Dell EMC Networking MXL

Switch Configuration Guide for Dell EMC SC Series and Dell PS Series SANs

Abstract

This document illustrates how to configure the Dell EMC Networking MXL 10/40GbE blade switch for Dell™ PowerEdge™ M1000e blade enclosures with Dell EMC™ SC Series or Dell PS Series storage using Dell EMC best practices.

July 2018

Revisions

Date	Description
January 2013	Initial release
September 2013	Revised for firmware version 9.2.0.0
February 2014	Revised for firmware version 9.3.0.0
April 2014	Minor update
July 2018	Revised for OS 9.13, and to include configuration for both SC Series and PS Series storage

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1 Introduction

This document illustrates how to configure the Dell EMC Networking MXL 10/40GbE blade switch for Dell™ PowerEdge™ M1000e blade enclosures with Dell EMC™ SC Series or Dell PS Series storage using Dell EMC best practices. Link Aggregation Groups (LAGs) for inter-switch connections are mandatory for PS Series iSCSI SAN environments and optional for SC Series iSCSI SAN environments. Optional steps are provided in section 3 to enable Data Center Bridging (DCB).

Note: For more information on SC Series or PS Series SAN design recommendations, see the *Dell EMC Storage Compatibility Matrix*.

1.1 Document conventions

Table 1 lists the formatting conventions used in this document.

Table 1 Document conventions

Item	Convention	Example
Code samples	Monospace	`System configuration has been modified.`
Parameters	Italic	`DellEMC(profile-name)#`
Command-line commands	Bold	`OS#show version`
Command-line user-supplied variables	Bold, italic, brackets	***<vlan-id>***

1.2 Audience

This switch configuration guide describes an optimal configuration following Dell EMC best practices for an SC Series or PS Series iSCSI SAN and is intended for storage or network administrators and deployment personnel.

1.3 Switch details

Table 2 provides an overview of the switch configuration.

Table 2 Switch specifications

Dell Networking MXL	
Switch vendor	Dell EMC Networking
Switch model	MXL
Switch operating system	9.13 or later

Note: For proper functionality, the switch must be at the switch operating system version shown in Table 2 before proceeding with this configuration. Using previous switch operating system versions may have unpredictable results.

Note: The latest switch operating system updates and documentation can be found at the Force10 Portal.

1.4 Cabling diagrams

Refer to one of the following cabling sections that is applicable to your storage system: SC Series (section 1.4.1) or PS Series (section 1.4.2).

Note: Host servers are connected internally to the switch ports.

1.4.1 SC Series cabling diagram

The cabling diagram shown in Figure 1 represents the Dell EMC recommended method for deploying servers and SC Series storage arrays.

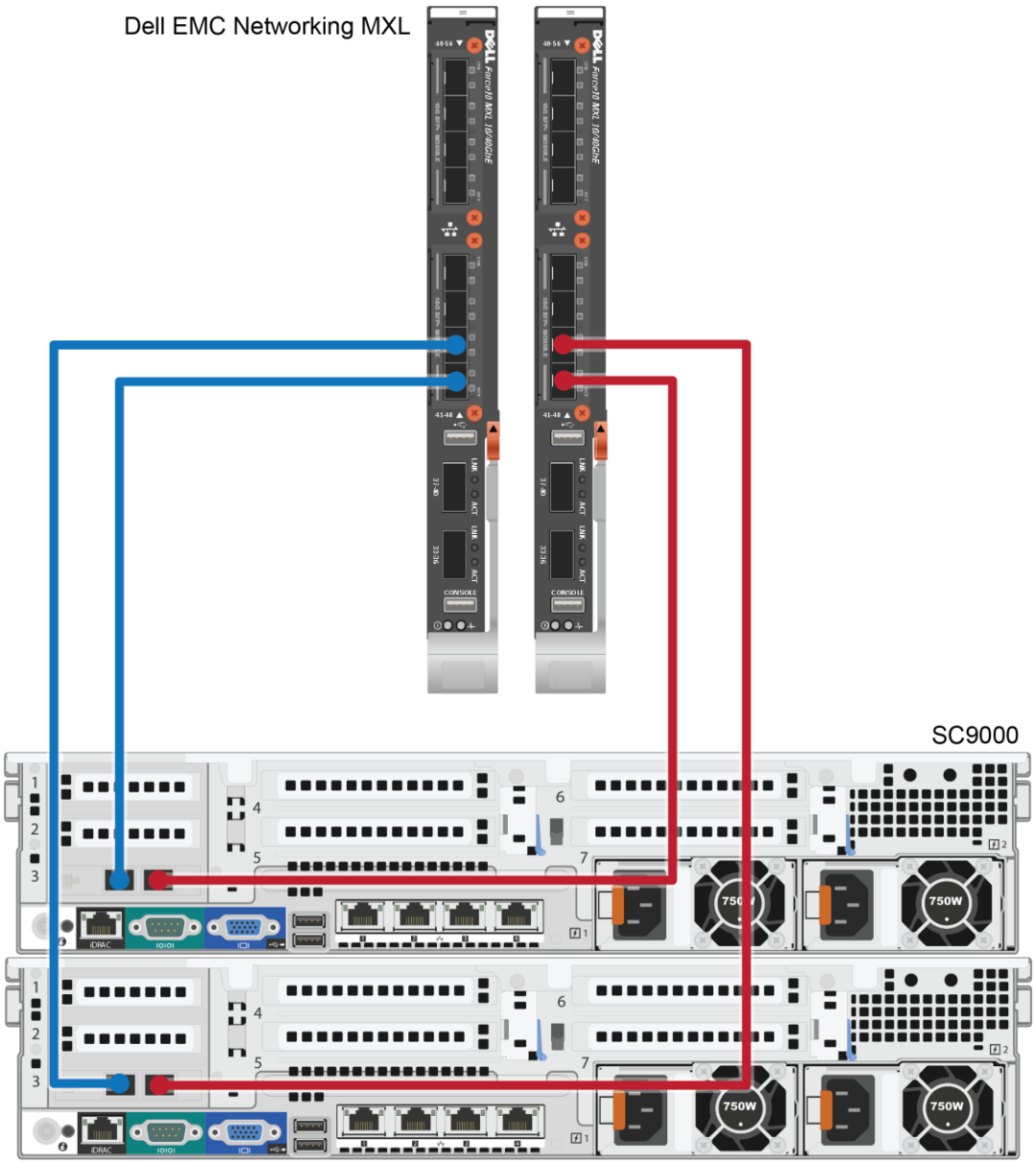

Figure 1 SC Series cabling diagram

1.4.2 PS Series cabling diagram

The cabling diagram shown in Figure 2 represents the Dell EMC recommended method for deploying servers and PS Series storage arrays.

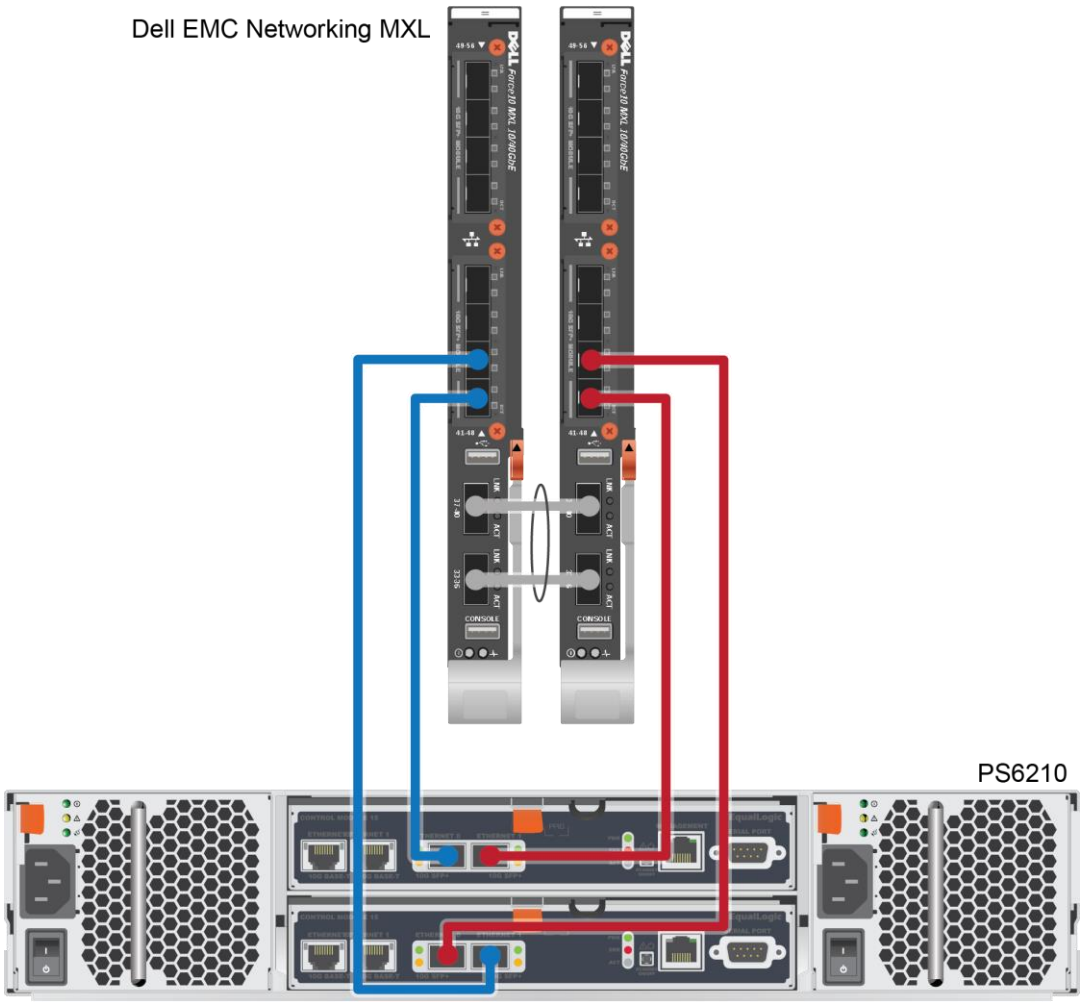

Figure 2 PS Series cabling diagram

2 Dell EMC recommended switch configuration

The steps in this section show how to configure two Dell EMC Networking MXL 10/40GbE blade switches with a Link Aggregation Group (LAG). The switches are interconnected using two of the 40GbE QSFP ports, and the LAG is configured for Dynamic Link Aggregation Control Protocol (LACP).

Note: In an SC Series iSCSI SAN environment, a LAG interconnect is not required.

2.1 Hardware configuration

Note: Do not connect any storage controller cables to the switch or interconnect cables before performing the following configuration steps.

1. Power on the M1000e chassis.
2. Login to the chassis CMC.
3. From the CMC CLI, connect to the MXL 10/40GbE blade switches using the following command:

   ```
   $connect switch-<n>
   ```

   In this command, ***<n>*** is the number of the switch. (To obtain the switch number, run the **getmodinfo** command from the CMC CLI.

4. Perform all CLI steps from section 2 and section 3 (optional) on switch 1. Repeat this process for switch 2.
5. **Required for PS Series (optional for SC Series):** Connect the interconnect cables between the switches by connecting physical port 33 on switch 1 to physical port 33 on switch 2, and physical port 37 on switch 1 to physical port 37 on switch 2. See the interconnect configuration in Figure 2.
6. Connect all storage controller cables to the switches.

2.2 Delete startup configuration

Note: This example assumes a switch is using the default configuration settings. Using the **delete startup-config** command will set the startup configuration file to its default settings. Always back up your configuration settings prior to performing any configuration changes.

```
Dell>enable
Dell#delete startup-config
Proceed to delete startup-config [confirm yes/no]yes
Dell#reload
System configuration has been modified. Save? [yes/no]no
Proceed with reload [confirm yes/no]yes
```

Note: The switch will reboot.

2.3 Disable iSCSI optimization

Note: As a best practice, Dell EMC recommends disabling iSCSI session monitoring for larger SAN deployments. iSCSI session monitoring is enabled by default as part of iSCSI optimization. These steps show how to disable iSCSI optimization and manually configure the switches for use with EqualLogic iSCSI storage.

```
Dell>enable
Dell#configure
Dell(conf)#no iscsi enable
```

2.4 Disabling DCB configuration

Note: For DCB environments, skip this section. For non-DCB environments, DCB must be manually disabled using the following steps:

```
Dell(conf)#no dcb enable
Dell(conf)#exit
Dell#copy running-config startup-config
```

2.5 Configure out-of-band management port

```
Dell#configure
Dell(conf)#interface managementEthernet 0/0
Dell(conf-if-ma-0/0)#ip address <ipaddress> <mask>
Dell(conf-if-ma-0/0)#no shutdown
Dell(conf-if-ma-0/0)#exit
```

2.6 Configure route for out-of-band management port (optional)

```
Dell(conf)#management route <X.Y.Z.0> /24 <A.B.C.1>
```

Note: In the previous command, ***<X.Y.Z.0>*** is the network your management system is connecting from and ***<A.B.C.1>*** is the gateway for the switch. If your management system is on the same subnet as the switch, the previous step may be omitted. The prior example assumes a class C subnet mask.

2.7 Configure login credentials

```
Dell(conf)#username admin privilege 15 password 0 <yourpassword>
Dell(conf)#enable password level 15 0 <yourpassword>
Dell(conf)#exit
```

2.8 Enable switch ports

Use the commands for option 1 or option 2 to enable the switch ports.

Option 1: Enable ports individually by entering the port number.

```
Dell#configure
Dell(conf)#interface tengigabitethernet 0/1
Dell(conf-if-te-0/1)#switchport
Dell(conf-if-te-0/1)#no shutdown
Dell(conf-if-te-0/1)#exit
```

Option 2: Enable multiple ports at once using the **range** parameter. The following example assumes the base MXL switch with two optional 4 port SFP+ Flex IO modules installed. Actual configuration may vary depending on the modules installed.

```
Dell(conf)#interface range tengigabitethernet 0/1-32 , tengigabitethernet 0/41 -
52
Dell(conf-if-range-te-0/1-32,te-0/41-52)#switchport
```

2.9 Enable Jumbo frames

```
Dell(conf-if-range-te-0/1-32,te-0/41-52)#mtu 9216
```

2.10 Configure flow control

```
Dell(conf-if-range-te-0/1-32,te-0/41-52)#flowcontrol rx on tx off
```

2.11 Configure spanning tree on edge ports

```
Dell(conf-if-range-te-0/1-32,te-0/41-52)#spanning-tree rstp edge-port
Dell(conf-if-range-te-0/1-32,te-0/41-52)#no shutdown
Dell(conf-if-range-te-0/1-32,te-0/41-52)#exit
Dell(conf)#protocol spanning-tree rstp
Dell(conf-rstp)#no disable
Dell(conf-rstp)#exit
```

2.12 Configure port channel for LAG

Note: This section is mandatory for PS Series SANs and optional for SC Series SANs.

These commands create a port channel or link aggregation used as an interconnect between two switches.

```
Dell(conf)#interface Port-channel 1
Dell(conf-if-po-1)#mtu 9216
Dell(conf-if-po-1)#switchport
Dell(conf-if-po-1)#no shutdown
Dell(conf-if-po-1)#exit
```

The following commands assign 40Gb QSFP ports to the port channel.

```
Dell(conf)#interface range fortyGigE 0/33 , fortyGigE 0/37
Dell(conf-if-range-fo-0/33,fo-0/37)#mtu 9216
Dell(conf-if-range-fo-0/33,fo-0/37)#flowcontrol rx on tx off
Dell(conf-if-range-fo-0/33,fo-0/37)#no shutdown
Dell(conf-if-range-fo-0/33,fo-0/37)#port-channel-protocol lacp
Dell(conf-if-range-fo-0/33-37-lacp)#port-channel 1 mode active
Dell(conf-if-range-fo-0/33-37-lacp)#end
```

2.13 Save configuration and reload switch

```
Dell#copy running-config startup-config
Dell#reload
System configuration has been modified. Save? [yes/no]Yes
Proceed with reload [confirm yes/no]yes
```

2.14 Configure additional switch

Repeat the commands from section 2 to configure the second switch.

Note: The preceding procedure places all switch ports in the default VLAN. If you prefer to place ports in a non-default VLAN, refer to the documentation for your switch.

3 Configure Data Center Bridging (optional)

DCB is enabled by default. This section shows the steps required to configure Data Center Bridging (DCB).

Note: You must complete the Dell EMC recommended switch configuration steps in section 2 before configuring the switch for DCB mode.

3.1 Disable 802.3x flow control on SFP+ ports

```
Dell#configure
Dell(conf)#interface range tengigabitethernet 0/1 – 32 , tengigabitethernet 0/41
- 52
Dell(conf-if-range-te-0/1-32,te-0/41-52)#no flowcontrol rx on tx off
Dell(conf-if-range-te-0/1-32,te-0/41-52)#exit
```

3.2 Disable 802.3x flow control on QSFP ports

```
Dell(conf)#interface range fortyGigE 0/33 , fortyGigE 0/37
Dell(conf-if-range-fo-0/33,fo-0/37)#no flowcontrol rx on tx off
Dell(conf-if-range-fo-0/33,fo-0/37)#exit
```

3.3 Enable DCB

```
Dell(conf)#dcb enable
```

3.4 Create tagged VLAN for all ports and port-channels

```
Dell(conf)#interface vlan <VLAN-id>
```

Note: You must supply a VLAN ID. The valid range is 2-4093. This example uses VLAN ID 100.

```
Dell(conf-if-vl-100)#tagged tengigabitethernet 0/1-32
Dell(conf-if-vl-100)#tagged tengigabitethernet 0/41-52
Dell(conf-if-vl-100)#tagged port-channel 1
Dell(conf-if-vl-100)#no shutdown
Dell(conf-if-vl-100)#exit
```

3.5 Configure DCB policies

```
Dell(conf)#dcb-map <profile-name>
Dell(conf-dcbmap-profile-name*)#priority-group 0 bandwidth 50 pfc off
Dell(conf-dcbmap-profile-name*)#priority-group 1 bandwidth 50 pfc on
```

Note: The sum of the bandwidth-percentages must be equal to 100.

```
Dell(conf-dcbmap-profile-name*)#priority-pgid 0 0 0 0 1 0 0 0
Dell(conf-dcbmap-profile-name*)#exit
```

3.6 Apply policies to switch ports

```
Dell(conf)#interface range tengigabitethernet 0/1 – 32 , tengigabitethernet 0/41
- 52
Dell(conf-if-range-te-0/1-32,te-0/41-52)# dcb-map <profile-name>
Dell(conf-if-range-te-0/1-32,te-0/41-52)#exit
Dell(conf)#interface range fortyGigE 0/33 , fortyGigE 0/37
Dell(conf-if-range-fo-0/33,fo-0/37)# dcb-map <profile-name>
Dell(conf-if-range-fo-0/33,fo-0/37)#end
```

3.7 Save configuration and reload switch

```
Dell#copy running-config startup-config
Dell#reload
System configuration has been modified. Save? [yes/no]Yes
Proceed with reload [confirm yes/no]yes
```

3.8 Configure additional switches

Repeat the commands from section 3 to configure DCB on additional switches.

A Technical support and resources

Dell.com/support is focused on meeting customer needs with proven services and support.

Dell TechCenter is an online technical community where IT professionals have access to numerous resources for Dell EMC software, hardware, and services.

Storage Solutions Technical Documents on Dell TechCenter provide expertise that helps to ensure customer success on Dell EMC storage platforms.

A.1 Related resources

See the following referenced or recommended Dell publications:

- *Dell PS Series Configuration Guide*
- *Dell EMC Storage Compatibility Matrix*

For best practices white papers, reference architectures, and sizing guidelines for enterprise applications and SANs, refer to PS Series Technical Documents or SC Series Technical Documents.