F–port–channel–trunk from MDS 9148 (NPV) to MDS 9509 (NPIV) Configuration Example

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Introduction

This document describes how to configure an F–port–channel–trunk from a Multilayer Data Switch (MDS) 9500 that runs with feature N_Port ID Virtualization (NPIV) to an MDS 9148 that runs feature N_Port Virtualization (NPV).

F–port–channel–trunks allow for the fabric logins from the NPV switch to be virtualized over the port–channel. This provides non–disruptive redundancy should individual member links fail. The individual links by default are in rate–mode shared, but can be rate–mode dedicated as well.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- N_Port Virtualization
- Fibre Channel

Components Used

The information in this document is based on these software and hardware versions:

- MDS 9509 that runs NX−OS Software Release 6.2(9)
- Slot 2 − DS−X9148 − 48 port 1/2/4 Gbps FC Module
- Slot 4 − DS−X9124 − 24 port 1/2/4 Gbps FC Module
- MDS 9148 that runs NX−OS Software Release 6.2(9)

This document relies on these features:

- Feature NPV and NPIV were added in SAN−OS Sofware Release 3.3
- Feature fport−channel−trunk was added NX−OS Software Release 4.1(3)

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Configure

Note: Use the Command Lookup Tool (registered customers only) in order to obtain more information on the commands used in this section.

Notes:
All interfaces should be in the same Virtual Storage Area Network (VSAN). This example uses VSAN 1.

It is a best practice to distribute the member interfaces onto different linecards.

"switchport rate−mode dedicated" is optional. By default, Trunking F (TF) port interfaces can run in rate−mode shared if desired. If the bandwidth on the port−group is available, they can be configured with the *switchport rate−mode dedicated* command. You can enter the *show port−resources module x* command in order to see the port−groups and available bandwidth on each.

MDS 9509 That Runs NX−OS Sofware Release 6.2(9)

```
feature fport-channel-trunk
 feature npiv

 interface port-channel 1
   channel mode active
   switchport mode F
   switchport trunk allowed vsan 1
   switchport trunk allowed vsan add 20
   switchport rate-mode dedicated

 interface fc2/2
   switchport rate-mode dedicated
   switchport mode F
   channel-group 1 force
   no shutdown

 interface fc4/8
   switchport rate-mode dedicated
   switchport mode F
   channel-group 1 force
   no shutdown
```

MDS 9148 That Runs NX−OS Sofware Release 6.2(9)

Notes:
All ports on a 9148 are dedicated (full−rate mode) so no configuration is necessary on the 9148 in order to

ensure dedicated. In fact, the "switchport rate–mode dedicated" command is added automatically and cannot be changed.

"feature fport–channel–trunk" does not need to be configured on MDS NPV switches.

A change to NPV mode erases the current configuration and reboots the switch in NPV mode.

```
feature npv

 interface port-channel 1
   channel mode active
   switchport mode NP
   switchport trunk allowed vsan 1
   switchport trunk allowed vsan add 20
   switchport rate-mode dedicated
   switchport trunk mode on

 interface fc1/2
   switchport mode NP
   switchport trunk mode on
   port-license acquire
   channel-group 1 force
   no shutdown

 interface fc1/14
   switchport mode NP
   switchport trunk mode on
   port-license acquire
   channel-group 1 force
   no shutdown
```

Network Diagram
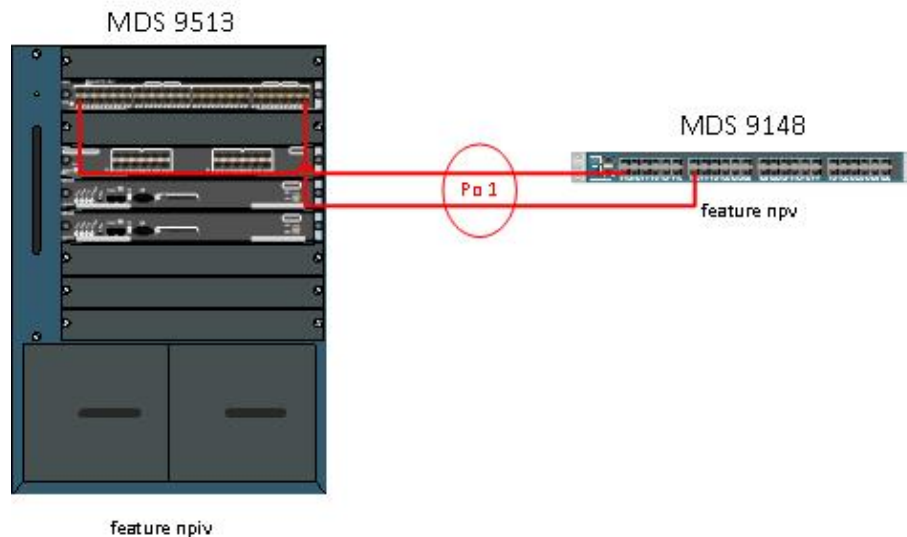
F–port–channel–trunk from MDS 9148(NPV) to MDS 9509(NPIV)

Topology

MDS 9509 module information:

```
mds9509# show mod
Mod  Ports  Module-Type                          Model            Status
---  -----  ------------------------------------ ---------------- ----------
```

```
2    48     1/2/4 Gbps FC Module              DS-X9148         ok
4    24     1/2/4 Gbps FC Module              DS-X9124         ok
5    0      Supervisor/Fabric-2               DS-X9530-SF2-K9  active *
6    0      Supervisor/Fabric-2               DS-X9530-SF2-K9  ha-standby
```

MDS 9148 module information:

```
mds9148# show mod
Mod  Ports  Module-Type                      Model             Status
---  -----  -------------------------------- ----------------- ----------
1    48     1/2/4/8 Gbps FC/Supervisor-3     DS-C9148-K9-SUP   active *
```

Verify

Use this section to confirm that your configuration works properly.

The Output Interpreter Tool (registered customers only) supports certain *show* commands. Use the Output Interpreter Tool in order to view an analysis of *show* command output.

MDS 9509

This command indicates port–channel 1 has two operational ports.

```
mds9509# show port-channel summary
--------------------------------------------------------------------------
Interface                 Total Ports      Oper Ports      First Oper Port
--------------------------------------------------------------------------
port-channel 1                2                2                 fc4/8
```

This command shows the port–channel and all of the member interfaces. The First Operational Port (FOP) is indicated with an asterisk:

```
mds9509(config-if)# show port-channel data
port-channel1
    Administrative channel mode is active
    Operational channel mode is active
    Last membership update succeeded
    First operational port is fc4/8
    2 ports in total, 2 ports up
    Ports:   fc2/2    [up]
             fc4/8    [up] *
```

This command shows the port–channel 1 interface is in state "trunking" which is the desired state.

Note: VSANs 1 and 20 are both up which indicates there are ports in both VSANs that are UP on the 9148.

```
 mds9509# show int po1
 port-channel 1 is trunking
    Hardware is Fibre Channel
    Port WWN is 24:01:00:0d:ec:20:ba:00
    Admin port mode is F, trunk mode is on
    snmp link state traps are enabled
    Port mode is TF
    Port vsan is 1
    Speed is 8 Gbps
    Trunk vsans (admin allowed and active) (1,20)
    Trunk vsans (up)                       (1,20)
    Trunk vsans (isolated)                 ()
    Trunk vsans (initializing)             ()
    5 minutes input rate 112 bits/sec, 14 bytes/sec, 0 frames/sec
```

```
        5 minutes output rate 152 bits/sec, 19 bytes/sec, 0 frames/sec
          25798 frames input, 1399932 bytes
             0 discards, 0 errors
             0 CRC,  0 unknown class
             0 too long, 0 too short
          23082 frames output, 1013152 bytes
             0 discards, 0 errors
          18 input OLS, 14 LRR, 29 NOS, 0 loop inits
          17 output OLS, 0 LRR, 21 NOS, 0 loop inits
        Member[1] : fc4/2
        Member[2] : fc4/8
        Interface last changed at Thu Mar  6 06:27:36 2014
```

This command shows the two member interfaces also in state "trunking".

```
mds9509# show interface fc2/2, fc4/8
fc2/2 is trunking
    Hardware is Fibre Channel, SFP is short wave laser w/o OFC (SN)
    Port WWN is 20:42:00:0d:ec:20:ba:00
    Admin port mode is F, trunk mode is on
    snmp link state traps are enabled
    Port mode is TF
    Port vsan is 1
    Speed is 4 Gbps
    Rate mode is dedicated
    Transmit B2B Credit is 32
    Receive B2B Credit is 16
    Receive data field Size is 2112
    Beacon is turned off
    admin fec state is down
    oper fec state is down
    Belongs to port-channel1
    Trunk vsans (admin allowed and active) (1,20)
    Trunk vsans (up)                       (1,20)
    Trunk vsans (isolated)                 ()
    Trunk vsans (initializing)             ()
    5 minutes input rate 0 bits/sec,0 bytes/sec, 0 frames/sec
    5 minutes output rate 0 bits/sec,0 bytes/sec, 0 frames/sec
      31 frames input,4476 bytes
        0 discards,0 errors
        0 invalid CRC/FCS,0 unknown class
        0 too long,0 too short
      30 frames output,4224 bytes
        0 discards,0 errors
      3 input OLS,3  LRR,7 NOS,0 loop inits
      5 output OLS,0 LRR, 4 NOS, 0 loop inits
      16 receive B2B credit remaining
      32 transmit B2B credit remaining
      32 low priority transmit B2B credit remaining
    Last clearing of "show interface" counters  :never

fc4/8 is trunking
    Hardware is Fibre Channel, SFP is short wave laser w/o OFC (SN)
    Port WWN is 20:c8:00:0d:ec:20:ba:00
    Admin port mode is F, trunk mode is on
    snmp link state traps are enabled
    Port mode is TF
    Port vsan is 1
    Speed is 4 Gbps
    Rate mode is dedicated
    Transmit B2B Credit is 32
    Receive B2B Credit is 16
    Receive data field Size is 2112
    Beacon is turned off
    admin fec state is down
    oper fec state is down
```

```
Belongs to port-channel1
Trunk vsans (admin allowed and active) (1,20)
Trunk vsans (up)                        (1,20)
Trunk vsans (isolated)                  ()
Trunk vsans (initializing)              ()
5 minutes input rate 8 bits/sec,1 bytes/sec, 0 frames/sec
5 minutes output rate 8 bits/sec,1 bytes/sec, 0 frames/sec
  45855 frames input,1934340 bytes
    0 discards,0 errors
    0 invalid CRC/FCS,0 unknown class
    0 too long,0 too short
  23018 frames output,1115304 bytes
    0 discards,0 errors
  8 input OLS,5  LRR,8 NOS,0 loop inits
  7 output OLS,0 LRR, 6 NOS, 0 loop inits
  16 receive B2B credit remaining
  32 transmit B2B credit remaining
  32 low priority transmit B2B credit remaining
Last clearing of "show interface" counters 2w 1d
```

MDS 9148

This command indicates port–channel 1 has two operational ports.

```
mds9148# show port-channel summary
-------------------------------------------------------------------------------
Interface                Total Ports      Oper Ports      First Oper Port
-------------------------------------------------------------------------------
port-channel 1               2                2                 fc1/2
```

This command shows the port–channel 1 interface is in state "trunking" which is the desired state.

Note: VSANs 1 and 20 are both up which indicates there are ports in both VSANs that are UP on the 9148.

```
mds9148# show int po1
 port-channel 1 is trunking
    Hardware is Fibre Channel
    Port WWN is 24:01:00:0d:ec:fc:40:c0
    Admin port mode is NP, trunk mode is on
    snmp link state traps are enabled
    Port mode is TNP
    Port vsan is 1
    Speed is 8 Gbps
    Trunk vsans (admin allowed and active) (1,20)
    Trunk vsans (up)                        (1,20)
    Trunk vsans (isolated)                  ()
    Trunk vsans (initializing)              ()
    5 minutes input rate 32 bits/sec,4 bytes/sec, 0 frames/sec
    5 minutes output rate 32 bits/sec,4 bytes/sec, 0 frames/sec
      688 frames input,91096 bytes
        0 discards,0 errors
        0 invalid CRC/FCS,0 unknown class
        0 too long,0 too short
      661 frames output,89080 bytes
        3 discards,0 errors
      14 input OLS,0  LRR,0 NOS,0 loop inits
      32 output OLS,29 LRR, 14 NOS, 0 loop inits
     Member[1] : fc1/2
     Member[2] : fc1/14
     Interface last changed at Thu Mar  6 18:48:57 2014
```

Troubleshoot

This section provides information you can use to troubleshoot your configuration.

If the port−channel does not come up, review this information:

A port can be configured as a member of a static PortChannel only if these configurations are the same in the port and the PortChannel:

- Speed
- Mode
- Rate mode
- Port VSAN
- Trunking mode
- Allowed VSAN list or VF−ID list

Configure the port not in a port−channel and verify it comes up.

Refer to Configuring Port Channels for more information.

VSAN(s) Remain in Initializing

VSANs show as initializing when there are no interfaces FLOGI'd in to that VSAN on the MDS 9148. Once the VSAN is up on the port−channel, if the last remaining port in the VSAN on the MDS 9148 goes down the VSAN remains up.

EPP Failure Messages Seen

Ensure trunk protocol (EPP) is enabled. It should never be turned off:

```
rtp-san-34-15-9509(config)# show trunk protocol
Trunk Protocol is enabled
```

If trunk protocol is disabled then turn it back on:

```
mds9509(config)# show trunk protocol
Trunk Protocol is disabled
mds9509(config)# trunk protocol
mds9509(config)#
mds9509(config)# show trunk protocol
Trunk Protocol is enabled
```