M-Series Blade I/O Guide

I/O Connectivity Options for the Dell PowerEdge M1000e Blade Enclosure

January 15, 2014

Send feedback to: BladeInterconnects@dell.com

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Blade Interconnects

M-Series Blade I/O Guide

Transform your Dell M1000e blade server enclosure.

Ethernet Switching Models	MXL	I/O aggregator	M8024-k	M8428-k	M6348	M6220	10Gb pass-through
Overview	**10/40GbE Switch** High-performance blade provides maximum throughput, flexibility, and iSCSI/FCoE convergence.	**10GbE Plug and Play** Converge infrastructure and connect easily to third-party networks with this flexible Layer 2 blade.	**10GbE Basic** Transition to 10GbE connectivity and extend an available iSCSI/FCoE fabric with this Layer 2/3 switch.	**Ethernet/FC Switch** Connect directly to the Fibre Channel SAN and Ethernet LAN without the need for an FCoE forwarding device.	**1GbE High-density** Leverage existing Ethernet cabling to enable broader scalability in the data center with this Layer 2/3 switch.	**1GbE Basic** Flexible Layer 2/3 switch with dual expansion slots allowing you to customize connectivity options.	**Direct connection** Transparently connect 16 Dell blade servers into the LAN of your choice at 10Gb speeds.
Performance							
Speeds	1, 10 or 40GbE	1 and 10GbE	1 and 10GbE	10GbE and 2/4/8Gb FC	1 and 10GbE	1 and 10GbE	10GbE
Switch fabric capacity	1.28Tbps	1.28Tbps	480Gbps	288Gbps	184Gbps	128Gbps	-
Forwarding capacity (Mpps)	960	960	357	120	160	95	-
Buffer size	9MB	9MB	2MB	7MB	4MB	768KB	-
Latency (Microseconds)	0.68 µs	0.68 µs	1.85 µs	0.6 µs	3.6 µs	6.3 µs	0.1 µs
Ports							
Internal blade server ports	32 (10GbE)	32 (10GbE)	16 (10GbE)	16 (10GbE)	32 (1GbE)	16 (1GbE)	16 (10GbE)
External 1/10GbE (Base-T)	4 (using module)	4 (using module)	2 (using module)	-	16 fixed (1GbE)	4 fixed (1GbE)	-
External 10GbE	8 ports using QSFP+ breakout cables (up to 24 using modules)	8 ports using QSFP+ breakout cables (up to 16 using modules)	4 fixed SFP+ ports (1/10Gb) (Add 4 more 10Gb ports using module)	8 fixed SFP+	2 fixed SFP+ and 2 fixed CX4	4 (using modules)	16 fixed SFP+ (supports 10GbE only)
External 40GbE (QSFP+)	2 integrated QSFP+ (up to 6 using modules)	2 integrated QSFP+ fixed in breakout mode (up to 6 using modules)	-	-	-	-	-
Native Fibre Channel support	Up to 8 FC ports (8Gb)	Up to 8 FC ports (8Gb)	-	4 integrated FC ports (8Gb)	-	-	-
Expansion modules (FlexIO)	2 slots and 3 options (mix or match) • 2 port QSFP+ (10/40GbE)[1] • 4 port SFP+ (1/10GbE) • 4 port Base-T (1/10GbE)[2] • 4 port FC8 (2/4/8Gb) [1]QSFP+ port on I/O Aggregator runs breakout mode 4x10GbE only [2]Both devices limited to one Base-T module only. Populate second slot with another module of your choice.		1 slot and 3 options • 4 port SFP+ (10Gb only) • 2 port Base-T (1/10Gb)	-	-	2 slots and 4 options (Mix or match) • 2 port SFP+ (1/10GbE) • 2 port Base-T (10GbE only) • 2 port CX4 (1/10GbE) • Stacking module (48Gbps)	-
Features							
DCB: PFC, DCBx and ETS	Yes	Yes	Yes (PFC and DCBx)	Yes	-	-	Supports DCB/CEE and FCoE
FCoE	FCoE transit or direct connect	FCoE transit or direct connect	Transit	Direct connect	-	-	Transit
Converged iSCSI (LAN and SAN)	Yes	Yes	Not suitable for iSCSI over DCB	-	-	-	Yes
Stacking	up to 6 using QSFP ports	2 via CLI only	up to 6 using SFP+ ports or SFP+ module	-	up to 12 using CX4 ports	up to 6 using module	-
PVST+	Yes	-	-	-	-	-	-
Simplified Networking Mode	-	Default	Simple Mode	AG Mode (NPIV) FC only	Simple Mode	Simple Mode	-
Accepts Cisco Twin-ax cables	Yes		Yes	Brocade cables only	Yes	Yes	Yes
Optical transceivers supported	QSFP+ (SR only) SFP+ (SR or LR) SFP (SX, LX, and SFP to RJ45)		SFP+ (SR, LR, LRM) SFP*: (SX, LX, or SFP to RJ45) *Optics work in fixed ports only	Brocade Short Wave and Long Wave Multi-mode	SFP+ (SR, LR, LRM)	SFP+ (SR, LR, LRM)	SFP+ (SR, LR)
Max L2 and L3 VLANs	4094/511	4094 (Layer 2 only)	1024/128	3583 (Layer 2 only)	1024/128	1024/128	-
Link Aggregation (Groups/Members)	128/16	1/16	12/8	28/8	48/8	18/8	-
Jumbo frames (Bytes)	12000	12000	9216	9048 Ethernet and 2112 FC	9216	9216	-
Max Routes (IPv4/IPv6)	16000/IPv6 Future	-	8160/4096	4000	10000/3000	224/128	-
IPv4 Routing	RIP, OSPF	-	RIP, OSPF	-	RIP, OSPF	RIP, OSPF	-
IPv6 Routing	Future release	-	OSPF	-	OSPF	OSPF	-
Multicast Routing	IGMP	IGMP Snooping only	IGMP, PIM, DVMRP	IGMP Snooping only	IGMP, PIM, DVMRP, MLD	IGMP, PIM, DVMRP	-

Blade Interconnects
M-Series Blade I/O Guide

Transform your Dell M1000e blade server enclosure.

Fibre channel switching				
Models	**Brocade M6505**	**Brocade M5424**	**Dell 8/4Gbps SAN module**	**Dell 8/4Gbps Pass-Through**
Overview	**High-performance 16Gb Switch** Transform SAN connectivity with maximum throughput and advanced management features for virtualized environments.	**Advanced 8Gb Switch** Connect directly to the Fibre Channel SAN, by-passing any external switches and reducing cables, optics, and management.	**Basic 8Gb Switch** Gain the benefits of port aggregation, fail over, and redundancy without the complexities of additional SAN switches.	**Basic 8Gb Aggregator** Directly connect and isolate bandwidth between servers and any Fibre Channel SAN infrastructure.
Performance				
Speed	16 Gbps (multi-speed 2,4, 8, or 16 Gbps)	8 Gbps (multi-speed: 2, 4, or 8)	8 Gbps (multi-speed: 2, 4, or 8)	8 Gbps (multi-speed: 2, 4, or 8)
Switch capacity (Gbps)	384 (768 Full Duplex)	192 (384 Full Duplex)	192 (384 Full Duplex)	256 Gbps (Full Duplex)
Max Buffer to Buffer Credit	8106	688	688	-
Latency (Microseconds)	0.7 µs	0.7 µs	0.7 µs	-
Ports				
Total ports	24 (16 internal and 8 external)	24 (16 internal and 8 external)	24 (16 internal and 8 external)	32 (16 internal and 16 external)
Port model options	• 24 ports with eight SFP+ transceivers • 24 ports with four SFP+ transceivers • 12 ports with two SFP+ transceivers (12 port model expands to 24 ports with on-demand license)	• 24 ports with eight SFP+ transceivers • 24 ports with four SFP+ transceivers • 12 ports with two SFP+ transceivers (12 port model expands to 24 ports with on-demand license)	• 24 ports with four SFP+ transceivers • 12 ports with two SFP+ transceivers (12 port model expands to 24 ports with on-demand license)	16 ports with 16 SFP+ transceivers
Port Types	D_Port (Diagnostic Port), E_Port, F_Port, M_Port (Mirror Port); self-discovery based on switch type (U_Port); optional port type control in Brocade Access Gateway mode: F_Port and NPIV-enabled N_Port	FL_Port, F_Port, M_Port (Mirror Port), and E_Port; self-discovery based on switch type (U_Port); optional port type control in Brocade Access Gateway mode: F_Port and NPIV-enabled N_Port	F_Port and NPIV-enabled N_Port	N_Port
Features				
Security	SSL, SSH v2, HTTPS, LDAP, RADIUS, Role-Based Access Control (RBAC), DH-CHAP (between switches and end devices), Port Binding, Switch Binding, Secure RPC, Secure Copy (SCP), Trusted Switch, IPSec, IP Filtering			–
Management	HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), SSH; Auditing, Syslog; Brocade Advanced Web Tools, Advanced Performance Monitoring, Brocade Fabric Watch; Brocade Network Advisor SAN Enterprise or Brocade Network Advisor SAN Professional/Professional Plus; Command Line Interface (CLI); SMI-S compliant; Administrative Domains; trial licenses for add-on capabilities	Telnet, HTTP, SNMP v1/v3 (FE MIB, FC Management MIB); Auditing, Syslog, Change Management tracking; EZSwitchSetup wizard; Brocade Advanced Web Tools; Brocade DCFM Professional/ Enterprise; SMI-S compliant, SMI-S scripting toolkit, Administrative Domains	Telnet, HTTP, SNMP v1/v3 (FE MIB, FC Management MIB); Auditing, Syslog, Change Management tracking; Administrative Domains	Module is unmanaged – all management occurs via HBA firmware or exterior switches
Enterprise Performance Pack	Software license option that includes Adaptive Networking, ISL Trunking, Fabric Watch, and Advanced Performance Monitoring.		–	–
ISL Trunking (for Brocade FC devices only)	Inter-Switch Link (ISL) Trunking allows all eight external SAN ports to be combined to form a single, logical ISL, delivering scalable I/O bandwidth utilization and load balancing with an aggregate bandwidth of 128 Gbps (M6505 model) and 64 Gbps (M5424 model).		–	–
Maximum frame size	2112-byte payload			–
Classes of Service	Class 2, Class 3, and Class F (inter-switch frames)			–
Data Traffic Types	Fabric switches supporting unicast	Fabric switches supporting unicast and broadcast		–
Brocade Optical Transceivers (Requires SFP LC connector)	16 Gbps: SWL, LWL, or ELWL	8 Gbps: SWL or LWL 4 Gbps: SWL, LWL, or ELWL	8 Gbps: SWL or LWL	8 Gbps: SWL (16 included)
Fabric Services	Simple Name Server (SNS); Registered State Change Notification (RSCN), NTP v3, Reliable Commit Service (RCS), Dynamic Path Selection (DPS), Brocade Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning), NPIV, and FDMI		-	–

Blade Interconnects

M-Series Blade I/O Guide

Transform your Dell M1000e blade server enclosure.

Cisco Models		1 product/2 versions	
	B22DELL FEX	**3130X**	**3130G**
Overview	**10GbE Nexus Extender** Acts as remote line card of the parent Nexus switch fabric. (Models 5548P, 5548UP, or 5596P only)	**Catalyst Blade Switches** Basic interconnects for Dell M1000e customers who want to maintain a Cisco fabric from server to core.	
Performance			
Speeds	1 and 10GbE	1 and 10GbE	1GbE
Switch fabric capacity	160Gbps	160Gbps	160Gbps
Forwarding capacity (Mpps)	297	59	59
Latency (Microseconds)	0.8 µs	-	-
Ports			
Internal blade server ports	16 (1 or 10GbE)	16 (1GbE)	16 (1GbE)
External 1GbE	-	4 ports (Base-T)	4 ports (Base-T) 4 ports SFP using modules
External 10GbE	8 ports SFP+	2 ports 10GbE using modules	-
Expansion modules	-	Two slots, four options: • 10GBase-CX4 X2 • 10GBase-SR X2 • 10GBase-LRM X2 • OneX SFP+ Converter* *Not sold by Dell	Ships with two TwinGig converter modules that support 1Gb SFP (copper or optical)
Features			
DCB: PFC, DCBx and ETS	Yes	No	No
FCoE	Yes	No	No
Converged iSCSI (LAN and SAN)	Yes	Yes	Yes
Stacking (Virtual Blade Switch)	No	Up to 9	Up to 9
PVST+	Yes	Yes	Yes
Simplified Networking Mode	Managed at top-of-rack	No	No
Twin-ax cables	1m: SFP-H10GB-CU1M 3m: SFP-H10GB-CU3M 5m: SFP-H10GB-CU5M 7m: SFP-H10GB-ACU7M 10m: SFP-H10GB-ACU10M	1m: SFP-H10GB-CU1M 3m: SFP-H10GB-CU3M 5m: SFP-H10GB-CU5M	N/A
Optical transceivers supported	FET-10G[1] SFP-10G-SR SFP-10G-LR SFP-10G-ER [1]FET-10G optic can only be used to connect FEX to Nexus	SFP-10G-SR	SFP-RJ45 converter SFP-LC connector-SWL SFP-LC connector-LWL
Max L2 and L3 VLANs	4013	1005/4096	
Link Aggregation (Groups/ Members)	96/16	48/8	
Jumbo frames (Bytes)	9216	9216	
Max Routes (IPv4 / IPv6)	Managed at top-of-rack	up to 11,000 (IPv4 only)	
IPv4 Routing	Managed at top-of-rack	Ships with IP Base features: Static routes and RIP. Additional features can be purchased: EIGRP, OSPF, and BGP as part of IP Services license.	
IPv6 Routing	Managed at top-of-rack	Available with additional license: Advanced IP Services feature set.	
Multicast Routing	Managed at top-of-rack	IGMP, PIM, DVMRP available with additional IP Services license.	

Infiniband Models	Mellanox 4001F	Mellanox 4001T
Overview	High-performance Infiniband switch	Mainstream Infiniband switch
Performance		
Speed / Bit rate	FDR/56Gbps	FDR10/40Gbps
Data rate	56Gbps	40Gbps
Switch capacity	3.58Tbps	2.56Tbps
Features		
Total ports	32 (16 internal and 16 external)	
IBTA compliance	Meets Infiniband Trade Association specification 1.21 and 1.3	
Quality of Service (QoS)	Advanced scheduling engine supports QoS for up to 9 traffic classes and 9 virtual lanes (8 data + 1 management)	
Linear forwarding table	256 to 4Kbyte MTU (Maximum Transmission Unit)	
Multicast subnet addresses	48K	
Unicast subnet addresses	16K	
Management	Mellanox OpenFabrics Enterprise Distribution (OFED) software stack contains a subnet manager and switch management tools to include: diagnostics, debugging, port mirroring, and OpenSM or third-party subnet manager capability.	
Optics/cables	QSFP active optical or passive fiber	

Dell Services

Whether you are seeking product support or complete IT outsourcing, Dell can deliver services based on your need. Ask about a free business consultation.

Consulting services

Achieve improved business outcomes with professional guidance pertaining to your infrastructure. Improve network performance, add functionality, and leverage existing infrastructure to maximize your investment.

Deployment services

Let us install and correctly optimize your data center infrastructure with a comprehensive set of remote and onsite deployment services.

Managed services

Free yourself to focus on your business and allow Dell to fully manage and monitor your multi-vendor network with triage, resolution, and tier 2 and 3 engineering support.

Support services*

Gain access to professionals 24 hours a day who help you configure, troubleshoot, and diagnose your data center infrastructure. Dell ProSupport™ experts can also help resolve complex issues related to third-party connectivity to Cisco, Brocade, Juniper, HP, and Aruba.

*Availability and terms of Dell Services vary by region. For more information, visit Dell.com/servicedescriptions

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M-Series I/O Modules

Converged Ethernet

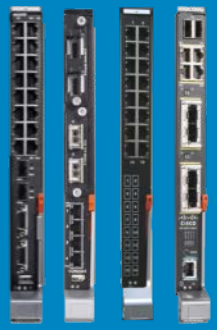
MXL
PowerEdge M I/O Aggregator
M8024-k
M8428-k
10 Gb Pass-Through
Cisco B22DELL FEX

Fibre Channel

Brocade M6505
Brocade M5424
FC SAN Module
Pass Through FC8/4

1Gb Ethernet

M6348
M6220
1Gb Pass-Through
Cisco Catalyst Blade



InfiniBand

Mellanox M4001F
Mellanox M4001T

Ethernet Blade I/O Modules

Product Portfolio

40Gb

10Gb

1Gb

Performance / Bandwidth

MXL

External Ports:
(2) 10/40GbE QSFP+
(2) Optional Modules
QSFP+, SFP+, Base-T, or FC

M8428-k

External Ports:
(8) SFP+ 10GbE
(4) 8Gb FC SAN

Cisco Nexus B22DELL (FEX)

External Ports:
(8) SFP+ 10GbE

M8024-k

External Ports:
(4) SFP+ 1/10GbE
(1) Optional Module
SFP+, or Base-T

I/O Aggregator

External Ports:
(2) QSFP+ ports in 4x10GbE mode
(2) Optional Modules
QSFP+, SFP+, Base-T, or FC

FCF | Integration w/ ToR | FCoE Transit / FSB

IEEE 802.1Q DCB Ethernet (for iSCSI or FCoE)

Cisco 3130G/3130X

External Ports:
(4) RJ45 GbE
(2) Optional Modules
TwinGig

M6220

External Ports:
(4) RJ45 GbE
(2) Optional Modules
SFP+, CX4, Base-T, or stacking

M6348

External Ports:
(16) RJ45 GbE
(2) SFP+ 10GbE
(2) CX4 10GbE

Server Ports

16 | 16 | 32

Converged Ethernet

10/40Gb Switch MXL

10Gb Plug & Play M-IOA

10Gb Basic M8024-k

Ethernet & FC Switch M8428-k

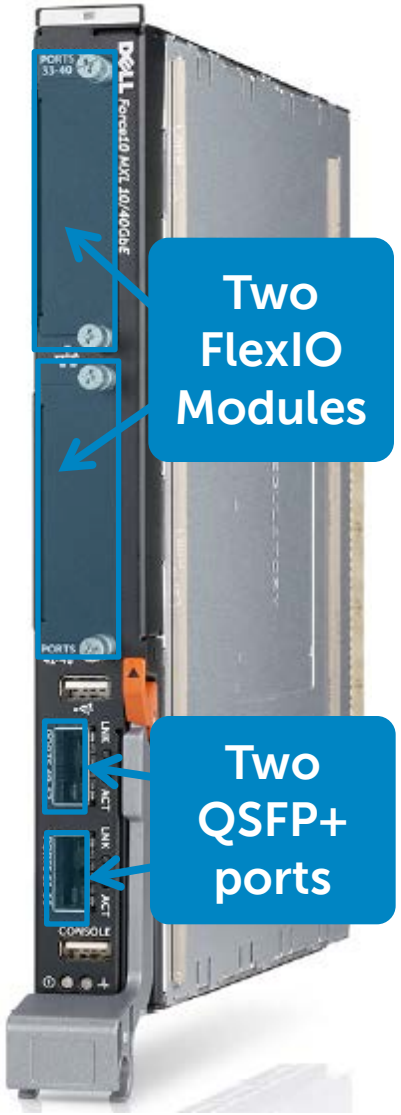
10Gb Pass-Through

Cisco B22DELL FEX

MXL – 10/40GbE blade

Converged

- Industry leading 56 port design:
  - 32x 10Gb internal server ports
  - Up to 6 external 40Gb ports
  - Up to 24 external 10Gb ports (6 QSFP+ ports with breakout cables)
- Two FlexIO bays enable choice (Modules can be different)
  - 2-port 40GbE QSFP+ module (can convert to 8-port 10GbE SFP+ using breakout cables)
  - 4-port 10GbE SFP+ module
  - 4-port 10GBASE-T module (If running Base-T module then second IO slot must be of different type due to power constraints)
  - 4-port FC module
  - Stack up to 6 devices
  - VLT
- PVST+ protocol for easy integration into Cisco environments
- Converged
  - Supports DCB (protocols PFC, ETC and DCBx)
  - Converged iSCSI with EqualLogic (supports iSCSI TLV)
  - Two FCoE Options
    - Native Fibre Channel uplinks with FC FlexIO module (FCoE on internal ports to the servers)
    - FCoE transit to top of rack switch with IOM acting as a FIP Snooping Bridge
- Industry standard CLI
- Enterprise class OS (FTOS)



MXL - 10/40GbE blade

Converged

Adapters

11G
-Broadcom 57712-k
-Brocade BR1741M-k
-Intel X520-x/k
-QLogic QME8242-k

12G
-Broadcom 57810S-k
-Broadcom 57840S-k
-Brocade BR1741M-k
-Intel X520-x/k
-Qlogic QME8262-k

Supports connectivity to 10Gb-KR adapters, all of which are notated with "-k." It does not provide connectivity to legacy 10Gb-XAUI NICs/CNAs

If connected to 1Gb Ethernet Mezzanine cards or LOMs, device will auto-negotiate individual internal ports to 1Gb.

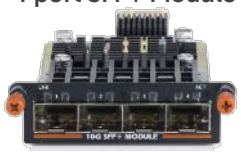
More details in Adapter Portfolio section

Designed for I/O bays

A1/A2
B1/B2
C1/C2

FlexIO modules do not have to be the same

4 port SFP+ Module



- **Optical Transceivers**
  SFP+ 10Gb: SR, LR
  SFP 1GbE: SX, LX
- **SFP to RJ45 converter**
  1000Base-T (only capable of 1Gbps)
- **SFP+ Direct Attach Cable (Twinax)**
  (0.5m, 1m, 2m, 3m, 5m, 7m available)
  Can operate at 10Gb and 1Gb

4 port 10GBASE-T Module
Limited to only one 10GBASE-T module . The other module bay can be populated

- **RJ45 / Cat6a Copper**
  10Gb/1Gb
  (supports auto-negotiation)

4 port FC Module

- **Optical Transceivers**
  SFP+ 8Gbps (will connect at 4/2 Gbps)
  SW 150m, LW 4km

2 port QSFP+ Module

- **QSFP+ to 4xSFP+ Breakout Cables**
  5m Passive Copper
  40GBASE-CR4 10Gb
- **QSFP+ to QSFP+ Direct Attach**
  1m, and 5m, Passive Copper
  40GBASE-CR4 40Gb
- **Optical Transceivers**
  SFP+ 40Gb: SR only

Two Integrated QSFP+ ports
Ports are defaulted to stacking mode but mode can be changed

Secondary Management Serial Port (Cable included)

USB Port

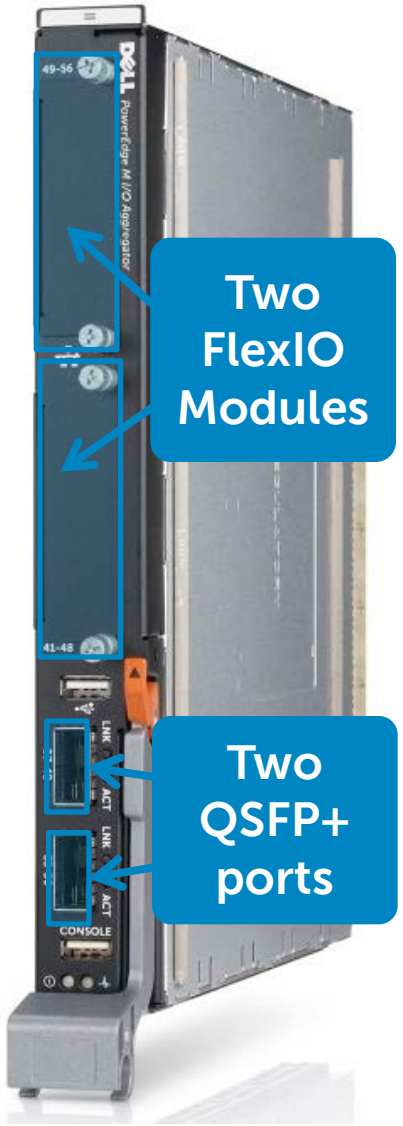
- **QSFP+ to QSFP+ Fiber Cables**
- **QSFP+ to 4xSFP+ Fiber Breakout Cables**

PowerEdge M I/O Aggregator

Plug & Play

Converged

- Easy Deployment
  - Simplified layer 2 connectivity (no spanning tree)
  - Faster Deployment: All VLANs on all ports with the option to set VLANs
  - No touch DCB and no touch FCoE
    - DCB and FCoE settings detected from top of rack switch through DCBx protocol
- Simple GUI Integrated into Chassis Management Controller (CMC)
  (Note: CMC GUI will not function if the IOA is stacked. IOA must be managed through CLI when stacked. Maximum stacking capability is 2)
- High Port Count:
  - 32x 10GbE internal server ports
  - Up to 16 external 10GbE ports (4 QSFP+ ports with breakout cables)
- Two FlexIO bays enable choice
  - 2-port 40GbE QSFP+ module (converts to 8-port 10GbE SFP+ using breakout cables)
  - 4-port 10GbE SFP+ module
  - 4-port 10GBASE-T module
    (If running Base-T module then second IO slot must be of different type due to power constraints)
  - 4-port FC module
- Converged
  - Supports DCB (protocols PFC, ETC and DCBx)
  - Converged iSCSI with EqualLogic and Compellent
  - Two FCoE Options
    - Native Fibre Channel uplinks with FC FlexIO module (FCoE on internal ports to the servers)
    - FCoE transit to top of rack switch with IOM acting as a FIP Snooping Bridge
- Industry standard CLI. Standard troubleshooting commands via CLI
- VLT up to 2 devices



PowerEdge M I/O Aggregator

Converged

Adapters

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More details in Adapter Portfolio section

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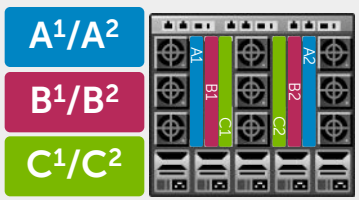
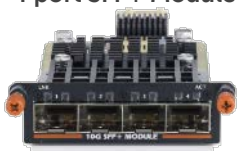


FlexIO modules do not have to be the same

4 port SFP+ Module



- **Optical Transceivers**
  SFP+ 10Gb: SR, LR
  SFP 1GbE: SX, LX
- **SFP to RJ45 converter**
  1000Base-T (only capable of 1Gbps)
- **SFP+ Direct Attach Cable (Twinax)**
  (0.5m, 1m, 2m, 3m, 5m, 7m available)
  Can operate at 10Gb and 1Gb

4 port 10GBASE-T Module
Limited to only one 10GBASE-T module . The other module bay can be populated

- **RJ45 / Cat6a Copper**
  10Gb/1Gb
  (supports auto-negotiation)

4 port FC Module

- **Optical Transceivers**
  SFP+ 8Gbps (will connect at 4/2 Gbps)
  SW 150m, LW 4km

2 port QSFP+ Module

- **QSFP+ to 4xSFP+ Breakout Cables**
  5m Passive Copper
  40GBASE-CR4 10Gb
- **QSFP+ to QSFP+ Direct Attach**
  1m, and 5m, Passive Copper
  40GBASE-CR4 40Gb
- **Optical Transceivers**
  SFP+ 40Gb: SR only

Two integrated QSFP+ ports
All QSFP+ ports and modules for this device are fixed in 4x10Gb breakout mode

- **QSFP+ to QSFP+ Fiber Cables**
- **QSFP+ to 4xSFP+ Fiber Breakout Cables**

Secondary Management Serial Port (Cable included)

USB Port

M8024-k

- Fully modular full wire-speed 10GbE managed Layer 2/3 Ethernet switching
- Converged
  - Supports DCB (protocols PFC and DCBx)
  - FCoE Transit Switch via FIP Snooping Bridge (not supported in Simple Switch Mode)
  - Stack up to 6 devices using SFP+ fixed ports or SFP+ module (not supported in Simple Switch Mode)
- 24 port design features:
  - 16 internal 10Gb server ports
  - 4 integrated external SFP+ ports (multi-speed 1/10Gb)
  - Up to 4 additional external ports via FlexIO modules
- FlexIO fully modular design enables connectivity choices including SFP+, and 10GBASE-T
- Default mode of operation is Simple Switch Mode (port aggregator); user-configurable to full switch mode
- Provides connectivity for the latest 10Gb-KR NICs and CNAs, including those supporting Switch Independent Partitioning

2-port 10GBASE-T

4-port SFP+

One FlexIO Module

Four SFP/SFP+ ports

M8024-k

Converged

Adapters

11G
-Broadcom 57712-k
-Brocade BR1741M-k
-Intel X520-x/k
-QLogic QME8242-k

12G
-Broadcom 57810S-k
-Brocade BR1741M-k
-Intel X520-x/k
-Qlogic QME8262-k
-Broadcom 57840S-k (will only link with 2 ports)

The M8024-k switch supports connectivity to 10Gb-KR adapters, all of which are notated with "-k." It does not provide connectivity to legacy 10Gb-XAUI NICs/CNAs

If connected to 1Gb Ethernet Mezzanine cards or LOMs, device will auto-negotiate individual internal ports to 1Gb.

More details in Adapter Portfolio section

Designed for I/O bays

A1/A2
B1/B2
C1/C2

Uplinks

10GBASE-T **Copper** Module

(supports auto-negotiation to 100Mb/1Gb)

Cables

RJ45 / Cat6a

Uplinks

10GbE SFP+ Module (10Gb only)

SFP+ Direct Attach Cable (Twinax)
(0.5m, 1m, 3m, 5m, 7m available)
Operate at 10Gb only

10GbE Optical Transceivers
SFP+ 10Gb: SR, LR, LRM
SFP 1Gb: none
FlexIO modules cannot support both SFP and SFP+ optics while the fixed ports can

Secondary Management Serial Port (Cable included)

4 external SFP/SFP+ ports
(multi-speed 1/10Gb)

SFP+ Direct Attach Cable (Twinax)
(0.5m, 1m, 3m, 5m, 7m available)
Can operate at 10Gb and 1Gb

10GbE Optical Transceivers
SFP+ 10Gb: SR, LR, LRM
SFP 1Gb: SX, LX
Fixed ports can support both SFP and SFP+ optics

SFP to RJ45 converter
1000Base-T (only capable of 1Gbps)

1GbE Optical Transceivers
SFP 1GbE: SX, LX

Fixed ports can support both SFP and SFP+ optics.

Converged

M8428-k

Converged Ethernet & Fibre Channel Switch

- Dell 10GbE Converged Network Switch
  - DCB compliant design accommodates both NIC and Fibre Channel Over Ethernet I/O
- Single wide blade I/O module supporting all 10GbE capable M1000e fabric bays
- Robust I/O bandwidth solution with 28 active fixed ports
  - 16 internal server ports
  - 8 external 10GbE SFP+ uplinks (10Gb speed only)
    - Brocade Short-wave optical transceivers / fiber
    - Brocade Long-wave optical transceivers / fiber
    - Brocade Direct-Attach copper (TwinAx) transceiver+cable (1m, 3m, and 5m)
  - 4 external 8Gbps SFP+ native Fibre Channel uplinks
    - Pre-installed 8Gbps short-wave SFP+ optical transceivers enable quick and easy cable-and-go connections
    - Long-wave SFP+ optical transceivers also available
    - Access Gateway (NPIV) or Brocade Full Fabric modes

M8428-k

Converged

Adapters

11G
-Broadcom 57712-k
-Brocade BR1741M-k
-Intel X520-x/k
-QLogic QME8242-k

12G
-Broadcom 57810S-k
-Brocade BR1741M-k
-Intel X520-x/k
-Qlogic QME8262-k
-Broadcom 57840S-k (will only link with 2 ports)

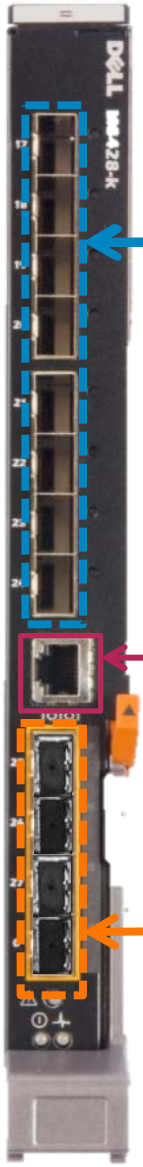
Supports connectivity to 10Gb-KR adapters, all of which are notated with "-k." It does not provide connectivity to legacy 10Gb-XAUI NICs/CNAs

1Gb Ethernet mezzanine cards and LOMs are not supported.

More details in Adapter Portfolio section

Designed for I/O bays

A1/A2
B1/B2
C1/C2



8 ports 10Gb Ethernet (DCB)

Brocade Optical Transceivers

Short Wave, Multi-Mode SFP+ Optics
Long Wave, Multi-Mode SFP+ Optics

Cables

Brocade SFP+ Direct Attach (Copper)
Twin-ax cable with SFP+ connector
(1m, 3m, 5m available)
Switch requires Active transceiver cables from Brocade.

10Gb speed only

Secondary Management Serial Port

4 ports 8Gbps Fibre Channel

Brocade Optical Transceivers
Speeds: 8, 4, 2 Gbps

Short Wave, Multi-Mode SFP+ Optics
(Four included with every M8248-k)

Long Wave, Multi-Mode SFP+ Optics

Cables

Converged

10Gb Ethernet Pass Through -k

- 16 ports correspond to 16 server blades
  - Only supports –k mezz cards
- 16 external 10GbE SFP+ ports
  - Supports 10Gb connections ONLY
- Supports DCB/CEE and FCoE
  - Connect to top-of-rack FCoE switches and Converged Network Adapters (CNA's) in individual blades
- Transparent connection between blade servers and external LAN

10Gb Ethernet Pass Through -k

Converged

Adapters

11G
-Broadcom 57712-k
-Brocade BR1741M-k
-Intel X520-x/k
-QLogic QME8242-k

12G
-Broadcom 57810S-k
-Brocade BR1741M-k
-Intel X520-x/k
-Qlogic QME8262-k
-Broadcom 57840S-k (will only link with 2 ports)

Supports connectivity to 10Gb-KR adapters, all of which are notated with "-k." It does not provide connectivity to legacy 10Gb-XAUI NICs/CNAs

1Gb Ethernet mezzanine cards and LOMs are not supported.

More details in Adapter Portfolio section

Designed for I/O bays

A1/A2
B1/B2
C1/C2

10Gb Optical Transceivers
SR & LR

Cables

SFP+ Direct Attach Cable (Twinax)
(0.5m, 1m, 3m, 5m, 7m available)

Cisco Nexus Blade

B22DELL Fabric Extender (FEX)

Converged

- Cisco 10GbE offering for the Dell M1000e Blade System
  - The 16 internal 10Gb or 1Gb ports and 8 external 10Gb ports enables customers to connect via 10GbE to a Cisco Nexus 5500 series Top of Rack switch
- The B22DELL FEX is only supported with these specific Cisco Nexus models:
  - Cisco Nexus 5548P, 5548UP, 5596P
  - Cisco Nexus 6001, 6004

  It cannot connect to Cisco Nexus 5010, 5020, 2000 or 7000 series switches.
- Managed from the Nexus Top of Rack
  - B22DELL FEX is managed at the top of rack and not managed at the M1000e nor the FEX device itself
  - Acts as a line card to supported Nexus Series switches

Cisco Nexus Blade

B22DELL Fabric Extender (FEX)

Converged

Adapters

11G
-Broadcom 57712-k
-Brocade BR1741M-k
-Intel X520-x/k
-QLogic QME8242-k

12G
-Broadcom 57810S-k
-Brocade BR1741M-k
-Intel X520-x/k
-Qlogic QME8262-k
-Broadcom 57840S-k (will only link with 2 ports)

Supports connectivity to 10Gb-KR adapters, all of which are notated with "-k." It does not provide connectivity to legacy 10Gb-XAUI NICs/CNAs

If connected to 1Gb Ethernet Mezzanine cards or LOMs, device will auto-negotiate individual internal ports to 1Gb.

More details in Adapter Portfolio section

Designed for I/O bays

A1/A2
B1/B2
C1/C2

This is not a usable port.
There is no management serial port on the B22DELL (external nor internal). The B22DELL is managed from the Cisco Nexus top of rack switch.

Cisco Direct Attach Copper (Twinax)
(1m, 3m, 5m, 7m, 10m)

Can only operate at 10Gb

Cisco branded cables only

Optical Transceivers
SFP+ 10Gb: FET, SR, LR, ER
SFP 1GbE: Not supported

FET-10Gb Optic
(Distance up to 100m with OM3 fiber)

A FET is a new optic provided by Cisco. A FET can only be used on FEX devices and Nexus switch ports that connect to a FEX.

FET optics are sold with FEX at time of purchase. You CANNOT purchase these optics separately

The minimum Cisco Nexus software versions to support the B22DELL FEX are
-5.2(1)N1(3)
-6.0(2)N1(2)

Comparison of Converged Blade options

Model	Dell MXL Switch	Dell PowerEdge M I/O Aggregator	Cisco Nexus B22DELL FEX	Dell M8024-k	Dell M8428-k
Overview	10/40GbE Switch	10GbE Plug & Play	10GbE Extender	10GbE Basic	Ethernet / FC
Server Ports Supported	32 (10GbE)	32 (10GbE)	16 (10GbE)	16 (10GbE)	16 (10GbE)
External 40G Ports (QSFP+)	2 Fixed – 6 Total	2 Fixed – 6 Total (Note: QSFP+ ports run in breakout mode 4x10GbE only)	None	None	None
External 10G Ports	24 (16 per LAG)	16 (in a single LAG)	8	8	8
Flex I/O Expansion Modules	Two slots and three options (Mix or match) • 2 port QSFP+ (10/40GbE) [1] • 4 port SFP+ (1/10GbE) • 4 port Base-T (1/10GbE) [2] • 4 port FC *2/4/8Gb) [1]QSFP+ port on I/O Aggregator runs breakout mode 4x10GbE [2]Both devices limited to one Base-T module only. Populate second slot with another module of your choice.		None	One slot & 3 options • 4 port SFP+ (10Gb only) • 2 port Base-T (1/10Gb)	None
Stacking	6	2	n/a	6	No
East-west traffic support	Yes	Yes	No (All traffic is forwarded to Nexus Top-of-Rack / End-of-Row)	Yes	Yes
Support for M420 Quarter-Height Blades on Fabric A	Yes	Yes	Not in a redundant manner	Not in a redundant manner	Not in a redundant manner
Support for MLAG (vLT/vPC)	Yes	Yes (Enabled via CLI)	Yes	No	No
Support for quad-port GbE and 10Gb LOM/Mezz	Yes	Yes	No	No	No

1Gb Ethernet

1/10Gb High-density M6348

1/10Gb Basic M6220

1Gb Pass-Through

Cisco Catalyst 3130X & 3130G

M6348

High-density 1GbE copper with 10GbE uplinks

1/10GbE

- Managed Layer 2/3 Gigabit Ethernet switch for M1000e blade enclosure
- Industry leading port availability
  - 32 internal (server) GbE ports; offering support of up to two ports per blade mezz card or Select Network Adapter (i.e. with quad-port 1GbE NICs)
  - 16 external fixed 10/100/1000Mb Ethernet RJ-45 ports
  - Up to four 10Gb uplink ports
    - 2x 10Gb Optical SFP+ (SR/LR) and/or SFP+ DAC
    - 2x 10Gb Copper CX4 or 32Gb stacking for M6348
  - Management console port
- Supports Dell Simple Switch Mode
- Stackable with rack-mount PowerConnect 7000 Series
- For optimized use (full internal-port utilization), pair with: Quad-port GbE mezz cards or Quad-port Fabric A adapters

M6348

Adapters

Works with all 1Gb Mezzanine cards and LOMs. Optimal use is with quad-port 1Gb adapters.

Functions with all 10Gb Mezzanine cards and Select Network Adapters with the exception of the:
Qlogic 8242-k, 8262-k, and Brocade BR1741M-k.

Dual port Mezzanine cards or LOMs/ Select Network Adapters will function and are fully supported with this IO module.

In such configurations, only half of the switch's internal ports will be used since the dual port Mezzanine card only has one port out to each IO module.

More details in Adapter Portfolio section

Designed for I/O bays

A1/A2
B1/B2
C1/C2

Cables
CAT 5

10Gb Optical Transceivers
SR, LR, LRM

Cables

SFP+ Direct Attach Cable (Twinax)
(0.5m, 1m, 3m, 5m, 7m available)

CX4 Cables
for 10Gb uplinks or 32Gb M6348 stacking
(with other M6348 or rack-mount PC 7000 series switches)
(1m or 3m available)

Secondary Management Serial Port (Cable included)

M6220

1/10GbE

Basic 1GbE copper with FlexIO & 10GbE uplinks

- Gigabit Ethernet Layer 2/3 Switch
- Optional 10Gb uplinks & resilient stacking
- IPv6 support
- 24 port switch
  - 16 internal ports corresponding to 16 blade servers (1Gbps)
  - 4 external fixed RJ-45 connections (10/100/1000Mbps)
  - 2 FlexIO bays for:
    4 external 10Gbps uplink ports
    – or –
    2 external 10Gbps uplink ports and 2 external stacking ports
- Same software image features as PowerConnect 6224/6248 switches
  - Routing protocols
  - Multicast routing protocols
  - Advanced QoS
  - Advanced Security
  - IPv6
- Supports Dell Simple Switch Mode

2 FlexIO Bays for:

48Gb Stacking Module

2 x 10Gb Optical SFP+ Uplinks

2 x 10GBASE-T Copper Uplinks

2 x 10Gb Copper CX-4 Uplinks

M6220

1/10GbE

Adapters

Works with all 1Gb Mezzanine cards and LOMs.

Functions with all 10Gb Mezzanine cards and Select Network Adapters with the exception of the Qlogic 8242-k, 8262-k, and Brocade BR1741M-k.

Quad port GbE Mezzanine cards or LOMs will function and are fully supported with this IO module. In such configurations, only half of the card's ports will be used since the switch only has one internal port per adapter.

More details in Adapter Portfolio section

Designed for I/O bays

A1/A2

B1/B2

C1/C2

Uplinks

Stacking Module, 48Gbps

Cables

Stacking Cable (1m included; 3m available)

Uplinks

PowerConnect 6xxx **SFP+** Module

10Gb Optical Transceivers

SR & LR

Cables

SFP+ Direct Attach Cable (Twinax)

(0.5m, 1m, 3m, 5m, 7m available)

Uplinks

10GBase-T (Copper) Uplink Module

(10Gb speed only)

Cables

RJ45 / Cat6a

Uplinks

10GbE Uplink Module for **CX4 Copper**

Cables

CX4 Cable for 10GbE Uplink, 12m

Cables

CAT 5

Secondary Management Serial Port (Cable included)

Gb Ethernet Pass-Through

1GbE

Adapters

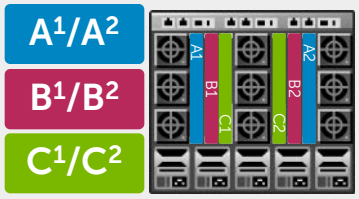
Works with all 1Gb Mezzanine cards and LOMs.

Functions with all 10Gb Mezzanine cards and Select Network Adapters with the exception of the Qlogic 8242-k, 8262-k, and Brocade BR1741M-k.

Quad port GbE Mezzanine cards or LOMs will function and are fully supported with this IO module. In such configurations, only half of the card's ports will be used since the switch only has one internal port per adapter.

More details in Adapter Portfolio section

Designed for I/O bays



Cables

CAT 5

1GbE Pass Through Module

- 16 ports correspond to 16 server blades
- Supports 10/100/1000Mb connections with all 1Gb Broadcom adapters
  (All other supported adapters provide 1Gb connection only)
  - Ethernet media speed is configured through the blade LOM firmware or by the operating system
- Transparent connection between LAN and server blades

Cisco Catalyst Blade Switches

Cisco Catalyst 3130X – 1/10Gb Switch

- Two 10GbE uplinks (X2 – CX4, SR, LRM optics)
- Four fixed 1GbE uplinks - 4xRJ45
- Virtual Blade Switch interconnect enabled

Cisco Catalyst 3130G – GbE Switch

- Up to eight GbE uplinks – fixed 4xRJ45 + up to four optional 1GbE SFPs (copper or optical)
- Virtual Blade Switch interconnect enabled

Virtual Blade Switch

- Interconnect up to 9 CBS 3130 switches to create a single logical switch
- Simplifies manageability & consolidates uplinks to lower TCO

Software

- IP Base software stack included in each SKU
  - Advanced L2 switching + basic IP routing features
- Optional IP Services available ONLY for CBS 3130
  - Adds advanced IP routing and IPv6 compatibility

Cisco Catalyst Blade Switches

1/10GbE

Adapters

Works with all 1Gb Mezzanine cards and LOMs.

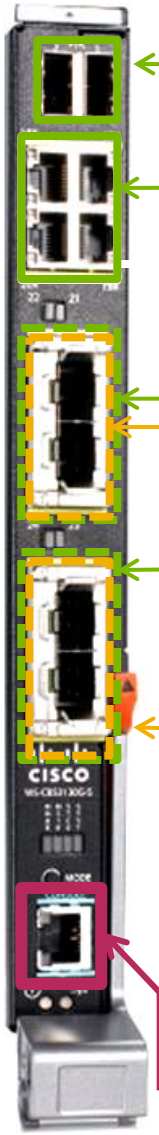
Functions with all 10Gb Mezzanine cards and Select Network Adapters with the exception of the Qlogic 8242-k, 8262-k, and Brocade BR1741M-k.

Quad port GbE Mezzanine cards or LOMs will function and are fully supported with this IO module. In such configurations, only half of the card's ports will be used since the switch only has one internal port per adapter.

More details in Adapter Portfolio section

Designed for I/O bays

A1/A2
B1/B2
C1/C2



Stacking Ports (supported on 3130G & 3130X models ONLY)
2x 64Gb StackWise Ports
(0.5m, 1m, 3m cables purchased separately for factory-installed blade switch)

GbE ports (all models)

Software Upgrades
IP Services Upgrade Available

CAT 5 Cables

TwinGig Converter (supports 2 x 1Gb SFP) Two TwinGig converters ship by default in each switch module

Cisco SFP Modules

•GbE SFP RJ45 converter, Copper

CAT5 Cable

•GbE SFP, LC connector, SWL (multimode)
•GbE SFP, LC connector, LWL (single mode)

Fibre

10GBASE-CX4 X2 Module

(for 3130X)

CX4 cable, IB 4x connector

10GBASE-SR X2 Module
or
10GBASE-LRM X2 Module

(3130X only)

MMF, dual SC connector

OneX SFP+ Converter Module
CVR-X2-SFP10G

Not sold by Dell – purchase elsewhere

SFP+

Copper

Cisco Direct Attach (Twin-ax copper)
1m: SFP-H10GB-CU1M=
3m: SFP-H10GB-CU3M=
5m: SFP-H10GB-CU5M=

SFP+ Optical:

Cisco SR SFP+ (SFP-10G-SR=)

Fibre

Secondary Management Serial Port

3130X Modules

Fibre Channel

16Gb M6505

8Gb M5424

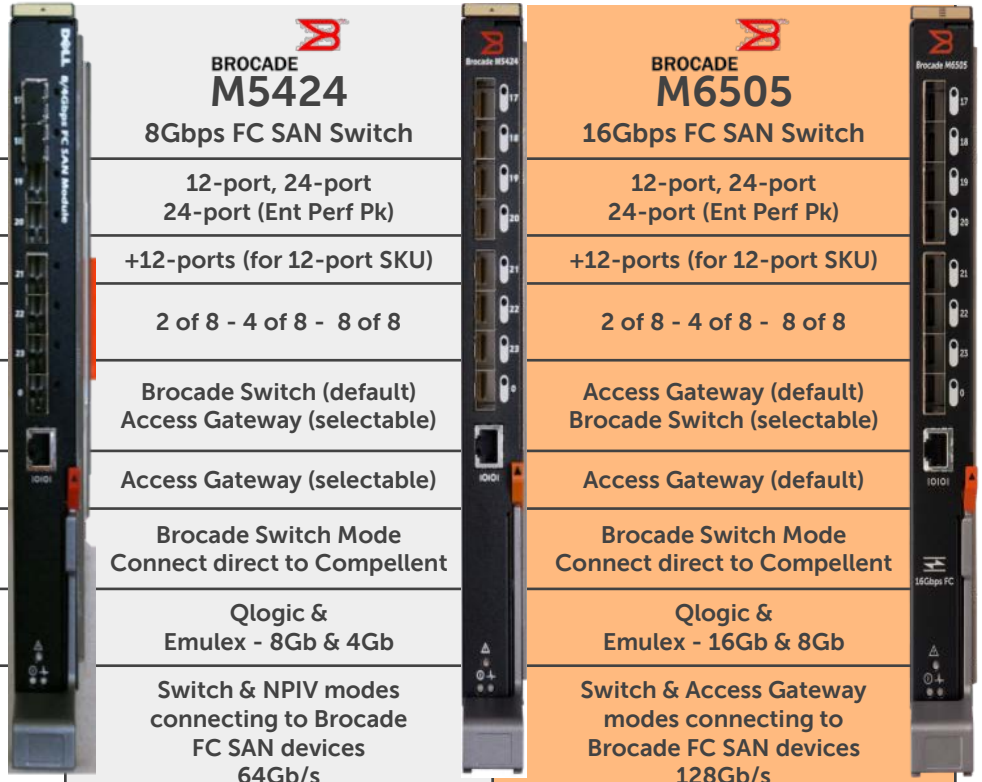
8Gb SAN Module

8Gb Pass-Through

See also the M8428-k in the Converged Ethernet section

M-Series Fibre Channel Comparison

	8/4Gbps FC SAN Module	BROCADE M5424 8Gbps FC SAN Switch	BROCADE M6505 16Gbps FC SAN Switch
Model Choices	12-port	12-port, 24-port 24-port (Ent Perf Pk)	12-port, 24-port 24-port (Ent Perf Pk)
Scalable Ports Upgrade	+12-ports	+12-ports (for 12-port SKU)	+12-ports (for 12-port SKU)
Factory pre-installed SFP+ Transceivers	2 of 8	2 of 8 - 4 of 8 - 8 of 8	2 of 8 - 4 of 8 - 8 of 8
Connect to Brocade FC SAN	NPIV	Brocade Switch (default) Access Gateway (selectable)	Access Gateway (default) Brocade Switch (selectable)
Connect to Cisco MDS FC SAN	NPIV	Access Gateway (selectable)	Access Gateway (default)
Direct connect to SAN disk/tape controller	Not Supported	Brocade Switch Mode Connect direct to Compellent	Brocade Switch Mode Connect direct to Compellent
FC Blade Mezzanine Cards	Qlogic & Emulex - 8Gb & 4Gb	Qlogic & Emulex - 8Gb & 4Gb	Qlogic & Emulex - 16Gb & 8Gb
Brocade ISL-Trunking (License option)	Not Supported	Switch & NPIV modes connecting to Brocade FC SAN devices 64Gb/s	Switch & Access Gateway modes connecting to Brocade FC SAN devices 128Gb/s
Brocade Advanced Performance Monitoring & Brocade Fabric Watch	Not Supported	Optional Available a-la-carte	Switch & NPIV modes connecting to Brocade FC SAN devices only
Brocade Enterprise Performance Pack (license option bundle)	Not Supported	Optional	Included
Diagnostic Ports, Hardware Buffer Credit Loss Detection/Recovery, Forward Error Correction	Not Supported	Not Supported	Included

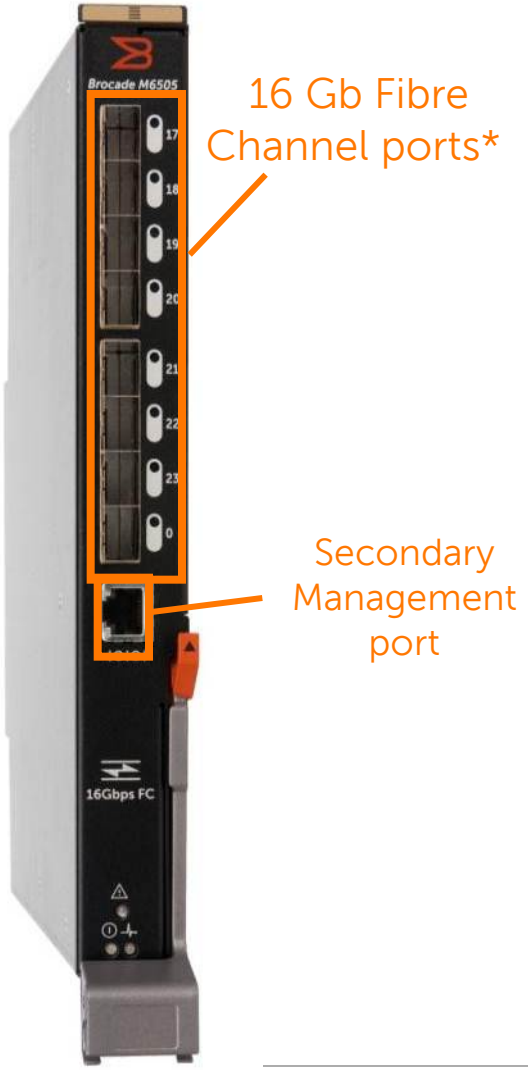


Good Better Best

Brocade M6505

16Gb switch

Fibre Channel



- 24 Fibre Channel ports
  - Up to 16 internal 16/8Gb server ports*
  - Up to 8 external 16/8/4Gb SAN ports**

  *The M6505 requires the enhanced midplane 1.1. The M6505 will not function with the original 1.0 midplane.

  **For connection to storage devices and/or other FC switches only
- Zero footprint, hot-pluggable design with no additional fans or power supplies
- Complete redundancy, up to 4 switches per chassis
- Dynamic Ports on Demand (PoD) and "pay-as-you-grow" port upgrades for 12-port configurations
- Heterogeneous SAN fabric interoperability
- Access Gateway (NPIV) or fabric switch connectivity
- Auto-sensing and speed-matching connections to 16/8/4 Gbps to Fibre Channel devices

Brocade M6505

16Gb switch

Fibre Channel

Adapters

11G
- Qlogic QME2572 FC8
- Emulex LPe1205-M FC8

12G
- Qlogic QME2662 FC16
- Emulex LPm16002 FC16
- Qlogic QME2572 FC8
- Emulex LPe1205-M FC8

*The M6505 requires the enhanced midplane (1.1). The switch will not function with the original midplane (1.0).

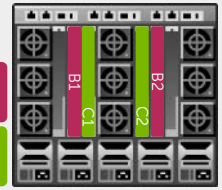
Does not support 4Gb Mezzanine cards.

More details in Adapter Portfolio section

Designed for I/O bays

B1/B2

C1/C2



Brocade Transceivers
Brocade SWL, LWL or ELWL 16Gb SFP+ Optics
Brocade SWL, LWL or ELWL 8Gb SFP+ Optics
Brocade SWL, LWL or ELWL 4Gb SFP+ Optics

Note: Requires SFP LC connector

Cables

Secondary Management Serial Port

Available Models - Brocade M6505

- 24 ports with eight SFP+ transceivers
- 24 ports with four SFP+ transceivers
- 12 ports with two SFP+ transceivers

(12 port model expands to 24 ports with on-demand license)

Brocade M5424

8Gb switch

Fibre Channel

- 8/4 Gbps Fibre Channel SAN solution
- Provides up to 24 8/4Gb FC ports
  - Up to 16 internal 8/4Gb server ports
  - Up to 8 external 8/4Gb SAN ports*
    *For connection to storage devices and/or other FC switches only
- One management console port
- Configurable as Brocade full fabric switch or Access Gateway Mode (NPIV) for multi-vendor interoperability
- Auto-negotiates between 4Gbps and 8Gbps based on linked mezzanine cards and top-of-rack switches
- Supports future FOS features and upgrades

Brocade M5424

8Gb switch

Fibre Channel

Adapters

11G
- Qlogic QME2572
- Emulex LPe1205

12G
- Qlogic QME2572
- Emulex LPe1205-M
- Qlogic QME2662 (at FC8 speeds)
- Emulex LPm16002 (at FC8 speeds)

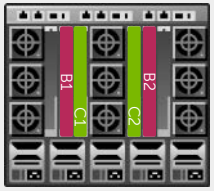
FC4 Mezzanine cards are also supported with this switch at 4Gbps

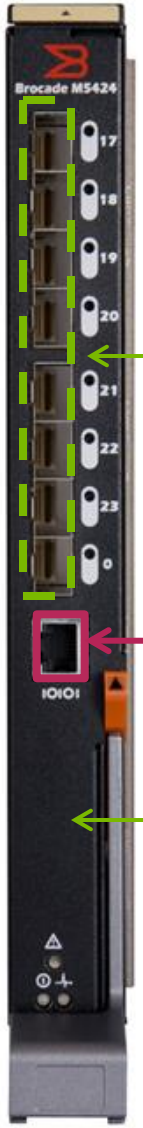
More details in Adapter Portfolio section

Designed for I/O bays

B1/B2

C1/C2





Brocade Transceivers
Brocade SWL or LWL 8Gb SFP+ Optics
Brocade SWL, LWL or ELWL 4Gb SFP+ Optics

Note: Requires SFP LC connector

Cables

Secondary Management Serial Port

Available Models - Brocade M5424

- 24 ports with eight SFP+ transceivers
- 24 ports with four SFP+ transceivers
- 12 ports with two SFP+ transceivers

(12 port model expands to 24 ports with
on-demand license)

Dell 8/4Gbps FC SAN Module

Fibre Channel

- Base model provides 12 active ports with two external SAN 8Gb SWL optical transceivers
- Scalable to 24 active ports using 12-port *pay-as-you-grow* option kit (includes two additional 8Gb SWL SFP+ transceivers)
- Add additional 8Gb SWL SFP+ transceivers for up to 8 external SAN ports
- Ideal scalability for data centers deploying increasingly more blade enclosures while requiring FC connectivity
- Device is in Access Gateway Mode (NPIV) for multi-vendor interoperability
- Ideal for Dell blade enclosure connectivity to any FC SAN
- Supports 8-4-2Gbps I/O

Dell 8/4Gbps FC SAN Module

SimpleConnect for SAN

Fibre Channel

Best solution for modular SAN connectivity

- Based on industry-standard NPIV (N-port ID Virtualization)
- Combines pass-through simplicity for connecting each server to any SAN fabric with beneficial I/O and cable aggregation
- Helps solve interoperability issues with heterogeneous fabrics, i.e. mixed Brocade, Cisco, etc.
- Enables scalable data center modular growth without disruption
  - Lessens RSCN traffic, addresses FCP Domain limits
- No management required
- Standard feature / mode available on M5424

Dell 8/4Gbps FC SAN Module

Fibre Channel

Adapters

11G
- Qlogic QME2572,
- Emulex LPe1205

12G
- Qlogic QME2572
- Emulex LPe1205-M

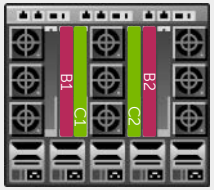
FC4 Mezzanine cards are also supported with this switch at 4Gbps.

More details in Adapter Portfolio section

Designed for I/O bays

B1/B2

C1/C2



Brocade Transceivers
SWL 8Gb SFP+ Optics
LWL 8Gb SFP+ Optics

Cables

Secondary Management Serial Port

Available Models

- 24 ports with four SFP+ transceivers
- 12 ports with two SFP+ transceivers

(12 port model expands to 24 ports with on-demand license)

Fibre Channel

Dell 8/4Gbps FC Pass-Through

- 16 ports correspond to 16 server blades
- 8, 4, or 2 Gbps connections
- Transparent connection between SAN and server blades
- As an alternative to this FC8 Pass-Through, the **Dell 8/4Gbps FC SAN Module** (NPIV aggregator) which provides the simplicity of a pass-through with the aggregation/redundancy benefits of a switch

Dell 8/4Gbps FC Pass-Through

Adapters

11G
- Qlogic QME2572,
- Emulex LPe1205

12G
- Qlogic QME25722
- Emulex LPe1205-M

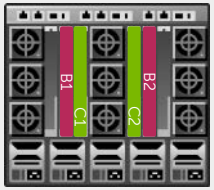
*FC4 Mezzanine cards will function with this pass-through. Doing so will cause the pass-through to run at 4Gbps rather than the full-capability 8Gbps.

More details in Adapter Portfolio section

Designed for I/O bays

B1/B2

C1/C2



Brocade Transceivers
16 pre-installed 8Gbps SWL SFP+ transceivers (one per port)

Cables

InfiniBand

56Gb
M4001F
FDR

40Gb
M4001T
FDR10

Mellanox Blades

Infiniband ∞

- For high performance computing (HPC) & low latency applications
- Available in redundant switch configuration
- Full non-blocking throughput

Models	M4001F	M4001T
Speed	FDR	FDR10
Data rate	56Gbps	40Gbps
Total ports	32 (16 internal and 16 external)	

Mellanox M4001F & M4001T

Infiniband ∞

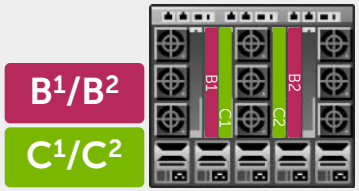
Adapters

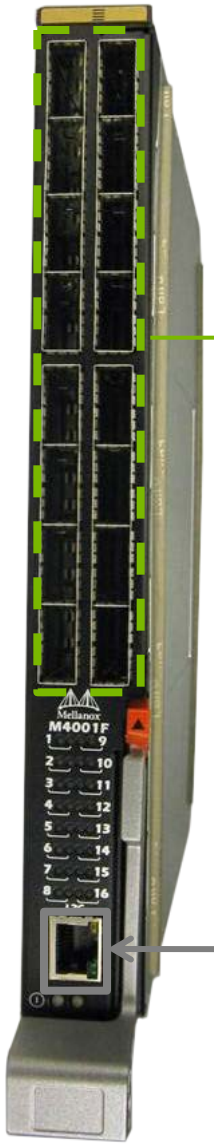
Combine the with Mellanox ConnectX3 InfiniBand mezz cards for end to end FDR or FDR10.

QDR ConnectX3 and QDR ConnectX2 are fully supported with these switches. They will connect at QDR speeds.

More details in Adapter Portfolio section

Designed for I/O bays



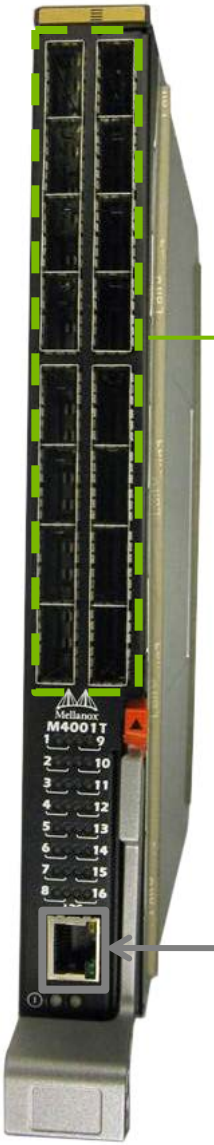


Cables

QSFP Active Optical
or
QSFP Passive Copper

Not a Management Port. Debug port only

M4001F FDR



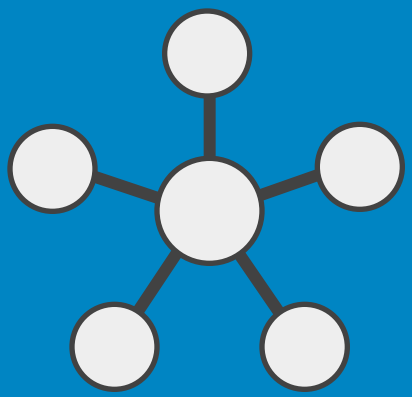
Cables

QSFP Active Optical
or
QSFP Passive Copper

Not a Management Port. Debug port only

M4001T FDR10

Fabric Topologies



Find more topologies and guides here:

- EqualLogic Compatibility Matrix - http://en.community.dell.com/techcenter/storage/w/wiki/2661.equallogic-compatibility-matrix.aspx
- EqualLogic Configuration Guide - http://en.community.dell.com/techcenter/storage/w/wiki/2639.equallogic-configuration-guide.aspx
- Rapid EqualLogic Configuration Portal - http://en.community.dell.com/techcenter/storage/w/wiki/3615.rapid-equallogic-configuration-portal-by-sis.aspx

FCoE transit

Direct traffic to the Top-of-Rack via FIP Snooping Bridge

Topology / Configuration

Topology

Fabric Inside Chassis: FCoE

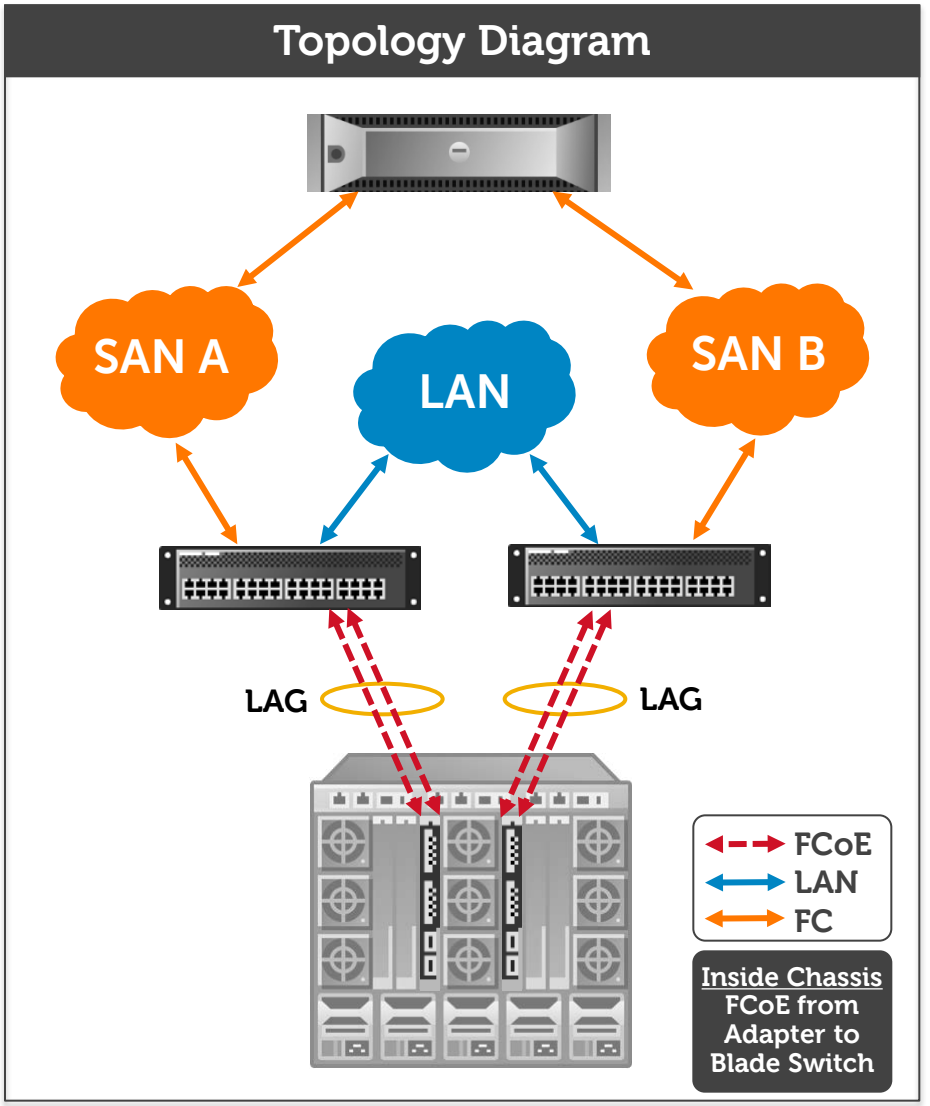
Blade models: MXL, IOA, M8024-k

Top-of-Rack switch: Dell S5000 as well as the Cisco Nexus 5000

Configuration

- All FCoE traffic moves from the adapters, to the IOM, then to the Top-of-Rack switch
- FC is broken out at the Top-of-Rack switch and moves to the SAN or directly to the storage array

Topology Diagram



Fibre Channel Breakout at Edge of Chassis

Topology / Configuration

Topology

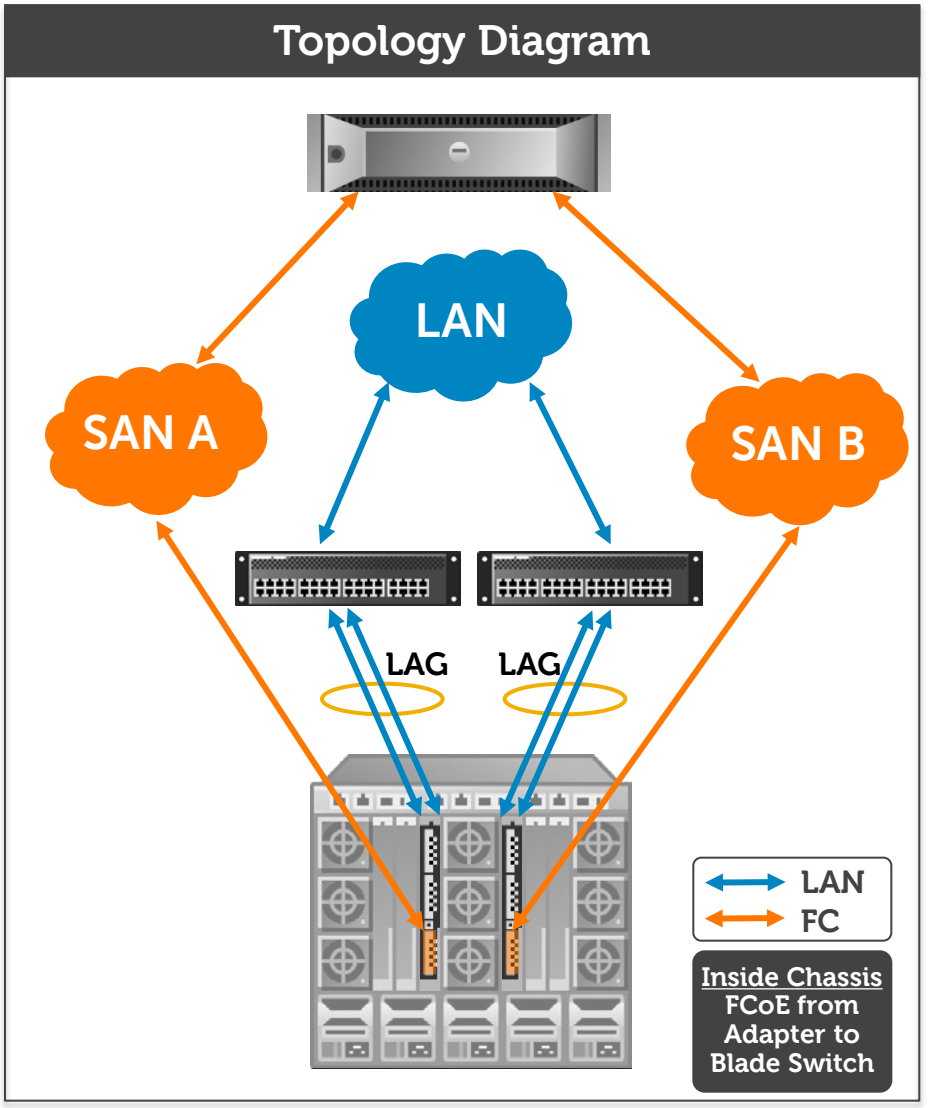
Fabric Inside Chassis: FCoE

Blade model: MXL, IOA, M8428-k

Top-of-Rack switch: Dell S5000, S4810, S4820T

Configuration

FCoE inside chassis (from adapter to blade switch) and Native FC outside the chassis



iSCSI and LAN Converged Storage Traffic

Topology / Configuration

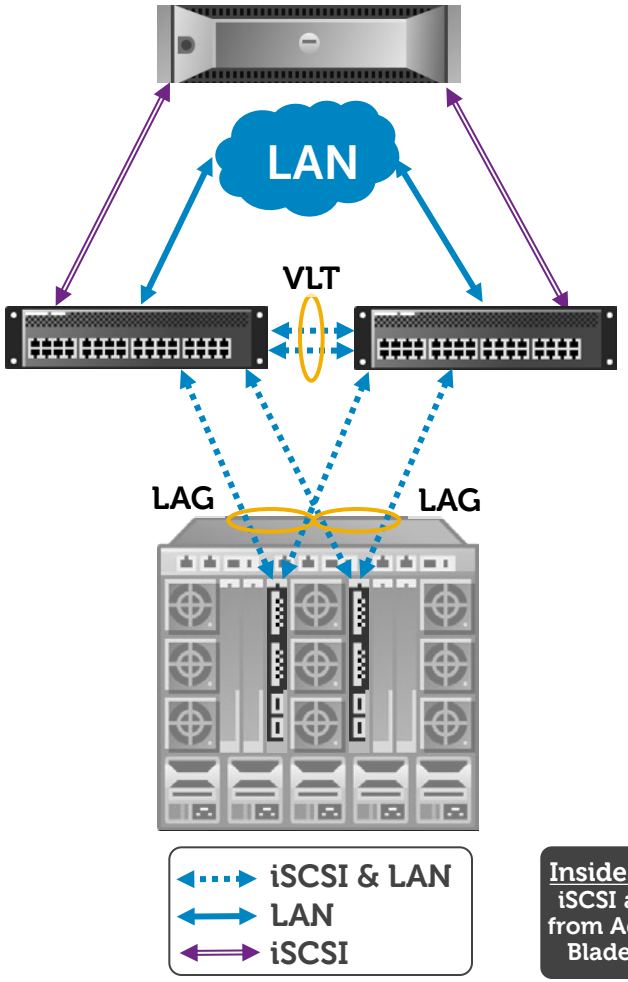
Topology

Fabric Inside Chassis: Converged iSCSI
Blade models: MXL or IOA
Top-of-Rack switch: S5000, S4810, S4820T
Storage: iSCSI External Array

Configuration

Converged iSCSI traffic (LAN and iSCSI) up to the Top-of-Rack switch

Topology Diagram



Storage Blade with Optional External Array

Topology / Configuration

Topology

Fabric Inside Chassis: Converged iSCSI

Blade model: MXL, IOA

Top-of-Rack switch: S5000, S4810, S4820T

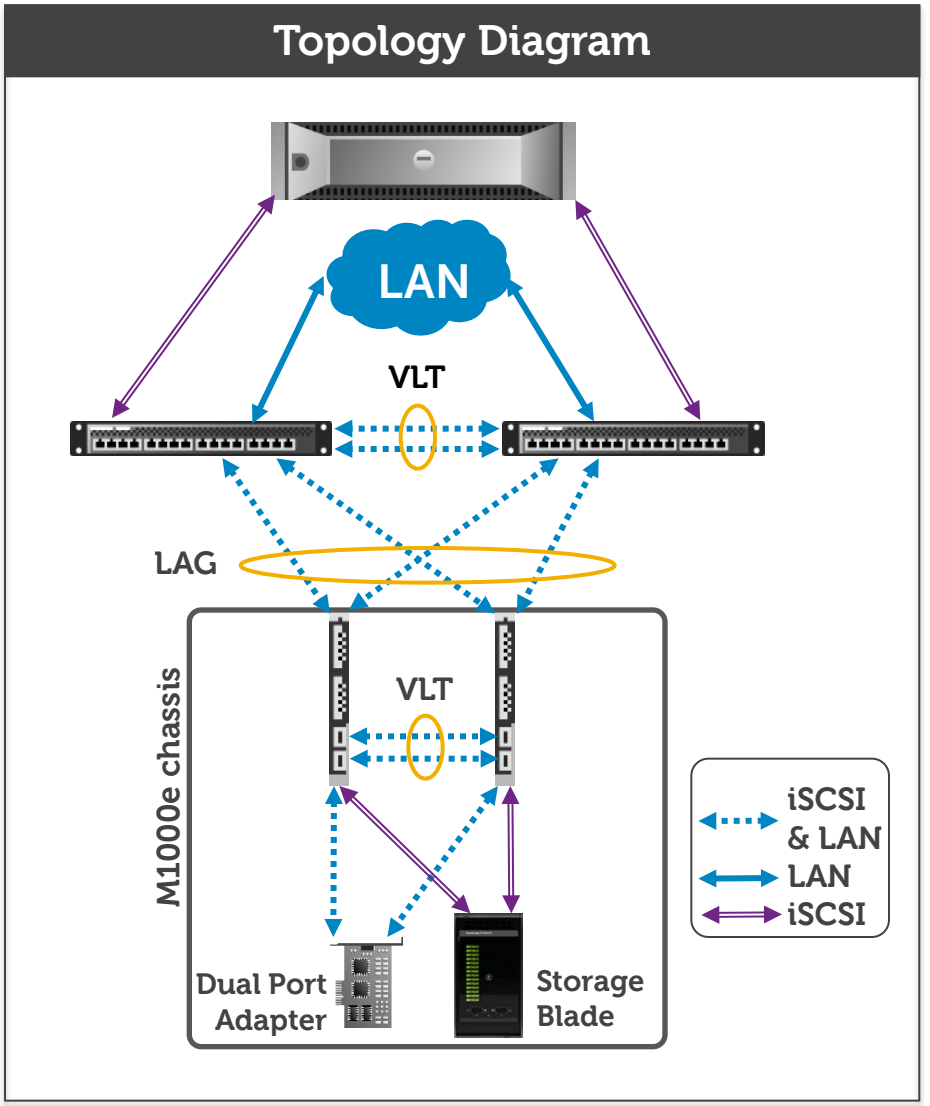
Storage: PS4410 storage blade

Optional Storage: EqualLogic External Array

Configuration

- Converged iSCSI to the blades and up to the Top-of-Rack switch
- Blade IOMs are using VLT so that array to array traffic can stay inside the M1000e chassis

Topology Diagram



Cross Chassis Stacking

Topology / Configuration

Topology

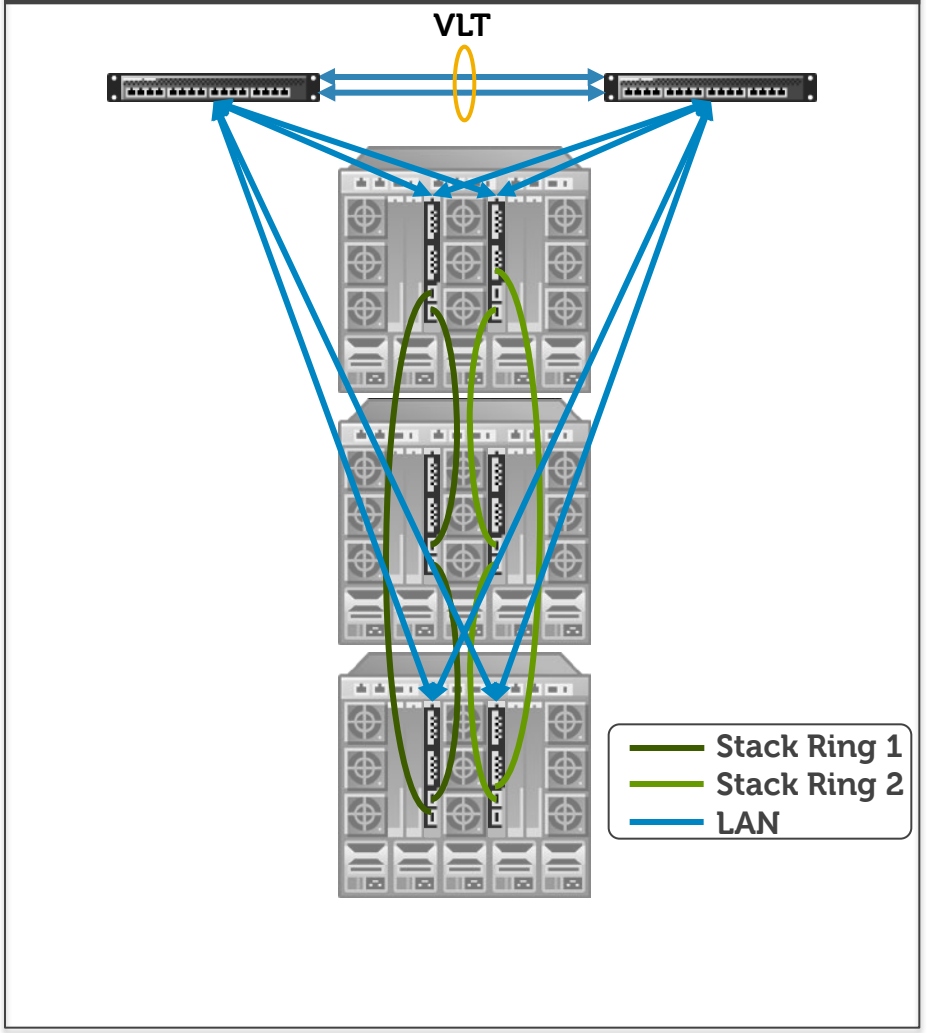
Blade models: MXL, M8024-k, M6348, M6248, IOA (using CLI)

Configuration

Blade switches are stacked vertically so that there are two independent stacking rings. Switches on the left of the chassis form a ring and switches on the right side of the chassis form a ring. Independent stack rings allow each ring to be upgraded independently.

Note that IOA is limited to a two unit stack. IOA has a simplified CLI command for stacking and IOA must be managed via CLI when stacked.

Topology Diagram



Benefits of Stacking

Benefits of Stacking

- Single point of management for each stack
- Increase of East/West traffic so less traffic goes to Top of Rack
  - Save on Top of Rack ports
  - Reduced Cables
  - Less Congestion at Top of Rack
- Use blade switches as the aggregation layer eliminating the need for Top of Rack switches

Topology / Configuration

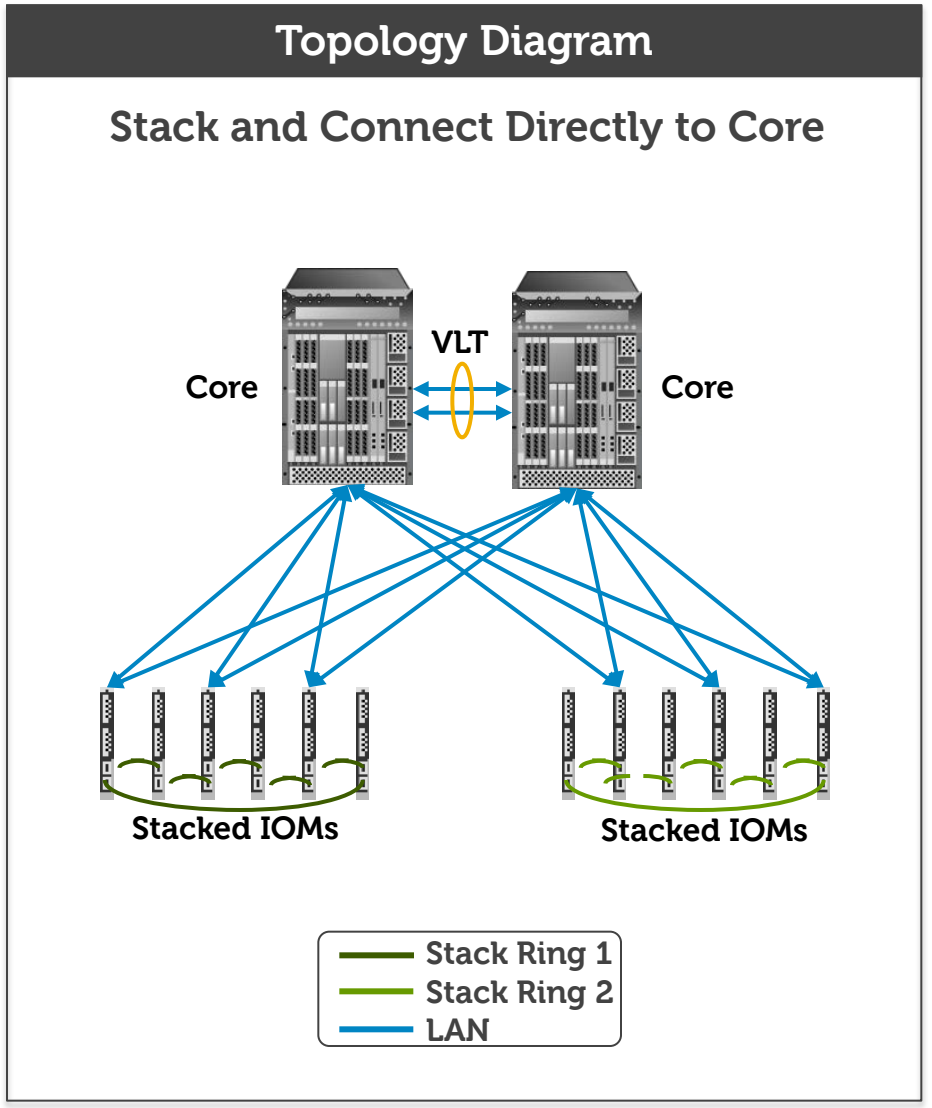
Topology

Stacked blade switches connected directly to the Network Core switches

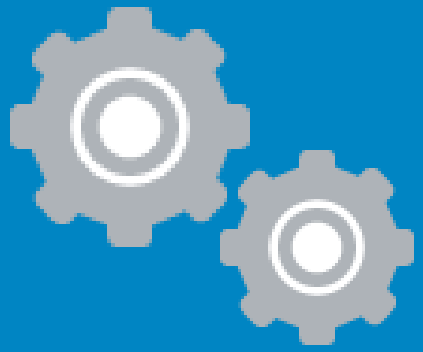
Configuration

Stacked blade switches act as the aggregation layer. No need for Top of Rack switches.

Topology Diagram



Automation & Management



Enhanced management of the M1000e

Simplifying blade server and I/O connectivity

The M1000e blade enclosure helps reduce the cost and complexity of managing computing resources with innovative management features.

The **Chassis Management Controller (CMC)** is an integrated hardware module with embedded system management. The simplified software interface, pictured below, gives administrators greater control of the chassis components and automates tasks to improve monitoring and management.

Pictured above, the Dell Chassis Management Controller (CMC) is a hot-pluggable hardware module that resides in the back of a Dell blade chassis and allows you to manage up to nine fully loaded Dell blade server chassis using a robust management software system.

CMC features

- Inventory of servers, I/O modules, & iDRAC cards
- Perform configuration and monitoring tasks
- Back up, clone settings and apply BIOS profiles
- Remotely power on or off blades
- Configure power and thermal settings
- Receive email or alert notifications if errors arise

CMC software provides configuration of:

- Network and security settings of the M1000e
- Power redundancy & power ceiling settings
- I/O switches and iDRAC network settings
- First boot device on the server blades
- User access security

FlexAddress Plus

Intelligent Network Addressing

- The CMC offers simple interface for enabling FlexAddress by chassis, by slot, or by fabric, assigning WWN/MAC values in place of factory-assigned WWN/MAC
- User-configurable enablement of iSCSI MAC, Ethernet MAC, and/or WWN Persistence which allows blades to be swapped without affecting SAN Zoning, iSCSI zoning, or any MAC-dependent functions
- FlexAddress Plus SD card provisioned with unique pool of 3136 MACs/WWNs

WWN/MAC Addresses — Slot 1: SLOT-01 ▲ Back to top

Location	Fabric	Server-Assigned	Chassis-Assigned
Note:	• This server is present • FlexAddress is enabled for this slot.		
iDRAC	Management	00:26:B9:FF:C3:A9	✔ 00:23:AE:59:70:0B
A1	Gigabit Ethernet	00:26:B9:FF:B4:88	✔ 00:23:AE:59:70:0C
	iSCSI	00:26:B9:FF:B4:89	✔ 00:23:AE:59:70:0D
	Gigabit Ethernet	00:26:B9:FF:B4:8C	✔ 00:23:AE:59:70:DE
	iSCSI	00:26:B9:FF:B4:8D	✔ 00:23:AE:59:70:DF
A2	Gigabit Ethernet	00:26:B9:FF:B4:8A	✔ 00:23:AE:59:70:0E
	iSCSI	00:26:B9:FF:B4:8B	✔ 00:23:AE:59:70:0F
	Gigabit Ethernet	00:26:B9:FF:B4:8E	✔ 00:23:AE:59:70:E0
	iSCSI	00:26:B9:FF:B4:8F	✔ 00:23:AE:59:70:E1
B1	None		
B2	None		
C1	None		
C2	None		

Original hardware-assigned MACs

FlexAddress-assigned MACs

SimpleConnect for LAN

Easy deployment feature

What is SimpleConnect?

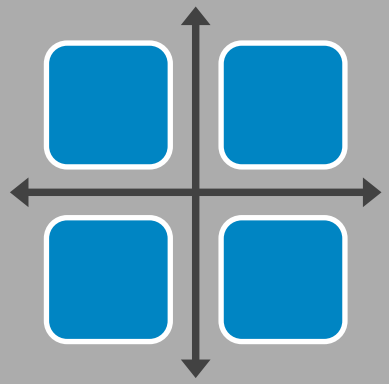
- Feature included on all PowerConnect blade switches (M8024-k/M6348/M6220); "SimpleConnect" (locked) models also available (M6348S/M6220S)
- Aggregate traffic from multiple downlinks to one or more uplinks by mapping internal (server) NIC ports to external (top-of-rack) switch ports
- Based on port aggregation industry standards

Benefits of Simple Switch Mode?

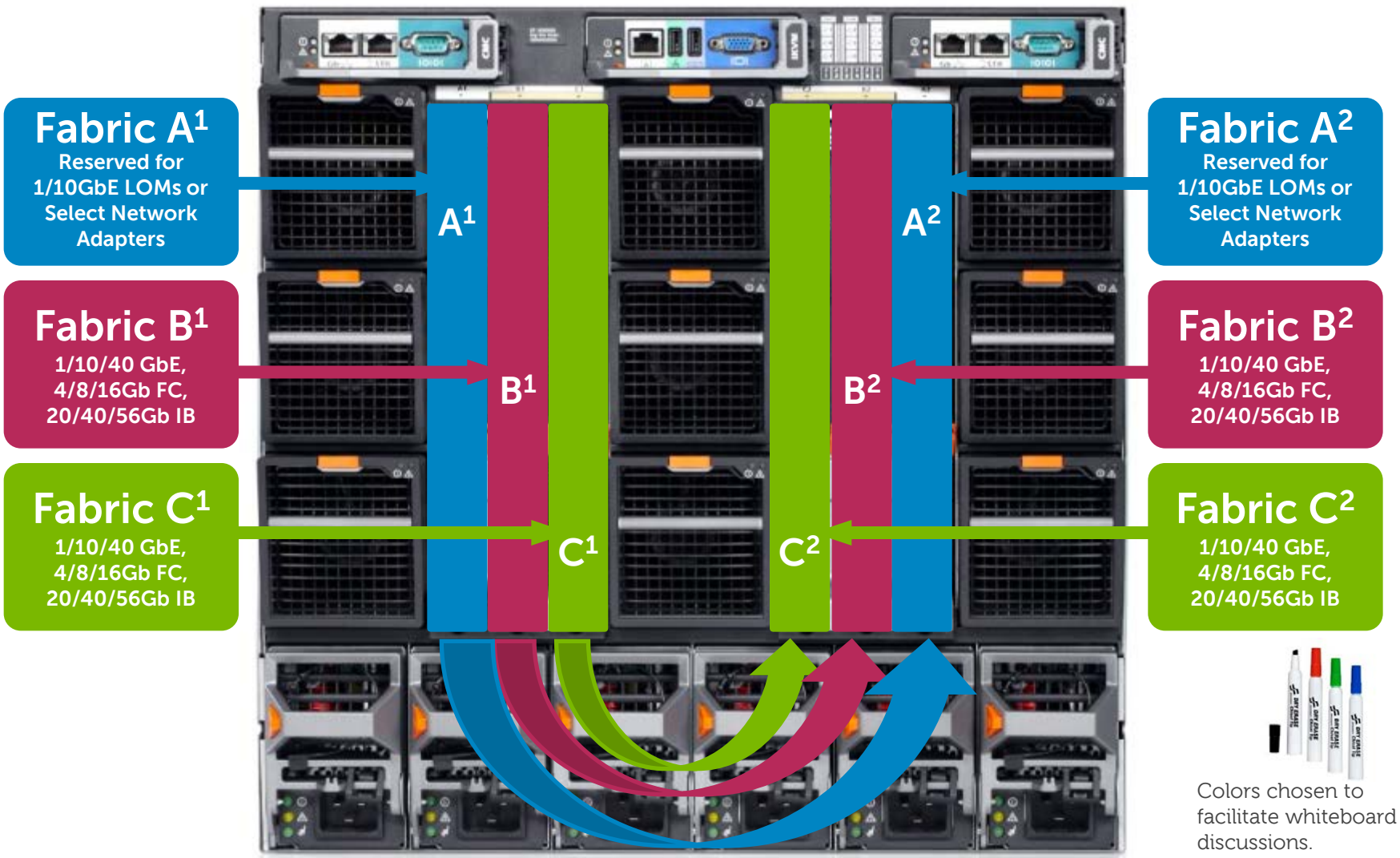
- Ease of deployment/management for in-chassis blade switches
- Ease of integration of PowerConnect blade switches with 3rd party networking H/W (Cisco, etc.)
- Provide cable aggregation benefit offered by integrated blade switches
- Reduce involvement of network admin in blade deployments by eliminating the need to understand STP (Spanning Tree Protocol), VLANs (Virtual Local Area Networks), & LACP (Link Aggregation Control Protocol) groups

For an overview demo of Simple Switch mode, visit:
http://www.delltechcenter.com/page/PowerEdge+Blade+Demos (English only)

Fabrics and Port Mapping



PowerEdge M1000e Chassis Fabrics and Capabilities



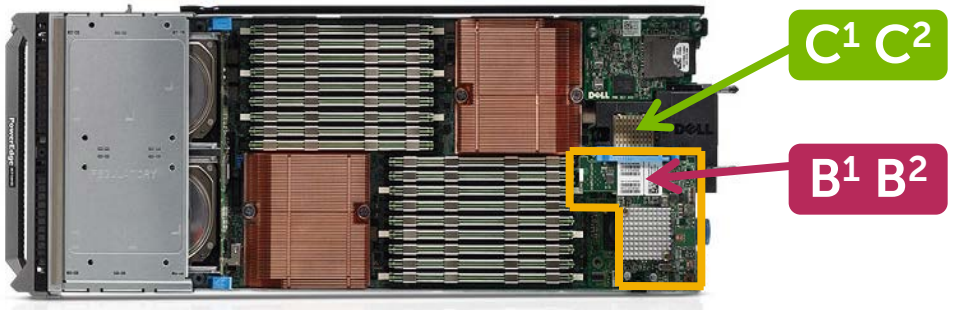
Colors chosen to facilitate whiteboard discussions.

The capabilities of the enhanced midplane (1.1) are shown above

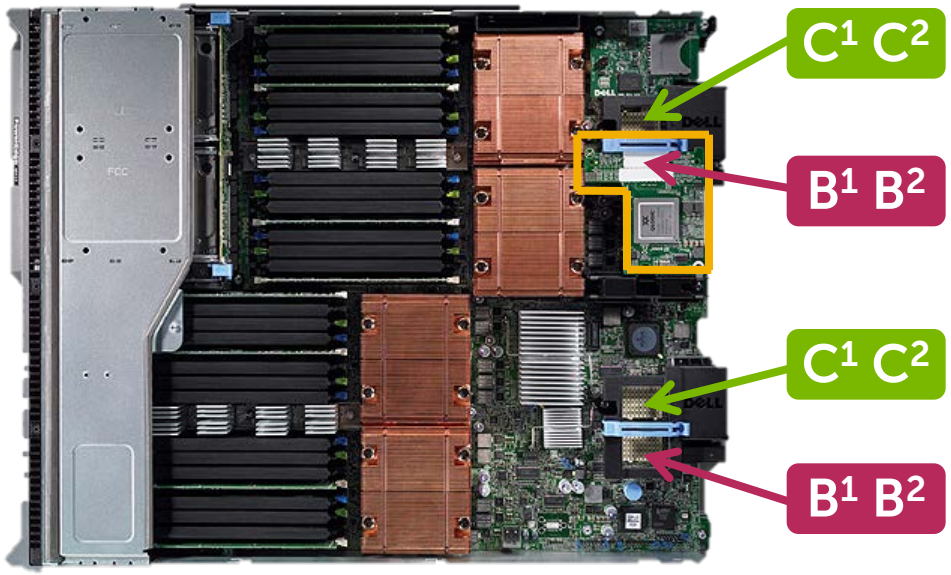
M-Series Blade I/O Fabrics

Quarter Height

Half Height



Full Height



Quarter Height Blades

One dual port LOM

•IOM with 32 internal ports (M6348 or Dell Force10 MXL) is needed to connect all LOM ports on all blades

•2 x 32 port IOMs needed to connect the 2 LOM ports on each blade

One fabric B OR fabric C mezzanine card

Half Height Blades

One Select Network Adapter or LOM

One fabric B mezzanine card

One fabric C mezzanine card

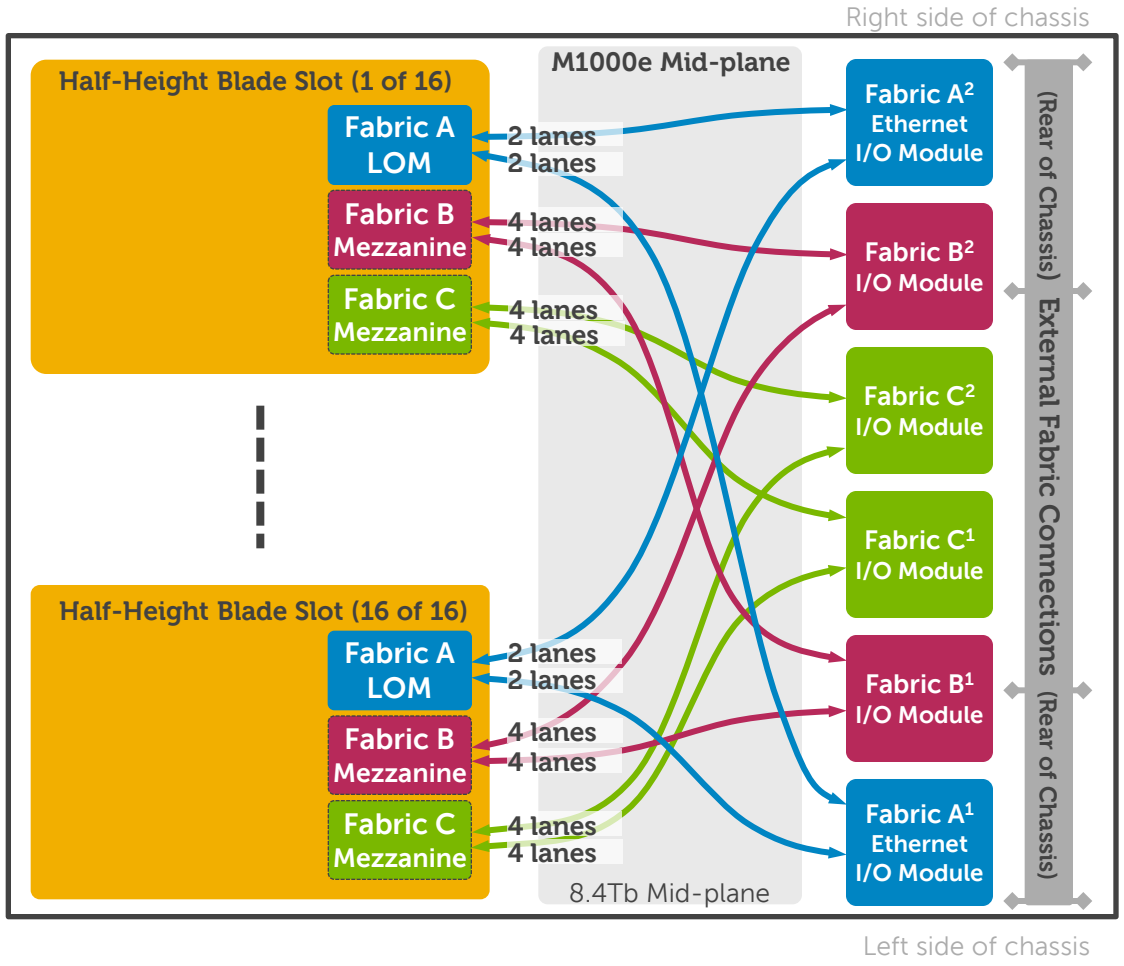
Full Height Blades

Two Select Network Adapters or LOMs

Two fabric B mezzanine cards

Two fabric C mezzanine cards

M1000e Midplane Mapping and Capabilities



Fabric A Capabilities:

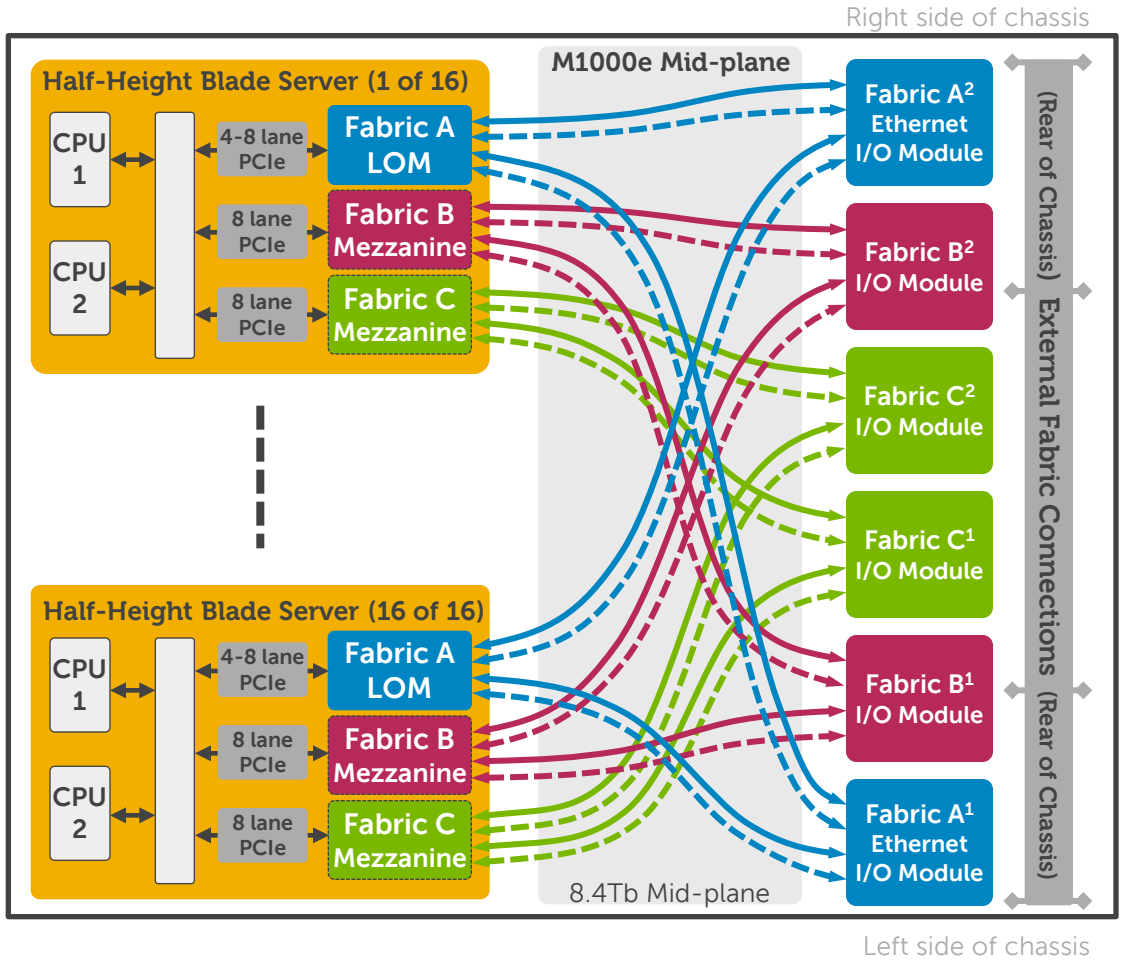
- Up to 2 lanes to each IOM
- 1Gb or 10Gb Ethernet per each lane

Fabric B & C Capabilities:

- 1Gb or 10Gb Ethernet per each lane or 40Gb Ethernet using all 4 lanes
- 4Gb, 8Gb, or 16Gb Fibre Channel over 1 lane to each IOM
- 40Gb QDR, 40Gb FDR10, or 56Gb FDR InfiniBand using all 4 lanes. 20Gb DDR InfiniBand using 2 lanes.

A lane represents a single link between an adapter and an IOM. Each port will utilize 1, 2 or 4 lanes depending on the communication protocol.

I/O Fabric Architecture for Half-Height Blades



Fabric A:

- Dual port and Quad port 1Gb or 10Gb Ethernet adapters

Fabric B & C:

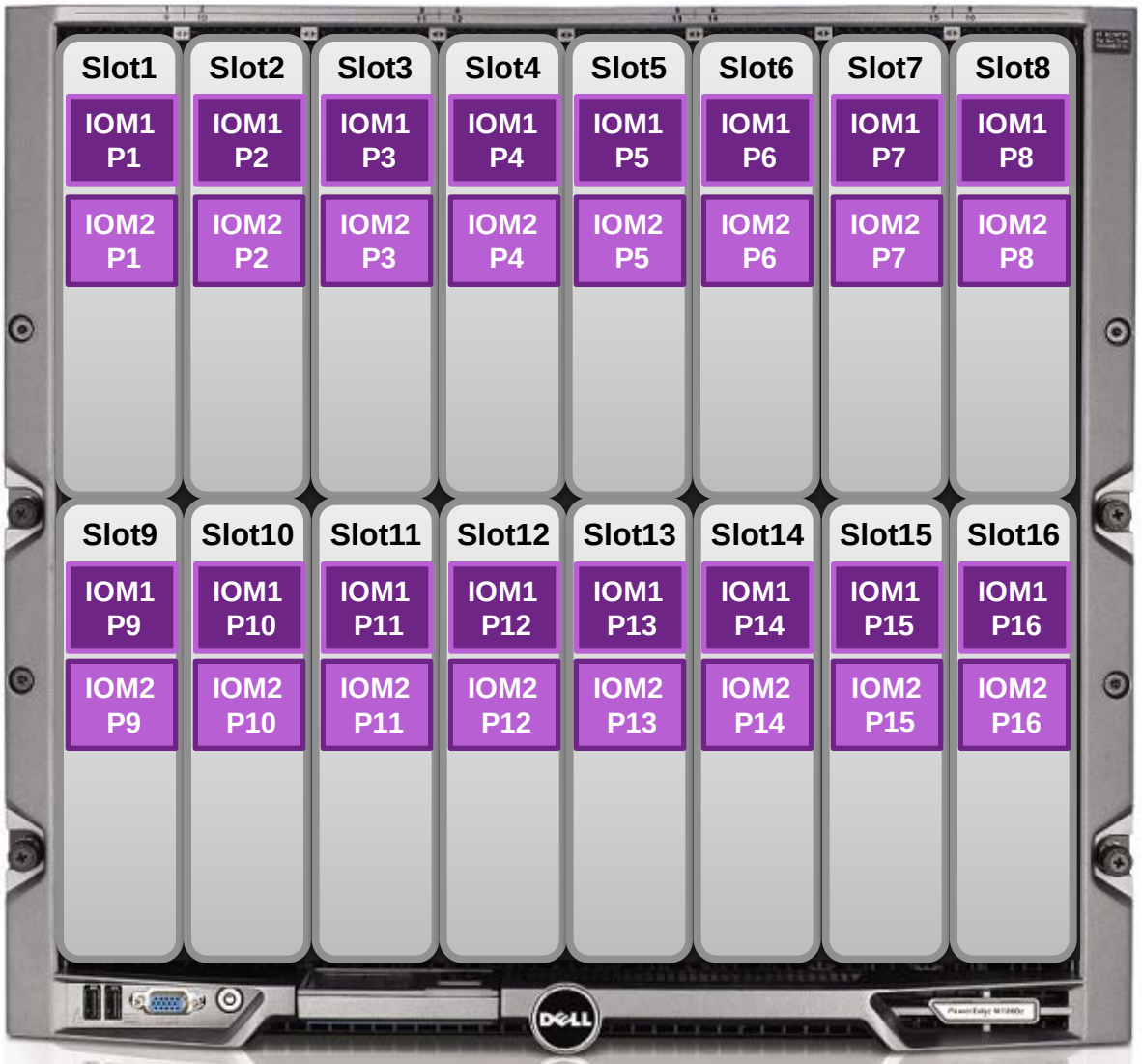
- Ethernet, Fibre Channel, &/or InfiniBand mezzanine cards
- Dual port 1Gb and 10Gb Ethernet mezzanine cards
- Quad port 1Gb Ethernet mezz. and capable of quad port 10Gb Ethernet mezzanine
- Dual port Fibre Channel mezz.
- Dual port InfiniBand mezzanine

Link between a dual port adapter and switch of same fabric type

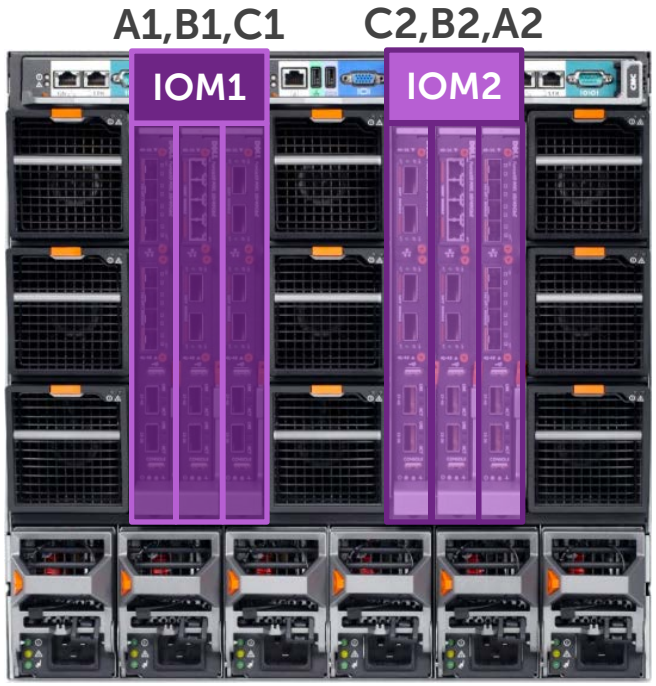
Additional link provided by quad-port adapter cards and an IOM with 32 internal ports

Port Mapping of Half Height blades with Dual Port Adapters to IOMs with 16 or 32 Internal Ports

IOM ports mapped to half height blade slots

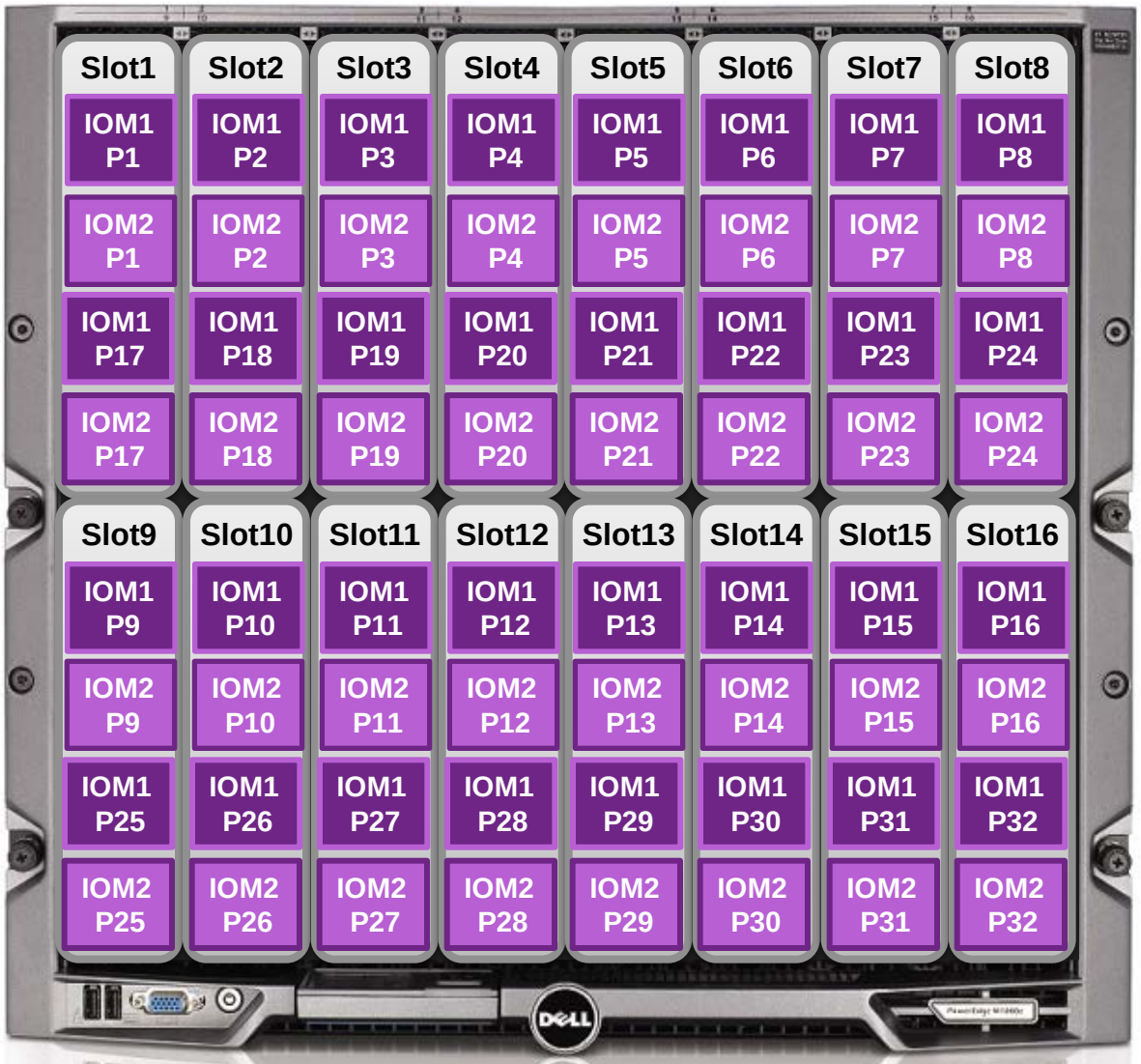


- All six IOMs have the same port mapping for half height blades
- IOMs with 32 internal ports will only connect with 16 internal ports when using dual port adapters



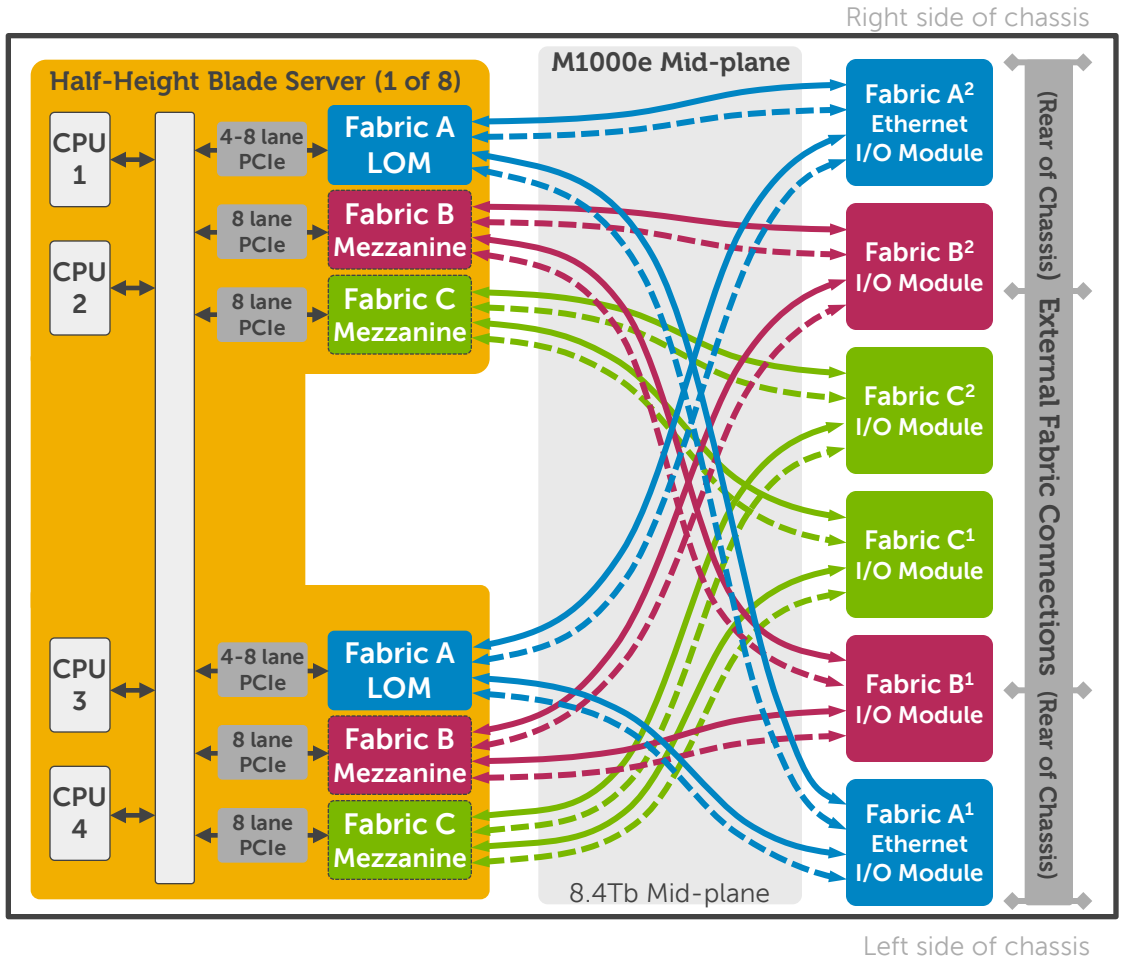
Port Mapping of Half Height blades with Quad Port Adapters to IOMs with 32 Internal Ports

IOM ports mapped to half height blade slots



- An IOM with 32 internal ports is required to connect to all quad port adapters
- All six IOMs have the same port mapping for half height blades

I/O Fabric Architecture for Full-Height Blades



Fabric A:

- Ethernet Only
- Dual port 1Gb and 10Gb Ethernet adapters
- Quad port 1Gb Ethernet and capable of quad port 10Gb Ethernet adapters

Fabric B & C:

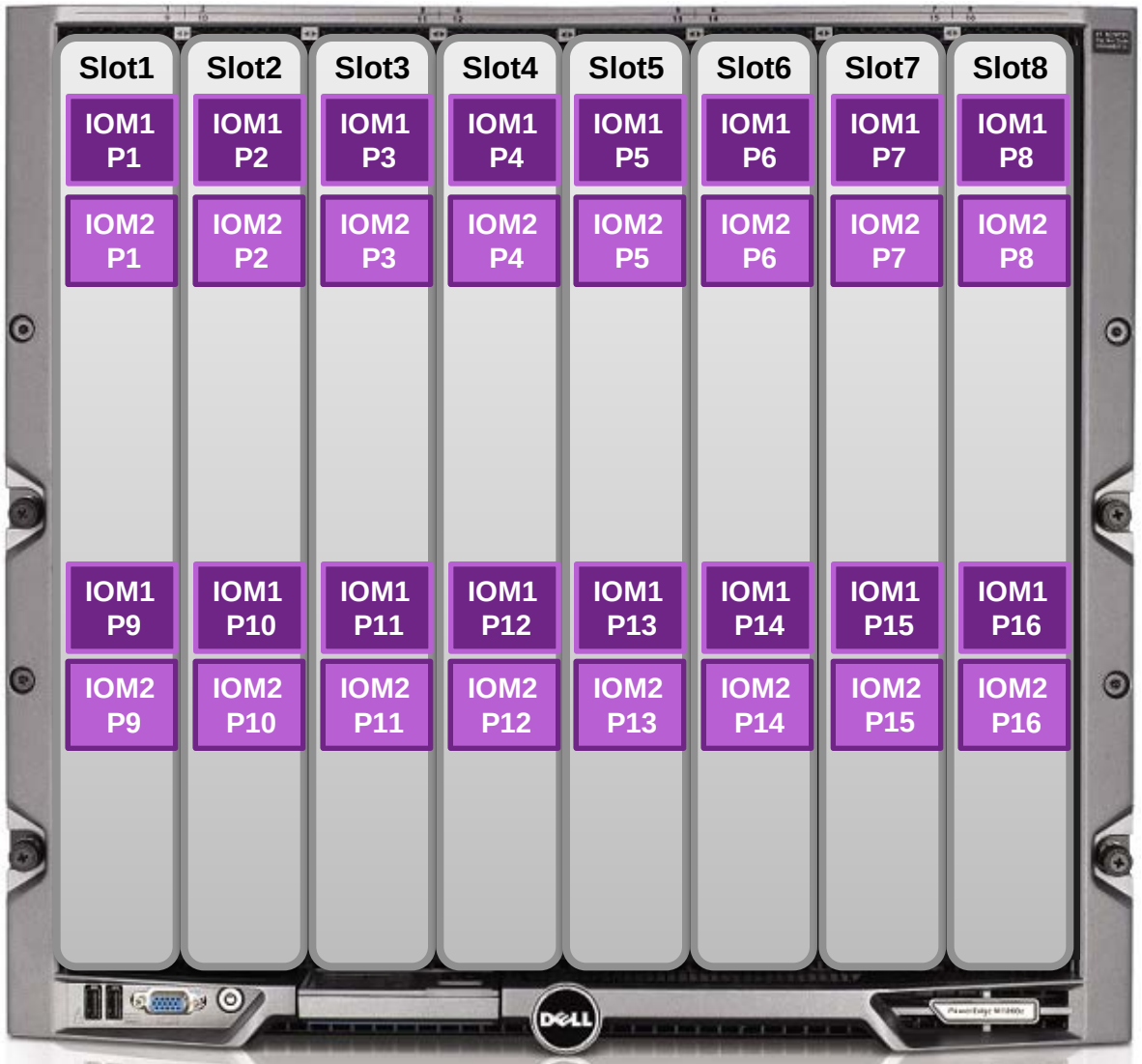
- Ethernet, Fibre Channel, &/or InfiniBand mezzanine cards
- Dual port 1Gb and 10Gb Ethernet mezzanine cards
- Quad port 1Gb Ethernet mezz. and capable of quad port 10Gb Ethernet mezzanine
- Dual port Fibre Channel mezz.
- Dual port InfiniBand mezzanine

Link between a dual port adapter and switch of same fabric type

Additional link provided by quad-port adapter cards and an IOM with 32 internal ports

Port Mapping of Full Height blades with Dual Port Adapters to IOMs with 16 or 32 Internal Ports

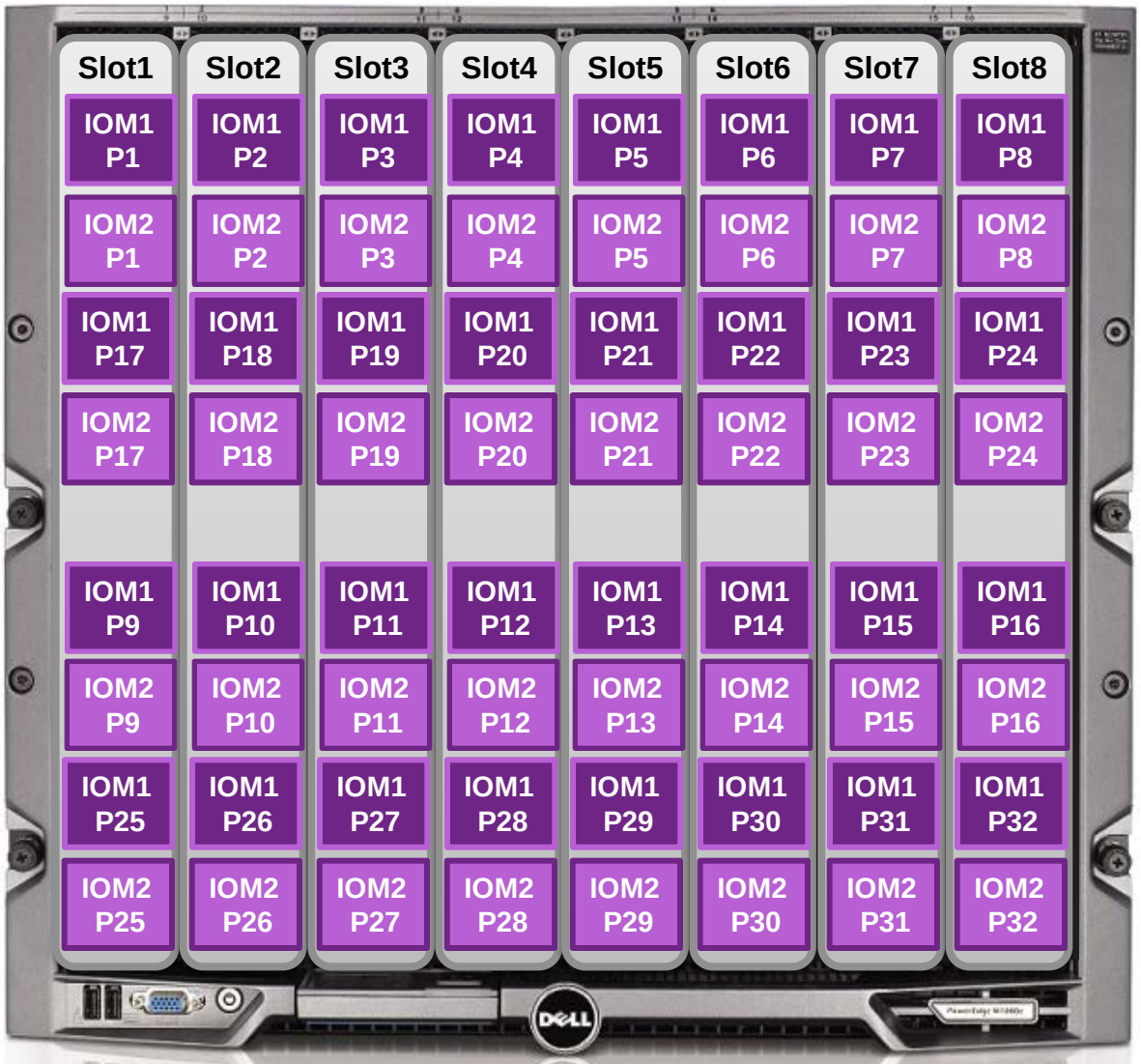
IOM ports mapped to full height blade slots



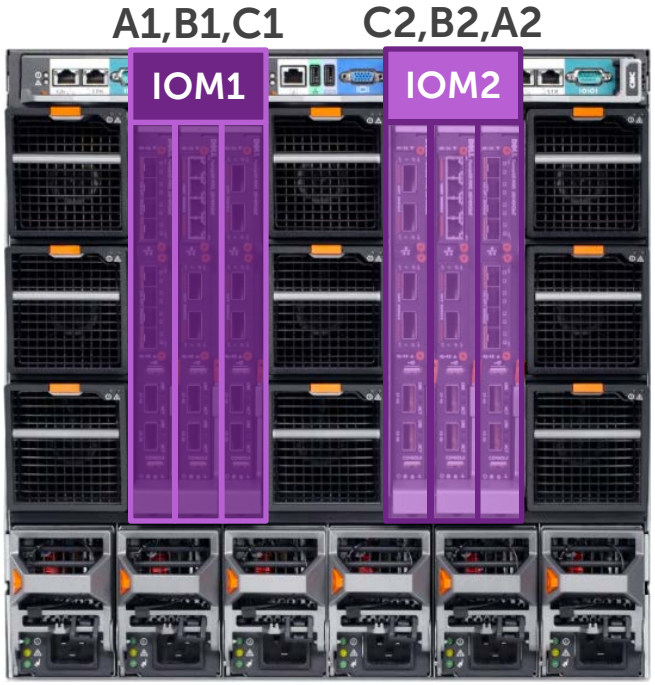
- All six IOMs have the same port mapping for half height blades

Port Mapping of Full Height blades with Quad Port Adapters to IOMs with 32 Internal Ports

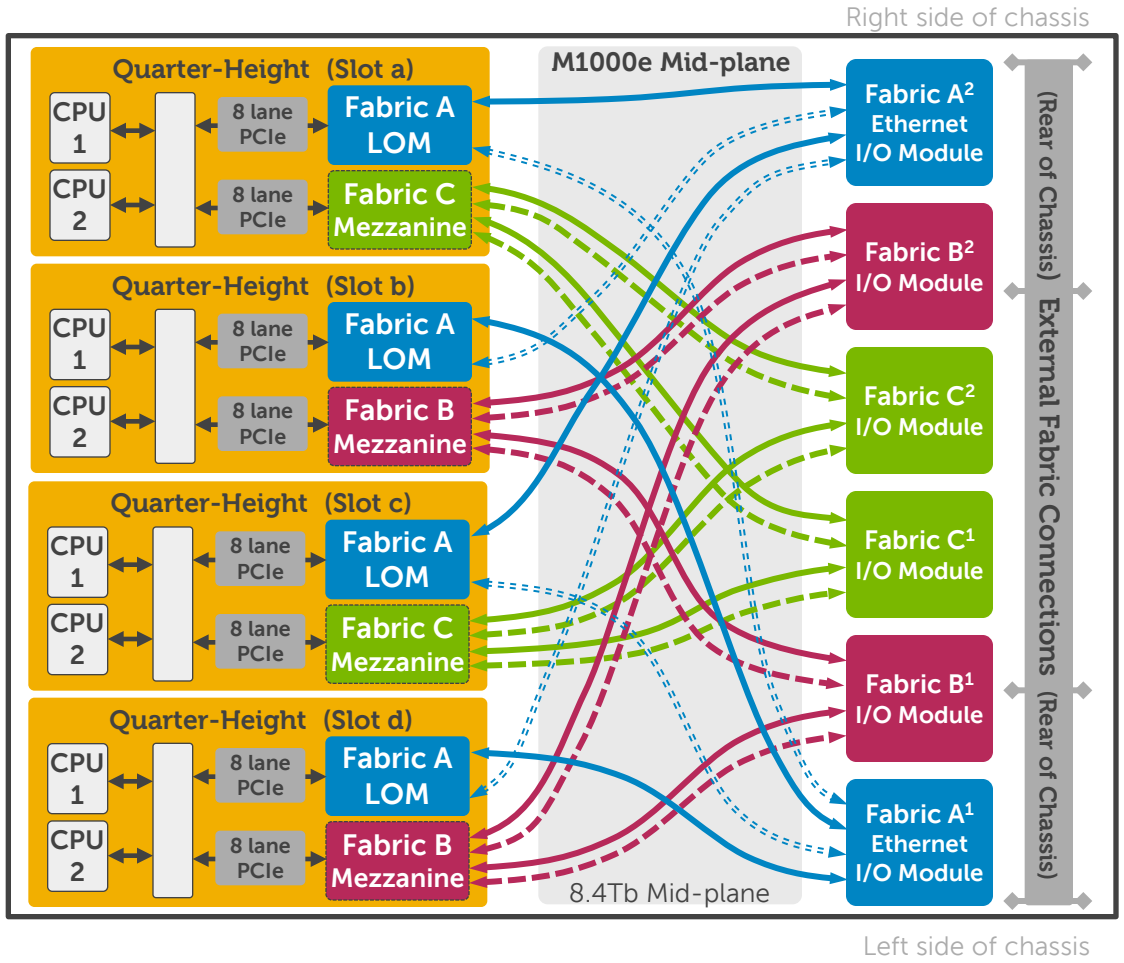
IOM ports mapped to full height blade slots



- All six IOMs have the same port mapping for half height blades
- An IOM with 32 internal ports is required to connect to all quad port adapters



I/O Fabric Architecture with Quarter Height Blades



Fabric A:

- Dual port 10Gb Ethernet LOM
- Connectivity for both LOM ports requires IOMs with 32 internal ports
- Two IOMs with only 16 internal ports will only provide a connected to a single LOM port on each blade

Fabric B & C:

- Ethernet, Fibre Channel, &/or InfiniBand mezzanine cards
- Each quarter height blade only has one mezzanine card

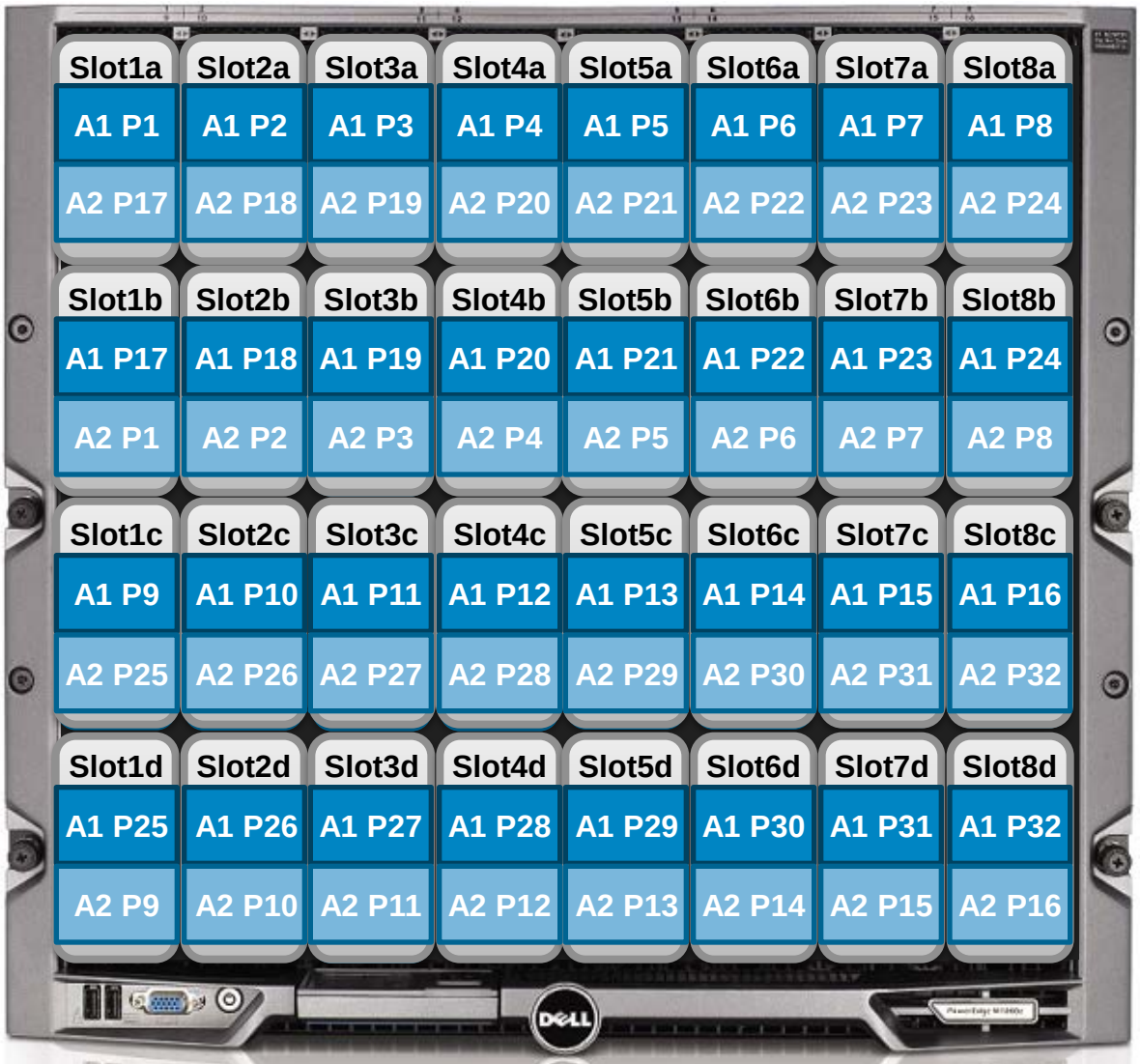
Link between a dual port adapter and switch of same fabric type

Additional link provided by quad-port adapter cards and an IOM with 32 internal ports

Redundant LOM link that requires an IOM with 32 internal ports. There will be no connection on this link with IOMs with only 16 ports

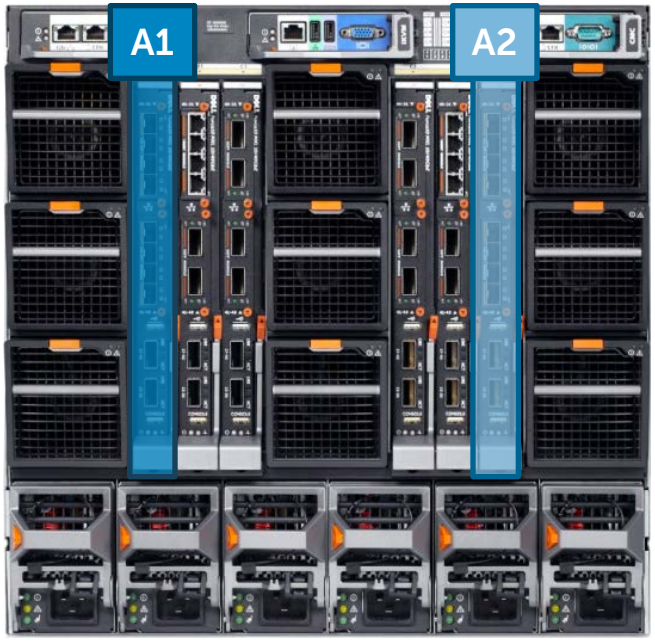
Port Mapping of Quarter Height blades to two IOMs with 32 Internal Ports on Fabric A:
Full LOM Port Redundancy

IOM ports mapped to quarter height blade slots



- On fabric A, two IOMs with 32 internal ports provide connectivity to two ports of the LOM on each quarter height blade.
- Full LOM port redundancy

IOM A1 and A2

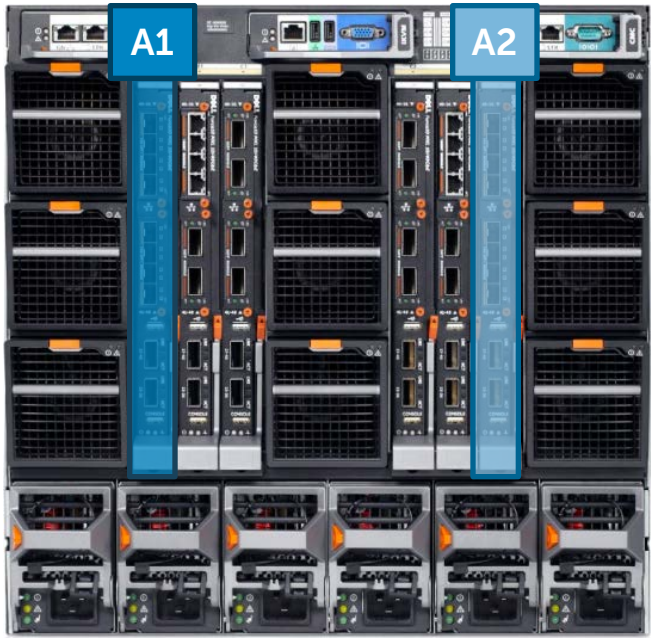


Port Mapping of Quarter Height blades to two IOMs with 16 Internal Ports on Fabric A:
No LOM Port Redundancy

IOM ports mapped to quarter height blade slots

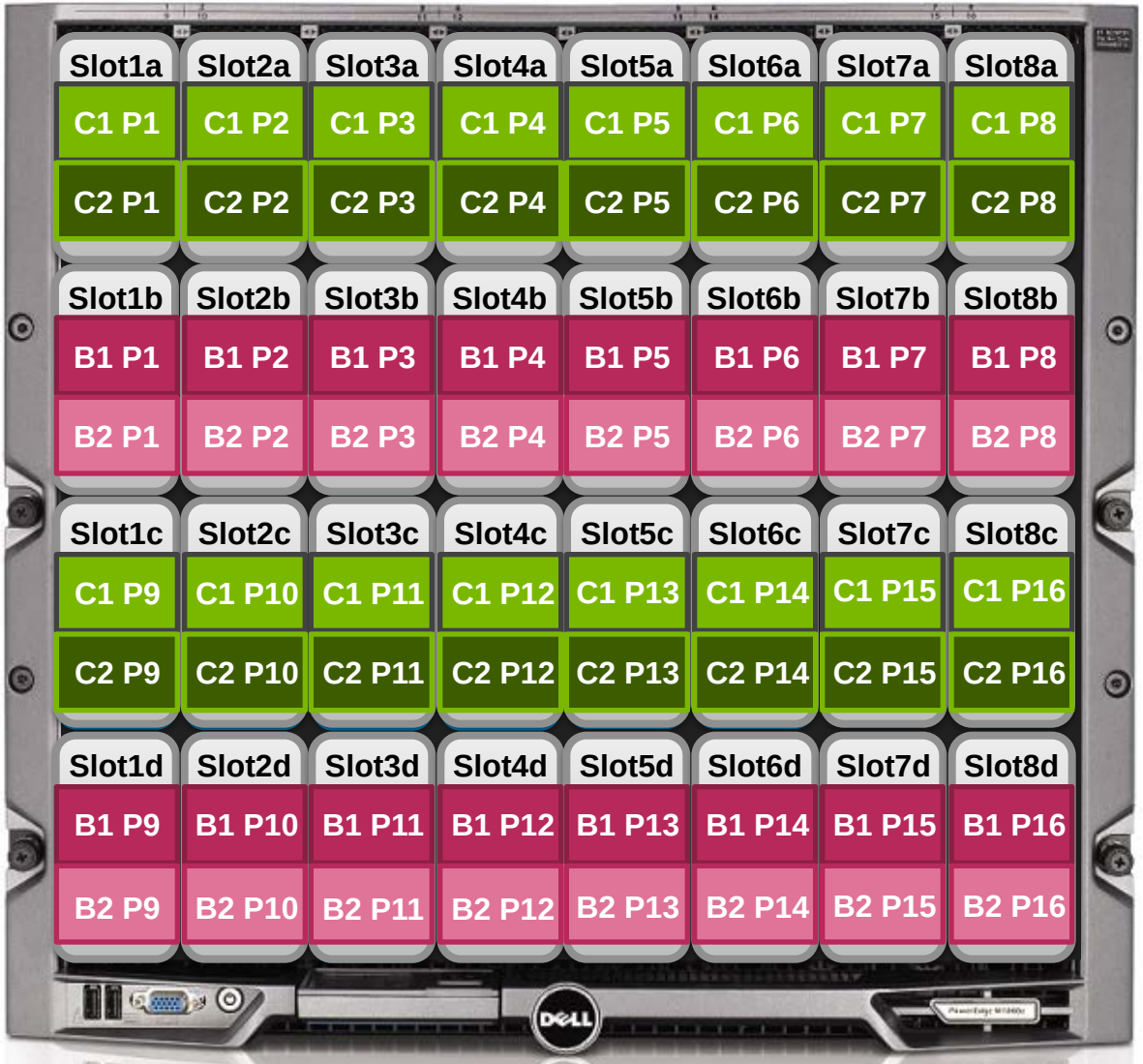
- On fabric A, two IOMs with 16 internal ports provide connectivity to one port of the LOM on each quarter height blade.
- Connectivity but not redundancy (only 1 LOM port per blade is connected)

IOM A1 and A2



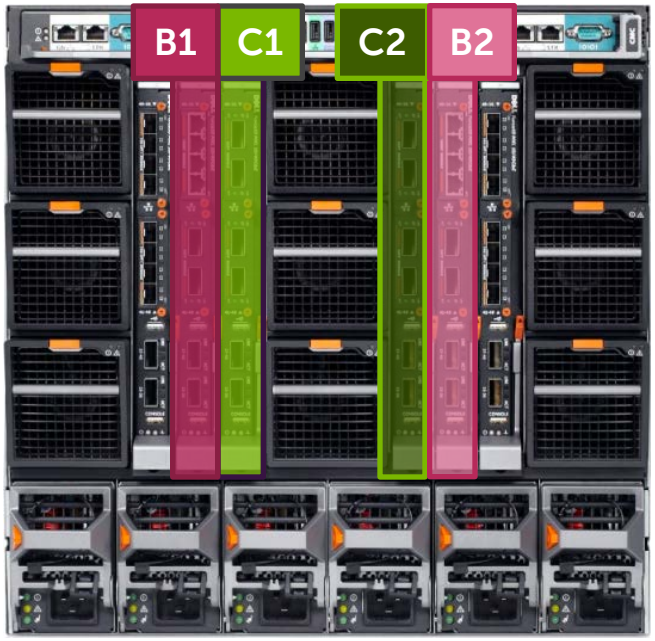
Port Mapping of Quarter Height blades to four IOMs on Fabric B&C:
Full Mezz Card Port Redundancy

IOM ports mapped to quarter height blade slots



- On fabric B&C, four IOMs provide full redundancy (connect all ports) to all mezzanine cards.

IOM B1,B2, C1 and C2



Dell PowerEdge M1000e I/O Interoperability guide

PowerEdge M1000e 1Gb Ethernet I/O Interoperability

		1Gb Ethernet I/O Modules					
		1GbE Pass-Through	M6348	M6220	Cisco 3032	Cisco 3130G	Cisco 3130X
Adapters	Broadcom 5708 Mezz	✓	✓	✓	✓	✓	✓
	Broadcom 5709 LOM/Mezz	✓	✓	✓	✓	✓	✓
	Broadcom 5709 4-port NDC/Mezz	✓	✓	✓	✓	✓	✓
	Intel ET 4-port Mezz	✓	✓	✓	✓	✓	✓
	1Gb Intel I350 4-port Mezz LOM	✓	✓	✓	✓	✓	✓
	Broadcom 5719 4-port Mezz	✓	✓	✓	✓	✓	✓
	Broadcom 5720 4-port Mezz	✓	✓	✓	✓	✓	✓

PowerEdge M1000e 10Gb Ethernet I/O Interoperability

		10Gb Ethernet I/O Modules								
		MXL	PowerEdge M I/O Aggregator	M8024-k	M8024	M8428-k	10Gb Pass-Through (original model)	10Gb Pass-Through II	10Gb Pass-Through -k	B22DELL
Adapters	Broadcom 57710 Mezz	Not Compatible	Not Compatible	Not Compatible	✓	Not Compatible	✓	✓	Not Compatible	Not Compatible
	Broadcom 57711 Mezz	Not Compatible	Not Compatible	Not Compatible	✓	Not Compatible	✓	✓	Not Compatible	Not Compatible
	Emulex OCm10102-f-m Mezz	Not Compatible	Not Compatible	Not Compatible	✓	Not Compatible	✓	✓	Not Compatible	Not Compatible
	QLogic QME8142 Mezz	Not Compatible	Not Compatible	Not Compatible	✓	Not Compatible	✓	✓	Not Compatible	Not Compatible
	Intel X520 Mezz	Not Compatible	Not Compatible	Not Compatible	✓	Not Compatible	✓	✓	Not Compatible	Not Compatible
	Intel X520-x/k Mezz (for 11G Servers)	✓	✓	✓	✓	✓	✓	✓	✓*	✓
	QLogic QME8242-k Mezz	✓*	✓*	✓*	✓*	✓*	Not Compatible	Not Compatible	✓*	✓*
	Brocade BR1741M-k Mezz	✓*	✓*	✓*	✓*	✓*	Not Compatible	Not Compatible	✓*	✓*
	Broadcom 57712-k NDC	✓	✓	✓	Not Compatible	✓	Not Compatible	Not Compatible	✓*	✓
	Broadcom 57810-k NDC	✓	✓	✓	Not Compatible	✓	N/A	N/A	✓*	✓
	Intel x520-k NDC	✓	✓	✓	Not Compatible	✓	N/A	N/A	✓*	✓
	QLogic QMD8262-k NDC	✓	✓	✓	Not Compatible	✓	N/A	N/A	✓*	✓
	Broadcom 57810S-k Mezz	✓	✓	✓	Not Compatible	✓	N/A	N/A	✓*	✓
	Broadcom 57840S-k Mezz	✓	✓	✓	Not Compatible	✓	N/A	N/A	✓*	✓
	Intel X520–x/k Mezz (for 12G Servers)	✓	✓	✓	✓	✓	✓	✓	✓*	✓
	QLogic QME8262-k Mezz	✓*	✓*	✓*	Not Compatible	✓*	N/A	N/A	✓*	✓*

10GBe on fabric 'A' with original mid-plane (1.0) will shift down to 1Gb. Note: fabrics B & C remain 10Gb with original mid-plane (1.0)
N/A: This combination is not possible
Not Compatible: This combination will not link]
✓*: In Fabric 'A' with original mid-plane (1.0), this combination will not link

PowerEdge M1000e InfiniBand I/O Interoperability

		I/O Modules				
		M2401G Mellanox DDR	M3601Q Mellanox QDR	M4001Q Mellanox QDR	M4001T Mellanox FDR10	M4001F Mellanox FDR
Mezzanine Cards	Mellanox DDR Connect-X	✓ DDR	✓ DDR	Not Supported	Not Supported	Not Supported
	Mellanox QDR Connect-X2	✓ DDR	✓ QDR	✓ QDR	✓ QDR	✓ QDR
	Mellanox QDR Connect-X3	Not Supported	✓ QDR	✓ QDR	✓ QDR*	✓ QDR
	Mellanox FDR10 Connect-X3	Not Supported	✓ QDR	✓ QDR	✓ FDR10	✓ FDR10
	Mellanox FDR Connect-X3	Not Supported	✓ QDR	✓ QDR	✓ FDR10	✓ FDR**

✓ QDR*: Requires switch firmware version "fw-sx_0JP9G6_9_1_6562" and adapter version "fw-ConnectX3-rel_0J05YT_B1_2_11_0550_Flexboot-3_4_000.bin". Customers with this combination can call Dell Support if they would like it to function on the M420 or M820

✓ FDR**: Not supported with original mid-plane (1.0)

PowerEdge Blade Servers and InfiniBand Adapters

		Mezzanine Cards				
		Mellanox DDR Connect-X	Mellanox QDR Connect-X2	Mellanox QDR Connect-X3	Mellanox FDR10 Connect-X3	Mellanox FDR Connect-X3
Blade Servers	M420	Not Supported	Not Supported	Not Supported	✓	Not Supported
	M520	Not Supported	Not Supported	✓	✓	Not Supported
	M620	Not Supported	Not Supported	✓	✓	✓
	M820	Not Supported	Not Supported	Not Supported	✓	Not Supported
	M910	✓	✓	✓	✓	Not Supported
	M915	✓	✓	✓	✓	Not Supported

PowerEdge M1000e Fibre Channel I/O Interoperability

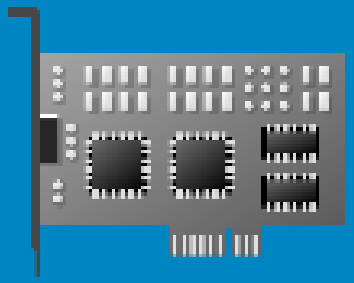
		I/O Modules					
		FC4 Passthrough	M4424 Brocade FC4	FC8 Passthrough	Dell 8/4Gbps FC SAN Module	M5424 Brocade FC8	M6505 Brocade FC16
Mezzanine Cards	**Emulex FC4**	✓ FC4	✓ FC4	✓ FC4	✓ FC4	✓ FC4	Not compatible
	QLogic FC4	✓ FC4	✓ FC4	✓ FC4	✓ FC4	✓ FC4	Not compatible
	Emulex LPe1205-M FC8 (for 11G and 12G servers)	✓ FC4	✓ FC4	✓ FC8	✓ FC8	✓ FC8	✓ FC8
	QLogic QME2572 FC8 (for 11G and 12G servers)	✓ FC4	✓ FC4	✓ FC8	✓ FC8	✓ FC8	✓ FC8
	Emulex LPm16002 FC16	Not compatible	Not compatible	✓ FC8	✓ FC8	✓ FC8	✓ FC16*
	Qlogic QME2662 FC16	Not compatible	Not compatible	✓ FC8	✓ FC8	✓ FC8	✓ FC16*

✓ FC16*: 16Gbps speeds require enhanced midplane (1.1). Auto-negotiates to FC8 with original mid-plane (1.0)

PowerEdge Blade Servers and Fibre Channel Adapters

Mezzanine Cards for 12G Servers					
		Emulex LPe1205-M FC8	QLogic QME2572 FC8	Emulex LPm16002 FC16	QLogic QME2662 FC16
Blade Servers	M420	✓	✓	Not Supported	Not Supported
	M520	✓	✓	Not Supported	Not Supported
	M620	✓	✓	✓	✓
	M820	✓	✓	✓	✓
	M910	✓	✓	✓	✓
	M915	✓	✓	✓	✓

Server Adapter Portfolio



Includes: Server Adapter products, features, compatibility and software support matrix

12G+ M1000e Server Adapter Portfolio: Ethernet and InfiniBand

10Gb Ethernet

Intel X520-k 2P NDC
Intel X520-k 2P Mezz

10Gb Converged Ethernet

Broadcom 57810S-k 2P NDC
Broadcom 57810S-k 2P LOM
Broadcom 57810S-k 2P Mezz
Broadcom 57840S-k 4P NDC

10Gb Converged Ethernet

QLogic QMD8262-k KR NDC
QLogic QME8262-k KR Mezz
Brocade BR1741M-k Mezz

1Gb Ethernet

Broadcom 5720 4P LOM
Broadcom 5719 4P Mezz
Intel I350 4P Mezz

QDR/FDR InfiniBand

Mellanox CX3 FDR Mezz
Mellanox CX3 FDR10 Mezz

Select Network Adapters for blade servers

Features	Broadcom 57810S-k NDC (Default choice)	Broadcom 57840S-k NDC	Intel X520-k NDC	QLogic QMD8262-k NDC
Ports x Link Speed	2x10Gb	4x10Gb	2x10Gb	2x10Gb
Supported Speed	1Gb, 10Gb	1Gb, 10Gb	1Gb,10Gb	10Gb
Chipset	57810S	57810S	X520/82599	P3+
Interface	KR	KR	KR	KR
ISCSI HBA	Yes	Yes	No	Yes
ISCSI Boot	Yes	Yes	Yes	Yes
FCoE	Yes	Yes	Yes	Yes
FCoE Boot	Yes	Yes	Yes	Yes
Switch Independent Partitioning	Yes[3]	Yes[4]	No	Yes
DCB	Yes	Yes	Yes	Yes
SR-IOV	Yes	Yes	Yes[1]	No
WOL	Yes	Yes	Yes	Yes
PXE	Yes	Yes	Yes	Yes
EEE	No	No	No	No
Multi-queue[2] (per port)	128 TX, 128 RX	128 TX, 128 RX	64 TX, 64 RX	64 TX, 64 RX
Supported Servers	M620, M820	M620, M820	M620, M820	M620, M820
Strengths	Continuity from older server designs Convergence features FCoE, iSCSI HBA and NPAR	High port count Convergence features FCoE, iSCSI HBA and NPAR	Preference for Intel Ethernet solutions Software iSCSI and FCoE	Trusted Storage driver stack Convergence features like ISCSI HBA, FCoE and NPAR

1: Citrix Xenserver 6.0 and Linux KVM only. 63 VFs per port
2: No. of queues will vary depending upon hypervisor memory limitations
3: 4 partitions per 10Gb port
4: 2 partitions per 10Gb port

LOMs for Blade Servers

Features	Broadcom 57810S-k 2p 10Gb LOM	Broadcom 5720 4p 1Gb LOM
Ports x Link Speed	2x10Gb	4x1Gb
Supported Speed	1Gb, 10Gb	1Gb
Chipset	57810S	5720
Interface	KR	Serdes
ISCSI HBA	Yes	No
ISCSI Boot	Yes	Yes
FCoE	Yes	No
FCoE Boot	Yes	No
Switch Independent Partitioning	Yes[2]	No
DCB	Yes	No
SR-IOV	Yes	No
WOL	Yes	Yes
PXE	Yes	Yes
EEE	No	Yes
Multi-queue[1] (per port)	128 TX, 128 RX	8 TX, 8 RX
Supported Servers	M420	M520

1: No. of queues will vary depending upon hypervisor memory limitations
2: 4 partitions per 10Gb port

Blade Mezzanine Card: 1Gb

Features	Intel I350 4p 1Gb Mezz	Broadcom 5719 4p 1Gb Mezz
Ports x Link speed	4x1Gb	4x1Gb
Supported Speed	1Gb	1Gb
Chipset	I350	5719
Interface	Serdes	Serdes
ISCSI HBA	No	No
iSCSI Boot	Yes	Yes
FCoE	No	No
FCoE boot	No	No
Switch Independent Partitioning	No	No
DCB	No	No
SR-IOV	No	No
WOL	Yes	Yes
PXE	Yes	Yes
EEE	Yes	Yes
Multi-queue[1] (per port)	8 TX, 8 RX	8 TX, 8 RX
Supported Servers	M420, M520, M620, M820	M420, M520, M620, M820
Great for	Preference for Intel Ethernet solutions	Continuity from previous generation server designs

1: No. of queues will vary depending upon hypervisor memory limitations

Blade Mezzanine Card: 10Gb

Features	Broadcom 57810S-k DP 10Gb	Intel X520 10Gb DP –x/k	QLogic QME8262-k	Brocade BR1741M-k KR
Ports x Link Speed	2x10Gb	2x10Gb	2x10Gb	2x10Gb
Supported Speed	1Gb,10Gb	1Gb,10Gb	10Gb	1Gb, 10Gb
Chipset	57810S	X520	P3+	Catapult I
Interface Type	KR	XAUI/KR	KR	KR
ISCSI HBA	Yes	No	Yes	No
iSCSI Boot	Yes	Yes	Yes	No
FCoE	Yes	Yes	Yes	Yes
FCoE boot	Yes	Yes	Yes	Yes
Switch Independent Partitioning	Yes[3]	No	Yes	No
DCB	Yes	Yes	Yes	Yes
SR-IOV	Yes	Yes[1]	No	No
WOL	Yes	Yes	Yes	No
PXE	Yes	Yes	Yes	Yes
EEE	No	No	No	No
RoCE	No	No	No	No
Multi-queue[2] (per port)	128 TX, 128 RX	64 TX, 64 RX	64 TX, 64 RX	128 TX, 128 RX
Supported Servers	M420, M520, M620, M820, M910, M915	M420, M520, M620, M820, M910, M915	M420, M520, M620, M820, M910, M915	M420, M520, M620, M820, M910, M915
Great for	Continuity from older server designs Convergence features FCoE, iSCSI HBA and NPAR	Preference for Intel Ethernet solutions Software iSCSI and FCoE	Trusted Storage driver stack Convergence features like ISCSI HBA, FCoE and NPAR	Works best with Brocade convergence switch and their management framework

1: Citrix Xenserver 6.0 and Linux KVM only. 63 VFs per port 2: No. of queues will vary depending upon hypervisor memory limitations 3. **4 partitions per 10Gb port**

Blade Mezzanine Card: FC8Gb and FC16Gb

Features	QLogic QLE2572 FC8	Emulex 1205-M FC8	Qlogic QME2662 FC16	Emulex LPm16002 FC16
Ports x Link speed	2x8Gb	2x8Gb	2x16Gb	2x16Gb
Supported Speed	4Gb, 8Gb	4Gb, 8Gb	8Gb, 16Gb	8Gb, 16Gb
Chipset	2500	LightPulse	2600	LightPulse
FC Boot	Yes	Yes	Yes	Yes
Supported Servers	M420, M520, M620, M820,	M420, M520, M620, M820	M620, M820, M910, M915	M620, M820, M910, M915

Blade Mezzanine: InfiniBand

Features	Mellanox CX3 FDR10	Mellanox CX3 FDR
Ports x Link	2 x 40Gb	2 x 56Gb
Chipset	CX-3	CX-3
Supported Protocols	IB	IB
Supported servers	M420, M520, M620, M820	M620
Great for	Real time market data distribution	HFT, co-located investment banks, algorithmic trading, low latency applications

Select Network Adapters – 11G vs. 12G

Speed	Form Factor	11G	12G
1Gb	Blade NDC	Broadcom 5709 4P 1Gb Blade NDC (M710HD, M915 only)	
10Gb	Blade NDC	Broadcom 57712-k 2P 10Gb KR NDC (M710HD, M915 only)	Broadcom 57810S-k 2P 10Gb NDC
			Broadcom 57840S-k 4P 10Gb NDC
			Intel X520-k 2P 10Gb NDC
			QLogic QMD8262-k 2P NDC

Mezzanine Adpaters - 11G vs. 12G

Speed	Form factor	11G	12G[1]
1Gb	Blade Mezz	Broadcom 5709 4P Adapter Mezz	Broadcom 5719 4P Adapter Mezz
		Intel ET 4P Adapter Mezz	Intel I350 4P Adapter Mezz
10Gb	Blade Mezz	Emulex OCm10102-F-M 2P XAUI Mezz	-
		Broadcom 57711 2P XAUI Mezz	Broadcom 57810S-k 2P Mezz
		QLogic QME8242-k 2P Mezz	QLogic QME8262-k 2P Mezz
		Brocade BR1741M-k 2P Mezz	Brocade BR1741M-k 2P Mezz
		Intel X520 x/k 2P Mezz	Intel X520 x/k 2P Mezz

1: no iSCSI offload support with 1Gb devices

Fibre Channel Adapters - 11G vs. 12G

Speed	Form factor	11G	12G
8Gb	Blade Mezz	QLogic QME2572 2P FC8 HBA	QLogic QME2572 2P FC8 HBA
		Emulex LPe1205-M 2P FC8 HBA Mezz	Emulex LPe1205-M 2P FC8 HBA Mezz
16Gb	Blade Mezz		Qlogic QME2662 FC16
			Emulex LPm16002 FC16

12G Systems Management Network Device Support Matrix

Form Factor	Vendor/Chipsets	Speed	LC configuration and update	Monitoring Support
Blade NDC	Broadcom 57810S-k NDC	10GbE	Yes	Yes
	Broadcom 57840S-k NDC	10GbE	Yes	Yes
	Intel X520-kNDC	10GbE	Yes	Yes
	QLogic QMD8262-k NDC	10GbE	Yes	Yes
Blade LOM	Broadcom 57810S-k LOM	10GbE	Yes	Yes
	Broadcom 5720 LOM	1GbE	Yes	Yes
Blade Mezz	Broadcom 57810S-k	10GbE	Yes	Yes
	Broadcom 5719 Serdes	1GbE	Yes	Yes
	Intel I350 Serdes	1GbE	Yes	Yes
	Intel X520 x/k	10GbE	Yes	Yes
	QLogic QME8262-k	10GbE	Yes	Yes
	Brocade BR1741M-k	10GbE	No	No

Note: FC HBAs are not currently supported by LC

Deployment and Technical Guides

Deployment & Technical Guides

Detailed guides to help you get connected

Product Focus	Document Title	Link
M6220	Stacking PowerConnect M6220 Blade Switch	http://del.ly/m6220stacking
M6220 and Cisco	MSTP Interoperability of the Dell 6200 & M6220 Series Switches	http://del.ly/m6200mstp
M6220 and Cisco	VLAN Interoperability of the Dell M6220	http://del.ly/m6220vlan
M6220, M6348	Sizing and Best Practices for Deploying VMware with Dell EqualLogic Storage	http://del.ly/vmwareoneql
M6220, M6348, M8024	CLI Transition Guide for Dell 7000, 8024, M8024, M6348, M6220 switches	http://del.ly/cli_transition
M6220, M6348, M8024, M8024-k	Simple Switch Mode Port Aggreation Feature	http://del.ly/portaggregator
M6348 and Cisco Catalyst	Deployment of Dell M6348 Blade Switch With Cisco 4900M Catalyst Switch (using Simple Mode)	http://del.ly/m6448tociscocatalyst
M6348, 1GbE Pass-Through & Cisco Catalyst	SAN Design Best Practices for the M1000e Blade Enclosure and EqualLogic PS Series Storage (1GbE)	http://del.ly/bladeeqlintegration
M8024-k	End-to-end deployment using SIP and M8024-k	http://del.ly/m8024kend2endsip
M8024-k, 8024, 8024F	Stacking 10G Switches	http://del.ly/m8024kstacking
M8024-k, 8024, 8024F	Deploying FCoE (FIP Snooping) on Dell 10G Switches	http://del.ly/m8024kfipsnooping
M8024-k and Cisco Nexus	Deployment of Dell M8024-k Blade Switch with Cisco Nexus 5000 Series Switch (in Simple Mode)	http://del.ly/m8024kcisconexussimple
M8024-k and Cisco Nexus	Deployment of Dell M8024-k Blade Switch with Cisco Nexus 5000 Series Switch	http://del.ly/m8024kcisconexus
MXL	Stacking the Dell MXL blade switch	http://del.ly/mxlstacking
MXL	Deploying FCoE (FIP Snooping) on Dell Force 10 MXL	http://del.ly/mxlfipsnooping
MXL, IOA, M8024-k, M8428-k, 10GbE pass-th	Dell PowerEdge M1000e Blade and EqualLogic PS Series SAN Design Best Practices Using Force10	http://del.ly/sandesignbestpractices
PowerEdge M I/O Aggregator (IOA)	Dell PowerEdge M I/O Aggregator Configuration Quick Reference	http://del.ly/ioaconfigquickref
Dell EqualLogic	EqualLogic Compatibility Matrix	http://del.ly/eqlcompatmatrix
Dell EqualLogic	EqualLogic Configuration Guide	http://del.ly/eqlconfigguide
Dell EqualLogic	Rapid EqualLogic Configuration Portal	http://del.ly/eqlconfigportal
Dell EqualLogic and Cisco Nexus FEX	Best Practices for Dell EqualLogic SANs Using Cisco Nexus 2248TP 1Gb Fabric Extender	http://del.ly/eqlciscofex

Interactive 3D Blade Server and Networking Demos!

- Get a closer look at the 12th Generation PowerEdge Server portfolio and explore the innovative technologies inside the servers with the new Dell Interactive Rack, Tower and Blade 3D demo tool. Using the tool, you can turn, spin, and pull out components of our servers via their laptop, tablet, phone or touchscreen display. Simply go online or download the new Interactive tool and you are ready to begin.

  - Blade Servers and Networking: www.bladeserverdemo.com

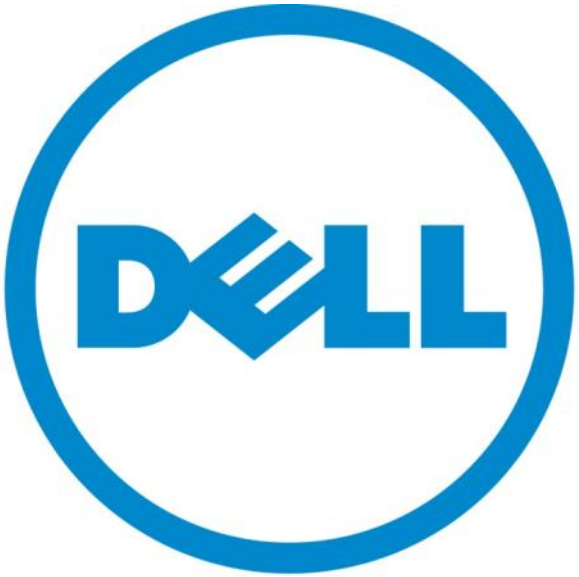
  - Enterprise Demo Landing Page: www.dellenterprisedemos.com

Feedback

We encourage readers of this publication to provide feedback on the quality and usefulness of this information by sending an email to BladeInterconnects@Dell.com.

Change Revision

Version	Changes
April 17, 2013	Modification and update to entire BladeIO Guide
June 22, 2013	• Updated "I/O Fabric Architecture with Quarter Height Blades" diagram • Updated "Comparison of Converged Blade options" table • M6348 and M8024-k now indicate that they have LRM support • Cisco 3300 series switch comes with two twingig converters • M8024S removed from Simple Switch page since it is no longer sold • VLT added to PSM4110 topology diagram • Top of rack switch list added to "Fibre Channel Breakout at Edge of Chassis" topology • Updated MXL and IOA capabilities slides with VLT • Added Broadcom 57840S-k quadport adapter (updated adapter content as well as relevant switch content) • Removed 12G Server IO Features" page
January 15, 2014	• Added FC FlexIO to MXL and IOA • Removed CX-4 FlexIO module from M8024-k page since it is no longer sold for that platform. Note that a CX-4 flexIO module still exists for the M6220 • Removed Cisco Catalyst 3032 since it is EOL. Note the 3130G and 3130X are still being sold. • Corrected a statement to indicate that M6505 requires the enhanced midplane (1.1) and will not function with the original midplane (1.0) • Corrected the listed order of the IOM slots on several port mapping page



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