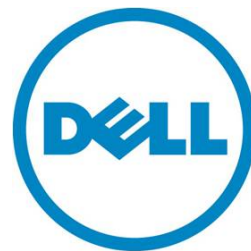

Dell PowerEdge M I/O Aggregator Configuration Quick Reference

Configuring the Dell PowerEdge M I/O Aggregator - Quick Reference

Network Enabled Solutions Team



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Introduction

This document provides an overview of the typical management and configuration of the Dell PowerEdge M I/O Aggregator. This product was designed with ease of use in mind and will enable customers to simply plug in and go with the average network infrastructure. The explanations and examples in this document focus on management through the CMC Web interface as it would be deployed when not part of a Dell Active System deployment or managed by Active System Manager. This device can also have advanced management tasks performed at the CLI (command line interface) when necessary. Please see Dell PowerEdge M I/O Aggregator User's Guide for further instructions on CLI.

The M I/O Aggregator or IOA as it will be called in the rest of the document is an aggregator and is not running any type of Spanning-tree protocols. With this in mind the key to understanding the device is that by default all VLAN's are allowed as if this were a patch-panel or pass-through module. The external ports are all part of the same LAG (link aggregation group) and thus there is no need for Spanning-tree. Common incompatibilities in networks occur with the different Spanning-tree protocols and this device eliminates those incompatibilities. This device should interoperate with any other networking device that would typically be used in a network.

Basic Terms

CMC - Chassis Management Controller of the M1000e Blade Server Chassis

IOA - Dell PowerEdge M I/O Aggregator

IOM - Dell I/O Module for bringing communication from back of servers to customer infrastructure

GUI - Graphical User Interface; provides a graphical interface for configuring a switch, usually through a web browser.

CLI - Command Line Interface; provides a text-based interface for configuring a switch, through the console (serial) port or via telnet/ssh.

Internal and External Ports

Internal Ports

The I/O Aggregator (IOA) is intended to act very similar to a pass-through module providing connectivity to the CNA/Network adapters internally and externally to upstream network devices. Internally the IOA provides thirty-two (32) connections. The connections are 10 Gigabit Ethernet connections for basic Ethernet traffic, iSCSI storage traffic or FCoE storage traffic. In a typical M1000e configuration of 16 half-height blade servers ports 1-16 are used and 17 -32 disabled. However if quad port adapters or quarter-height blade servers are used the 17-32 will be enabled.

Integrated External Ports

The IOA includes two (2) integrated 40Gb Ethernet ports on the base of the module. These ports can be used in a default configuration with a 4 X 10Gb breakout cable to provide 4 (four) 10Gb links for network traffic. Alternatively the ports can be used as 40Gb links for stacking.

FlexIO Expansion

The Dell PowerEdge M I/O Aggregator supports three (3) different types of add-in expansion modules, which are called FlexIO Expansion modules. The modules available are: 4-port 10Gbase-T FlexIO module, 4-port 10G SFP+ FlexIO module, and the 2-port 40G QSFP+ FlexIO module.

-Note: Only 1 (one) 4-port 10Gbase-T module may be used in the IOA at a time, however 2 (two) or a pair of the other types of modules may be used in the IOA at the same time.

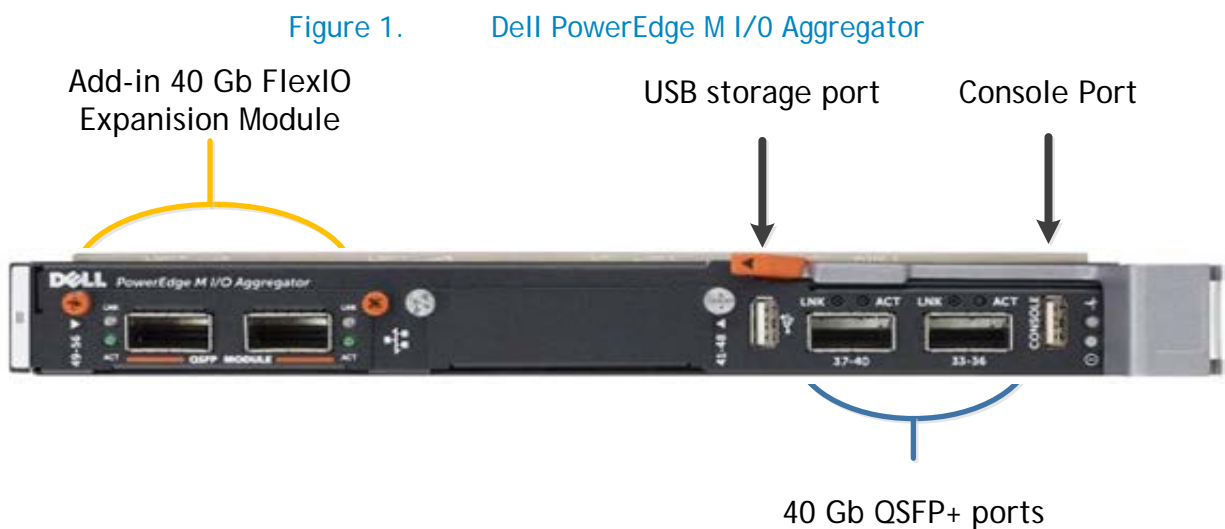


Figure 2. 10Gbase-T four-port FlexIO expansion module

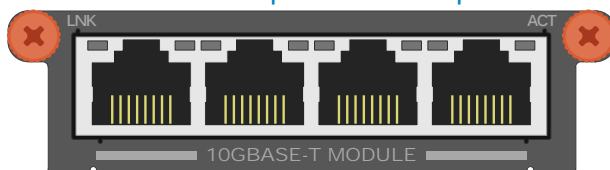
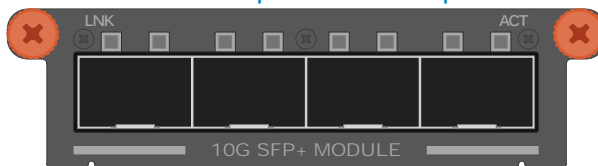


Figure 3. 40G QSFP+ two-port FlexIO expansion module



Figure 4. 10G SFP+ four-port FlexIO expansion module




Management of the M I/O Aggregator

The ease of use with this new Dell product enables for basic management to occur through the PowerEdge M1000e CMC (Chassis Management Controller) browser based management. Through the CMC management pages the IP address of the device can be set statically or by DHCP.

The out-of-band management port on the IOA is reached by connection through the CMC's management port. This one management port on the CMC allows for management connections on all the IOM's within the chassis. To configure the IOA, navigate to the particular IOM in the CMC Web UI and click the setup as displayed in the following picture.

Figure 5. Setup tab for configuring management information of the IOM's

IOM Slot	A1	A2	B1	B2	C1	C2
Name	Dell PowerConnect M6348	Dell PowerConnect M6348	Not Present	PowerEdge M I/O Aggregator	Not Present	Not Present
Power State	On	On		On		
DHCP Enabled	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		
IP Address	172.25.190.41	172.25.190.42		172.25.190.44		
Subnet Mask	255.255.0.0	255.255.0.0		255.255.0.0		
Gateway	0.0.0.0	0.0.0.0		0.0.0.0		
User Name				root		
Password					
SNMP RO Community String				public		
SysLog Server IP Address				0.0.0.0		
Reset to Factory Defaults	<input type="button" value="Reset"/>	<input type="button" value="Reset"/>		<input type="button" value="Reset"/>		

 **Prior to Installation NOTE:** IOA uses LACP for the uplink LAG so it is necessary for the corresponding connections at the upstream switch to also be configured as a LACP LAG. If this is not configured properly uplink failure detection will cause the internal server facing ports to stay in a down state also. This uplink failure detection is in place so that failovers will occur properly when links are lost upstream.

VLAN Management and Behavior

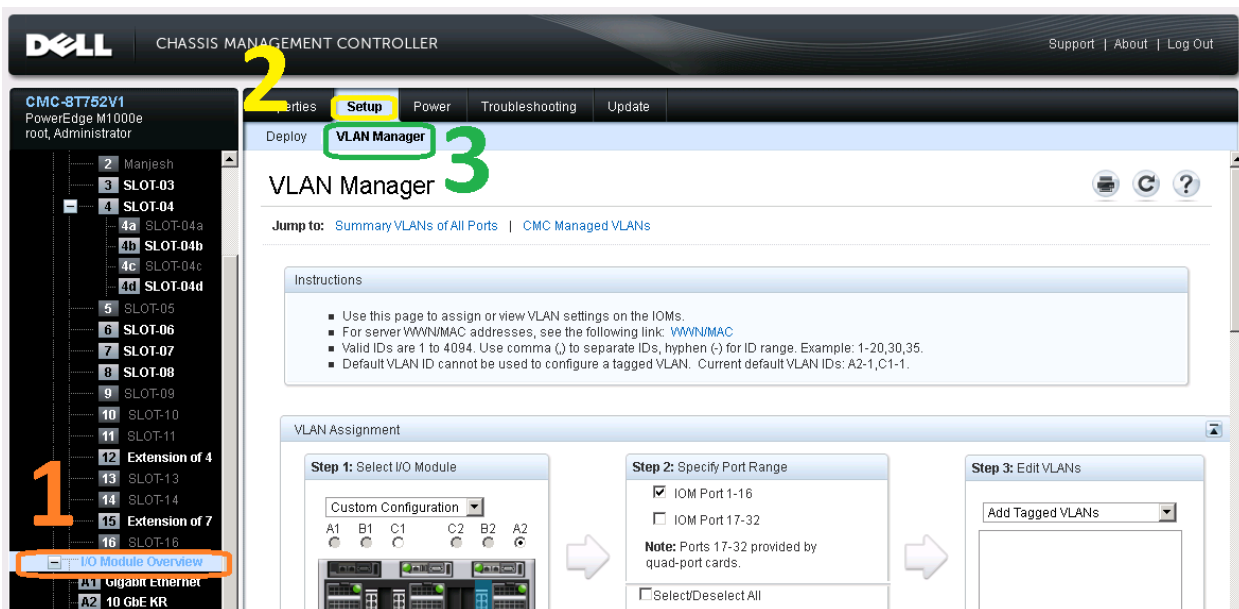
The IOA's simplicity lends to being able to use it in almost any environment with little to no configuration. The IOA has all VLAN's allowed as a default setting. In some environments this would enable the switch to simply act as a patch panel or pass-through module for connecting the blade servers into any managed environment. The idea with this type of configuration is that the ToR (top of rack) managed switch would control what traffic is allowed down to the blade servers via VLAN management.

In many environments this would not allow for the individual VLAN control desired for the individual blade servers. When this is the case the IOA has the ability to set the applicable VLAN ID's and what type of VLAN is desired.

The following picture displays the VLAN management page for the IOA. This can be reached through the CMC Web UI following these steps:

1. click on the I/O Module Overview link in the left navigation bar
2. clicking on the setup tab at the top of the page
3. select VLAN Manager under the setup tab.

Figure 6. Navigation to the VLAN Manager



Setting the VLAN's via the CMC VLAN Management page is done by using the following steps:

1. Select I/O Module - select the applicable radio button for the IOA that should be configured.
2. Specify Port Range - with a typical chassis of half-height blade servers such as the M620 you will use IOM Port 1-16 and this is automatically selected. If you have quarter-height blade

servers such as the M420 either range could be selected to configure the needed ports. Once that is selected it is refined by choosing the specific blade server to configure.

3. Edit VLANs, Add Tagged VLANs - within this text box simply type the number of the tagged VLAN needed. There are also additional options to show VLANs, reset a port to all VLANs, and update the untagged VLANs. These actions are also accomplished with entering the number in the textbox.
4. Apply - with all changes or additions done click apply to complete the configuration settings. The settings can be verified by looking at the VLAN assignment summary field

NOTE: It will take a few seconds up to a few minutes for the changes to be implemented, please be patient. The screen can be refreshed to verify the changes.

Figure 7. Configuring VLANs with the VLAN Manager

VLAN Manager

Jump to: [Summary VLANs of All Ports](#) | [CMC Managed VLANs](#)

Instructions

- Use this page to assign or view VLAN settings on the IOMs.
- For server WWN/MAC addresses, see the following link: [WWN/MAC](#)
- Valid IDs are 1 to 4094. Use comma (,) to separate IDs, hyphen (-) for ID range. Example: 1-20,30,35.
- Default VLAN ID cannot be used to configure a tagged VLAN. Current default VLAN IDs: A2-1, C1-1.

VLAN Assignment

Step 1: Select I/O Module

Custom Configuration

A1 B1 C1 C2 B2 A2

Note: Only CMC Managed IOMs are selectable.

Step 2: Specify Port Range

☒ IOM Port 1-16

☐ IOM Port 17-32

Note: Ports 17-32 provided by quad-port cards.

☐ Select/Deselect All

Step 3: Edit VLANs

Add Tagged VLANs

10

VLAN Assignment Summary

```
undefined10
I/O Module: C1
Chassis Slot 8: Port 8
```

Cancel Apply

[Back to top](#)

After the changes having taken place the CMC Managed VLANs table on the VLAN Manager page will show all applied changes. Scroll down the VLAN Manager page to see this table. An abbreviated version of the table can be seen in the following figure.

Figure 8. CMC VLAN Manager Table

The screenshot shows the CMC VLAN Manager interface. At the top, there are tabs for Properties, Setup, Power, Troubleshooting, and Update. The Setup tab is active, and the VLAN Manager section is selected. Below this, there is a 'VLAN Assignment Summary' window showing 'undefined' and 'I/O Module: A2'. Below the summary, there is a 'Summary VLANs of All Ports' table. At the bottom, there is a 'CMC Managed VLANs' table, which is circled in green. The table shows VLAN assignments for IOM A2 and C1 across ports 1-16 and 17-32.

Summary VLANs of All Ports

IOM	VLANs
A1	Not Managed by CMC
A2	All VLANs, 1 (Untagged)
C1	All VLANs, 60, 100, 102, 1 (Untagged)

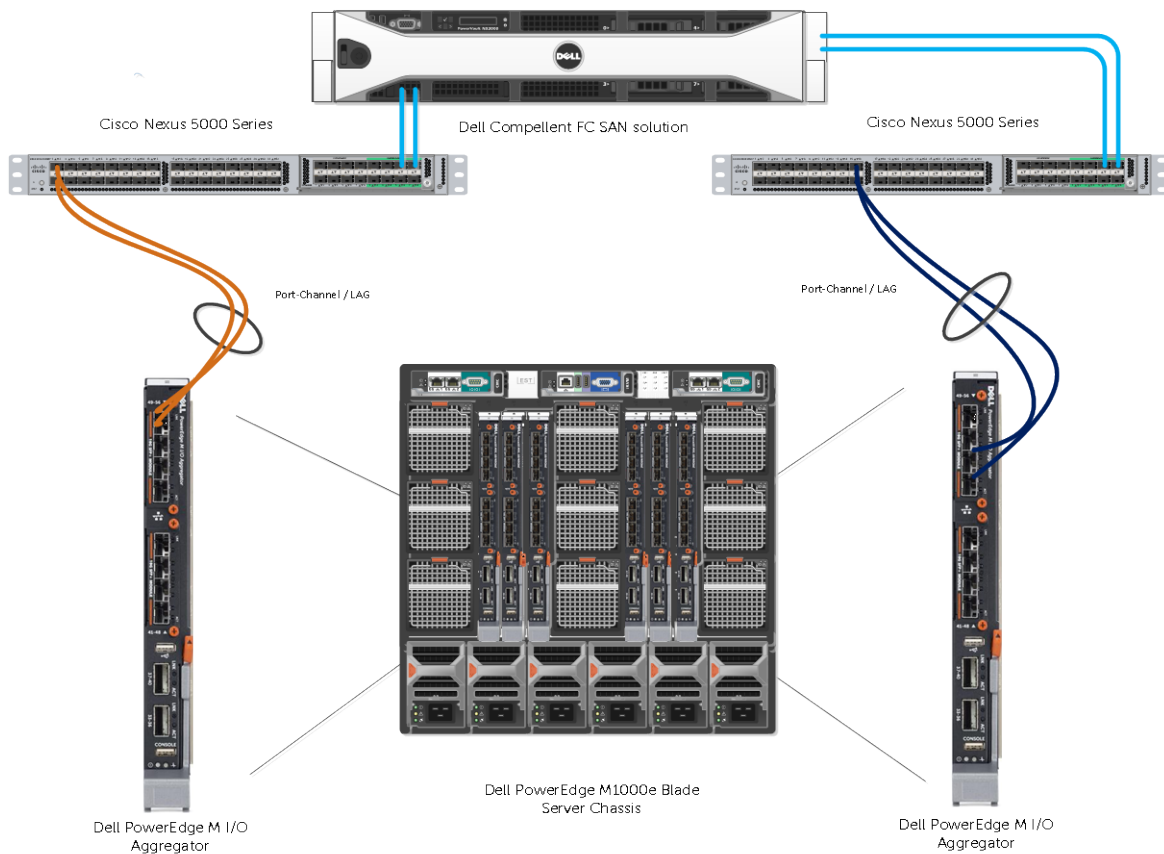
CMC Managed VLANs

IOM	Port	IOM Port (1-16)	VLANs (Ports 1-16)	IOM Port (17-32)	VLANs (Ports 17-32)
A2	1	1	1 (Untagged)	17	All VLANs, 1 (Untagged)
	2	2	1 (Untagged)	18	All VLANs, 1 (Untagged)
	3	3	1 (Untagged)	19	All VLANs, 1 (Untagged)
	4	4	1 (Untagged)	20	All VLANs, 1 (Untagged)
	5	5	1 (Untagged)	21	All VLANs, 1 (Untagged)
	6	6	1 (Untagged)	22	All VLANs, 1 (Untagged)
	7	7	1 (Untagged)	23	All VLANs, 1 (Untagged)
	8	8	1 (Untagged)	24	All VLANs, 1 (Untagged)
	9	9	1 (Untagged)	25	All VLANs, 1 (Untagged)
	10	10	1 (Untagged)	26	All VLANs, 1 (Untagged)
	11	11	1 (Untagged)	27	All VLANs, 1 (Untagged)
	12	12	1 (Untagged)	28	All VLANs, 1 (Untagged)
	13	13	1 (Untagged)	29	All VLANs, 1 (Untagged)
	14	14	1 (Untagged)	30	All VLANs, 1 (Untagged)
	15	15	1 (Untagged)	31	All VLANs, 1 (Untagged)
	16	16	1 (Untagged)	32	All VLANs, 1 (Untagged)
C1	1	1	All VLANs, 1 (Untagged)	17	All VLANs, 1 (Untagged)
	2	2	All VLANs, 1 (Untagged)	18	All VLANs, 1 (Untagged)
	3	3	All VLANs, 1 (Untagged)	19	All VLANs, 1 (Untagged)
	4	4	All VLANs, 1 (Untagged)	20	All VLANs, 1 (Untagged)
	5	5	All VLANs, 1 (Untagged)	21	All VLANs, 1 (Untagged)
	6	6	All VLANs, 1 (Untagged)	22	All VLANs, 1 (Untagged)
	7	7	All VLANs, 1 (Untagged)	23	All VLANs, 1 (Untagged)
	8	8	60, 100, 102, 1 (Untagged)	24	All VLANs, 1 (Untagged)

The CMC Managed VLANs table will show all ports and the VLAN's specific to those ports.

FCoE

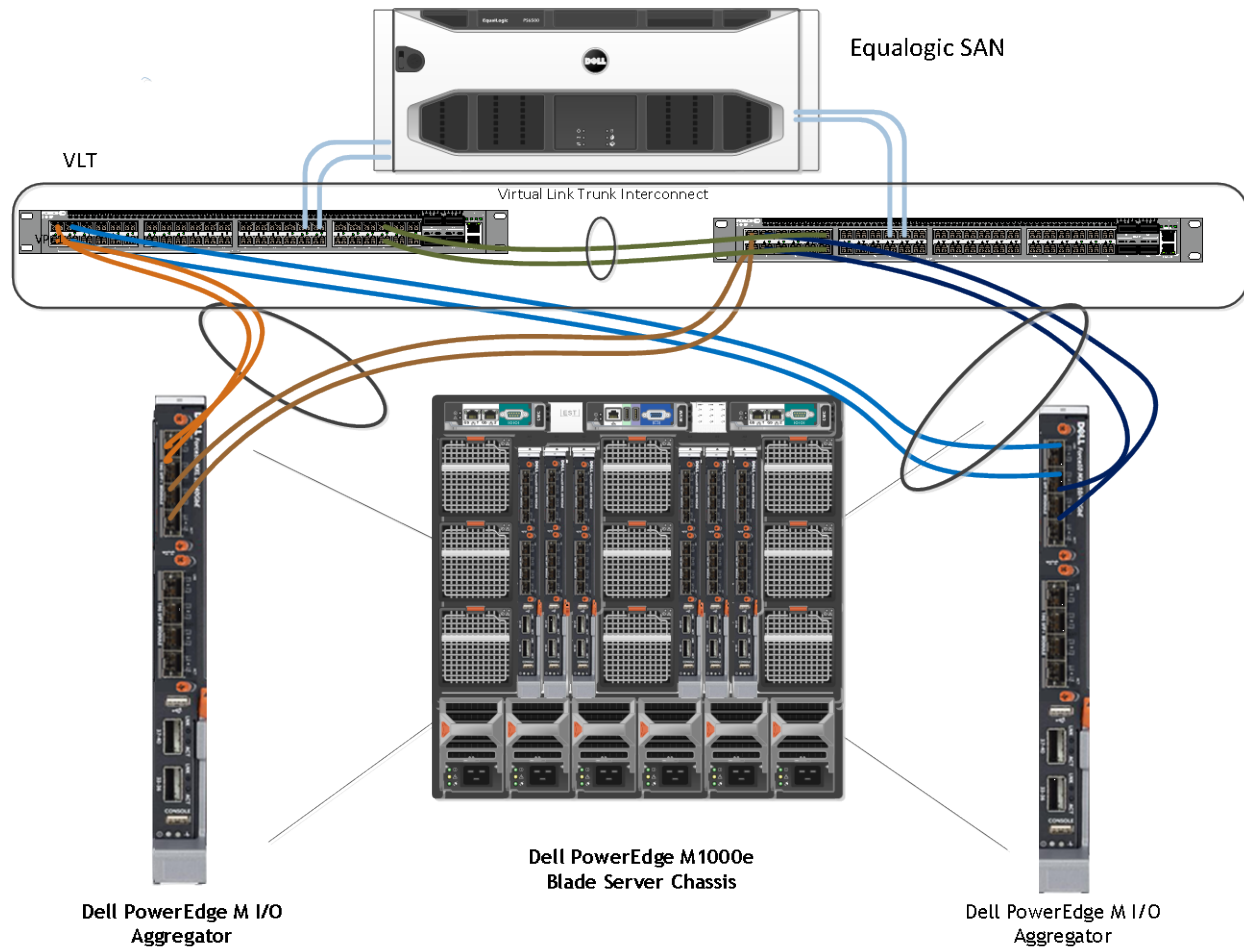
Figure 9. FCoE Configuration



By default the IOA is configured to work with all applicable FCoE settings. If the VLANs are changed for blade servers that are going to be used for FCoE care must be taken to make sure the VLANs are configured correctly to match the upstream ToR (top-of-rack) switch. For the FCoE settings it must be noted that the default VLAN of the IOA (which is 1 unless changed) must be included along with the FCoE tagged VLAN that matches the upstream ToR as mentioned before. See the following document for reference to the Cisco Nexus ToR configuration: [Deploying FCoE on Dell Force10 MXL](#)


iSCSI

Figure 10. iSCSI SAN Network



iSCSI is a TCP/IP-based protocol for establishing and managing connections between IP-based storage devices in a storage area network (SAN). Support for iSCSI traffic is turned on by default when the IOA powers up. No configuration is required. IOA ports are preconfigured for DCB, jumbo frames (MTU 12000 bytes) and storm control (Broadcast, multicast & unknown unicast).

iSCSI optimization provides a means of monitoring iSCSI sessions and applying QoS policies on iSCSI traffic. When enabled iSCSI optimization allows a switch to monitor (snoop) the creation and termination of iSCSI connections. The switch uses the snooped information to detect iSCSI sessions and connections established through the switch. Also iSCSI optimization allows you to reduce deployment time and management complexity in data centers.

 **Note:-** IOA doesn't support spanning-tree so this will not be a consideration for this configuration


Default iSCSI Optimization Values :

Parameter	Default value
iSCSI Optimization global setting	Enabled
iSCSI CoS mode (802.1p priority queue mapping)	Enabled: dot1p priority 4 without remark setting
iSCSI CoS Packet classification	iSCSI packets are classified by VLAN instead of by DSCP values.
DSCP	None: user-configurable.
VLAN priority tag	iSCSI flows are assigned by default to dot1p priority 4 without remark setting.
iSCSI session aging time	10 minutes
iSCSI optimization target ports	iSCSI well-known ports 3260 and 860 are configured as default (with no IP address or name) but can be removed as any other configured target.

The IOA uses the link layer discovery protocol (LLDP) on all interfaces to discover Dell EqualLogic/Compellent devices on the network. LLDP is enabled by default. Once it detects an applicable storage device unicast storm control is disabled on that interface along with setting preconfigured jumbo frames to optimize performance.

The IOA also monitors TCP ports for iSCSI storage device on all interfaces. When a session is detected an entry is created and monitored as long as the session is active.

CLI configuration is necessary only when the configuration includes iSCSI storage devices that cannot be automatically detected and when non-default QoS handling is required

-  **Note:** In some network topologies, you may want to disable DCB on an IOA and allow link-level flow control to control data transmission between the IOA and other network devices. Link-level flow control is automatically enabled when DCB is disabled. The CLI will prompt for the IOA to reload to disable DCB or to re-enable DCB.

Additional Important Notes

The IOA can be stacked to allow for single point management and redundancy across two aggregators, however this is not supported unless used with Dell Active Infrastructure and Dell Active System manager.

Appendix A - Network switch versions

Version information for the network switches used in creating this document are as follows:

Network switch	Software Version
Dell PowerConnect 8100	5.0.0.4
Cisco Catalyst WS-C6504-E	IOS 12.2(33)SX14a;

Appendix B - Common CLI commands

CLI commands	Description
Show version	Shows firmware version
Show running-config	Shows active configuration.
Show interface status	Shows status of all the interfaces
Show boot system stack unit x	Shows A & B system firmware & which is active.
Show system brief	Shows stack brief information
Show system stack-ports	Shows ports that are part of stack group
Show vlan	Shows ports - vlans mapping
Show interface port-channel brief	Lists the port-channel group along with status.
ISCSI related commands	
Show iSCSI	Displays the currently configured iSCSI settings.
Show iSCSI sessions	Displays information on active iSCSI sessions on the switch.
FCOE related commands	
Show fip-snooping fcf	Shows forwarder information
Show fip-snooping enode	Shows all hosts/CNA's that logged into FCF
Show interface tex/x dcbx detail	Shows details of dcbx on that port.
Show interface tex/x pcf/ets summary/detail/statistics	Show details about ets or pfc for that port

About Dell

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