Dell Networking MXL and PowerEdge I/O Aggregator with Cisco Nexus 5000 series "fabric mode" Config Sheets

CLI Config Sheets

Dell Networking Engineering
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A Dell Deployment and Configuration Guide

Revisions (required)

Date	Description	Authors / Editors
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Dell Networking MXL and Dell PowerEdge M I/O Aggregator – Port Mapping

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I/O Bay Two		56			
		55			
		54			
	53	53			
		52	52	52	52
		51	51	51	51
		50	50	50	50
	49	49	49	49	49
	QSFP+ 2 X 40Gb	**QSFP+ 8 X 10GB SFP+ (breakout)**	**SFP+ 4 X10Gb**	**10G-BaseT 4 X 10Gb**	**FC8 x 4**
I/O BayOne		48			
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Fixed QSFP Ports		40			
		39			
		38			
	37	37			
		36	.	.	.
		35	.	.	.
		34	.	.	.
	33	33	.	.	.
Internal 10/1 Gb	**Internal 10 / 1 GB interfaces**				
	32	32	32	32	32
	31	31	31	31	31
	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	.
	2	2	2	2	2
	1	1	1	1	1

Figure 1   Port mapping for MXL and IOA

1 Dell Networking MXL and PowerEdge M I/O Aggregator Module switches in Cisco Nexus 5000 series FCoE environment
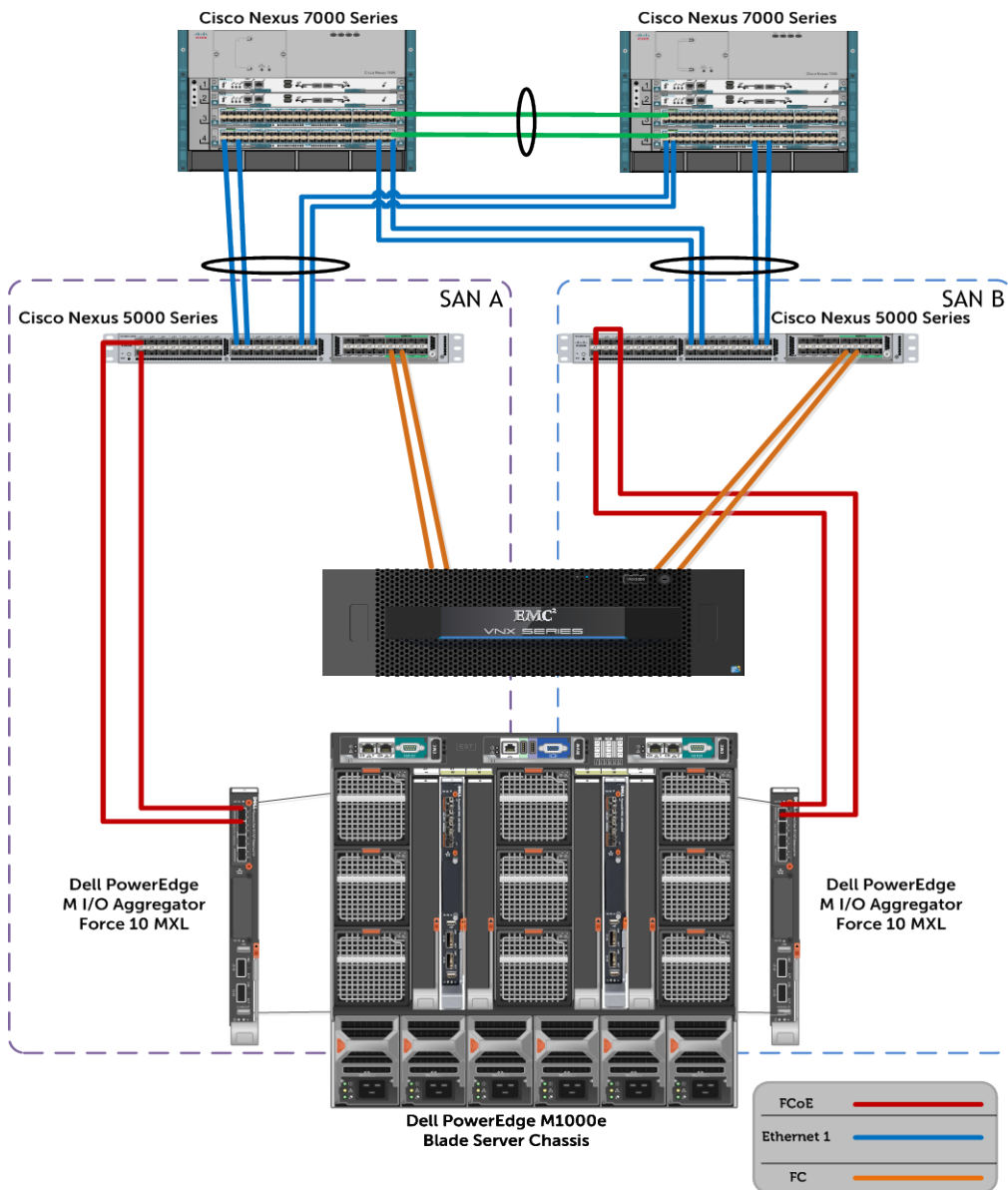

Figure 2   Dell MXL and IOA with Cisco Nexus 5000 series "fabric mode" topology

1.1 Cisco Nexus 5000 series configuration – fabric mode

Enable features, configure all pre-planned VSAN's, VLAN's, and VFC's (see planning matrix) - Side 1 (SAN A)

1. Enable "feature fcoe" to allow the FC ports to function.
2. Feature npiv allows multiple device logins through the same physical port
3. Feature lacp enables the LACP protocol for port-channels (LAGs)

Command line interface
```
feature fcoe
feature npiv
feature lacp
```

4. Create a new VSAN - instantiate it in the VSAN database.
5. Configure regular ethernet VLANs, and then the FCoE VLAN is created with an assignment to its respective VSAN
6. Instantiate but do not configure the upstream port-channel (LAG) to the core /aggregation switch
7. Instantiate but do not configure the downstream port-channel (LAG) to the IOA

Command line interface
```
vsan database
 vsan 2
vlan 20,30-32, 88
vlan 1000
 fcoe vsan 2
interface port-channel 1
interface port-channel 20
```

8. Create the VFC interface to bind to the servers CNA FIP MAC address. This can be located in the CMC WWN table or the IDRAC page for the server. (in this example 2 different server's CNA's are configured)

Command line interface
```
interface vfc101
 bind mac-address 5C:F9:DD:16:EF:07
 no shutdown
interface vfc102
 bind mac-address 5C:F9:DD:16:EF:21
 no shutdown
```

9. Move back into the VSAN database and create entries for the new VFC just created and create entries for the FC port(s) that will be used.

Command line interface
```
vsan database
 vsan 2 interface vfc101
 vsan 2 interface vfc102
 vsan 2 interface fc2/1
 vsan 2 interface fc2/2
```

1st (SAN A) Cisco Nexus 5548 Configuration

Enable features, configure all pre-planned VSAN's, VLAN's, and VFC's (see planning matrix) - Side 2 (SAN B)

1. Enable "feature fcoe" to allow the FC ports to function.
2. Feature npiv allows multiple device logins through the same physical port
3. Feature lacp enables the LACP protocol for port-channels (LAGs)

Command line interface
```
feature fcoe
feature npiv
feature lacp
```

4. Create a new VSAN - instantiate it in the VSAN database.
5. Configure regular ethernet VLANs, and then the FCoE VLAN is created with an assignment to its respective VSAN
6. Instantiate but do not configure the upstream port-channel (LAG) to the core /aggregation switch
7. Instantiate but do not configure the downstream port-channel (LAG) to the IOA

Command line interface
```
vsan database
 vsan 3
vlan 21,30-32,88
vlan 1001
 fcoe vsan 3
interface port-channel 2
interface port-channel 21
```

8. Create the VFC interface to bind to the servers CNA FIP MAC address. This can be located in the CMC WWN table or the IDRAC page for the server. (in this example 2 different server's CNA's are configured)

Command line interface
```
interface vfc201
 bind mac-address 5C:F9:DD:16:F0:10
 no shutdown
interface vfc202
 bind mac-address 5C:F9:DD:16:F1:7E
 no shutdown
```

9. Move back into the VSAN database and create entries for the new VFC just created and create entries for the FC port(s) that will be used.

Command line interface
```
vsan database
 vsan 3 interface vfc201
 vsan 3 interface vfc202
 vsan 3 interface fc2/1
 vsan 3 interface fc2/2
```

2nd (SAN B) Cisco Nexus 5548 Configuration

Side 1 (SAN A)

10. Configure the needed port-channels/LAGs/Trunks.
- There will be one going upstream to the core/ aggregation switch, and one going downstream to the IOA/MXL.

```
interface ethernet 1/1-2
 channel-group 20 mode active
 description FCoE_downlink_to_IOA-MXL
interface ethernet 1/9-10
 channel-group 1 mode active
 description Ethernet_uplink_to_7K
```

11. Configure the port-channels with the applicable settings which will then automatically apply to the individual ethernet interfaces if done in this order.
- VLAN 30-32, and 88 are example ethernet VLAN's just to show how these are applied in this configuration.
- VLAN 20 is the native VLAN applicable to the port-channel that is being used for FCoE, however the default VLAN of the switch can be used in this case and this is not required to be configured.
- VLAN 1000 is the FCoE VLAN and this must be configured for FCoE traffic to traverse from the FSB to the Nexus 5k and then to storage.

Command line interface

```
interface port-channel 1
 description port-channel_eth9+10_to_7k
 switchport mode trunk
 switchport trunk allowed vlan 30-32,88

interface port-channel 20
 description port-
channel_eth1+2_to_IOA-MXL
 switchport mode trunk
 switchport trunk native vlan 20
 switchport trunk allowed vlan 20,1000
```

12. Turn on or enable the FC ports that are applicable to this configuration.

Command line interface

```
interface fc2/1-2
 no shutdown
```

1ˢᵗ (SAN A) Cisco Nexus 5548 Configuration

Side 2 (SAN B)

10. Configure the needed port-channels (LAGs)/Trunks. There will be one going upstream to the core/ aggregation switch, and one going downstream to the IOA/MXL.

Command line interface

```
interface ethernet 1/1-2
 channel-group 21 mode active
 description FCoE_downlink_to_IOA-MXL
interface ethernet 1/9-10
 channel-group 2 mode active
 description Ethernet_uplink_to_7K
```

11. Configure the port-channels with the applicable settings which will then automatically apply to the individual ethernet interfaces if done in this order.
- VLAN 30-32, and 88 are example ethernet VLAN's just to show how these are applied in this configuration.
- VLAN 21 is the native VLAN applicable to the port-channel that is being used for FCoE, however the default VLAN of the switch can be used in this case and this is not required to be configured.
- VLAN 1001 is the FCoE VLAN and this must be configured for FCoE traffic to traverse from the FSB to the Nexus 5k and then to storage.

Command line interface

```
interface port-channel 2
 description port-channel_eth9+10_to_7k
 switchport mode trunk
 switchport trunk allowed vlan 30-32,88

interface port-channel 21
 description port-
channel_eth1+2_to_IOA-MXL
 switchport mode trunk
 switchport trunk native vlan 21
 switchport trunk allowed vlan 21,1001
```

12. Turn on or enable the FC ports that are applicable to this configuration.

Command line interface

```
interface fc2/1-2
 no shutdown
```

2ⁿᵈ (SAN B) Cisco Nexus 5548 Configuration

Configure Zoning with Cisco Nexus in switch mode (NPIV)- Side 1 (SAN A)

13. Configure applicable zones that will match the blade server CNA's (2 are used in this example) to applicable FC port(s) going to storage.
- "zone1SAN_A" is the example name being used here but this name is at the discretion of the administrator
- pwwn <hh...hh> is applicable to the PWWN of the CNA

Command line interface
```
zone name zone1SAN_A vsan 2
 member pwwn <20:01:5c:f9:dd:16:ef:07>
 member pwwn <20:01:5c:f9:dd:16:ef:21>
 member interface fc2/1
 member interface fc2/2
```

14. Create a zoneset that will group all the applicable zones together and allow for the group activation.
- "set1SAN_A" is just an example name for this configuration

15. Activate the zoneset

Command line interface
```
zoneset name set1SAN_A vsan 2
 member zone1SAN_A

zoneset activate name set1SAN_A vsan 2
```

- Check that the applicable zoneset and zones are now active

Command line interface
```
Show zoneset active
```

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results
```
Zoneset name set1SAN_A vsan 2
 zone name zone1SAN_A vsan 2
 * fcid 0x850000 [interface pwwn
20:01:5c:f9:dd:16:ef:07]
 * fcid 0x850100 [interface pwwn
20:01:5c:f9:dd:16:ef:21]
 * fcid 0x850200 [interface fc2/1 swwn
20:41:54:7f:ee:53:3e:80]
 * fcid 0x850300 [interface fc2/1 swwn
20:42:54:7f:ee:53:3e:80]
```

1ˢᵗ (SAN A) Cisco Nexus 5548 Configuration

Configure Zoning with Cisco Nexus in switch mode (NPIV)- Side 2 (SAN B)

13. Configure applicable zones that will match the blade server CNA's (2 are used in this example) to applicable FC port(s) going to storage.
- "zone1SAN_B" is the example name being used here but this name is at the discretion of the administrator
- pwwn <hh...hh> is applicable to the PWWN of the CNA

Command line interface
```
zone name zone1SAN_B vsan 3
 member pwwn <20:01:5c:f9:dd:16:f0:10>
 member pwwn <20:01:5c:f9:dd:16:f1:7e>
 member interface fc2/1
 member interface fc2/2
```

14. Create a zoneset that will group all the applicable zones together and allow for the group activation.
- "set1SAN_B" is just an example name for this configuration

15. Activate the zoneset

Command line interface
```
zoneset name set1SAN_B vsan 3
 member zone1SAN_B

zoneset activate name set1SAN_B vsan 3
```

- Check that the applicable zoneset and zones are now active

Command line interface
```
Show zoneset active
```

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results
```
Zoneset name set1SAN_B vsan 3
 zone name zone1SAN_A vsan 3
 * fcid 0x850000 [interface pwwn
20:01:5c:f9:dd:16:f0:10]
 * fcid 0x850100 [interface pwwn
20:01:5c:f9:dd:16:f1:7e]
 * fcid 0x850200 [interface fc2/1 swwn
20:41:54:7f:ee:56:55:40]
 * fcid 0x850300 [interface fc2/1 swwn
20:42:54:7f:ee:56:55:40]
```

2ⁿᵈ (SAN B) Cisco Nexus 5548 Configuration

1.2 Dell Networking MXL CLI configuration for FIP Snooping

Enable features, configure all pre-planned VLAN's, and other commands - Side 1 (SAN A)
- Enable FIP-snooping feature
- Enable LLDP protocol
- Configure service-class dynamic dot1p

Command line interface
```
feature fip-snooping
protocol lldp
exit
service-class dynamic dot1p
```

- Configure default VLAN for switch if needed, this is the global untagged VLAN for the switch

Command line interface
```
default vlan-id 20
```

- Configure the downstream or server facing switch ports.

Command line interface
```
interface range te 0/1 – 2
 portmode hybrid
 switchport
 protocol lldp
   dcbx port-role auto-downstream
 spanning-tree pvst edge-port
 no shutdown
```

- Configure the upstream or FCF switch facing individual external ports to be part of a port-channel

Command line interface
```
interface range te 0/51 – 52
 port-channel-protocol LACP
  port-channel 1 mode active
 protocol lldp
  no advertise dcbx-tlv ets-reco
  dcbx port-role auto-upstream
 no shutdown
```

- Configure the upstream port-channel

Command line interface
```
interface port-channel 1
 portmode hybrid
 switchport
 fip-snooping port-mode fcf
 no shutdown
```

1st (SAN A) Dell Networking MXL (FIP-Snooping) Configuration

Enable features, configure all pre-planned VLAN's, and other commands - Side 2 (SAN B)
- Enable FIP-snooping feature
- Enable LLDP protocol
- Configure service-class dynamic dot1p

Command line interface
```
feature fip-snooping
protocol lldp
exit
service-class dynamic dot1p
```

- Configure default VLAN for switch if needed, this is the global untagged VLAN for the switch

Command line interface
```
default vlan-id 21
```

- Configure the downstream or server facing switch ports.

Command line interface
```
interface range te 0/1 – 2
 portmode hybrid
 switchport
 protocol lldp
   dcbx port-role auto-downstream
 spanning-tree pvst edge-port
 no shutdown
```

- Configure the upstream or FCF switch facing individual external ports to be part of a port-channel

Command line interface
```
interface range te 0/51 – 52
 port-channel-protocol LACP
  port-channel 1 mode active
 protocol lldp
  no advertise dcbx-tlv ets-reco
  dcbx port-role auto-upstream
 no shutdown
```

- Configure the upstream port-channel

Command line interface
```
interface port-channel 1
 portmode hybrid
 switchport
 fip-snooping port-mode fcf
 no shutdown
```

2nd (SAN B) Dell Networking MXL (FIP-Snooping) Configuration