APPENDIX A

Interoperability Guidelines for Non-Cisco Switches

This appendix includes information on changing interop modes and describes release-specific behavior for certain versions of Brocade, McData, or IBM BladeCenter firmware. It includes the following sections:

Brocade Switches

- Starting with Brocade FOS release 6.x:

  - When a Brocade switch is connected to an MDS switch in MDS interop mode 1, all zoning operations (create new/add/delete/modify/activate/deactivate) need to be performed from the MDS switch. This is due to the restriction from the Brocade firmware on performing the zone related operations in Brocade Open-fabric mode.

  - When a Brocade switch is connected to an MDS switch with NX-OS versions below 5.x in MDS interop mode 3, all zoning operations (create new/add/delete/modify/activate/deactivate) need to be performed from the MDS switch. This is due to the restriction from the Brocade firmware rejecting the non-RCS protocol based zoning operations.

  - When a Brocade switch is connected to an MDS switch in either MDS interop mode 1 or MDS interop mode 3, all zoning operations (create new/add/delete/modify/activate/deactivate) need to be performed from the MDS switch.

    For more information about the Brocade FOS 6.x release, refer to the "Interoperability with Brocade FOS 6.x Release" section on page 1-2.

- The host attached to the Brocade switch cannot detect IVR zoned devices if IVR-NAT is enabled on the MDS switch.

- If IVR is used while connecting to a Brocade switch running firmware version 5.x and higher, and the VSAN is configured for interop mode 1,2 or 3, RDI mode should be configured on that VSAN. RDI mode must be manually configured in interop mode 1 (both IVR-NAT and IVR-non-NAT configurations), and in interop modes 2 and 3 (IVR NAT configurations only). In interop modes 2 and 3 (IVR-non-NAT configurations), and in interop mode 4 (both IVR-NAT and IVR-non-NAT configurations), RDI mode is automatically enabled. To enable RDI mode, enter the command: **ivr virtual-fcdomain-add vsan-ranges.**

- If an MDS 9020 is running FabricWare Release 2.1(2) and is the only MDS switch in a fabric, or if the MDS 9020 is used as the seed switch for DCNM-SAN, devices connected to a third-party switch might not be displayed properly in DCNM-SAN. The devices are fully accessible with the CLI and are functioning properly. This issue is being tracked with DDTS CSCsc77866.

- On Brocade switches running version 3.1.1 and version 4.1.1, ISL ports need to be set to ISLMODE 1 using the **portcfgislmode** *port number*, **1** command. This action is required for Brocade switch models 3800, 3900, and 12000. However, Brocade models 2800 and earlier do not require this. Brocade 3800s running version 3.0.x do not have this command.

- If there is an attempt to merge a Brocade switch that in its active configuration is an fcalias in which one of its members is listed twice with an MDS VSAN, the MDS switch will isolate the Inter-Switch Link (ISL).

    Workaround: This is resolved in MDS SAN-OS Release 3.0(2a). This issue is tracked in DDTS CSCsd81137. A duplicate member looks like this:

    ```
    alias:  L1PNL2b_LTO1
            6,14; 6,14;
    ```

- Brocade switch models 3800 and 2800 running core PID mode 1 should be treated as if they were Brocade 3900s. Legacy switch interop mode 3 should be used.

- When using Brocade switches running version 4.1.1 (typically, the Brocade 3900 or 12000), force the ISLs on the MDS 9000 switch to E port. If this is not done, a link flap might crash the Brocade 3900 or 12000.

- The MDS 9000 switch **zoneset distribute vsan** exec command should be used to emulate the Brocade **cfgsave** command. The command will distribute the full zone set database, and the Brocade switches will implicitly save their configuration to nonvolatile memory. Activating a zone set from the MDS 9000 switch will implicitly send a **cfgsave** command to the other Brocade switches in VSAN.

- Even though the zone sets have the same zones and members in legacy switch interop mode 2 and 3, a fabric merge with Brocade might fail due to the exact order of the zones and members not matching. To resolve this issue, make sure that one of the merging fabrics has a null full or active zone database.

- In legacy switch interop mode 2 and 3, a fabric merge with Brocade might fail if the current active zone set in MDS has a zone that is not present in the **Defined configuration** of the Brocade switch. This is as per the Brocade behavior.

- If the MDS 9000 switch ISL is not forced to a specific buffer-to-buffer (B2B) credit using the MDS NX-OS **switchport fcrxbbcredit 16** command, the ISL may fail to come up and the following error message will be displayed on the Brocade switch:

    ```
    elpFailureInvalidFlowCTLParam
    ```

- The Brocade 3800 model has trouble tolerating domain SW-RSCNs in version 3.1.1. It often fails to function when it receives one.

    Workaround: Use the **rscn suppress domain-swrscn vsan** command to suppress domain SW-RSCNs. This Brocade bug is tracked in DDTS as CSCec75477.

- Brocade core PID definitions:

    - **CorePID 0 (Native Mode)**—Introduced in the 2000 series of Brocade fabric switches supporting up to 16 ports. Uses only 4 bits of the area_ID in the FC ID for the port number. Use this setting with MDS 9000 switches in legacy switch interop mode 2.

        FC ID / PID 0x021F00—Core PID 0 means domain ID 02, 1 always set, port 15, 00 is assigned for N port or ALPA.

- **CorePID 1 (Core Mode)**—Introduced in the 3900/12000 series of Brocade switches with more than 16 ports. Uses all 8 bits of the area_ID in the FC ID for the port number. Can support up to 256 ports per switch. Use this setting with MDS 9000 switches in legacy switch interop mode 3.

  FC ID / PID 0x021F00—Core PID 1 means domain ID 02, port is 31, 00 is assigned address or ALPA. Even though the FC ID is the same, the entire second byte is used for the port number.

- **CorePID 2 (Extended Edge)**—Introduced in Brocade version 2.6.2, version 3.1.2, and version 4.2.0. Uses the same format PID as native mode, however it can be used on switches with up to 128 ports. This mode is only used when a core PID 1 switch must connect to a core PID 0 switch that absolutely cannot be rebooted.

  For example, a 16-port Brocade switch may be set for core PID = 1 if it was previously attached to a fabric with other core PID = 1 switches (such as Brocade models 3900 and 12000).

  To configure core PID = 1, enter this command:

```
Herlaar:admin> configure

Configure...

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

    Domain: (1..239) [98]
    BB credit: (1..27) [16]
    R_A_TOV: (4000..120000) [10000]
    E_D_TOV: (1000..5000) [2000]
    WAN_TOV: (1000..120000) [0]
    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) [1]    <==== 0 for interop 2; 1 for interop 3
```

- When setting up interoperability with a Brocade 3800 (version 3.1.1) or 12000 (version 4.1.1) switch, the following error message can be seen on the Brocade console when the MDS 9000 switches connect to the Brocade in interop mode 1, 2, or 3:

```
fabric: Reconfiguring (Mon Jan 26 19:59:56 2004)
 5  4  3  2  1
10  9  8  7  6  5  4  3  2  1
fabric: Principal switch
fabric: Domain 103
Received unknown interswitch command 1000000
Received unknown interswitch command 1000000
Received unknown interswitch command 1000000
Received unknown interswitch command 1000000
Received unknown interswitch command 1000000
```

  Each time the E port is flapped, FDMI FC-CT-Reserved frames are sent from the MDS 9000 switch to the Brocade switch. These frames can cause a memory leak on the Brocade switch, which can then lead to the Brocade switch failing to function. This problem is not seen on Brocade 2800 switches running version 2.6.1a, as it correctly rejects the FDMI frames with the valid reason code Command Not Supported, which is the expected behavior.

  Workaround: Execute the **fdmi suppress-updates vsan** *vsan-id* command in configuration mode, for the VSAN that the Brocade switch is a member of. This bug is tracked in DDTS as CSCed56659.

- If changes to a VSAN would typically require the MDS domain to be restarted (FC timers, domain IDs, and so on), suspend and then no suspend the VSAN rather than using the **fcdomain restart disruptive vsan** command. The RCF frame (Reconfigure Fabric) can cause the links to become isolated.

- If a Brocade switch displays with a red X through it in the DCNM-SAN map, and placing the mouse over the Brocade switch results in a SNMP timeout message, then enable SNMP version 1 on the Brocade switch.

To modify the Brocade switch using DCNM-SAN, follow these steps:

Step 1   Launch a web browser using the IP address of the Brocade switch as the URL.

Step 2   Click **Admin** on the front panel and log into the switch.

Step 3   Click the **SNMP** tab.

Step 4   Enter the IP address of the system where DCNM-SAN is running in the Recipient column of the Community/Trap table for private and public community strings.

Step 5   Enter the IP address of your desktop under the Access SW Host column of the table and set it to ReadWrite access list. To do this, modify an empty row that has 0.0.0.0.

McData Switches

- If IVR is used while connecting to a McData switch, and the VSAN is configured for interop mode 1 or 4, RDI mode should be configured on that VSAN. RDI mode is automatically enabled in interop modes 4, but must be manually enabled for interop mode 1. To enable RDI mode, enter the **ivr virtual-fcdomain-add vsan-ranges** *VSAN #s* command.

- If you are using interop mode 4 on an MDS 9000 switch running Cisco SAN-OS Release 3.1(1) or earlier with a McData switch and IVR is enabled, we recommend using auto-topology for the IVR configuration.

  Workaround: Configure IVR with auto-topology instead of manual topology. This issue is being tracked in DDTS as CSCsh60422.

- If more than two devices exist with the same area byte in their respective FC IDs (for example, McData attached: 0x101100, MDS 9000 switch attached: 0x201100, 0x201101, and 0x201102), the device(s) attached to the McData will not be able to access the MDS 9000 switch devices because the McData switch drops the frames. This situation occurs because the McData switch has trouble with an FC ID that uses all three bytes of the FC ID (domain,area,port). McData switches only use two bytes in the FC ID (domain,area,00).

  Workaround: Configure the devices on the MDS 9000 switches using preconfigured persistent FC IDs that have 00 for the port fields in the FC ID (0x####00). This issue is resolved in McData firmware version 7.01. This issue is tracked in DDTS as CSCee34298.

- If a McData switch is running firmware version 8.1, and the MDS 9000 switch is configured for IVR, then zone activations from the MDS switch may fail.

  Workaround: Configure IVR in the interop VSAN for RDI mode by executing the **ivr virtual-fcdomain-add vsan-ranges** *vsan-range* command in configuration mode**.** RDI mode is the default mode for switches running MDS SAN-OS Release 2.1(1b), and enabling RDI mode may be disruptive to IVR traffic for switches running MDS SAN-OS Release 2.1(2b) or later. RDI mode should be enabled prior to activating the IVR zone set.

- If an MDS 9020 switch is running FabricWare Release 2.1(2) and is the only MDS switch in a fabric, or if the MDS 9020 is used as the seed switch for DCNM-SAN, devices connected to a third-party switch may not be displayed properly in DCNM-SAN. The devices are fully accessible using with the CLI and are functioning properly. This is being tracked with DDTS CSCsc77866.

- In McData firmware versions 4.01.xx and 5.01.xx, the McData switch might not send a domain RSCN to a connected host when a new switch joins the fabric. If this occurs, the host might not see the remote target.

    Workaround: Plug and unplug the host cable.

- When a McData switch with firmware versions 4.01.xx/5.01.xx/5.02.xx in open-fabric mode is attached to an MDS 9000 switch, and there are hosts attached to the MDS 9000 switch which register a symbolic port or node name with the FCNS, the name server on the McData switch may send ABTS (abort sequences) to devices that are locally attached to the McData switch. According to the FC SW-2 standard, (Section 9.3.3 Name Server Objects), Port Symbolic Name and Node Symbolic Name are not mandatory fields in the small name server object. The result is that an end device that successfully registers a symbolic port/node name with an MDS 9000 switch may cause the McData switch name server to malfunction. End devices that log into the McData name server will receive abort sequences (ABTS).

    Workaround: Plug all devices that register symbolic node and port world wide names into the McData switch. This issue is resolved in MDS SAN-OS Release 1.3(4a) and the MDS 9000 switch no longer distributes symbolic port or node names as part of interop mode 1 VSANs.

    MDS SAN-OS CLI command: **show fcns database detail**

```
Device registered with Symbolic Node Name:
----------------------
VSAN:1     FCID:0xea0100
----------------------
port-wwn (vendor)     :21:00:00:e0:8b:08:96:22 (Qlogic)
node-wwn              :20:00:00:e0:8b:08:96:22
class                 :3
node-ip-addr          :0.0.0.0
ipa                   :ff ff ff ff ff ff ff ff
fc4-types:fc4_features:scsi-fcp:init
symbolic-port-name    :
symbolic-node-name    :QLA23xx FW:v3.01.19 DVR:v8.2.2.25 (W2K VI)
port-type             :N
port-ip-addr          :0.0.0.0
fabric-port-wwn       :20:41:00:05:30:00:94:9e
hard-addr             :0x000000

Device that does not register a symbolic name:
----------------------
VSAN:1     FCID:0x7d0200
----------------------
port-wwn (vendor)     :20:00:00:e0:69:40:8d:63 (JNI)
node-wwn              :10:00:00:e0:69:40:8d:63
class                 :2,3
node-ip-addr          :0.0.0.0
ipa                   :ff ff ff ff ff ff ff ff
fc4-types:fc4_features:ipfc
symbolic-port-name    :
symbolic-node-name    :
port-type             :N
port-ip-addr          :0.0.0.0
fabric-port-wwn       :20:0c:00:0b:be:57:70:40
hard-addr             :0x000000
```

- When routing with IVR between an interop mode 1 VSAN and a non-interop mode 1 VSAN, make sure that there are no domains outside the 97 to 127 range in the native mode, or in the legacy interop mode 2 or 3 VSANs. Domains outside of this range cannot be created in the interop mode 1 VSAN. This is not a limitation of IVR, but a restriction is imposed upon the configuration by interop mode 1.

- When using the McData EFCM application (also know as HAFM when purchased through Hewlett Packard), the McData switch needs to be the principal switch in the fabric. If the McData switch is not the principal switch in the fabric, the application will not work correctly.

- If changes to a VSAN require the MDS 9000 switch domain to be restarted (FC Timers, domain IDs, and so on), suspend and unsuspend the VSAN instead of using the **fcdomain restart disruptive vsan** command. The RCF frame can cause the links to become isolated.

IBM BladeCenter (QLogic Switch)

- If the IBM BladeCenter is involved in an IVR configuration, the **ivr virtual-fcdomain-add** command should be used because the specified switches do not query the remote name server unless it is present in the domain list. Issuing this command causes all virtual domains to appear in the domain list. This command only needs to be issued in the VSANs (border VSANs) in which the specified switch is present. With MDS SAN-OS Release 1.3(4a) or later, issue this command only in edge or border VSANs and not in transit VSANs. If multiple IVR-enabled switches exist in an edge or border VSAN, the following error message may be displayed in the system messages: (DEVICE_ON_WRONG_NATIVE_VSAN). This message can be ignored.

- Enabling IOStreamGuard will prevent RSCNs from being sent to the blades in the BladeCenter. Therefore, a blade will not be notified if a target joins or leaves the fabric. The BladeCenter **show config port** command displays the status. This feature is disabled by default.

- If DCNM-SAN is unable to see initiators on the IBM BladeCenter, verify that the InbandEnabled parameter on the IBM switch module is set to true. Use the following CLI commands to verify that InbandEnabled is set to true:

```
Sanbox2 login: admin
    Password: ********
    #> show config switch
```

The following displays:

```
    Switch Configuration Information
    -------------------------------
    AdminState Online
    BroadcastEnabled True
    * InbandEnabled True
```

If InbandEnabled is set to false, use the following CLI commands to change the setting:

```
#> admin start
(admin)#> config edit
(admin-config)#> set config switch
```

A list of attributes with formatting and current values displays. Enter a new value or press **Enter** to accept the current value. If you want to terminate this process before reaching the end of the list, press **q + Enter** or **Q + Enter**.

```
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [False] True
```

```
DefaultDomainID (decimal value, 1-239) [6]
```

This configuration must be saved (using the **config save** command) and activated (using the **config activate** command) before it can take effect. If you want to discard this configuration, use the **config cancel** command.

```
(admin-config) #> config save
(admin) #> config act
```

DCNM-SAN is now able to display the initiators present in the IBM fabric within its topology map.

IBM BladeCenter (QLogic Switch)