



Dell Networking MXL / PowerEdge I/O Aggregator with Cisco Nexus 5000 series "NPV mode" and Cisco MDS 9100 fabric switch Config Sheets

CLI Config Sheets

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Dell Networking MXL and Dell PowerEdge M I/O Aggregator – Port Mapping

	QSFP+ 2x40Gb	QSFP+ 8x10GB SFP+ (breakout)	SFP+ 4x10Gb	10G-BaseT 4x10Gb	FC8 x 4
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
I/O BayOne	QSFP+ 2 X 40Gb	QSFP+ 8 X 10GB SFP+ (breakout)	SFP+ 4 X10Gb	10G-BaseT 4 X 10Gb	FC8 x 4
		48			
		47			
		46			
	45	45			
		44	44	44	44
		43	43	43	43
	42	42	42	42	
	41	41	41	41	41
Fixed QSFP Ports	QSFP+ 2 X 40Gb	QSFP+ 8 X 10GB SFP+ (breakout)	SFP+ 4 X10Gb	10G-BaseT 4 X 10Gb	FC8 x 4
		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

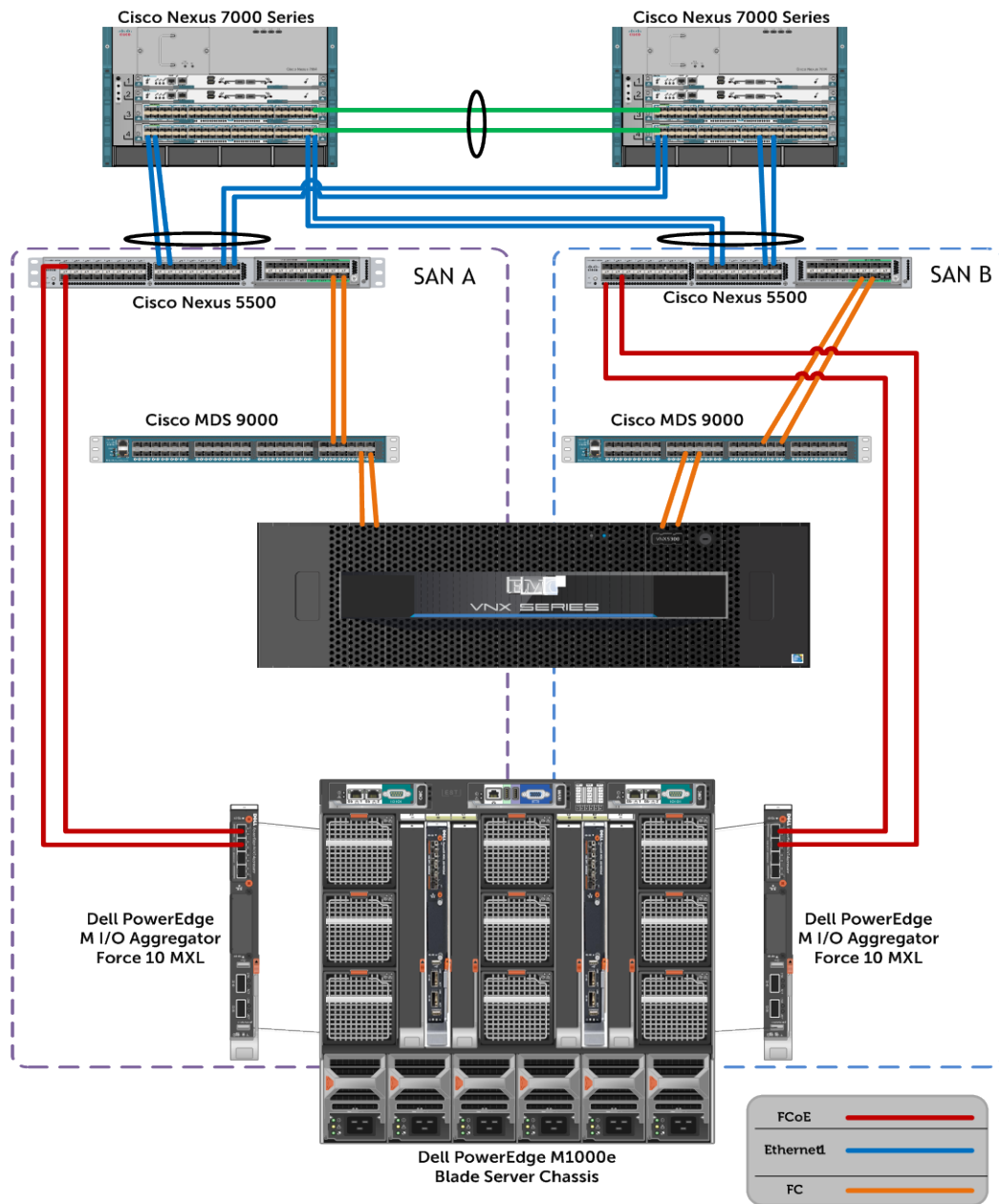


Figure 2 Dell MXL and IOA with Cisco Nexus 5000 series “NPV mode” topology



1.1 Cisco Nexus 5000 series configuration – NPV mode

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

1. For NPV configuration with FC SAN switches the feature NPV must be set and this will cause the configuration and switch to reload.

```
feature npv
```

Command line interface

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

```
feature fcoe
feature npiv
feature lacp
```

Command line interface

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

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

Command line interface

9. 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)

```
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
```

Command line interface

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

1. For NPV configuration with FC SAN switches the feature NPV must be set and this will cause the configuration and switch to reload.

```
feature npv
```

Command line interface

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

```
feature fcoe
feature npiv
feature lacp
```

Command line interface

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

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

Command line interface

9. 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)

```
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
```

Command line interface

1st (SAN A) Cisco Nexus 5548 Configuration

2nd (SAN B) Cisco Nexus 5548 Configuration

Side 1 (SAN A)

10. 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.

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

Command line interface

11. 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-MXL1

interface ethernet 1/9-10
channel-group 1 mode active
description Ethernet_uplink_to_7K1
```

Command line interface

12. 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
- VLAN 20 is the native VLAN
- 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.

```
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
```

Command line interface

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

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

Command line interface

Side 2 (SAN B)

10. 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.

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

Command line interface

11. 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 21 mode active
description FCoE_downlink_to_IOA-MXL2

interface ethernet 1/9-10
channel-group 2 mode active
description Ethernet_uplink_to_7K2
```

Command line interface

12. 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
- VLAN 21 is the native VLAN
- 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.

```
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
```

Command line interface

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

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

Command line interface

1.2 Cisco MDS 9100 Series configuration

Configure Cisco MDS 9100 Series **Side 1 (SAN A)**

1. Enable feature NPV

```
feature npiv
```

Command line interface

2. Create entries in the VSAN database to instantiate the VSAN and then add needed interfaces to that VSAN

```
vsan database
vsan 2
vsan 2 interface fc1/1-2
vsan 2 interface fc1/13-14
```

Command line interface

3. Configure zones

- The zone name used in this example is Blade1And2-SAN_A. This can be any name desired that makes troubleshooting and management easy.

```
zone name Blade1And2-SAN_A vsan 2
member interface fc1/1-2
member interface fc1/13-14
```

Command line interface

4. Create zoneset and activate

- The zoneset is a larger container that can hold several zones to be activated as a group. This can be named any name desired for management and troubleshooting purposes. In this example set1-SAN_A is the name used.

```
zoneset name set1-SAN_A vsan 2
member Blade1And2-SAN_A vsan 2

zoneset activate name set1-SAN_A vsan 2
```

Command line interface

- Check that the zoneset and zones are active.

```
show zoneset active
```

Command line interface

```
zoneset name set1-SAN_A vsan 2
zone name Blade1And2-SAN_A vsan 2
* fcid 0x850000 [interface fc1/1 swwn
20:00:54:7f:ee:50:45:e8]
* fcid 0x850001 [interface fc1/2 swwn
20:00:54:7f:ee:50:45:e8]
* fcid 0x850200 [interface fc1/13 swwn
20:00:54:7f:ee:50:45:e8]
* fcid 0x850201 [interface fc1/14 swwn
20:00:54:7f:ee:50:45:e8]
```

results

Configure Cisco MDS 9100 Series **Side 2 (SAN B)**

1. Enable feature NPV

```
feature npiv
```

Command line interface

2. Create entries in the VSAN database to instantiate the VSAN and then add needed interfaces to that VSAN

```
vsan database
vsan 3
vsan 3 interface fc1/1-2
vsan 3 interface fc1/13-14
```

Command line interface

3. Configure zones

- The zone name used in this example is Blade1And2-SAN_B. This can be any name desired that makes troubleshooting and management easy.

```
zone name Blade1And2-SAN_B vsan 3
member interface fc1/1-2
member interface fc1/13-14
```

Command line interface

4. Create zoneset and activate

- The zoneset is a larger container that can hold several zones to be activated as a group. This can be named any name desired for management and troubleshooting purposes. In this example set1 is the name used.

```
zoneset name set1-SAN_B vsan 3
member Blade1And2-SAN_B vsan 3

zoneset activate name set1-SAN_B vsan 3
```

Command line interface

- Check that the zoneset and zones are active.

```
show zoneset active
```

Command line interface

```
zoneset name set1-SAN_B vsan 3
zone name Blade1And2-SAN_B vsan 3
* fcid 0x380000 [interface fc1/1 swwn
20:00:54:7f:ee:cb:0f:60]
* fcid 0x380001 [interface fc1/2 swwn
20:00:54:7f:ee:cb:0f:60]
* fcid 0x380100 [interface fc1/13 swwn
20:00:54:7f:ee:cb:0f:60]
* fcid 0x380101 [interface fc1/14 swwn
20:00:54:7f:ee:cb:0f:60]
```

results

1st (SAN A) Cisco MDS 9000 Series Configuration

2nd (SAN B) Cisco MDS 9000 Series Configuration

1.3 Dell Networking MXL – FIP snooping configuratoin

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

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

Command line interface

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

```
default vlan-id 20
```

Command line interface

- Configure the downstream or server facing switch ports.

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

Command line interface

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

```
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
```

Command line interface

- Configure the upstream port-channel

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

Command line interface

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

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

Command line interface

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

```
default vlan-id 21
```

Command line interface

- Configure the downstream or server facing switch ports.

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

Command line interface

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

```
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
```

Command line interface

- Configure the upstream port-channel

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

Command line interface

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

