste to create the zones.

```
MDS9509# conf t
Enter configuration commands, one per line.  End with CNTL/Z.

MDS9509(config)# zone name vz1 vsan 1

MDS9509(config-zone)# member pwwn 50:06:01:60:88:02:90:cb
MDS9509(config-zone)# member pwwn 10:00:00:00:c9:24:3d:90
MDS9509(config-zone)# exit
MDS9509(config)#
MDS9509(config)# zone name vz2 vsan 1
MDS9509(config-zone)#
MDS9509(config-zone)# member pwwn 10:00:00:00:c9:24:3f:75
MDS9509(config-zone)# member pwwn 21:00:00:20:37:a7:ca:b7
MDS9509(config-zone)# member pwwn 21:00:00:20:37:a7:c7:e0
MDS9509(config-zone)# member pwwn 21:00:00:20:37:a7:c7:df
MDS9509(config-zone)#
MDS9509(config-zone)# exit
MDS9509(config)#
MDS9509(config)# zone name vz3 vsan 1
MDS9509(config-zone)#
MDS9509(config-zone)# member pwwn 10:00:00:e0:69:f0:43:9f
MDS9509(config-zone)# member pwwn 21:00:00:20:37:28:31:6d
MDS9509(config-zone)# member pwwn 21:00:00:20:37:28:24:7b
MDS9509(config-zone)# member pwwn 21:00:00:20:37:28:22:ea
MDS9509(config-zone)# member pwwn 21:00:00:20:37:28:2e:65
MDS9509(config-zone)# member pwwn 21:00:00:20:37:28:26:0d
MDS9509(config-zone)#
MDS9509(config-zone)# exit
MDS9509(config)#
MDS9509(config)#
MDS9509(config)# zoneset name mdscore vsan 1

MDS9509(config-zoneset)# member vz1
MDS9509(config-zoneset)# member vz2
MDS9509(config-zoneset)# member vz3
MDS9509(config-zoneset)# exit
MDS9509(config)#
```

At this point, we have created three zones (VZ1, VZ2 and VZ3). We have also created a zone set named MDSCORE.

Step 3 Activate the zone set MDSCORE.

```
MDS9509(config)# zoneset activate name mdscore vsan 1
Zoneset Activation initiated. check zone status
MDS9509(config)#

MDS9509(config)#
MDS9509(config)# exit
```

Step 4 View each switch in the fabric to verify that zoning is in place.

a. Show the zone and zone set. The running config on the MDS 9509 switch shows the zone and zone set because they were created on this switch.

```
MDS9509# show zoneset active
zoneset name mdscore vsan 1
  zone name vz1 vsan 1
```

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```
  * fcid 0x630500 [pwwn 50:06:01:60:88:02:90:cb]
  * fcid 0x610400 [pwwn 10:00:00:00:c9:24:3d:90]
zone name vz2 vsan 1
  * fcid 0x630400 [pwwn 10:00:00:00:c9:24:3f:75]
  * fcid 0x6514e2 [pwwn 21:00:00:20:37:a7:ca:b7]
  * fcid 0x6514e4 [pwwn 21:00:00:20:37:a7:c7:e0]
  * fcid 0x6514e8 [pwwn 21:00:00:20:37:a7:c7:df]

  zone name vz3 vsan 1
  * fcid 0x651500 [pwwn 10:00:00:e0:69:f0:43:9f]
  * fcid 0x6105dc [pwwn 21:00:00:20:37:28:31:6d]
  * fcid 0x6105e0 [pwwn 21:00:00:20:37:28:24:7b]
  * fcid 0x6105e1 [pwwn 21:00:00:20:37:28:22:ea]
  * fcid 0x6105e2 [pwwn 21:00:00:20:37:28:2e:65]
  * fcid 0x6105e4 [pwwn 21:00:00:20:37:28:26:0d]

  zone name $default_zone$ vsan 1
```

b. Show the active zone set on the second MDS 9509 switch (MDS 9509-B). (The running config does not show this information because the zone was not created on this MDS 9509 switch.)

```
MDS9509B# show zoneset active
zoneset name mdscore vsan 1
  zone name vz1 vsan 1
  * fcid 0x630500 [pwwn 50:06:01:60:88:02:90:cb]
  * fcid 0x610400 [pwwn 10:00:00:00:c9:24:3d:90]

  zone name vz2 vsan 1
  * fcid 0x630400 [pwwn 10:00:00:00:c9:24:3f:75]
  * fcid 0x6514e2 [pwwn 21:00:00:20:37:a7:ca:b7]
  * fcid 0x6514e4 [pwwn 21:00:00:20:37:a7:c7:e0]
  * fcid 0x6514e8 [pwwn 21:00:00:20:37:a7:c7:df]

  zone name vz3 vsan 1
  * fcid 0x651500 [pwwn 10:00:00:e0:69:f0:43:9f]
  * fcid 0x6105dc [pwwn 21:00:00:20:37:28:31:6d]
  * fcid 0x6105e0 [pwwn 21:00:00:20:37:28:24:7b]
  * fcid 0x6105e1 [pwwn 21:00:00:20:37:28:22:ea]
  * fcid 0x6105e2 [pwwn 21:00:00:20:37:28:2e:65]
  * fcid 0x6105e4 [pwwn 21:00:00:20:37:28:26:0d]

  zone name $default_zone$ vsan 1
```

c. Show the configuration on the Brocade 3200 switch. There is a defined configuration and an effective configuration.

```
3200_TOP:admin> cfgshow
Defined configuration:
 cfg:     Interop     Dell; Netfinity
 zone:    Dell  10:00:00:00:c9:24:3d:90; 50:06:01:60:88:02:90:cb
 zone:    Netfinity
          10:00:00:00:c9:24:3f:75; 21:00:00:20:37:a7:ca:b7;
          21:00:00:20:37:a7:c7:e0; 21:00:00:20:37:a7:c7:df

Effective configuration:
 cfg:     mdscore
 zone:    vz1    50:06:01:60:88:02:90:cb
                 10:00:00:00:c9:24:3d:90
 zone:    vz2    10:00:00:00:c9:24:3f:75
                 21:00:00:20:37:a7:ca:b7
                 21:00:00:20:37:a7:c7:e0
                 21:00:00:20:37:a7:c7:df
 zone:    vz3    10:00:00:e0:69:f0:43:9f
                 21:00:00:20:37:28:31:6d
```

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```
                21:00:00:20:37:28:24:7b
                21:00:00:20:37:28:22:ea
                21:00:00:20:37:28:2e:65
                21:00:00:20:37:28:26:0d
```

d. Show the configuration on the Brocade 3800 switch.

```
B3800_IBM_SAN:admin> cfgshow
Defined configuration:
 cfg:     Interop     Dell; Netfinity
 zone:    Dell  10:00:00:00:c9:24:3d:90; 50:06:01:60:88:02:90:cb
 zone:    Netfinity
          10:00:00:c9:24:3f:75; 21:00:00:20:37:a7:ca:b7;
          21:00:00:20:37:a7:c7:e0; 21:00:00:20:37:a7:c7:df

Effective configuration:
 cfg:     mdscore
 zone:    vz1    50:06:01:60:88:02:90:cb
                 10:00:00:00:c9:24:3d:90
 zone:    vz2    10:00:00:00:c9:24:3f:75
                 21:00:00:20:37:a7:ca:b7
                 21:00:00:20:37:a7:c7:e0
                 21:00:00:20:37:a7:c7:df
 zone:    vz3    10:00:00:e0:69:f0:43:9f
                 21:00:00:20:37:28:31:6d
                 21:00:00:20:37:28:24:7b
                 21:00:00:20:37:28:22:ea
                 21:00:00:20:37:28:2e:65
                 21:00:00:20:37:28:26:0d
```

e. Show the configuration on the Brocade 2400 switch.

```
BR2400_IBM_SAN:admin> cfgshow
Defined configuration:
 cfg:     Interop     Dell; Netfinity
 zone:    Dell  10:00:00:00:c9:24:3d:90; 50:06:01:60:88:02:90:cb
 zone:    Netfinity
          10:00:00:00:c9:24:3f:75; 21:00:00:20:37:a7:ca:b7;
          21:00:00:20:37:a7:c7:e0; 21:00:00:20:37:a7:c7:df

Effective configuration:
 cfg:     mdscore
 zone:    vz1    50:06:01:60:88:02:90:cb
                 10:00:00:00:c9:24:3d:90
 zone:    vz2    10:00:00:00:c9:24:3f:75[c7]
                 21:00:00:20:37:a7:ca:b7
                 21:00:00:20:37:a7:c7:e0
                 21:00:00:20:37:a7:c7:df
 zone:    vz3    10:00:00:e0:69:f0:43:9f
                 21:00:00:20:37:28:31:6d
                 21:00:00:20:37:28:24:7b
                 21:00:00:20:37:28:22:ea[ff]
                 21:00:00:20:37:28:2e:65[fc]
                 21:00:00:20:37:28:26:0d
```

All switches in the fabric now have the correct zoning information.

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Creating Zones on the Brocade 3800 Switch

The next example shows how to create the zones and a zone set on the Brocade 3800 switch, activate the zone set, and verify that each switch in the fabric has the correct zoning in place. The zone members in this example are the same as used in the previous example, but the zone names and zone set name are different.

Step 1 Clear the zoning configuration. If this command is issued and this switch is part of the fabric, all switches will have no zoning in effect.

```
B3800_IBM_SAN:admin> cfgclear
Do you really want to clear all configurations?  (yes, y, no, n): [no] yes
Clearing All zoning configurations...

B3800_IBM_SAN:admin> cfgshow
Defined configuration:
 no configuration defined

Effective configuration:
 no configuration in effect
```

Step 2 Create the zones. In this example, the zones are named vz11, vz22, and vz33.

```
B3800_IBM_SAN:admin> zonecreate :"vz11", "10:00:00:00:c9:24:3d:90;
50:06:01:60:88:02:90:cb"

B3800_IBM_SAN:admin> zonecreate "vz22", "10:00:00:00:c9:24:3f:75; 21:00:00:20:37:a7:ca:b7;
21:00:00:20:37:a7:c7:e0; 21:00:00:20:37:a7:c7:df"
```

Due to command line limitations, and the number of members, zone vz33 is created with some members, and the rest are added.

```
B3800_IBM_SAN:admin> zonecreate "vz33", "10:00:00:e0:69:f0:43:9f; 21:00:00:20:37:28:31:6d;
21:00:00:20:37:28:24:7b;
21:00:00:20:37:28:22:ea"

B3800_IBM_SAN:admin> zoneadd "vz33", "21:00:00:20:37:28:2e:65; 21:00:00:20:37:28:26:0d"
```

Step 3 Check the zones before making them active.

```
B3800_IBM_SAN:admin> zoneshow
Defined configuration:
 zone:  vz11  10:00:00:00:c9:24:3d:90; 50:06:01:60:88:02:90:cb
 zone:  vz22  10:00:00:00:c9:24:3f:75; 21:00:00:20:37:a7:ca:b7;
              21:00:00:20:37:a7:c7:e0; 21:00:00:20:37:a7:c7:df
 zone:  vz33  10:00:00:e0:69:f0:43:9f; 21:00:00:20:37:28:31:6d;
              21:00:00:20:37:28:24:7b; 21:00:00:20:37:28:22:ea;
              21:00:00:20:37:28:2e:65; 21:00:00:20:37:28:26:0d

Effective configuration:
 no configuration in effect
```

Step 4 Create the configuration. When the configuration is activated, it is known on the MDS 9509 switch as the active zone set.

```
B3800_IBM_SAN:admin> cfgcreate "mdscore1", "vz11; vz22; vz33"
```

Step 5 Activate the configuration.

```
B3800_IBM_SAN:admin> cfgenable "mdscore1"
zone config "mdscore1" is in effect
Updating flash ...
```

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Step 6 Check the display on the Brocade 3800 switch.

```
B3800_IBM_SAN:admin> cfgshow
Defined configuration:
 cfg:     mdscore1
          vz11; vz22; vz33
 zone:  vz11  10:00:00:00:c9:24:3d:90; 50:06:01:60:88:02:90:cb
 zone:  vz22  10:00:00:00:c9:24:3f:75; 21:00:00:20:37:a7:ca:b7;
              21:00:00:20:37:a7:c7:e0; 21:00:00:20:37:a7:c7:df
 zone:  vz33  10:00:00:e0:69:f0:43:9f; 21:00:00:20:37:28:31:6d;
              21:00:00:20:37:28:24:7b; 21:00:00:20:37:28:22:ea;
              21:00:00:20:37:28:2e:65; 21:00:00:20:37:28:26:0d

Effective configuration:
 cfg:     mdscore1
 zone:  vz11  10:00:00:00:c9:24:3d:90
              50:06:01:60:88:02:90:cb
 zone:  vz22  10:00:00:00:c9:24:3f:75
              21:00:00:20:37:a7:ca:b7
              21:00:00:20:37:a7:c7:e0
              21:00:00:20:37:a7:c7:df
 zone:  vz33  10:00:00:e0:69:f0:43:9f
              21:00:00:20:37:28:31:6d
              21:00:00:20:37:28:24:7b
              21:00:00:20:37:28:22:ea
              21:00:00:20:37:28:2e:65
              21:00:00:20:37:28:26:0d
```

The new configuration is in effect and defined.

Step 7 Look at the other switches in the fabric.

a. Display the configuration on the Brocade 3200 switch.

```
3200_TOP:admin> cfgshow
Defined configuration:
 cfg:     mdscore1
         vz11; vz22; vz33
 zone:  vz11  10:00:00:00:c9:24:3d:90; 50:06:01:60:88:02:90:cb
 zone:  vz22  10:00:00:00:c9:24:3f:75; 21:00:00:20:37:a7:ca:b7;
              21:00:00:20:37:a7:c7:e0; 21:00:00:20:37:a7:c7:df
 zone:  vz33  10:00:00:e0:69:f0:43:9f; 21:00:00:20:37:28:31:6d;
              21:00:00:20:37:28:24:7b; 21:00:00:20:37:28:22:ea;
              21:00:00:20:37:28:2e:65; 21:00:00:20:37:28:26:0d

Effective configuration:
 cfg     mdscore1
 zone:  vz11  10:00:00:00:c9:24:3d:90
              50:06:01:60:88:02:90:cb
 zone:  vz22  10:00:00:00:c9:24:3f:75
              21:00:00:20:37:a7:ca:b7
              21:00:00:20:37:a7:c7:e0
              21:00:00:20:37:a7:c7:df
 zone:  vz33  10:00:00:e0:69:f0:43:9f
              21:00:00:20:37:28:31:6d
              21:00:00:20:37:28:24:7b
              21:00:00:20:37:28:22:ea
              21:00:00:20:37:28:2e:65
              21:00:00:20:37:28:26:0d
```

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b. Display the configuration on the other Brocade 3800 switch.

```
B3800_IBM_SAN:admin> cfgshow
Defined configuration:
 cfg:     mdscore1
          vz11; vz22; vz33
 zone:  vz11  10:00:00:00:c9:24:3d:90; 50:06:01:60:88:02:90:cb
 zone:  vz22  10:00:00:00:c9:24:3f:75; 21:00:00:20:37:a7:ca:b7;
              21:00:00:20:37:a7:c7:e0; 21:00:00:20:37:a7:c7:df
 zone:  vz33  10:00:00:e0:69:f0:43:9f; 21:00:00:20:37:28:31:6d;
              21:00:00:20:37:28:24:7b; 21:00:00:20:37:28:22:ea;
              21:00:00:20:37:28:2e:65; 21:00:00:20:37:28:26:0d

Effective configuration:
 cfg:     mdscore1
 zone:  vz11  10:00:00:00:c9:24:3d:90
              50:06:01:60:88:02:90:cb
 zone:  vz22  10:00:00:00:c9:24:3f:75
              21:00:00:20:37:a7:ca:b7
              21:00:00:20:37:a7:c7:e0
              21:00:00:20:37:a7:c7:df
 zone:  vz33  10:00:00:e0:69:f0:43:9f
              21:00:00:20:37:28:31:6d
              21:00:00:20:37:28:24:7b
              21:00:00:20:37:28:22:ea
              21:00:00:20:37:28:2e:65
              21:00:00:20:37:28:26:0d
```

c. Display the configuration on the Brocade 2400 switch.

```
BR2400_IBM_SAN:admin> cfgshow
Defined configuration:
 cfg:     mdscore1
          vz11; vz22; vz33
 zone:  vz11  10:00:00:00:c9:24:3d:90; 50:06:01:60:88:02:90:cb
 zone:  vz22  10:00:00:00:c9:24:3f:75; 21:00:00:20:37:a7:ca:b7;
              21:00:00:20:37:a7:c7:e0; 21:00:00:20:37:a7:c7:df
 zone:  vz33  10:00:00:e0:69:f0:43:9f; 21:00:00:20:37:28:31:6d;
              21:00:00:20:37:28:24:7b; 21:00:00:20:37:28:22:ea;
              21:00:00:20:37:28:2e:65; 21:00:00:20:37:28:26:0d

Effective configuration:
 cfg:     mdscore1
 zone:  vz11  10:00:00:00:c9:24:3d:90
              50:06:01:60:88:02:90:cb[6]
 zone:  vz22  10:00:00:00:c9:24:3f:75
              21:00:00:20:37:a7:ca:b7
              21:00:00:20:37:a7:c7:e0
              21:00:00:20:37:a7:c7:df[29]
 zone:  vz33  10:00:00:e0:69:f0:43:9f
              21:00:00:20:37:28:31:6d
              21:00:00:20:37:28:24:7b
              21:00:00:20:37:28:22:ea
              21:00:00:20:37:28:2e:65
              21:00:00:20:37:28:26:0d
```

d. Show the active zone set on the first MDS 9509 switch (MDS 9509-A).

```
MDS9509# show zoneset active
zoneset name mdscore1 vsan 1
  zone name vz11 vsan 1
  * fcid 0x610400 [pwwn 10:00:00:00:c9:24:3d:90]
  * fcid 0x630500 [pwwn 50:06:01:60:88:02:90:cb]

  zone name vz22 vsan 1
```

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```
  * fcid 0x630400 [pwwn 10:00:00:00:c9:24:3f:75]
  * fcid 0x6514e2 [pwwn 21:00:00:20:37:a7:ca:b7]
  * fcid 0x6514e4 [pwwn 21:00:00:20:37:a7:c7:e0]
  * fcid 0x6514e8 [pwwn 21:00:00:20:37:a7:c7:df]

  zone name vz33 vsan 1
  * fcid 0x651500 [pwwn 10:00:00:e0:69:f0:43:9f]
  * fcid 0x6105dc [pwwn 21:00:00:20:37:28:31:6d]
  * fcid 0x6105e0 [pwwn 21:00:00:20:37:28:24:7b]
  * fcid 0x6105e1 [pwwn 21:00:00:20:37:28:22:ea]
  * fcid 0x6105e2 [pwwn 21:00:00:20:37:28:2e:65]
  * fcid 0x6105e4 [pwwn 21:00:00:20:37:28:26:0d]

  zone name $default_zone$ vsan 1

MDS9509# show zone vsan 1
zone name vz1 vsan 1
  pwwn 50:06:01:60:88:02:90:cb
  pwwn 10:00:00:00:c9:24:3d:90

zone name vz2 vsan 1
  pwwn 10:00:00:00:c9:24:3f:75
  pwwn 21:00:00:20:37:a7:ca:b7
  pwwn 21:00:00:20:37:a7:c7:e0
  pwwn 21:00:00:20:37:a7:c7:df

zone name vz3 vsan 1
  pwwn 10:00:00:e0:69:f0:43:9f
  pwwn 21:00:00:20:37:28:31:6d
  pwwn 21:00:00:20:37:28:24:7b
  pwwn 21:00:00:20:37:28:22:ea
  pwwn 21:00:00:20:37:28:2e:65
  pwwn 21:00:00:20:37:28:26:0d
```

Note The **show zone** command displays the zones that were created earlier on this switch.

e. Check the running configuration on the MDS 9509 switch.

```
MDS9509# show run

Building Configuration...

 interface fc2/1
no shutdown

<snip>

zone name vz1 vsan 1
  member pwwn 50:06:01:60:88:02:90:cb
  member pwwn 10:00:00:00:c9:24:3d:90

zone name vz2 vsan 1
  member pwwn 10:00:00:00:c9:24:3f:75
  member pwwn 21:00:00:20:37:a7:ca:b7
  member pwwn 21:00:00:20:37:a7:c7:e0
  member pwwn 21:00:00:20:37:a7:c7:df

zone name vz3 vsan 1
  member pwwn 10:00:00:e0:69:f0:43:9f
  member pwwn 21:00:00:20:37:28:31:6d
  member pwwn 21:00:00:20:37:28:24:7b
  member pwwn 21:00:00:20:37:28:22:ea
```

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```
    member pwwn 21:00:00:20:37:28:2e:65
    member pwwn 21:00:00:20:37:28:26:0d

  zoneset name mdscore vsan 1
    member vz1
    member vz2
    member vz3

  <snip>

  MDS9509#
```

Note The running configuration and the active zone set are different.

f. Show the active zone set on the second MDS 9509 switch (MDS 9509-B).

```
MDS9509B# show zoneset active
zoneset name mdscore1 vsan 1
  zone name vz11 vsan 1
  * fcid 0x610400 [pwwn 10:00:00:00:c9:24:3d:90]
  * fcid 0x630500 [pwwn 50:06:01:60:88:02:90:cb]

  zone name vz22 vsan 1
  * fcid 0x630400 [pwwn 10:00:00:00:c9:24:3f:75]
  * fcid 0x6514e2 [pwwn 21:00:00:20:37:a7:ca:b7]
  * fcid 0x6514e4 [pwwn 21:00:00:20:37:a7:c7:e0]
  * fcid 0x6514e8 [pwwn 21:00:00:20:37:a7:c7:df]

  zone name vz33 vsan 1
  * fcid 0x651500 [pwwn 10:00:00:e0:69:f0:43:9f]
  * fcid 0x6105dc [pwwn 21:00:00:20:37:28:31:6d]
  * fcid 0x6105e0 [pwwn 21:00:00:20:37:28:24:7b]
  * fcid 0x6105e1 [pwwn 21:00:00:20:37:28:22:ea]
  * fcid 0x6105e2 [pwwn 21:00:00:20:37:28:2e:65]
  * fcid 0x6105e4 [pwwn 21:00:00:20:37:28:26:0d]

  zone name $default_zone$ vsan 1
```

The zone set (configuration) created on the Brocade 3800 switch is now active and effective in all switches in the fabric.

The zones created on the MDS 9509 switch are propagated to the Brocade switches. Although the **cfgshow** command does not show these zones under a defined configuration, if the switch is isolated and rebooted, then the correct zone configuration is effective.

On the MDS switch, the active zone configuration is always saved to memory. It is not displayed in the running configuration. If the switch is isolated and rebooted, the last active zone set is reinstated as the current active zone set.

Changes to the zones or zone set while the switch is isolated will need to pass a zone merge validation when the ISLs are activated.