

M-Series Blade I/O Guide














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

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Contents

| | | | |
|---|--|----|-----|
|  | Quick Reference Guides | | |
| | - Ethernet switching | 3 | |
| | - Fibre Channel switching | 4 | |
| | - Cisco and Infiniband switching | 5 | |
|  | Converged Ethernet Blades | | |
| | - 10/40GbE Switch – MXL | 9 | |
| | - 10GbE Plug & Play – PowerEdge M I/O | 11 | |
| | - 10GbE Basic – M8024-k | 13 | |
| | - 10Gb Pass-Through | 15 | |
| | - Cisco Nexus Blade – B22DELL FEX | 17 | |
|  | 1Gb Ethernet Blades | | |
| | - 1GbE High-density – M6348 | 21 | |
| | - 1GbE Basic – M6220 | 23 | |
| | - 1GbE Pass-Through | 25 | |
|  | Fibre Channel Blades | | |
| | - 16Gb switch – Brocade M6505 | 28 | |
| | - 8Gb switch – Brocade M5424 | 30 | |
| | - 8Gb Pass-Through | 32 | |
|  | Infiniband Blades | | 36 |
| | - 56Gb FDR switch – M4001F | | |
| | - 40Gb FDR switch – M4001T | | |
|  | Fabric Topologies | | 37 |
|  | Automation & Management | | 44 |
|  | Fabrics & Port Mapping | | 48 |
|  | Interoperability Guide | | 62 |
|  | Server Adapter Portfolio | | 71 |
|  | M1000e XAUI-KR Transition | | 70 |
| | Deployment & Technical Guides | | 93 |
| | Legacy Products | | 96 |
| | Change Revision | | 101 |

Ethernet Switching



| Models | MXL | I/O Aggregator | M8024-k | M6348 | M6220 | 10Gb Pass-Through |
|-----------------------------------|---|--|--|---|--|---|
| | 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. | 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 | 1 and 10GbE | 1 and 10GbE | 10GbE |
| Switch fabric capacity | 1.28Tbps | 1.28Tbps | 480Gbps | 184Gbps | 128Gbps | - |
| Forwarding capacity (Mpps) | 960 | 960 | 357 | 160 | 95 | - |
| Buffer size | 9MB | 9MB | 2MB | 4MB | 768KB | - |
| Latency (Microseconds) | 0.68 µs | 0.68 µs | 1.85 µs | 3.6 µs | 6.3 µs | 0.1 µs |
| Ports | | | | | | |
| Internal blade server ports | 32 (10GbE) | 32 (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) | 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) | - | - | - | - |
| Expansion modules (FlexIO) | 2 slots and 3 options (mix or match) <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 4 port SFP+ (10Gb only) • 2 port Base-T (1/10Gb) | | 2 slots and 4 options (mix or match) <ul style="list-style-type: none"> • 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) | - | - | Support DCB/CEE and FCoE |
| FCoE | FCoE transit or direct connect | FCoE transit or direct connect | Transit | - | - | Transit |
| Storage fabric services | Zoning, F_Port, NPIV | Zoning, F_Port, NPIV | | | | |
| 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 | - |
| PSVT+ | Yes | - | - | - | - | - |
| Simplified Networking Mode | - | Default | Simple Mode | Simple Mode | Simple Mode | - |
| Accepts Cisco Twin-ax cables | Yes | | Yes | 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 | SFP+ (SR, LR, LRM) | SFP+ (SR, LR, LRM) | SFP+ (SR, LR) |
| Max L2 and L3 VLANs | 4094/511 | 4094 (Layer 2 only) | 1024/128 | 1024/128 | 1024/128 | - |
| Link Aggregation (Groups/Members) | 128/16 | 1/16 | 12/8 | 48/8 | 18/8 | - |
| Jumbo frames (Bytes) | 12000 | 12000 | 9216 | 9216 | 9216 | - |
| Max Routes (IPv4/IPv6) | 16000/IPv6 Future | - | 8160/4096 | 10000/3000 | 224/128 | - |
| IPv4 Routing | RIP, OSPF | - | RIP, OSPF | RIP, OSPF | RIP, OSPF | - |
| IPv6 Routing | OSPF/OSPF v3 | - | OSPF | OSPF | OSPF | - |
| Multicast Routing | IGMP | IGMP snooping only | IGMP, PIM, DVMRP | IGMP, PIM, DVMRP, MLD | IGMP, PIM, DVMRP | - |

Fibre Channel Switching



| Models | Brocade M6505 | Brocade M5424 | Dell 8/4Gbps Pass-Through |
|--|---|--|--|
| | 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, bypassing any external switches and reducing cables, optics, and management. | Basic 8/4Gb Pass-Through Module Directly connect and isolate bandwidth between servers and any Fibre Channel SAN infrastructure. |
| Performance | | | |
| Speeds | 16Gbps (multi-speed 2, 4, 8, or 16Gbps) | 8Gbps (multi-speed 2, 4, or 8Gbps) | 8Gbps (multi-speed 2, 4, or 8Gbps) |
| Switch capacity (Gbps) | 384 (768 full duplex) | 192 (384 full duplex) | 256 (full duplex) |
| Max Buffer to Buffer Credit | 8106 | 688 | - |
| Latency (Microseconds) | 0.7 μs | 0.7 μs | - |
| Ports | | | |
| Total ports | 24 (16 internal and 8 external) | 24 (16 internal and 8 external) | 32 (16 internal and 16 external) |
| Port model options | <ul style="list-style-type: none"> • 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) | <ul style="list-style-type: none"> • 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) | 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 | 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 | Module is unmanaged – all management occurs via HBA firmware or external 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 128Gbps (M6505 model) and 64Gbps (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 | | - |
| Brocade optical transceivers (requires SFP LC connector) | 16Gbps: SWL, LWL, or ELWL | 8Gbps: SWL or LWL 4Gbps: SWL, LWL, or ELWL | 8Gbps: 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 | | - |

Transform your Dell M1000e blade server enclosure.

| Cisco | |
|-----------------------------------|---|
| Models | B22DELL FEX |
| | 10GbE Fabric Extender Acts as a remote line card of the parent Nexus switch fabric. |
| Performance | |
| Speeds | 1 and 10GbE |
| Switch fabric capacity | 160Gbps |
| Forwarding capacity (Mpps) | 297 |
| Latency (Microseconds) | 0.8 µs |
| Ports | |
| Internal blade server ports | 16 (1 or 10GbE) |
| External 10GbE | 8 ports SFP+ |
| Features | |
| DCB: PFC, DCBx and ETS | Yes |
| FCoE | Yes |
| Converged iSCSI (LAN and SAN) | Yes |
| Stacking | No |
| PSVT+ | Yes |
| Simplified Networking Mode | Managed at top-of-rack |
| Twin-ax cables | 1m: SFP-H10GB-CU1M 3m: SFP-H10GB-CU3M 5m: SFP-H10GB-CU5M 7m: SFP-H10GB-ACU7M 10m: SFP-H10GB-ACU10M |
| 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 |
| Max L2 and L3 VLANs | 4013 |
| Link Aggregation (Groups/Members) | 96/16 |
| Jumbo frames (Bytes) | 9216 |
| Max Routes (IPv4/IPv6) | Managed at top-of-rack |
| IPv4 Routing | Managed at top-of-rack |
| IPv6 Routing | Managed at top-of-rack |
| Multicast Routing | Managed at top-of-rack |



| InfiniBand | | |
|----------------------------|--|------------------------------|
| Models | Mellanox 4001F | Mellanox 4001T |
| | High performance InfiniBand switch | Mainstream InfiniBand switch |
| Performance | | |
| Speed / Bit rate | FDR/56 Gbps | 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 your multi-vendor network with triage, resolution, and tier 2 and 3 engineering support.

Support services*

Gain access to professional 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, HPE, and Aruba.

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

M-Series I/O Modules

Converged Ethernet

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



Fibre Channel

Brocade M6505
Brocade M5424
Pass Through FC8/4



1Gb Ethernet

M6348
M6220
1Gb Pass-Through
Cisco Catalyst Blade



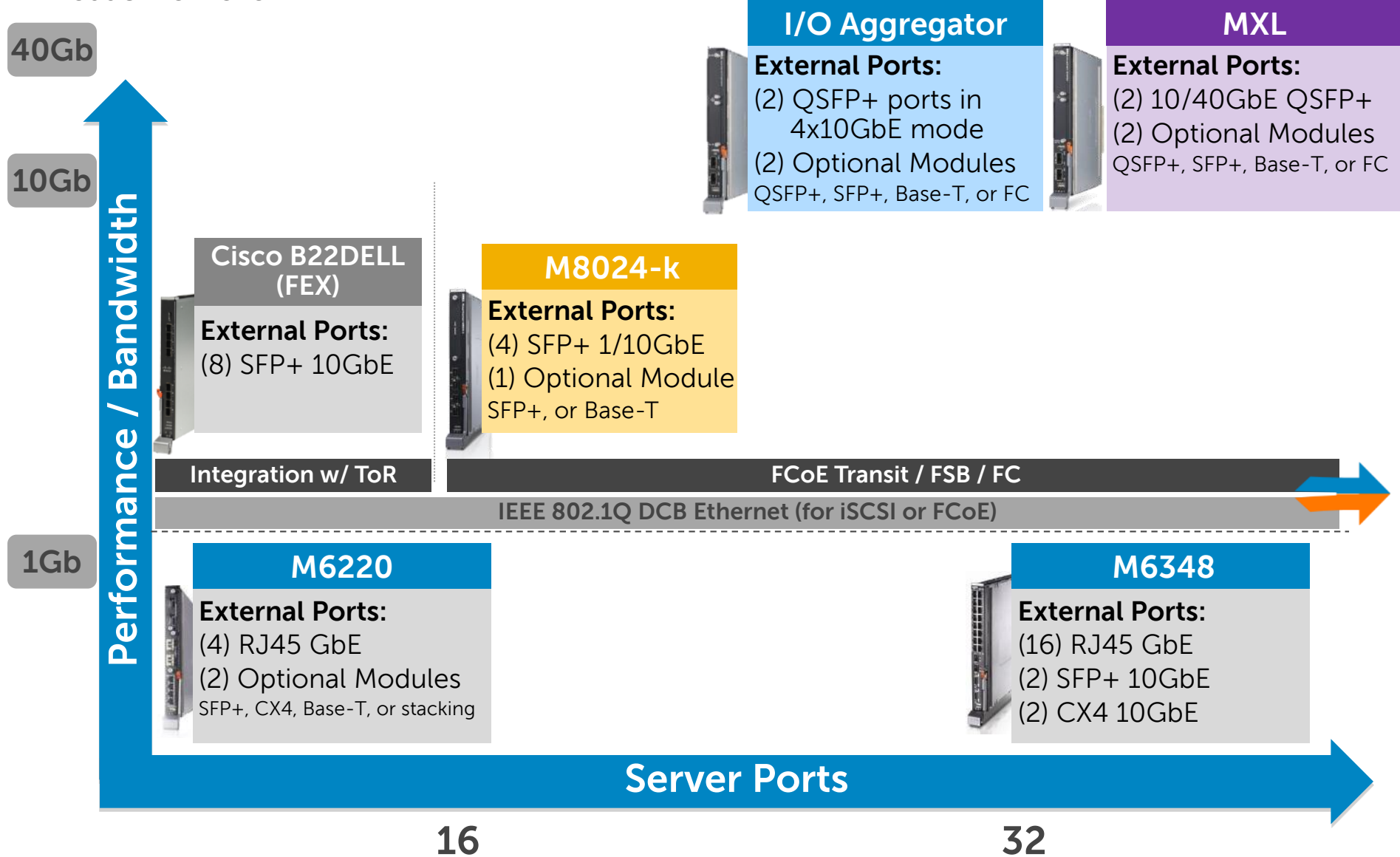
InfiniBand

Mellanox M4001F
Mellanox M4001T



Ethernet Blade I/O Modules

Product Portfolio



Converged Ethernet



10/40Gb
Switch
MXL



10Gb
Plug & Play
M-IOA



10Gb
Basic
M8024-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 2 peers
- 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



Adapters

12G

- Brocade BR1741M-k
- Emulex OCm14102-U2-D
- Emulex OCm14102-U3-D
- Intel X520-x/k
- Mellanox CX-3 DP 10GbE
- QLogic 57810S-k
- QLogic 57840S-k
- QLogic QME8262-k

13G

- Emulex OCm14102-N5-D
- Emulex OCm14102B-N5-D
- Emulex OCm14102-N6-D
- Emulex OCm14102B-N6-D
- Emulex OCm14102-U4-D
- Emulex OCm14102B-U4-D
- Emulex OCm14102-U5-D
- Emulex OCm14102B-U5-D
- Intel X520-x/k
- Intel X710-k
- Mellanox CX-3 DP 10GbE
- Mellanox CX-3 Pro DP 10GbE
- QLogic 57810S-k
- QLogic 57840S-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

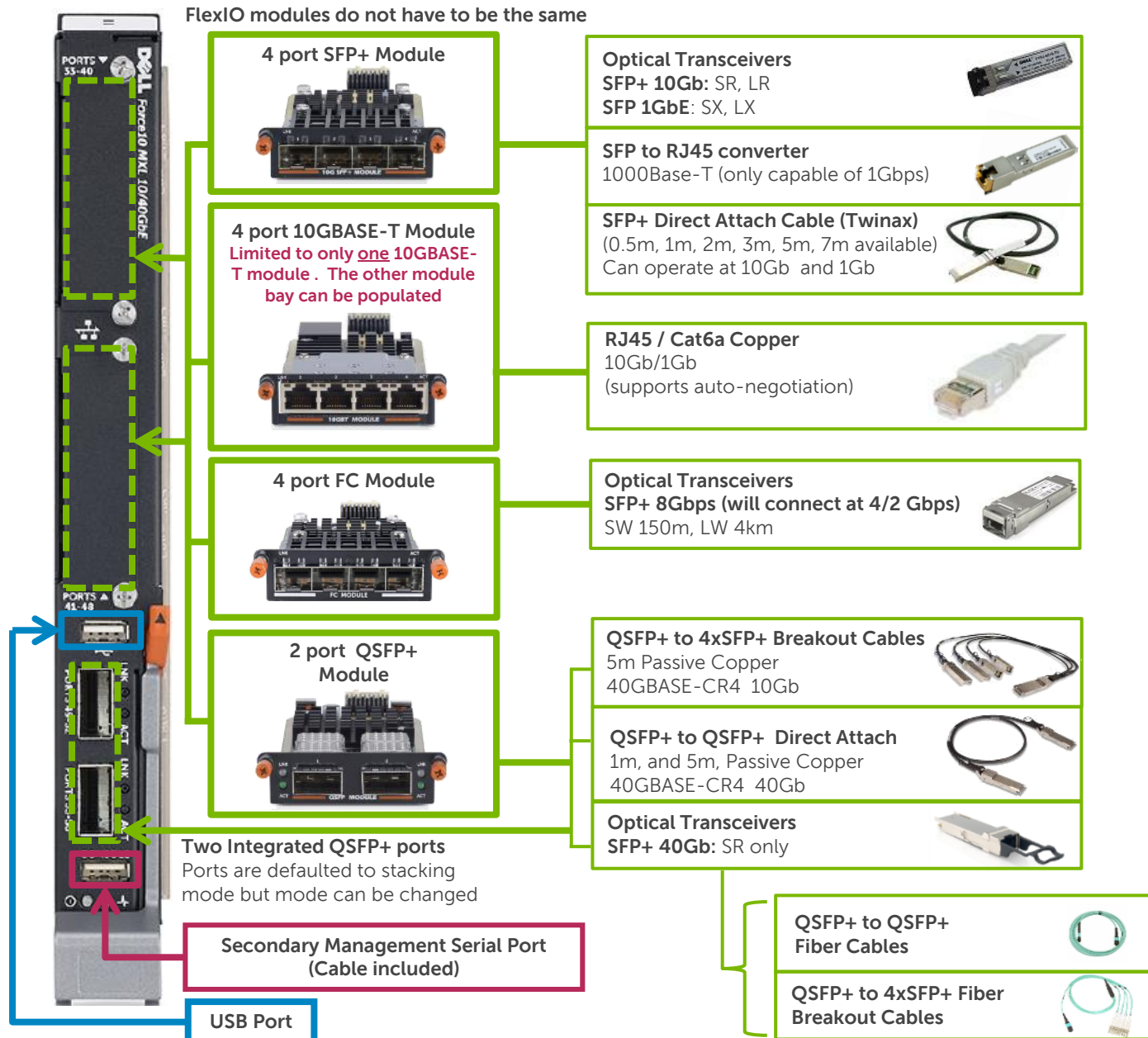
More details in Adapter Portfolio section

Designed for I/O bays

A1/A2

B1/B2

C1/C2



PowerEdge M I/O Aggregator



Plug & Play

- 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 6)
- 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 peers



PowerEdge M I/O Aggregator



Adapters

12G

- Brocade BR1741M-k
- Emulex OCm14102-U2-D
- Emulex OCm14102-U3-D
- Intel X520-x/k
- Mellanox CX-3 DP 10GbE
- QLogic 57810S-k
- QLogic 57840S-k
- QLogic QME8262-k

13G

- Emulex OCm14102-N5-D
- Emulex OCm14102B-N5-D
- Emulex OCm14102-N6-D
- Emulex OCm14102B-N6-D
- Emulex OCm14102-U4-D
- Emulex OCm14102B-U4-D
- Emulex OCm14102-U5-D
- Emulex OCm14102B-U5-D
- Intel X520-x/k
- Intel X710-k
- Mellanox CX-3 DP 10GbE
- Mellanox CX-3 Pro DP 10GbE
- QLogic 57810S-k
- QLogic 57840S-k

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

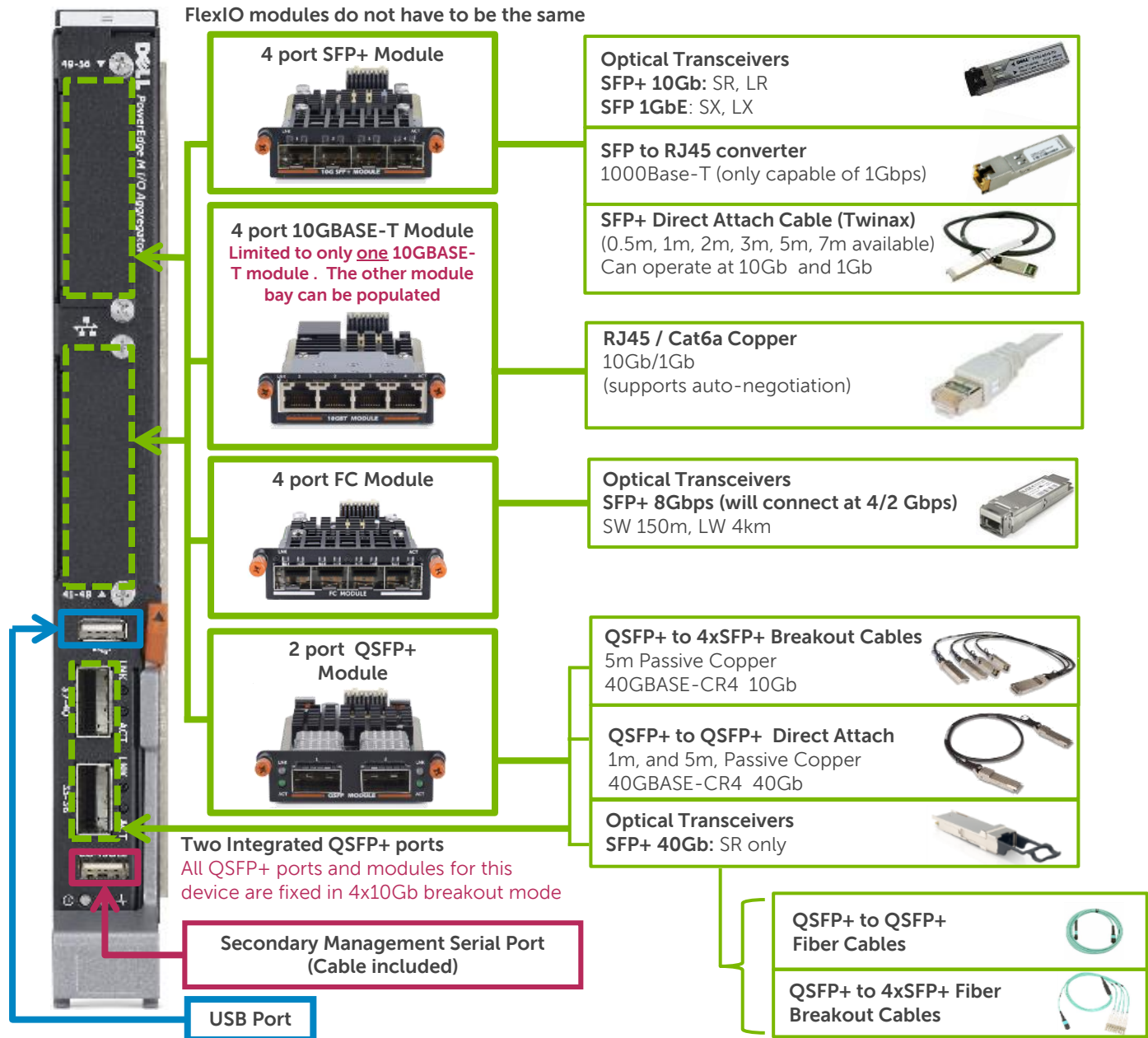
More details in Adapter Portfolio section

Designed for I/O bays

A1/A2

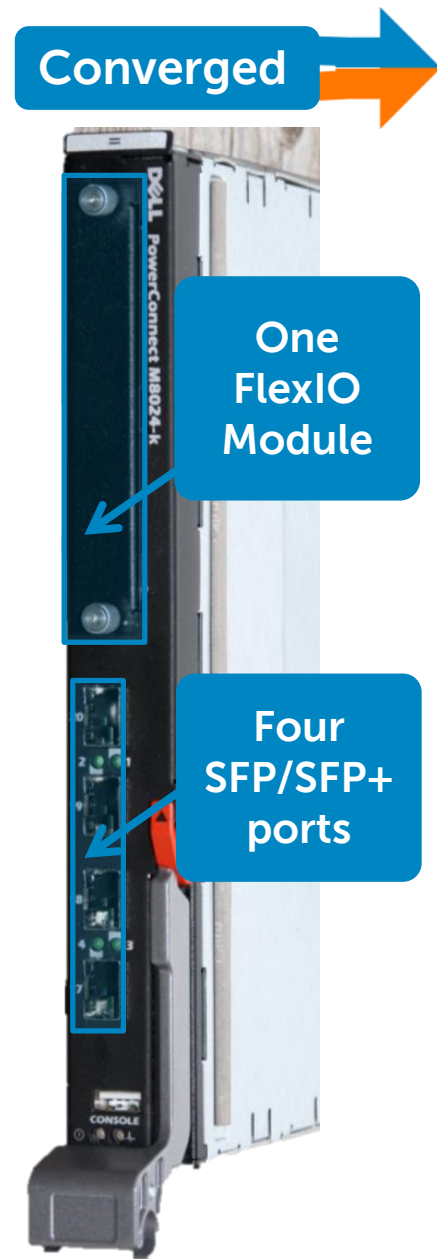
B1/B2

C1/C2



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



M8024-k



Adapters

12G

- Brocade BR1741M-k
- Emulex OCm14102-U2-D
- Emulex OCm14102-U3-D
- Intel X520-x/k
- Mellanox CX-3 DP 10GbE
- QLogic 57810S-k
- QLogic 57840S-k (links 2 ports only)
- QLogic QME8262-k

13G

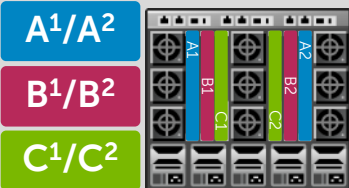
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- Emulex OCm14102B-U5-D
- Intel X520-x/k
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- Mellanox CX-3 DP 10GbE
- Mellanox CX-3 Pro DP 10GbE
- QLogic 57810S-k
- QLogic 57840S-k (links 2 ports only)

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




Uplinks



10GBASE-T Copper Module

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

Uplinks




10GbE SFP+ Module (10Gb only)


Cables
RJ45 / Cat6a




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




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.



Secondary Management Serial Port
(Cable included)

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

10Gb Ethernet Pass Through -k

Converged

- 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



Adapters

12G

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- Emulex OCm14102-U2-D
- Emulex OCm14102-U3-D
- Intel X520-x/k
- Mellanox CX-3 DP 10GbE
- QLogic 57810S-k
- QLogic 57840S-k (links 2 ports only)
- QLogic QME8262-k

13G

- Emulex OCm14102-N5-D
- Emulex OCm14102B-N5-D
- Emulex OCm14102-N6-D
- Emulex OCm14102B-N6-D
- Emulex OCm14102-U4-D
- Emulex OCm14102B-U4-D
- Emulex OCm14102-U5-D
- Emulex OCm14102B-U5-D
- Intel X520-x/k
- Intel X710-k
- Mellanox CX-3 DP 10GbE
- Mellanox CX-3 Pro DP 10GbE
- QLogic 57810S-k
- QLogic 57840S-k (links 2 ports only)

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

| | |
|--------------------------------|--|
| A ¹ /A ² | |
| B ¹ /B ² | |
| C ¹ /C ² | |



10Gb Optical Transceivers
SR & LR

Cables

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



Cisco Nexus B22DELL Fabric Extender

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, 5596UP, 5672UP, 56128P
 - Cisco Nexus 6001, 6004
 - Cisco Nexus 9372PX, 9396PXIt 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 B22DELL Fabric Extender



Adapters

12G

- Brocade BR1741M-k
- Emulex OCm14102-U2-D
- Emulex OCm14102-U3-D
- Intel X520-x/k
- Mellanox CX-3 DP 10GbE
- QLogic 57810S-k
- QLogic 57840S-k (links 2 ports only)
- QLogic QME8262-k

13G

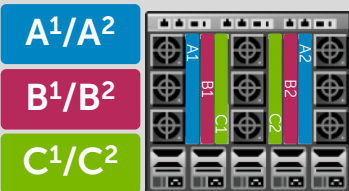
- Emulex OCm14102-N5-D
- Emulex OCm14102B-N5-D
- Emulex OCm14102-N6-D
- Emulex OCm14102B-N6-D
- Emulex OCm14102-U4-D
- Emulex OCm14102B-U4-D
- Emulex OCm14102-U5-D
- Emulex OCm14102B-U5-D
- Intel X520-x/k
- Intel X710-k
- Mellanox CX-3 DP 10GbE
- Mellanox CX-3 Pro DP 10GbE
- QLogic 57810S-k
- QLogic 57840S-k (links 2 ports only)

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




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 |
|--|--|--|--|---------------------------|
| Overview | 10/40GbE Switch | 10GbE Plug & Play | 10GbE Extender | 10GbE Basic |
| Server Ports Supported | 32 (10GbE) | 32 (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 |
| External 10G Ports | 24 (16 per LAG) | 24 (16 in a single LAG) | 8 | 8 |
| Flex I/O Expansion Modules | Two slots and three options (Mix or match) <ul style="list-style-type: none"> • 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 ² Both devices limited to one Base-T module only. Populate second slot with another module of your choice. | None | One slot & 3 options <ul style="list-style-type: none"> • 4 port SFP+ (10Gb only) • 2 port Base-T (1/10Gb) | |
| Stacking | 6 | 6 | n/a | 6 |
| East-west traffic support | Yes | Yes | No (All traffic is forwarded to Nexus Top-of-Rack / End-of-Row) | Yes |
| Support for M420 Quarter-Height Blades on Fabric A | Yes | Yes | Not in a redundant manner | Not in a redundant manner |
| Support for MLAG (vLT/vPC) | Yes | Yes (Enabled via CLI) | Yes | No |
| Support for quad-port GbE and 10Gb LOM/Mezz | Yes | Yes | No | No |

1Gb Ethernet



1/10Gb
High-density
M6348

1/10Gb
Basic
M6220

1Gb
Pass-
Through

M6348

1/10GbE

High-density 1GbE copper with 10GbE uplinks

- 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



Adapters

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

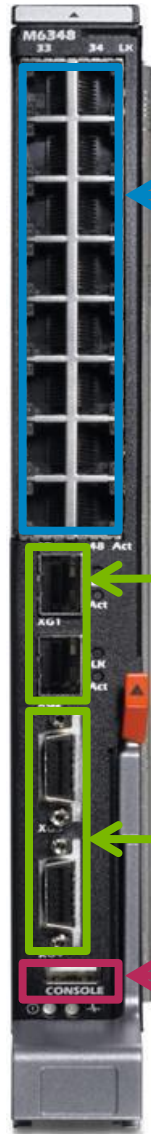
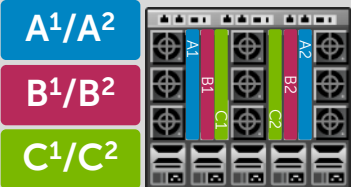
Functions with all 10Gb Mezzanine cards and Select Network Adapters **with the exception of the:** QLogic 8242-k, 8262-k, and Brocade BR1741M-k.

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



Cables
CAT 5



10Gb Optical Transceivers
SR, LR, LRM



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





Basic 1GbE copper with FlexIO and 10GbE uplinks

- Gigabit Ethernet Layer 2/3 Switch
- Optional 10Gb uplinks and 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



4 x fixed
10/100/1000Mb
(RJ-45)

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 |



Adapters

Works with all 1Gb Mezzanine cards and LOMs.

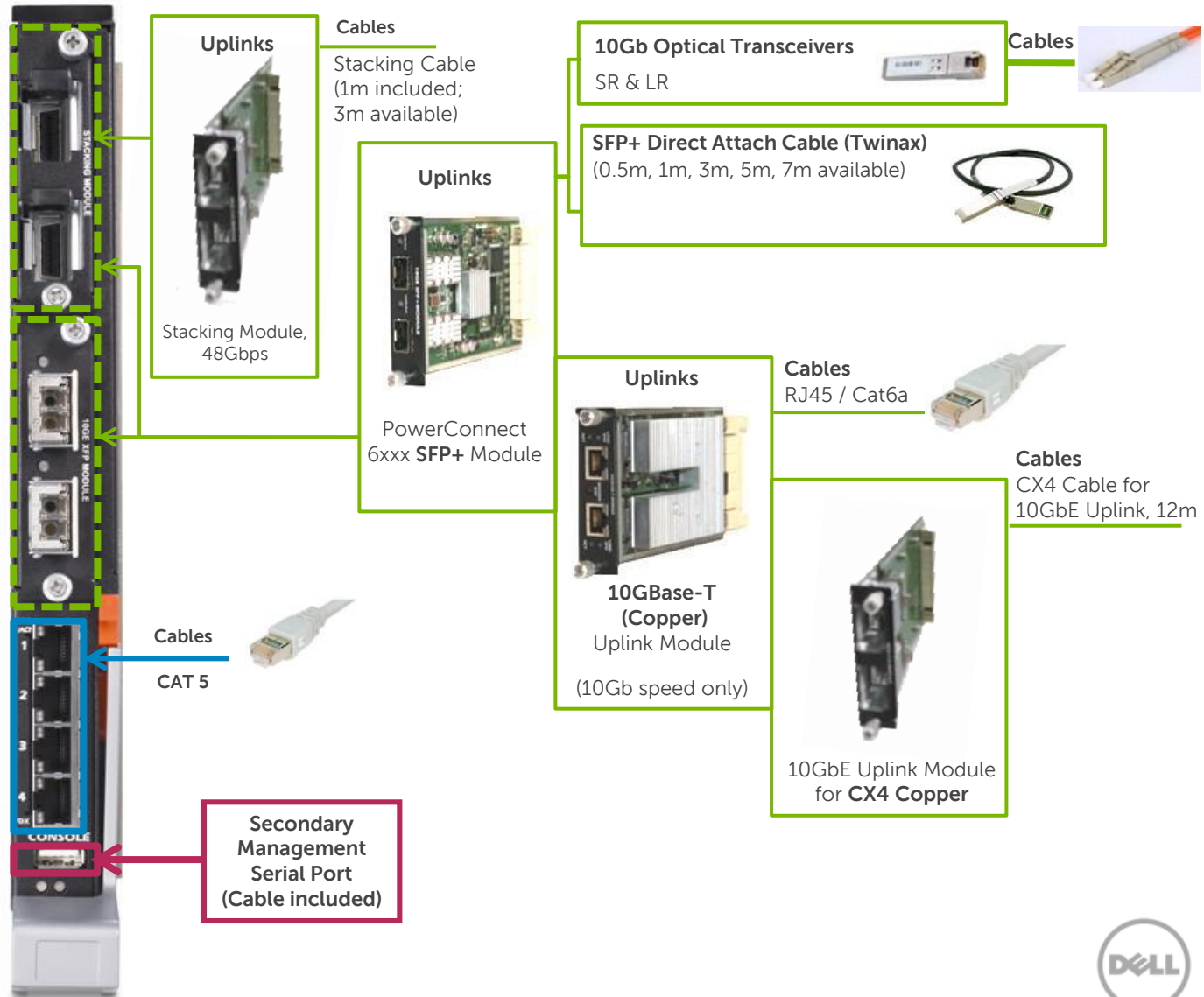
Functions with all 10Gb Mezzanine cards and Select Network Adapters **with the exception of the: QLogic 8242-k, 8262-k, and Brocade BR1741M-k.**

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 | A1 | A2 |
| B1/B2 | B1 | B2 |
| C1/C2 | C1 | C2 |



Gb Ethernet Pass-Through

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.

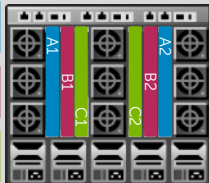
More details in Adapter Portfolio section

Designed for I/O bays

A¹/A²

B¹/B²

C¹/C²



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



Fibre Channel



16Gb
M6505




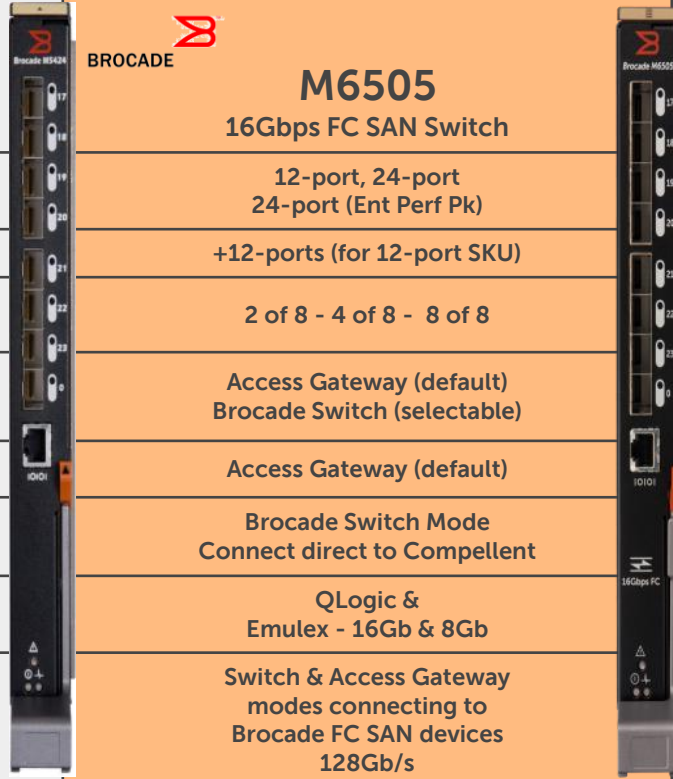
8Gb
M5424



8Gb
Pass-
Through

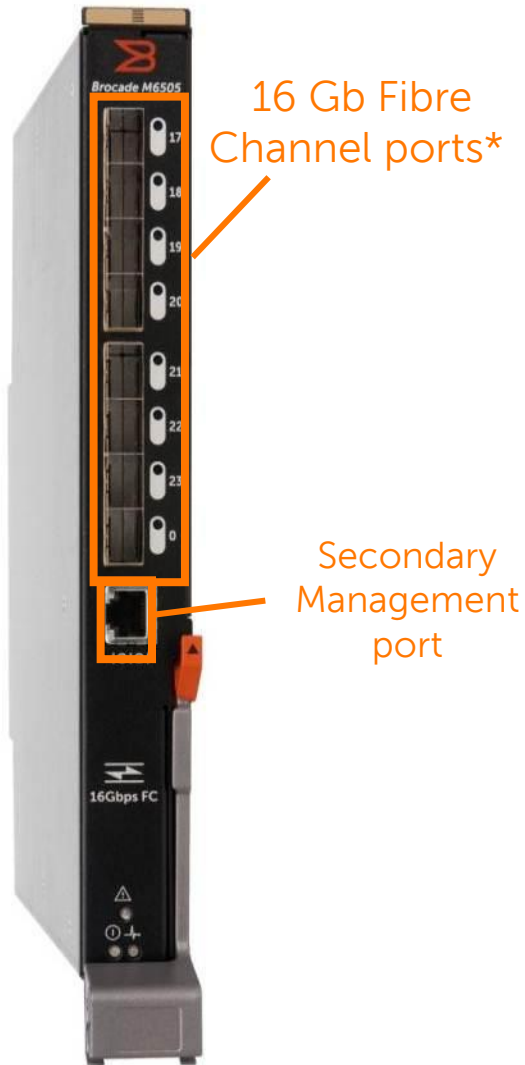


M-Series Fibre Channel Comparison

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

Brocade M6505

16Gb switch



- 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

Adapters

12G & 13G

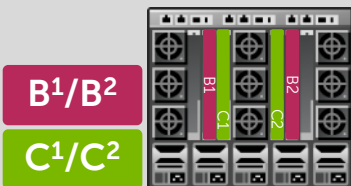
- Emulex LPe1205-M FC8
- Emulex LPm15002B-D FC8
- Emulex LPm16002B FC16
- QLogic QME2572 FC8
- QLogic QME2662 FC16

*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



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

- (16) internal and (8) SFP+ external FC16 ports with (8) FC16 SWL transceivers and Enterprise Performance Pack
- (16) internal and (8) SFP+ external FC16 ports with (4) FC16 SWL transceivers
- (8) internal and (4) SFP+ external FC16 ports with (2) FC16 SWL transceivers (12 port model expands to 24 ports with on-demand license)



Brocade M5424

8Gb switch

- 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

Adapters

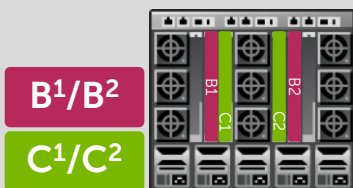
12G & 13G

- Emulex LPe1205-M FC8
- Emulex LPm15002B-D FC8
- Emulex LPm16002B FC16
- QLogic QME2572 FC8
- QLogic QME2662 FC16

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

More details in Adapter Portfolio section

Designed for I/O bays



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

- (16) internal and (8) SFP+ external FC8 ports with (8) FC8 SWL transceivers and Enterprise Performance Pack
- (16) internal and (8) SFP+ external FC8 ports with (4) FC8 SWL transceivers
- (8) internal and (4) SFP+ external FC8 ports with (2) FC8 SWL transceivers (12 port model expands to 24 ports with on-demand license)



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 M IOA populated with FC Flex IO Modules (NPIV aggregator) provides the simplicity of a pass-through with the aggregation/redundancy benefits of a switch.





Dell 8/4Gbps FC Pass-Through

Adapters

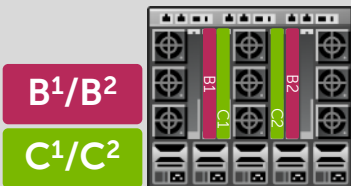
12G & 13G

- Emulex LPe1205-M FC8
- QLogic QME2572 FC8

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



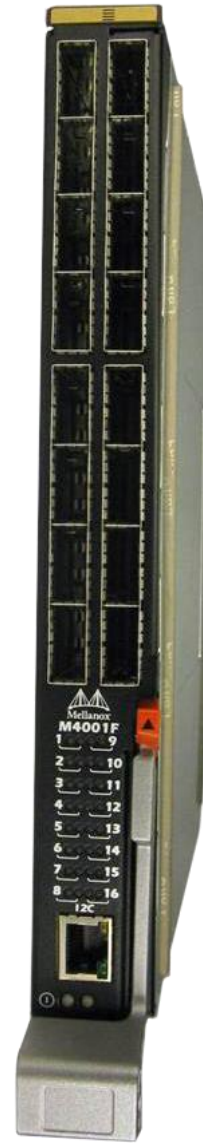
Brocade Transceivers

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

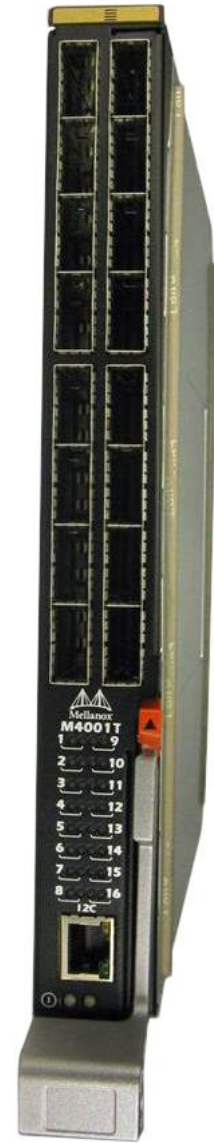
Cables



InfiniBand



56Gb
M4001F
FDR



40Gb
M4001T
FDR10

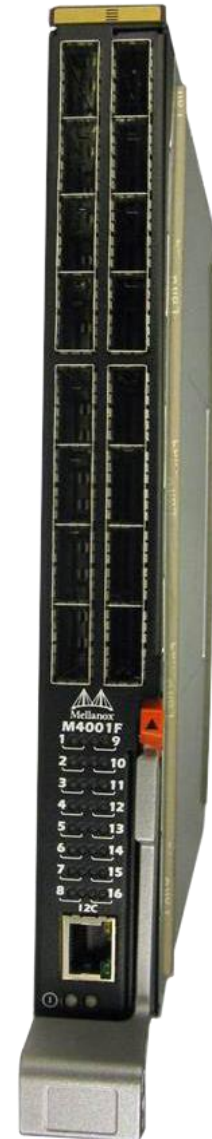




Mellanox Blades

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

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



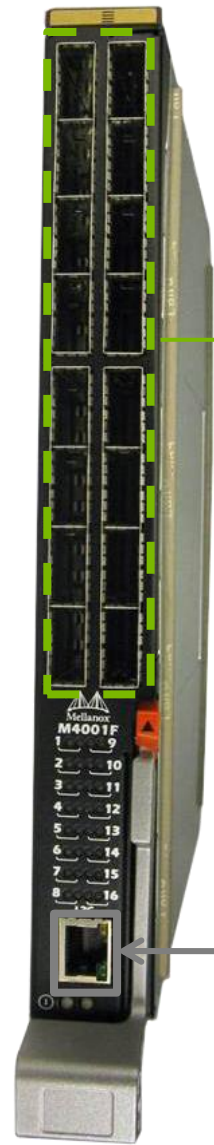
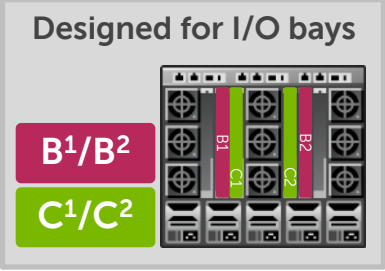
Mellanox M4001F & M4001T

Adapters

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

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

More details in Adapter Portfolio section



M4001F FDR

Cables



QSF Active Optical
or
QSF Passive Copper

Not a Management Port. Debug port only



M4001T FDR10

Cables

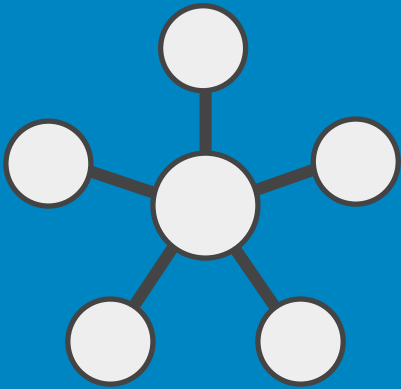


QSF Active Optical
or
QSF Passive Copper

Not a Management Port. Debug port only



Fabric Topologies



Find more topologies and guides here:

Dell Storage Compatibility Matrix

<http://en.community.dell.com/dell-groups/dtcmedia/m/mediagallery/20438558>

Dell Storage Networking I/O Guide

http://en.community.dell.com/techcenter/networking/m/networking_files/20440701

Dell PS Series 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

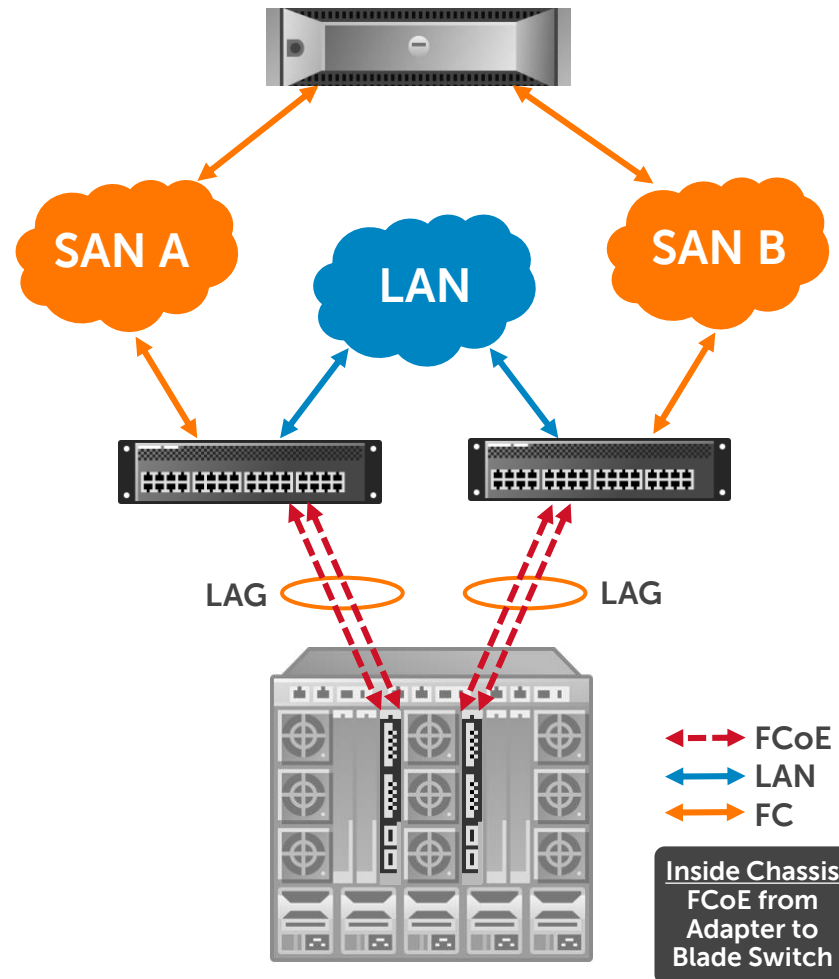
Topology

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

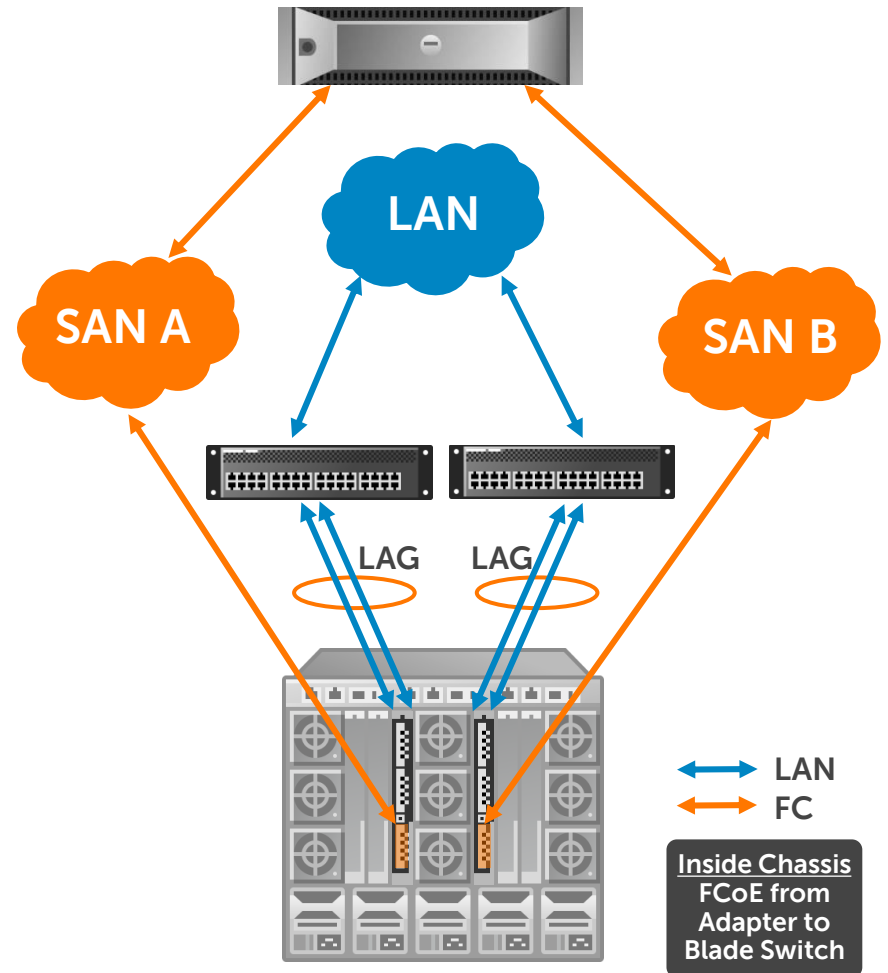
Blade model: MXL, IOA

Top-of-Rack switch: Dell S5000, S6000, S6000-ON, S6010-ON, S4810, S4810-ON, S4820T, S4048-ON, S4048T-ON

Configuration

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

Topology Diagram



iSCSI and LAN Converged Storage Traffic

Topology / Configuration

Topology

Fabric Inside Chassis: Converged iSCSI

Blade models: MXL or IOA

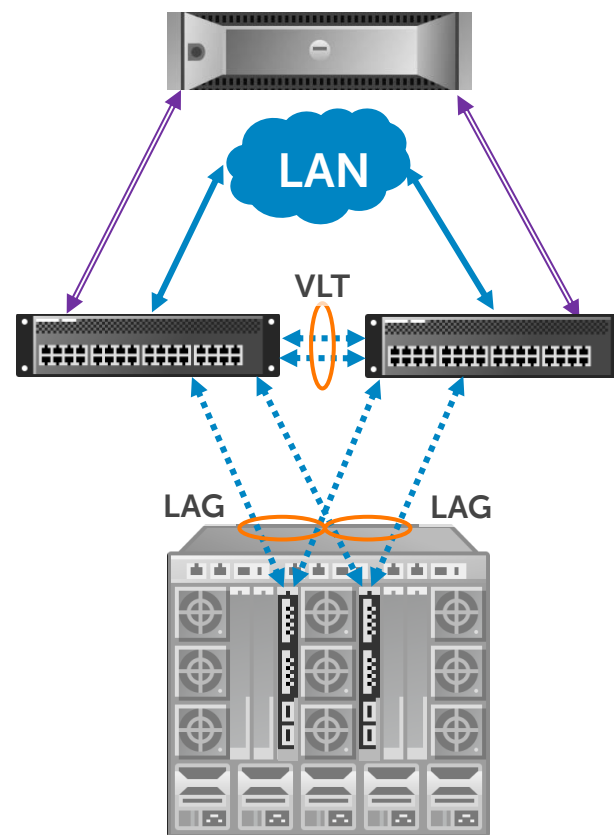
Top-of-Rack switch: Dell S5000, S6000, S6000-ON, S6010-ON, S4810, S4810-ON, S4820T, S4048-ON, S4048T-ON

Storage: iSCSI External Array

Configuration

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

Topology Diagram



- iSCSI & LAN
- LAN
- iSCSI

Inside Chassis
iSCSI and LAN
from Adapter to
Blade switch

Storage Blade with Optional External Array

Topology / Configuration

Topology

Fabric Inside Chassis: Converged iSCSI

Blade model: MXL, IOA

Top-of-Rack switch: Dell S5000, S6000, S6000-ON, S6010-ON, S4810, S4810-ON, S4820T, S4048-ON, S4048T-ON

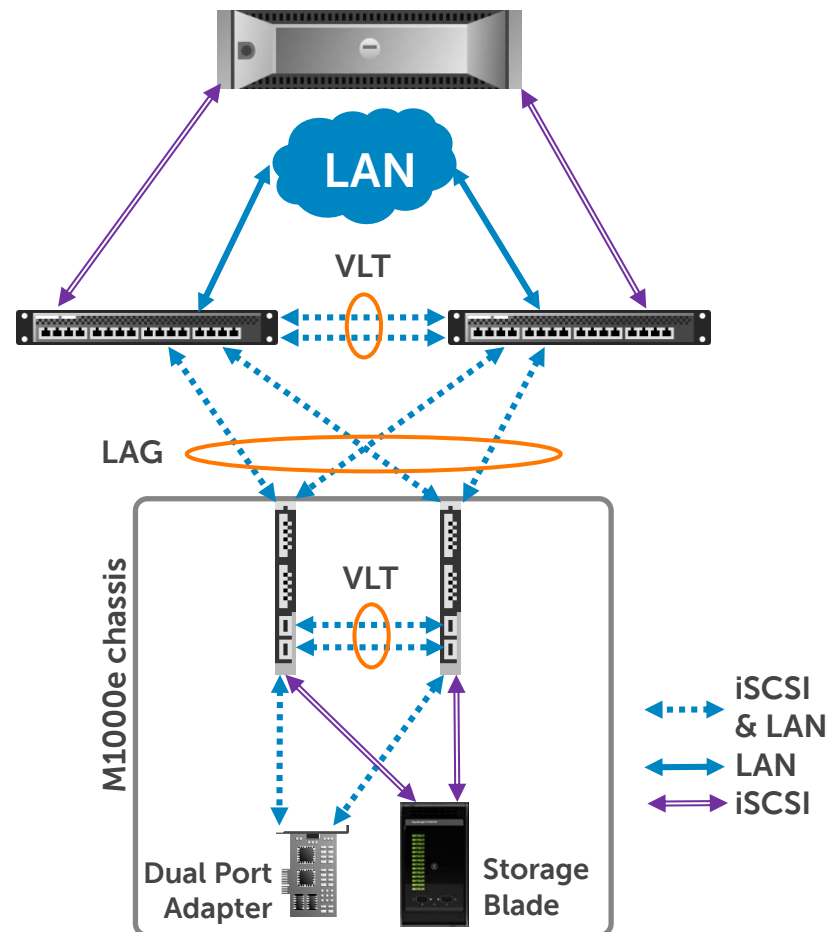
Storage: PS4410 storage blade

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

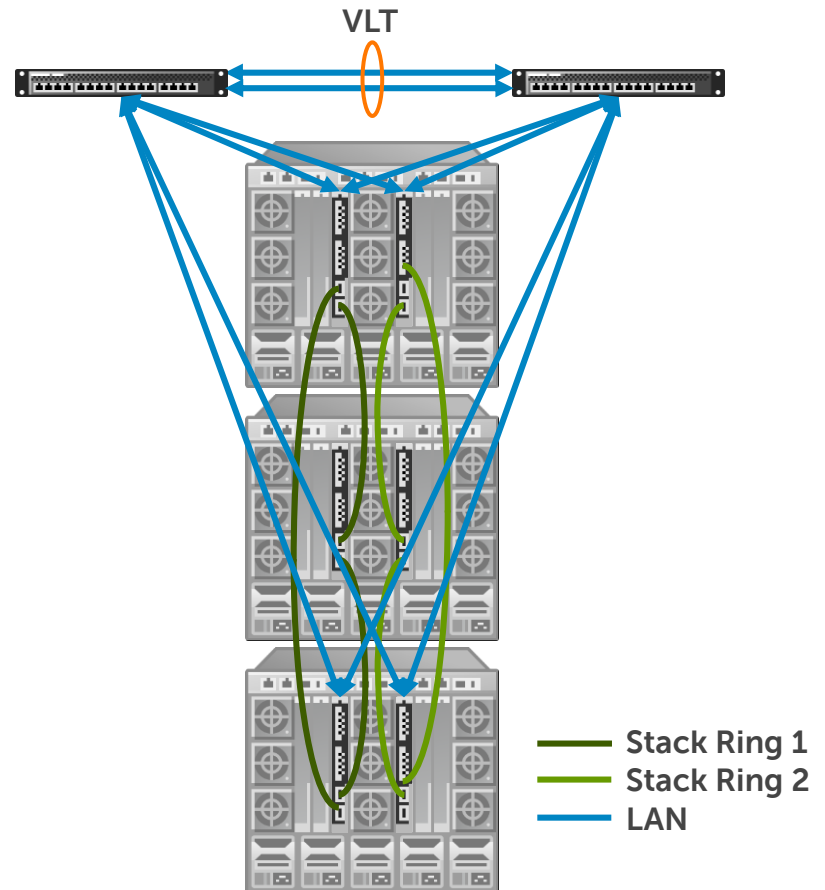
Topology

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

- 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

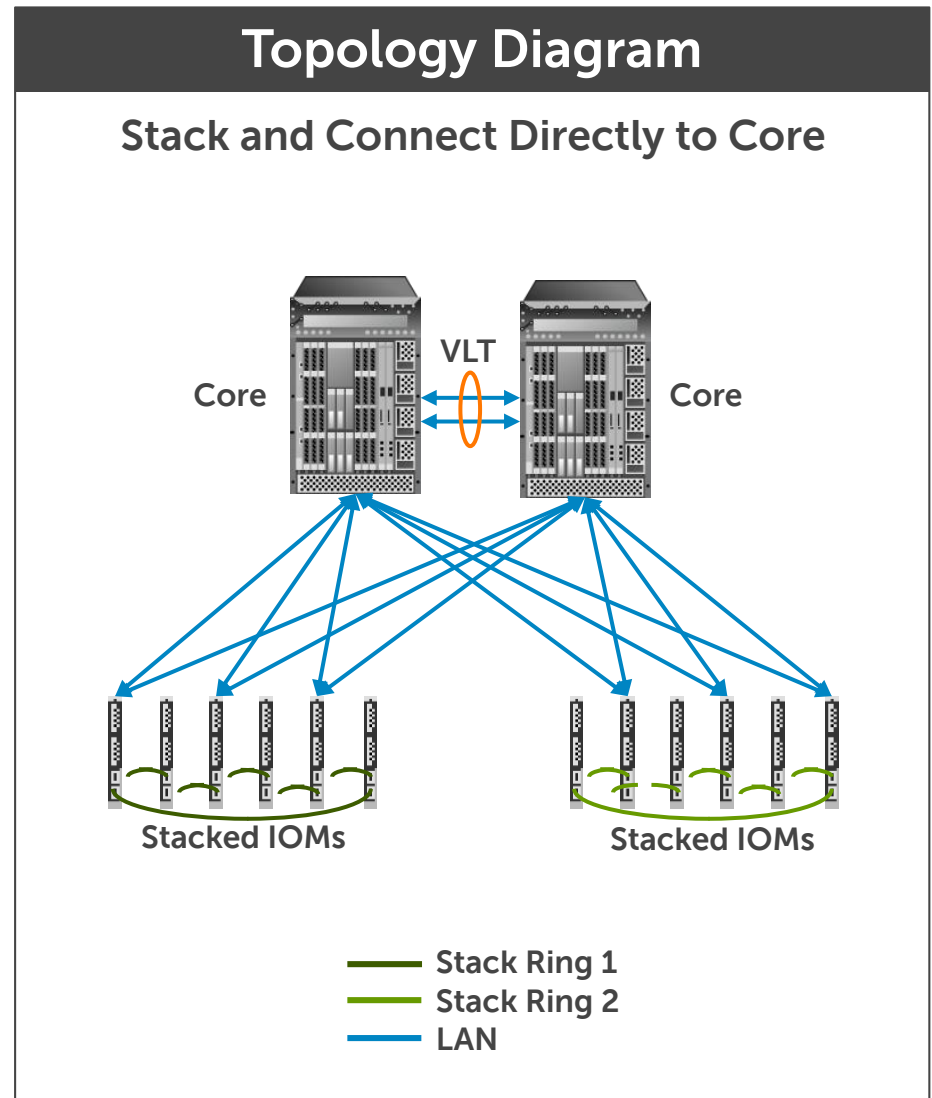
Topology / Configuration

Topology

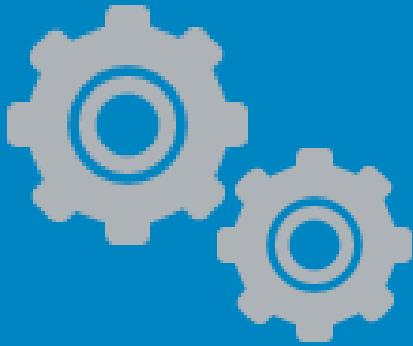
Stacked blade switches connected directly to the Network Core switches

Configuration

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



Automation and 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 |
| A2 | 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 |
| | 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 |
| B1 | 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 |
| 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?

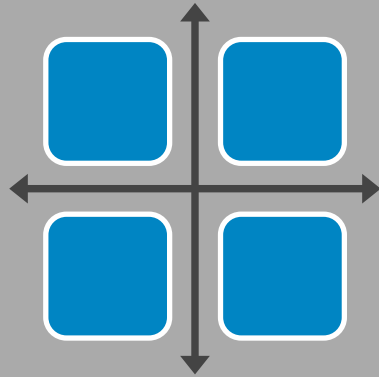
- Ease of deployment/management for in-chassis blade switches
- Ease of integration of PowerConnect blade switches with 3rd party networking H/W (Cisco, etc.)
- Provide cable aggregation benefit offered by integrated blade switches
- Reduce involvement of network admin in blade deployments by eliminating 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:

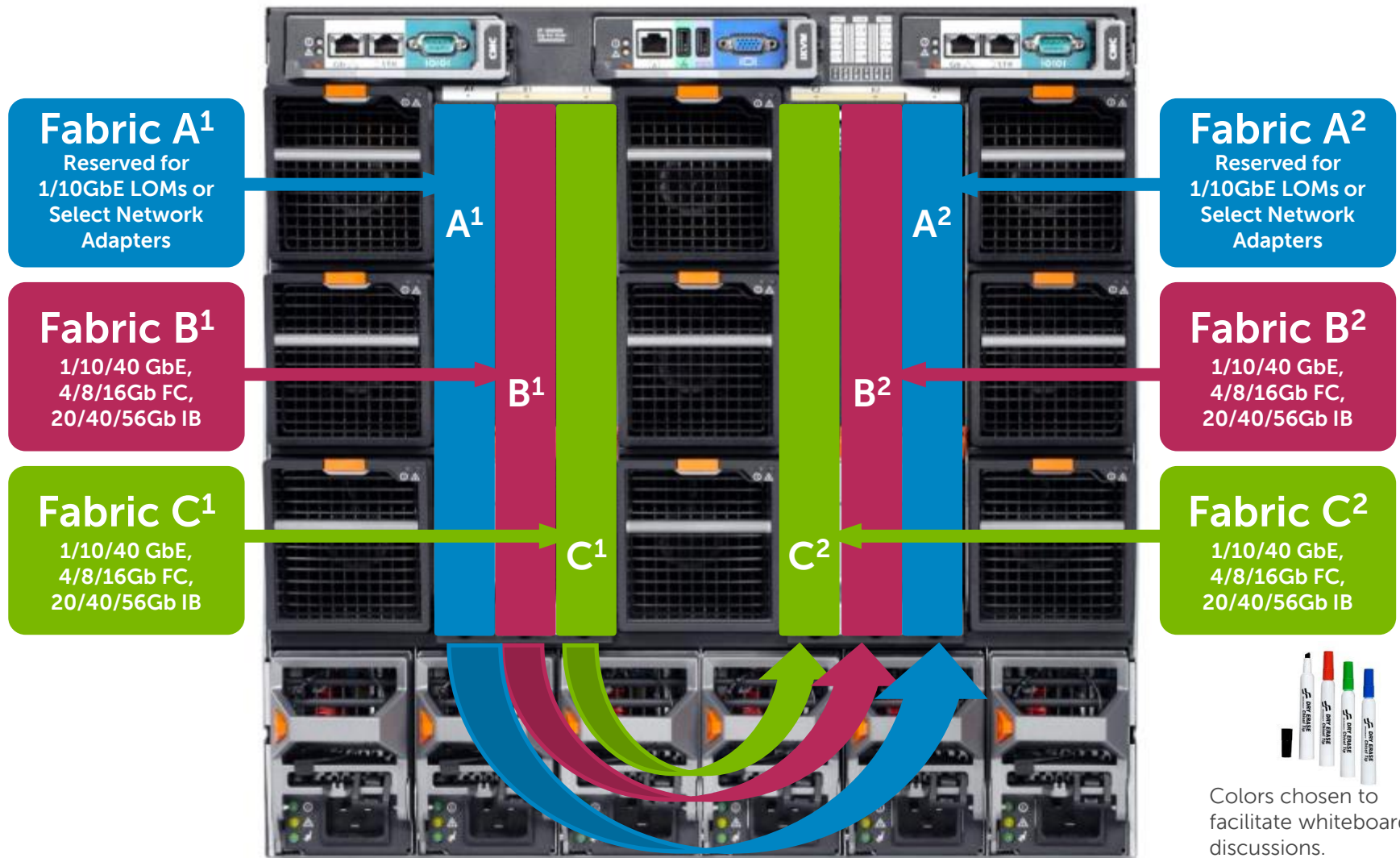
<http://www.delltechcenter.com/page/PowerEdge+Blade+Demos> (English only)



Fabrics and Port Mapping



PowerEdge M1000e Chassis Fabrics and Capabilities



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



M-Series Blade I/O Fabrics

Quarter Height

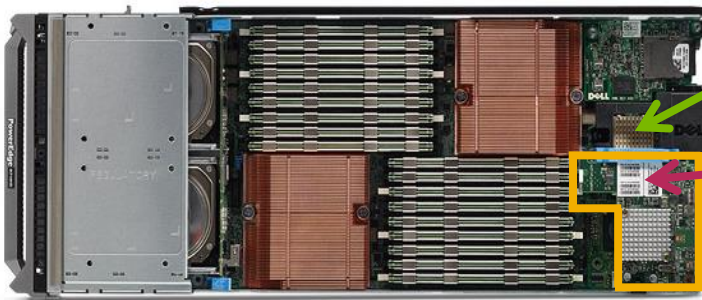


C¹ C²
OR
B¹ B²

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

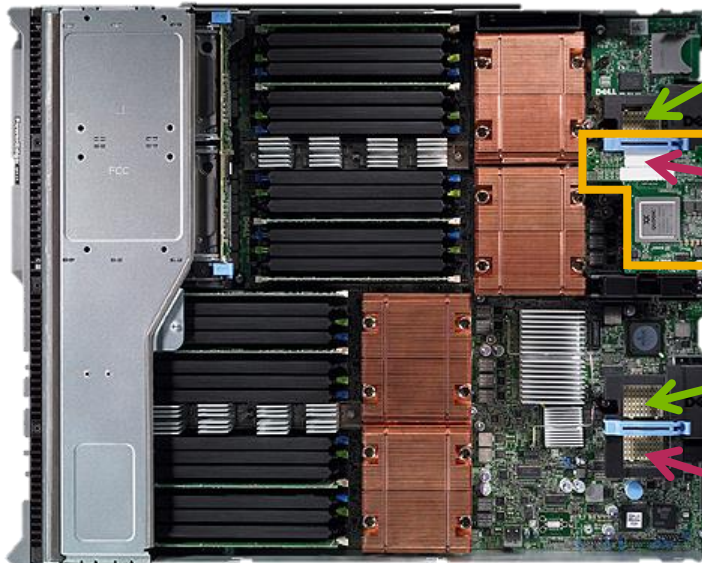


C¹ C²
B¹ B²

Half Height Blades

- One Select Network Adapter or LOM
- One fabric B mezzanine card
- One fabric C mezzanine card

Full Height



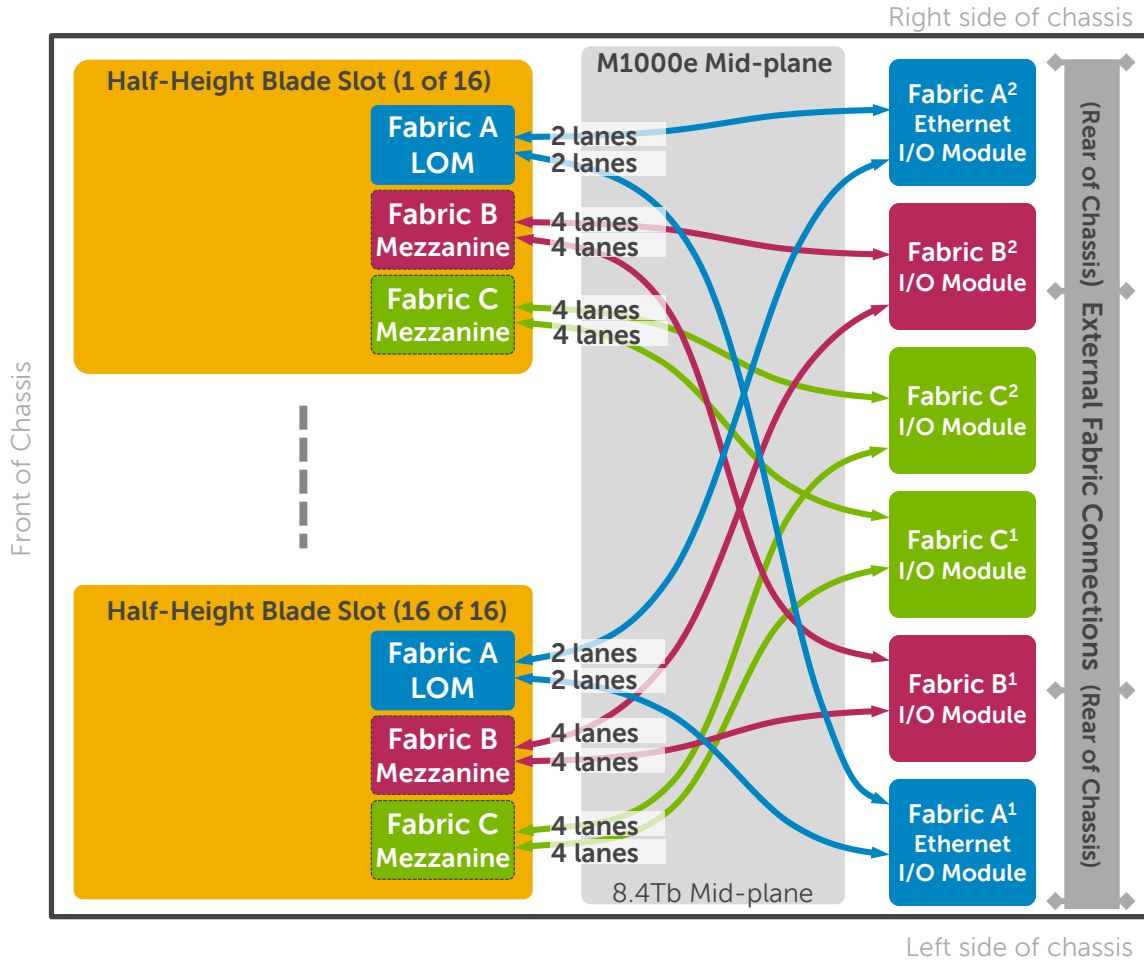
C¹ C²
B¹ B²
C¹ C²
B¹ B²

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:

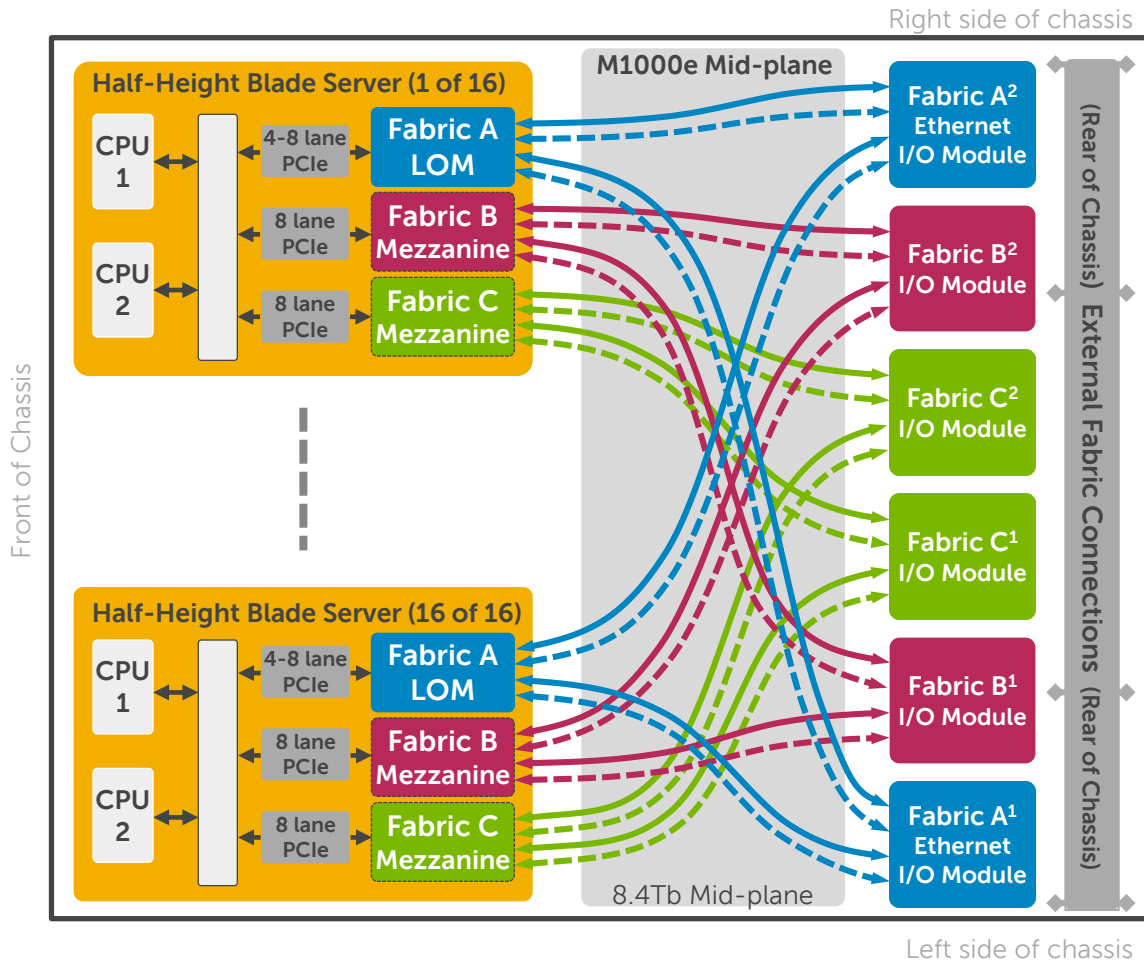
- Up to 2 lanes to each IOM
- 1Gb or 10Gb Ethernet per each lane

Fabric B & C Capabilities:

- Up to 4 lanes to each IOM
- 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:

- Ethernet only
- 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

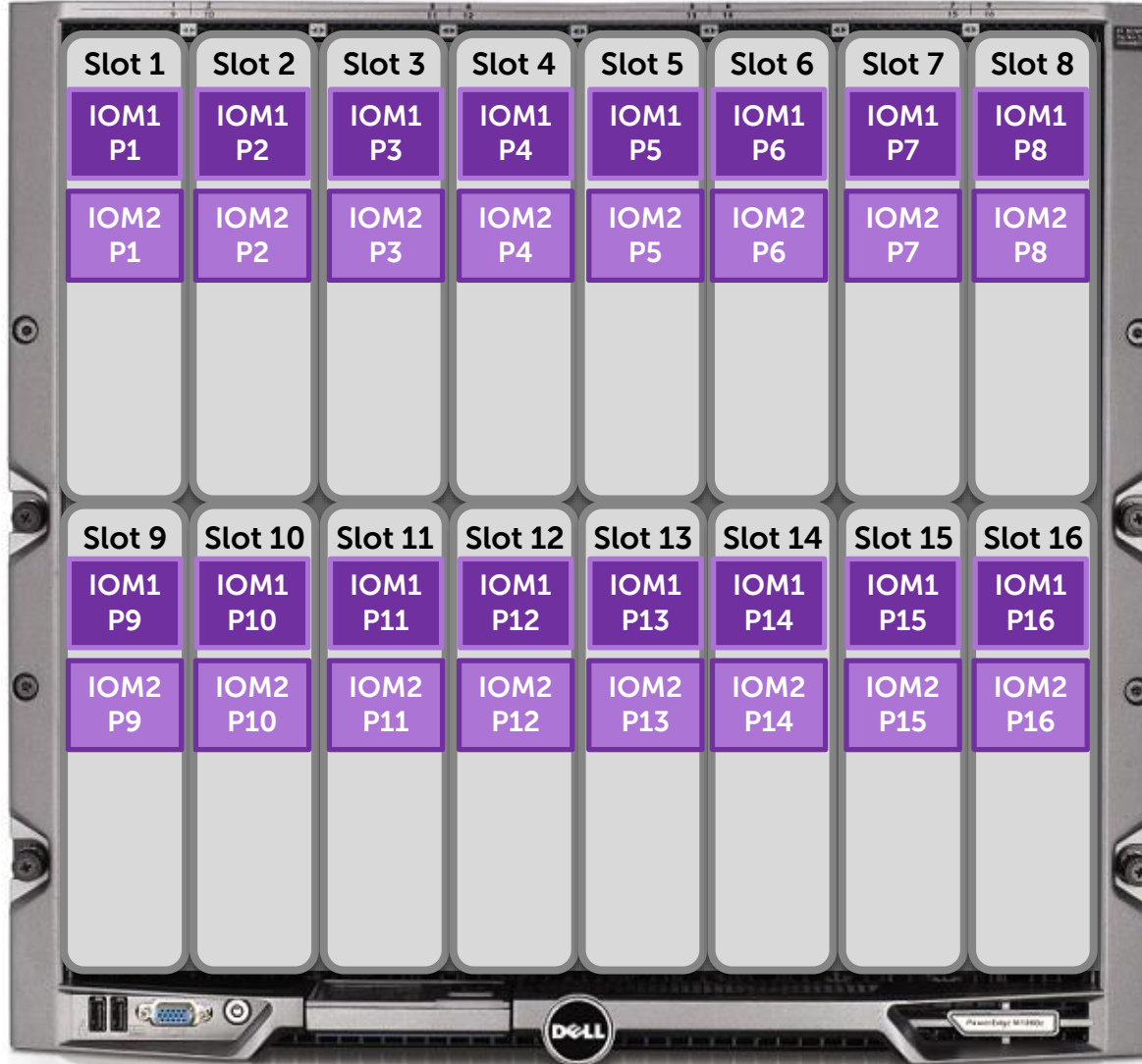
— Link between a dual port adapter and switch of same fabric type

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

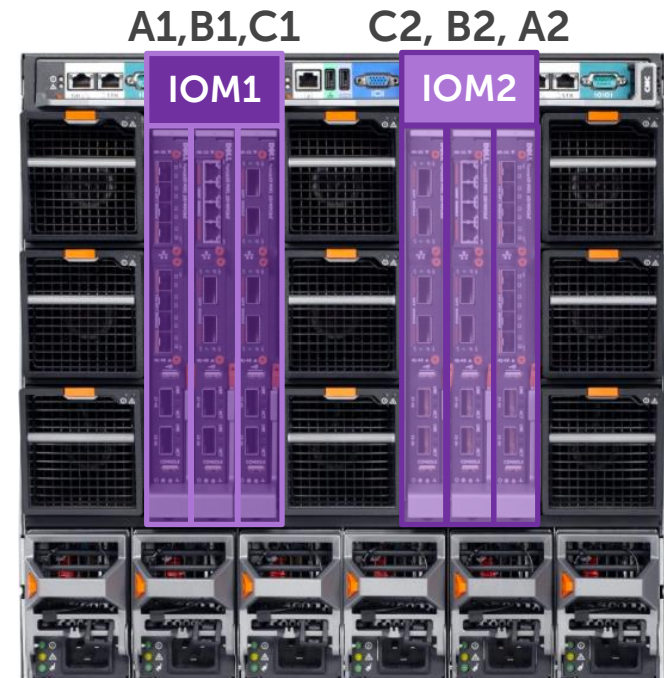


Port Mapping of Half Height blades with Dual Port Adapters to IOMs with 16 or 32 Internal Ports

IOM ports mapped to half height blade slots

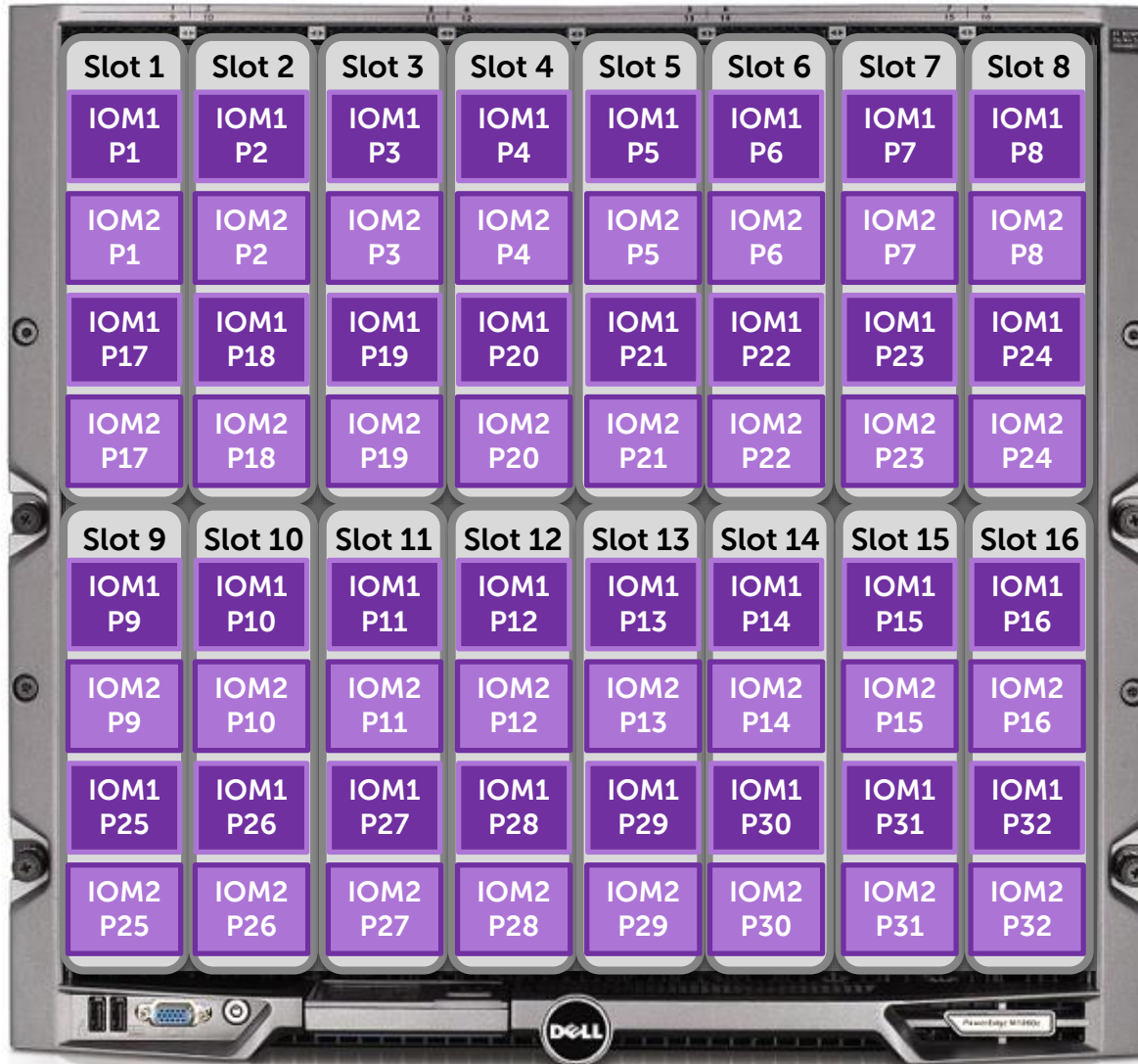


- All six IOMs have the same port mapping for half height blades
- IOMs with 32 internal ports will only connect with 16 internal ports when using dual port adapters

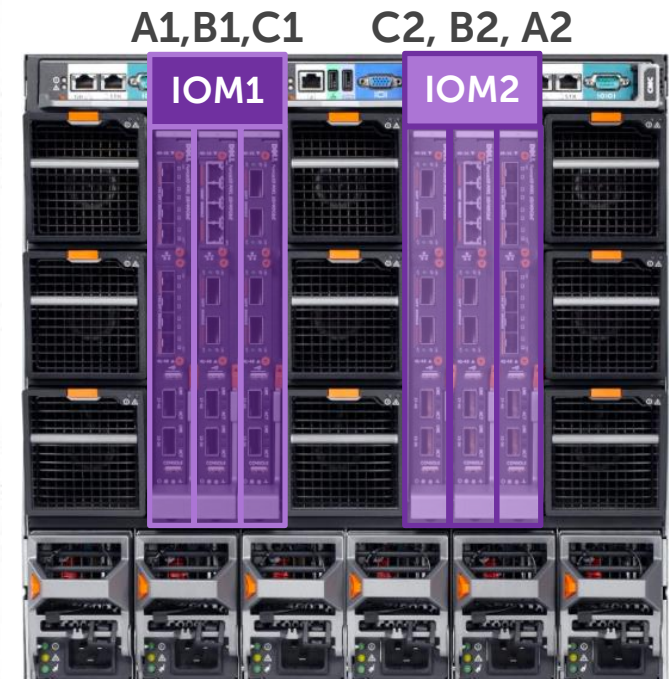


Port Mapping of Half Height blades with Quad Port Adapters to IOMs with 32 Internal Ports

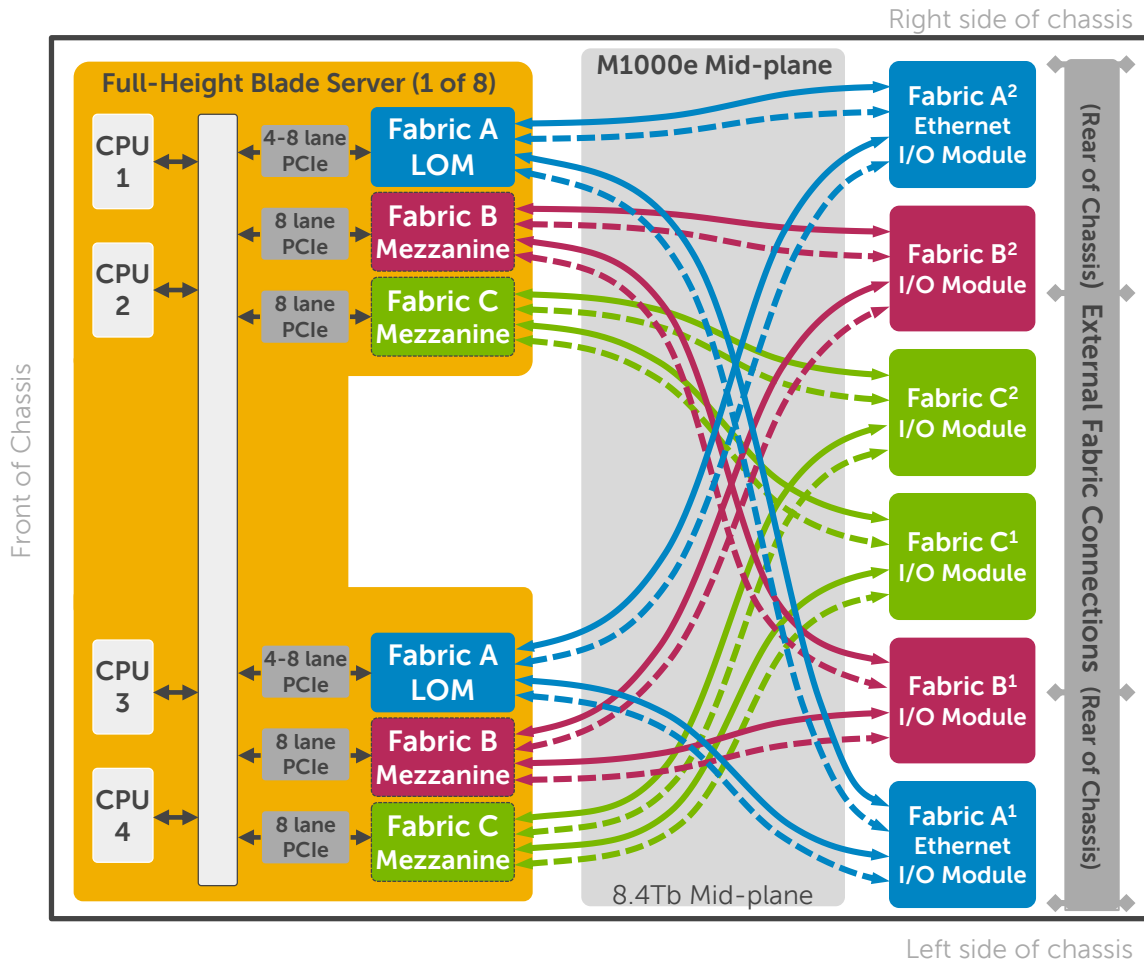
IOM ports mapped to half height blade slots



- 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 for Full-Height Blades



Fabric A:

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

Fabric B & C:

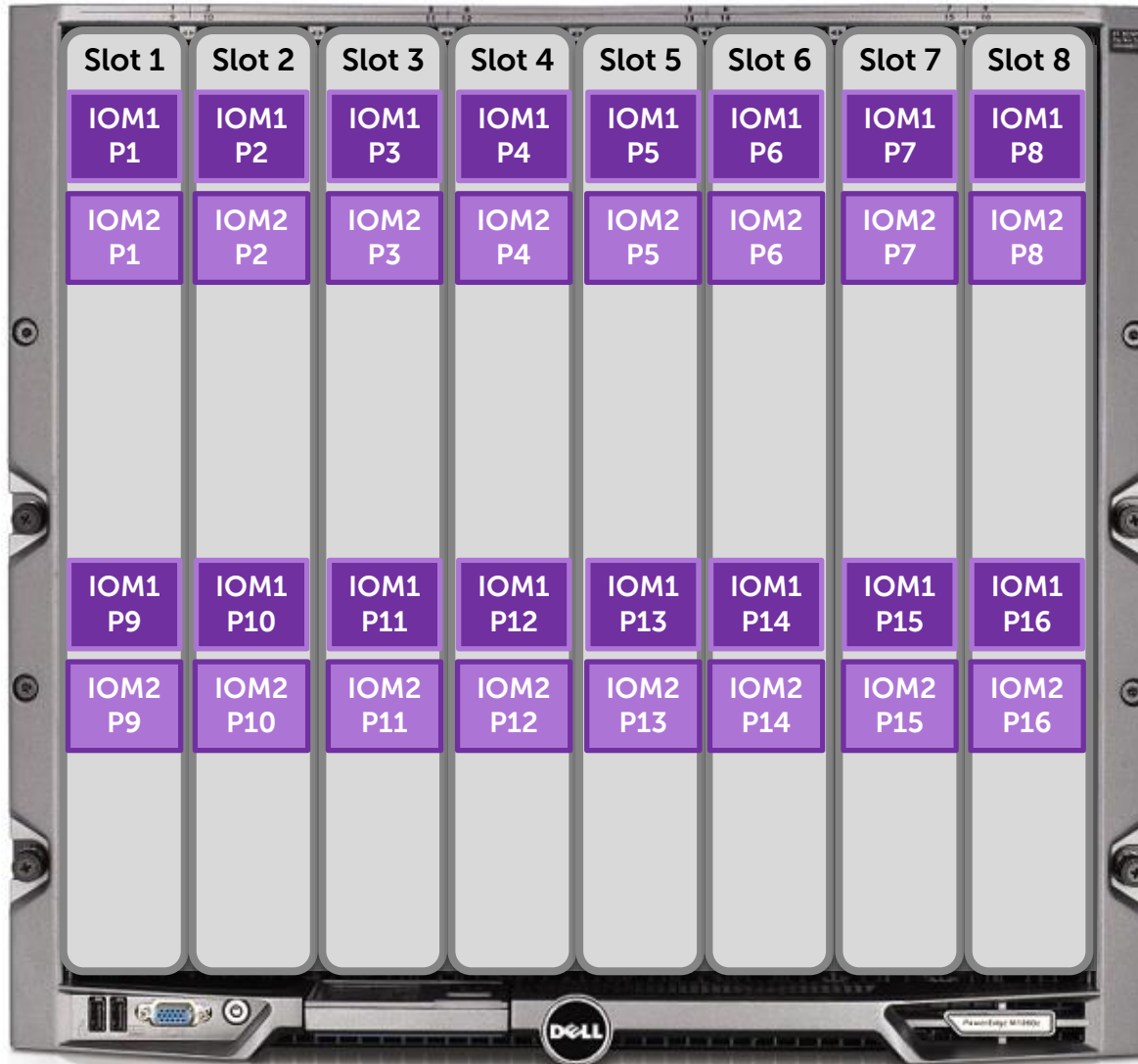
- Ethernet, Fibre Channel, &/or InfiniBand mezzanine cards
- Dual port 1Gb and 10Gb Ethernet mezzanine cards
- Quad port 1Gb Ethernet mezz. and capable of quad port 10Gb Ethernet mezzanine
- Dual port Fibre Channel mezz.
- Dual port InfiniBand mezzanine

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

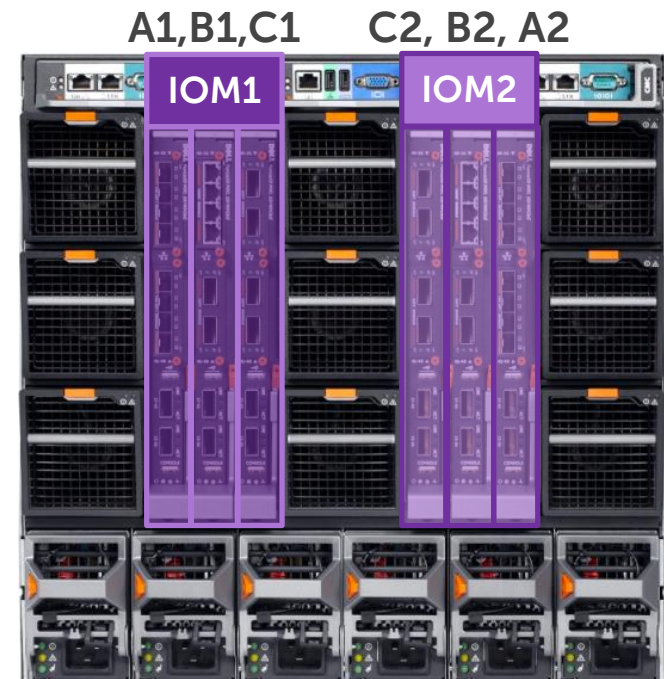
■ ■ ■ ■ Additional link provided by quad-port adapter cards and an IOM with 32 internal ports

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

IOM ports mapped to full height blade slots

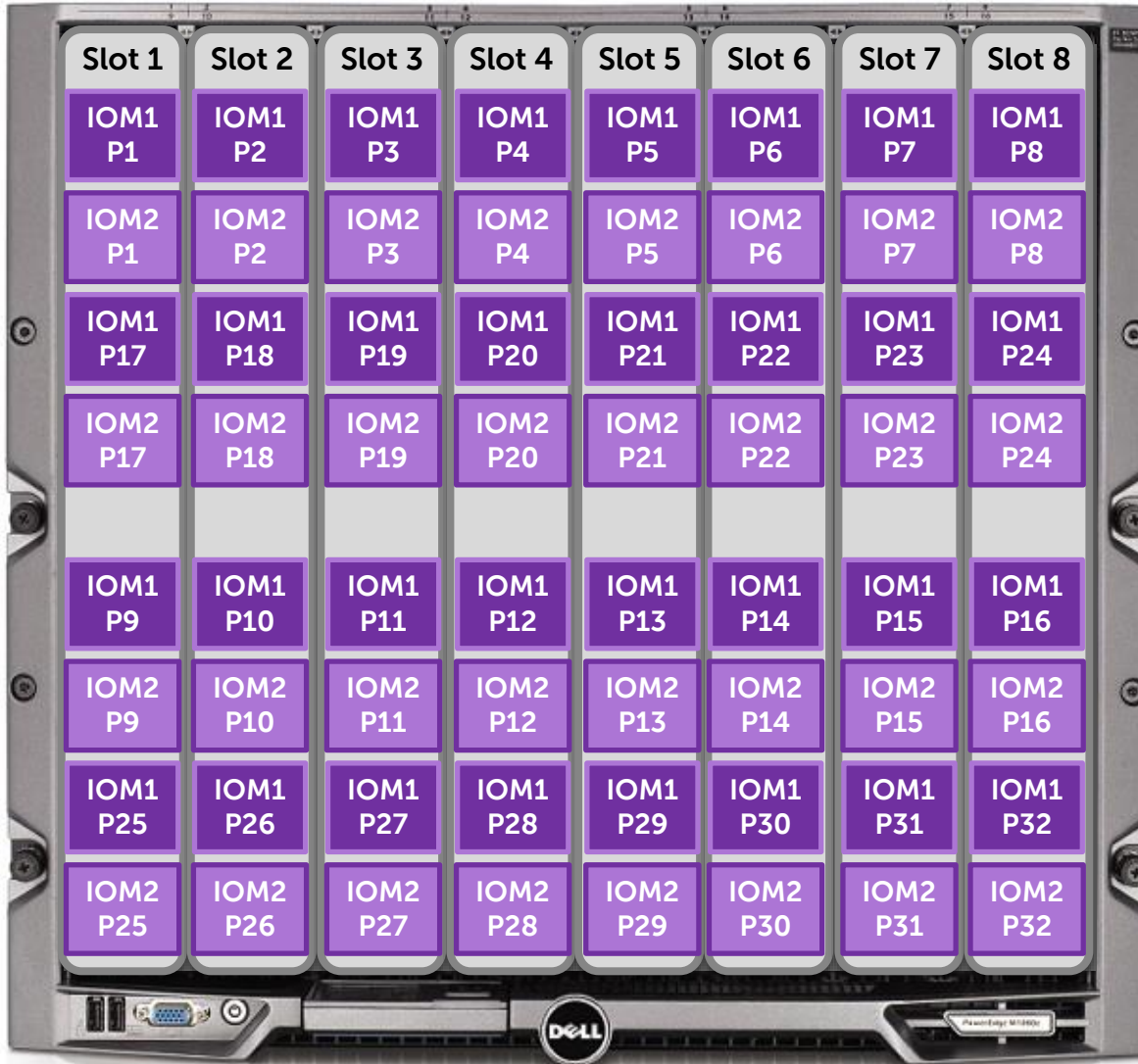


- All six IOMs have the same port mapping for half height blades

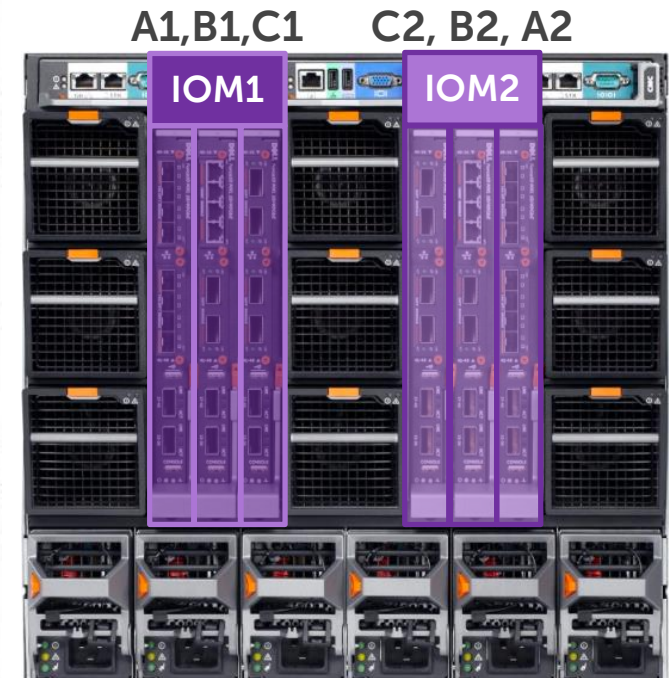


Port Mapping of Full Height blades with Quad Port Adapters to IOMs with 32 Internal Ports

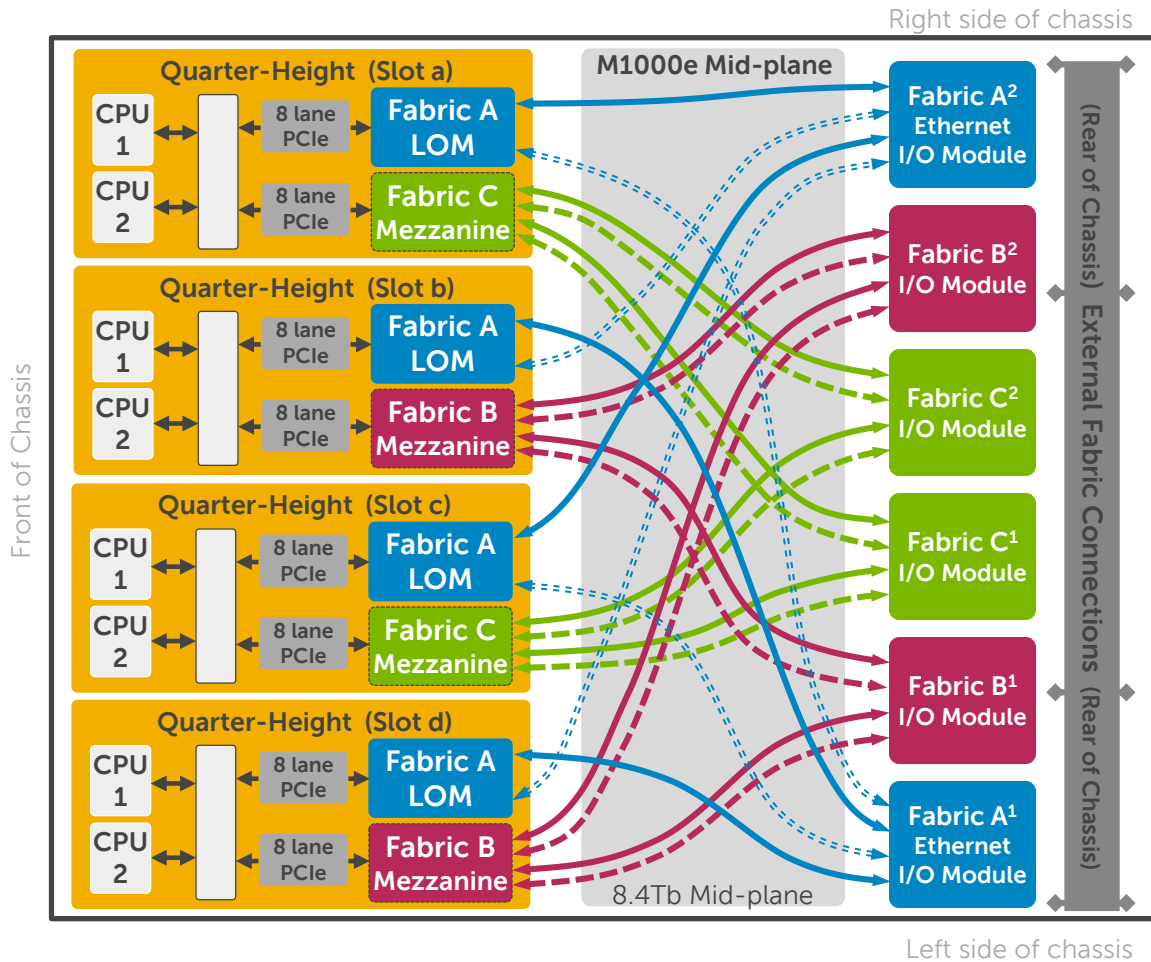
IOM ports mapped to full height blade slots



- 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 for Quarter-Height Blades

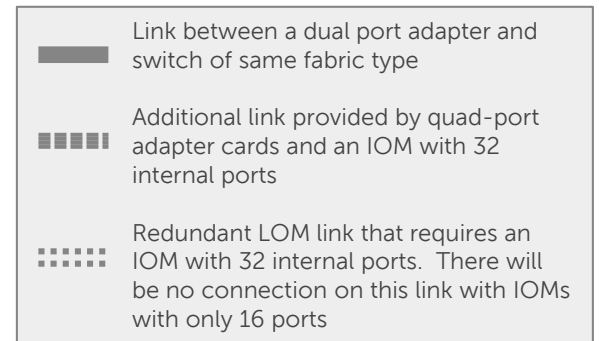


Fabric A:

- 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



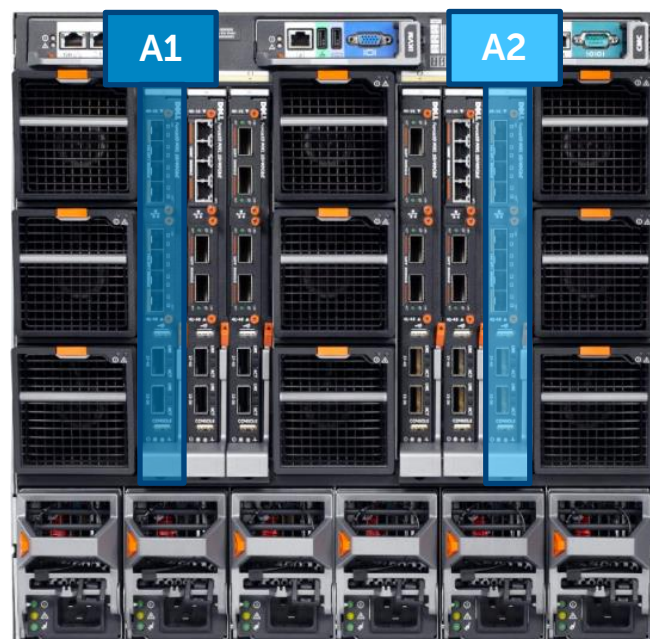
Port Mapping of Quarter Height blades to two IOMs with 32 Internal Ports on Fabric A: Full LOM Port Redundancy

IOM ports mapped to quarter height blade slots

| Slot 1a | Slot 2a | Slot 3a | Slot 4a | Slot 5a | Slot 6a | Slot 7a | Slot 8a |
|---------|---------|---------|---------|---------|---------|---------|---------|
| A1 P1 | A1 P2 | A1 P3 | A1 P4 | A1 P5 | A1 P6 | A1 P7 | A1 P8 |
| A2 P17 | A2 P18 | A2 P19 | A2 P20 | A2 P21 | A2 P22 | A2 P23 | A2 P24 |
| Slot 1b | Slot 2b | Slot 3b | Slot 4b | Slot 5b | Slot 6b | Slot 7b | Slot 8b |
| A1 P17 | A1 P18 | A1 P19 | A1 P20 | A1 P21 | A1 P22 | A1 P23 | A1 P24 |
| A2 P1 | A2 P2 | A2 P3 | A2 P4 | A2 P5 | A2 P6 | A2 P7 | A2 P8 |
| Slot 1c | Slot 2c | Slot 3c | Slot 4c | Slot 5c | Slot 6c | Slot 7c | Slot 8c |
| A1 P9 | A1 P10 | A1 P11 | A1 P12 | A1 P13 | A1 P14 | A1 P15 | A1 P16 |
| A2 P25 | A2 P26 | A2 P27 | A2 P28 | A2 P29 | A2 P30 | A2 P31 | A2 P32 |
| Slot 1d | Slot 2d | Slot 3d | Slot 4d | Slot 5d | Slot 6d | Slot 7d | Slot 8d |
| A1 P25 | A1 P26 | A1 P27 | A1 P28 | A1 P29 | A1 P30 | A1 P31 | A1 P32 |
| A2 P9 | A2 P10 | A2 P11 | A2 P12 | A2 P13 | A2 P14 | A2 P15 | A2 P16 |

- 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



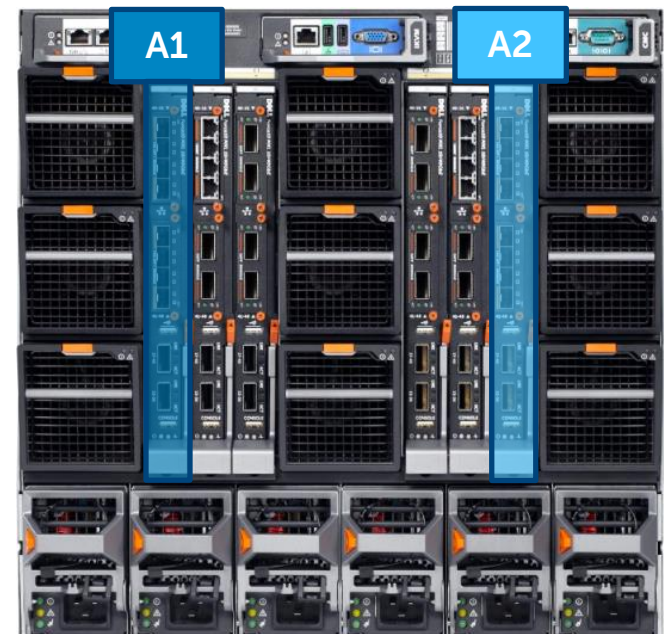
Port Mapping of Quarter Height blades to two IOMs with 16 Internal Ports on Fabric A: No LOM Port Redundancy

IOM ports mapped to quarter height blade slots



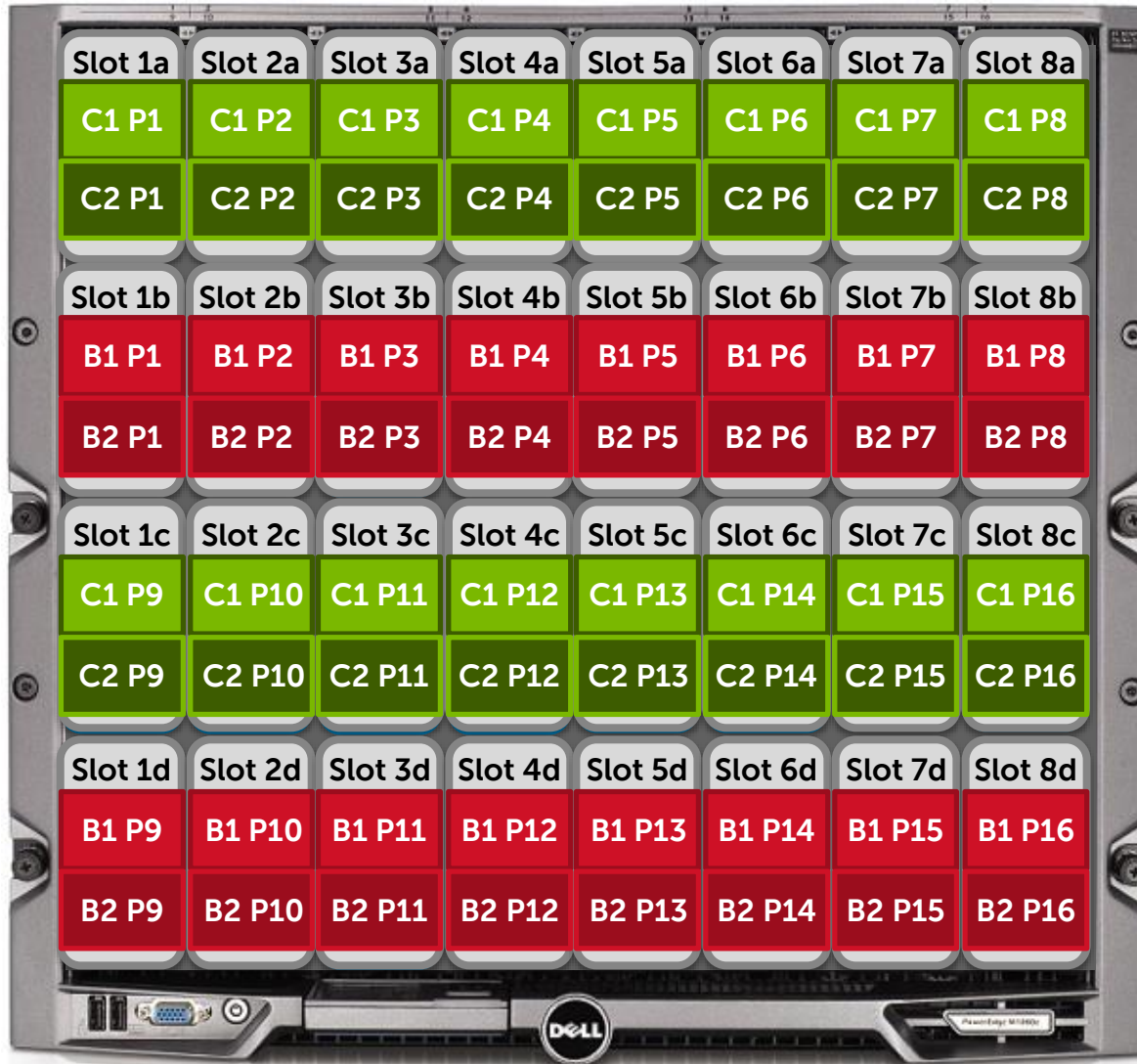
- On fabric A, two IOMs with 16 internal ports provide connectivity to one port of the LOM on each quarter height blade.
- Connectivity but not redundancy (only 1 LOM port per blade is connected)

IOM A1 and A2



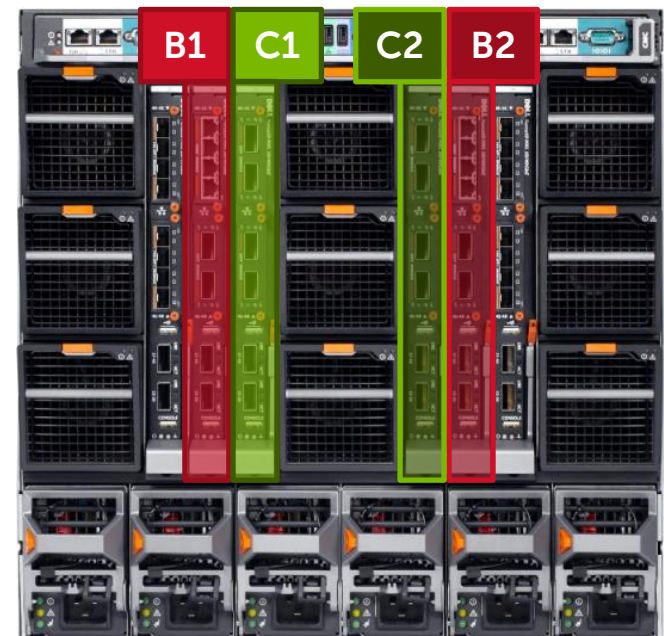
Port Mapping of Quarter Height blades to four IOMs on Fabric B & C: Full Mezz Card Redundancy

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 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 (EOL) | Cisco 3130G (EOL) | Cisco 3130X (EOL) |
| Adapters | Broadcom 5708 Mezz | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Broadcom 5709 LOM/Mezz | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Broadcom 5709 4-port NDC/Mezz | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Intel ET 4-port Mezz | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 1Gb Intel i350 4-port NDC/Mezz | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Broadcom 5719 4-port Mezz | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Broadcom 5720 4-port LOM/NDC | ✓ | ✓ | ✓ | ✓ | ✓ |



PowerEdge M1000e 10Gb Ethernet I/O Interoperability

10Gb Ethernet I/O Modules

| | MXL | PowerEdge M I/O Aggregator | M8024-k | M8024 (EOL) | M8428-k (EOL) | 10Gb Pass-Through (Original Model/ EOL) | 10Gb Pass-Through II (EOL) | 10Gb Pass-Through-k | Cisco B22DELL | |
|---------------------|---|----------------------------|---------|-------------|----------------|---|----------------------------|---------------------|---------------|---|
| NDC Adapters | Broadcom 57712-k NDC | ✓ | ✓ | ✓ | Not Compatible | ✓ | Not Compatible | Not Compatible | ✓* | ✓ |
| | Broadcom 57810-k NDC | ✓ | ✓ | ✓ | Not Compatible | ✓ | N/A | N/A | ✓* | ✓ |
| | Emulex OCm14102-U2-D NDC (12G only) Emulex OCm14102-N6-D NDC (13G only) Emulex OCm14102B-N6-D NDC (13G only) Emulex OCm14102-U4-D NDC (13G only) Emulex OCm14102B-U4-D NDC (13G only) | ✓ | ✓ | ✓ | Not Compatible | ✓ | Not Compatible | ✓ | ✓ | ✓ |
| | Intel x520-k NDC | ✓ | ✓ | ✓ | Not Compatible | ✓ | N/A | N/A | ✓* | ✓ |
| | Intel x710-k NDC | ✓ | ✓ | ✓ | Not Compatible | ✓ | N/A | N/A | ✓* | ✓ |
| | QLogic 57840S-k NDC | ✓ | ✓ | ✓ | Not Compatible | ✓ | N/A | N/A | ✓* | ✓ |
| | QLogic QMD8272-k NDC | ✓ | ✓ | ✓ | Not Compatible | ✓ | N/A | N/A | ✓* | ✓ |

10GbE on fabric 'A' with original mid-plane (1.0) will shift down to 1Gb. Fabrics B and C will 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 10Gb Ethernet I/O Interoperability

10Gb Ethernet I/O Modules

| | MXL | PowerEdge M I/O Aggregator | M8024-k | M8024 (EOL) | M8428-k (EOL) | 10Gb Pass-Through (Original Model/ EOL) | 10Gb Pass-Through II (EOL) | 10Gb Pass-Through-k | Cisco B22DELL | |
|-----------------|--|----------------------------|----------------|----------------|----------------|---|----------------------------|---------------------|----------------|----------------|
| Mezzanine Cards | Broadcom 57710 Mezz Broadcom 57711 Mezz | Not Compatible | Not Compatible | Not Compatible | ✓ | Not Compatible | ✓ | ✓ | Not Compatible | Not Compatible |
| | Brocade BR1716M-k Mezz | ✓* | ✓* | ✓* | ✓* | ✓* | Not Compatible | Not Compatible | ✓* | ✓* |
| | Emulex OCm14102-U3-D Mezz (12G only) Emulex OCm14102-N5-D Mezz (13G only) Emulex OCm14102B-N5-D Mezz (13G only) Emulex OCm14102-U5-D Mezz (13G only) Emulex OCm14102B-U5-D Mezz (13G only) | ✓ | ✓ | ✓ | Not Compatible | ✓ | Not Compatible | ✓ | ✓ | ✓ |
| | Emulex OC10102-f-m Mezz Intel x520 Mezz | Not Compatible | Not Compatible | Not Compatible | ✓ | Not Compatible | ✓ | ✓ | Not Compatible | Not Compatible |
| | Intel x520-x/k Mezz | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓* | ✓* |
| | Mellanox ConnectX-3 DP 10Gb KR Mezz Mellanox ConnectX-3 Pro DP 10Gb KR Mezz | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓* | ✓ |
| | QLogic QME8142 Mezz | Not Compatible | Not Compatible | Not Compatible | ✓ | Not Compatible | ✓ | ✓ | Not Compatible | Not Compatible |
| | QLogic QME8242-k Mezz | ✓* | ✓* | ✓* | ✓* | ✓* | Not Compatible | Not Compatible | ✓* | ✓* |
| | QLogic QME8262-k Mezz | ✓* | ✓* | ✓* | Not Compatible | ✓* | N/A | N/A | ✓* | ✓* |
| | QLogic 57810S-k Mezz | ✓ | ✓ | ✓ | Not Compatible | ✓ | N/A | N/A | ✓* | ✓ |

10GbE on fabric 'A' with original mid-plane (1.0) will shift down to 1Gb. Fabrics B and C will 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

| InfiniBand I/O Modules | | | | | | |
|------------------------|---------------------------|---------------------------|---------------------------|---------------------------|-----------------------|---------------------|
| | | M2401G Mellanox DDR (EOL) | M3601Q Mellanox QDR (EOL) | M4001Q Mellanox QDR (EOL) | M4001T Mellanox FDR10 | M4001F Mellanox FDR |
| Mezzanine Cards | Mellanox DDR ConnectX | ✓ DDR | ✓ DDR | Not Supported | Not Supported | Not Supported |
| | Mellanox QDR ConnectX-2 | ✓ DDR | ✓ QDR | ✓ QDR | ✓ QDR | ✓ QDR |
| | Mellanox QDR ConnectX-3 | Not Supported | ✓ QDR | ✓ QDR | ✓ QDR* | ✓ QDR |
| | Mellanox FDR10 ConnectX-3 | Not Supported | ✓ QDR | ✓ QDR | ✓ FDR10 | ✓ FDR10 |
| | Mellanox FDR ConnectX-3 | 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, M820

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



PowerEdge Blade Servers and InfiniBand Adapters

| InfiniBand Mezzanine Cards | | | | | | |
|----------------------------|------|-----------------------|-------------------------|-------------------------|---------------------------|-------------------------|
| | | Mellanox DDR ConnectX | Mellanox QDR ConnectX-2 | Mellanox QDR ConnectX-3 | Mellanox FDR10 ConnectX-3 | Mellanox FDR ConnectX-3 |
| Blade Servers | M420 | Not Supported | Not Supported | ✓ | ✓ | Not Supported |
| | M520 | Not Supported | Not Supported | ✓ | ✓ | Not Supported |
| | M620 | Not Supported | Not Supported | ✓ | ✓ | ✓ |
| | M630 | Not Supported | Not Supported | Not Supported | ✓ | ✓ |
| | M820 | Not Supported | Not Supported | ✓ | ✓ | Not Supported |
| | M830 | Not Supported | Not Supported | Not Supported | ✓ | Not Supported |
| | M910 | ✓ | ✓ | ✓ | ✓ | Not Supported |
| | M915 | ✓ | ✓ | ✓ | ✓ | Not Supported |



PowerEdge M1000e Fibre Channel I/O Interoperability

| Fibre Channel I/O Modules | | | | | | | |
|---------------------------|-------------------------|-------------------------|-----------------|----------------------------------|-------------------|--------------------|----------------|
| | FC4 Passthrough (EOL) | M4424 Brocade FC4 (EOL) | FC8 Passthrough | Dell 8/4Gbps FC SAN Module (EOL) | 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 | ✓ FC4 | ✓ FC4 | ✓ FC8 | ✓ FC8 | ✓ FC8 | ✓ FC8 |
| | Emulex LPm15002B-D FC8 | Not Compatible | Not Compatible | Not Compatible | Not Compatible | ✓ FC8 | ✓ FC8 |
| | QLogic QME2572 FC8 | ✓ FC4 | ✓ FC4 | ✓ FC8 | ✓ FC8 | ✓ FC8 | ✓ FC8 |
| | Emulex LPm16002B-D FC16 | Not Compatible | Not Compatible | Not Compatible | ✓ FC8 | ✓ FC8 | ✓ FC16* |
| | QLogic QME2662 FC16 | Not Compatible | Not Compatible | Not Compatible | ✓ FC8 | ✓ FC8 | ✓ FC16* |

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



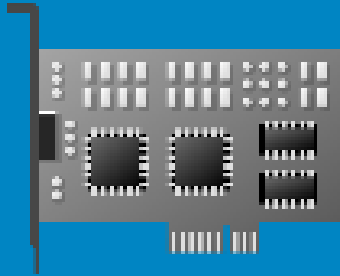
PowerEdge Blade Servers and Fibre Channel Adapters

Fibre Channel Mezzanine Cards

| | | Emulex LPe1205-M FC8 | QLogic QME2572 FC8 | Emulex LPm15002B-D FC8 | Emulex LPm16002B-D FC16 | QLogic QME2662 FC16 |
|----------------------|------|----------------------|--------------------|------------------------|-------------------------|---------------------|
| Blade Servers | M420 | ✓ | ✓ | ✓ | Not Supported | Not Supported |
| | M520 | ✓ | ✓ | ✓ | Not Supported | Not Supported |
| | M620 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | M630 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | M820 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | M830 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | M910 | ✓ | ✓ | Not Supported | ✓ | ✓ |
| | M915 | ✓ | ✓ | Not Supported | ✓ | ✓ |



Server Adapter Portfolio



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

11G, 12G, 13G M1000e Server Adapter Portfolio:

Ethernet, Fibre Channel, and InfiniBand

10Gb Ethernet

Emulex OCm14102-N5-D Mezz
Emulex OCm14102B-N5-D Mezz
Emulex OCm14102-N6-D NDC
Emulex OCm14102B-N6-D NDC
Intel X710 NDC
Intel X520-k 2P NDC
Intel X520-k 2P Mezz
Mellanox ConnectX-3 Mezz
Mellanox ConnectX-3 Pro Mezz

Fibre Channel

Emulex LPe1205-M FC8
Emulex LPm15002B-D FC8
Emulex LPm16002B-D FC16
QLogic QME2572 FC8
QLogic QME2662 FC16

10Gb Converged Ethernet

Brocade BR1741M-k Mezz
Emulex OCm14102-U2-D NDC
Emulex OCm14102-U3-D Mezz
Emulex OCm14102-U4-D NDC
Emulex OCm14102B-U4-D NDC
Emulex OCm14102-U5-D Mezz
Emulex OCm14102B-U5-D Mezz
QLogic QMD8262-k KR NDC
QLogic QME8262-k KR Mezz
QLogic 57810S-k 2P NDC
QLogic 57810S-k 2P LOM
QLogic 57810S-k 2P Mezz
QLogic 57840S-k 4P NDC

1Gb Ethernet

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

QDR/FDR InfiniBand

Mellanox ConnectX-3 FDR10 Mezz
Mellanox ConnectX-3 FDR Mezz



10Gb Select Network Adapters (NDC) for blade servers

Intel and QLogic

| Features | Intel X520-k NDC | Intel X710-k NDC | QLogic 57810S-k NDC | QLogic 57840S-k NDC | QLogic QMD8262-k NDC |
|-------------------------------------|--|--|--|---|--|
| Ports x Link speed | 2x10Gb | 2x10Gb or 4x10Gb | 2x10Gb | 4x10Gb | 2x10Gb |
| Supported speed | 1Gb, 10Gb | 10Gb | 1Gb, 10Gb | 1Gb, 10Gb | 10Gb |
| Chipset | X520/82599 | X710 | 57810S | 57810S | P3+ |
| Interface | KR | KR | KR | KR | KR |
| iSCSI HBA | No | No | Yes | Yes | Yes |
| iSCSI Boot | Yes | Yes | Yes | Yes | Yes |
| FCoE | Yes | No | Yes | Yes | Yes |
| FCoE Boot | Yes | No | Yes | Yes | Yes |
| Switch independent NIC partitioning | No | Yes 8 or 16 per device | Yes 4 per 10Gb port | Yes 2 per 10Gb port | Yes |
| DCB | Yes | Yes | Yes | Yes | Yes |
| SR-IOV | Yes ¹ | Yes ¹ | Yes | No | Yes |
| WOL | Yes | Yes | Yes | Yes | Yes |
| PXE | Yes | Yes | Yes | Yes | Yes |
| EEE | No | No | No | No | No |
| Multi-queue ² (per port) | 64 TX, 64 RX | 128 TX, 128 RX | 128 TX, 128 RX | 128 TX, 128 RX | 64 TX, 64 RX |
| Supported servers | M620, M820 M630, M830 | M630, M830 | M620, M820 M630, M830 | M620, M820 M630, M830 | M620, M820 |
| Strengths | Preference for Intel Ethernet solutions Software iSCSI and FCoE | Preference for Intel Ethernet solutions Software iSCSI and FCoE | Continuity from older server designs Convergence features FCoE, iSCSI HBA, and NPAR | High port count Convergence features FCoE, iSCSI HBA, and NPAR | Trusted storage driver stack Convergence features FCoE, iSCSI HBA, and NPAR |

72 ¹Citrix XenServer 6.0 and Linux KVM only. 63 VFs per port.

²Number of queues will vary depending on hypervisor memory limitations.

10Gb Select Network Adapters (NDC) for blade servers

Emulex

| Features | Emulex OCm14102-U2-D NDC | Emulex OCm14102-U4-D NDC | Emulex OCm14102B-U4-D NDC | Emulex OCm14102-N6-D NDC | Emulex OCm14102B-N6-D NDC |
|-------------------------------------|--|--|--|---|---|
| Ports x Link speed | 2x10Gb | 2x10Gb | 2x10Gb | 2x10Gb | 2x10Gb |
| Supported speed | 10Gb | 10Gb | 10Gb | 10Gb | 10Gb |
| Chipset | Skyhawk | Skyhawk | Skyhawk | Skyhawk | Skyhawk |
| Interface | KR | KR | KR | KR | KR |
| iSCSI HBA | Yes | Yes | Yes | No | No |
| iSCSI Boot | Yes | Yes | Yes | Yes | Yes |
| FCoE | Yes | Yes | Yes | No | No |
| FCoE Boot | Yes | Yes | Yes | No | No |
| Switch independent NIC partitioning | Yes 4 per 10Gb port | Yes 8 per 10Gb port | Yes 8 per 10Gb port | Yes 8 per 10Gb port | Yes 8 per 10Gb port |
| DCB | Yes | Yes | Yes | Yes | Yes |
| SR-IOV | Yes | Yes | Yes | Yes | Yes |
| WOL | Yes | Yes | Yes | Yes | Yes |
| PXE | Yes | Yes | Yes | Yes | Yes |
| EEE | No | No | No | No | No |
| Multi-queue ¹ (per port) | 128 TX, 128 RX | 128 TX, 128 RX | 128 TX, 128 RX | 128 TX, 128 RX | 128 TX, 128 RX |
| Supported servers | M620, M820 | M630, M830 | M630, M830 | M630, M830 | M630, M830 |
| Strengths | Convergence features FCoE, iSCSI HBA, and NPAR | NPAR EP, RoCE support Convergence features FCoE, iSCSI HBA, and NPAR | NPAR EP, RoCEv2 support Convergence features FCoE, iSCSI HBA, and NPAR | NPAR EP, RoCE support 10Gb NIC Only | NPAR EP, RoCEv2 support 10Gb NIC Only |

10Gb mezzanine cards for blade servers

Intel / Mellanox / QLogic

| Features | Intel X520-x/k | Mellanox ConnectX-3-k | Mellanox ConnectX-3 Pro-k | QLogic 57810S-k |
|-------------------------------------|--|--|---------------------------|--|
| Ports x Link speed | 2x10Gb | 2x10Gb | 2x10Gb | 2x10Gb |
| Supported speed | 10Gb | 10Gb | 10Gb | 10Gb |
| Chipset | X520 | ConnectX-3 | ConnectX-3 | 57810S |
| Interface | XAUI/KR | KR | KR | KR |
| iSCSI HBA | No | No | No | Yes |
| iSCSI Boot | Yes | Yes | Yes | Yes |
| FCoE | Yes | No | No | Yes |
| FCoE Boot | Yes | No | No | Yes |
| Switch independent NIC partitioning | No | No | No | Yes 4 per 10Gb port |
| DCB | Yes | No | No | Yes |
| SR-IOV | Yes ¹ | Yes | Yes | Yes |
| WOL | Yes | Yes | Yes | Yes |
| PXE | Yes | Yes | Yes | Yes |
| EEE | No | No | No | No |
| RoCE | No | Yes | Yes, RoCEv2 | No |
| Multi-queue ² (per port) | 64 TX, 64 RX | 128 TX, 128 RX | 128 TX, 128 RX | 128 TX, 128 RX |
| Supported servers | M420, M520 M620, M820 M910, M915 M630, M830 | M420, M520 M620, M820 M630, M830 | M630, M830 | M420, M520 M620, M820 M630, M830 |

74 ¹Citrix XenServer 6.0 and Linux KVM only. 63 VFs per port.
²Number of queues will vary depending on hypervisor memory limitations.



10Gb mezzanine cards for blade servers

Emulex

| Features | Emulex OCm14102-U3-D | Emulex OCm14102-U5-D | Emulex OCm14102B-U5-D | Emulex OCm14102-N5-D | Emulex OCm14102B-N5-D |
|-------------------------------------|--------------------------|------------------------|------------------------|------------------------|------------------------|
| Ports x Link speed | 2x10Gb | 2x10Gb | 2x10Gb | 2x10Gb | 2x10Gb |
| Supported speed | 10Gb | 10Gb | 10Gb | 10Gb | 10Gb |
| Chipset | Skyhawk | Skyhawk | Skyhawk | Skyhawk | Skyhawk |
| Interface | KR | KR | KR | KR | KR |
| iSCSI HBA | Yes | Yes | Yes | No | No |
| iSCSI Boot | Yes | Yes | Yes | Yes | Yes |
| FCoE | Yes | Yes | Yes | No | No |
| FCoE Boot | Yes | Yes | Yes | No | No |
| Switch independent NIC partitioning | Yes 4 per 10Gb port | Yes 8 per 10Gb port | Yes 8 per 10Gb port | Yes 8 per 10Gb port | Yes 8 per 10Gb port |
| DCB | Yes | Yes | Yes | Yes | Yes |
| SR-IOV | Yes | Yes | Yes | Yes | Yes |
| WOL | No | No | No | Yes | Yes |
| PXE | Yes | Yes | Yes | Yes | Yes |
| EEE | No | No | No | No | No |
| RoCE | Yes | Yes | Yes, RoCE v2 | Yes | Yes, RoCE v2 |
| Multi-queue ¹ (per port) | 128 TX, 128 RX | 128 TX, 128 RX | 128 TX, 128 RX | 128 TX, 128 RX | 128 TX, 128 RX |
| Supported servers | M420, M520 M620, M820 | M630, M830 | M630, M830 | M630, M830 | M630, M830 |

10Gb mezzanine cards for blade servers

End-of-Life Cards

| Features | Brocade BR1741M-k (EOL) | QLogic QME8262-k (EOL) |
|-------------------------------------|--|----------------------------------|
| Ports x Link speed | 2x10Gb | 2x10Gb |
| Supported speed | 1Gb, 10Gb | 10Gb |
| Chipset | Catapult I | P3+ |
| Interface | KR | KR |
| iSCSI HBA | No | Yes |
| iSCSI Boot | No | Yes |
| FCoE | Yes | Yes |
| FCoE Boot | Yes | Yes |
| Switch independent NIC partitioning | No | Yes |
| DCB | Yes | Yes |
| SR-IOV | No | No |
| WOL | No | Yes |
| PXE | Yes | Yes |
| EEE | No | No |
| RoCE | No | No |
| Multi-queue ¹ (per port) | 128 TX, 128 RX | 128 TX, 128 RX |
| Supported servers | M420, M520 M620, M820 M910, M915 | M420, M520 M620, M820 M910 |



1Gb and 10Gb LOMs for Blade Servers

| Features | QLogic 57810S-k 2 port 10Gb LOM | Broadcom 5720 4 port 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 NIC partitioning | Yes 4 per 10Gb port | 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 |

¹Number of queues will vary depending on hypervisor memory limitations.



1Gb Select Network Adapters (NDC) for blade servers

| Features | Intel I350 4 port 1Gb NDC | Broadcom 5720 4 port 1Gb NDC |
|-------------------------------------|------------------------------|---------------------------------|
| Ports x Link speed | 4x1Gb | 4x1Gb |
| Supported speed | 1Gb | 1Gb |
| Chipset | I350 | 5720 |
| Interface | Serdes | Serdes |
| iSCSI HBA | No | No |
| iSCSI Boot | Yes | Yes |
| FCoE | No | No |
| FCoE Boot | No | No |
| Switch independent NIC 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 | M630, M830 | M620, M820 M630, M830 |

¹Number of queues will vary depending on hypervisor memory limitations.



1Gb mezzanine cards for blade servers

| Features | Intel I350 4 port mezz | Broadcom 5719 4 port 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 NIC 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 M630, M830 | M420, M520 M620, M820 M630, M830 |

¹Number of queues will vary depending on hypervisor memory limitations.



Fibre Channel mezzanine cards for blade servers

| Features | QLogic QME2572 FC8 | Emulex LPe1205-M FC8 | Emulex LPm15002B-D FC8 | QLogic QME2662 FC16 | Emulex LPm16002B-D FC16 |
|--------------------|--|--|--|--|--------------------------|
| Ports x Link speed | 2x8Gb | 2x8Gb | 2x8Gb | 2x16Gb | 2x16Gb |
| Supported speed | 4Gb, 8Gb | 4Gb, 8Gb | 4Gb, 8Gb | 8Gb, 16Gb | 8Gb, 16Gb |
| Chipset | 2500 | LightPulse | Lancer G5 | 2600 | Lancer G5 |
| FC Boot | Yes | Yes | Yes | Yes | Yes |
| Supported servers | M420, M520 M620, M820 M630, M830 | M420, M520 M620, M820 M630, M830 | M420, M520 M620, M820 M630, M830 | M620, M820 M910, M915 M630, M830 | M620, M820 M630, M830 |



InfiniBand mezzanine cards for blade servers

| Features | Mellanox ConnectX-3 FDR10 | Mellanox ConnectX-3 FDR |
|---------------------|--|---|
| Ports x Link speed | 2x40Gb | 2x56Gb |
| Chipset | CX-3 | CX-3 |
| Supported Protocols | InfiniBand | InfiniBand |
| Supported servers | M420, M520 M620, M820 M630, M830 | M620, M630 |
| Great for | Real time market data distribution | HFT, co-located investment banks, algorithmic trading, low latency applications |



Select Network Adapters – 11G, 12G, 13G

| Speed | Form Factor | 11G | 12G | 13G |
|-------|-----------------------------------|---|----------------------------------|-----------------------------------|
| 1Gb | Blade NDC | Broadcom 5709 4P 1Gb Blade NDC (M710HD, M915 only) | Broadcom 5720 4P 1Gb | Broadcom 5720 4P 1Gb |
| | | | | Intel i350 4P 1Gb |
| 10Gb | Blade NDC | Broadcom 57712-k 2P 10Gb KR NDC (M710HD, M915 only) | QLogic 57810S-k 2P 10Gb NDC | QLogic 57810S-k 2P 10Gb NDC |
| | | | QLogic 57840S-k 4P 10Gb NDC | QLogic 57840S-k 4P 10Gb NDC |
| | | | Intel x520-k 2P 10Gb NDC | Intel x520-k 2P 10Gb NDC |
| | | | QLogic QMD8262-k 2P 10Gb NDC | Intel x710-k 2P 10Gb NDC |
| | | | Emulex OCm14102-U2-D 2P 10Gb NDC | Emulex OCm14102-U4-D 2P 10Gb NDC |
| | | | | Emulex OCm14102B-U4-D 2P 10Gb NDC |
| | | | | Emulex OCm14102-N6-D 2P 10Gb NDC |
| | Emulex OCm14102B-N6-D 2P 10Gb NDC | | | |

Ethernet Mezzanine Cards – 11G, 12G, 13G

| Speed | Form Factor | 11G | 12G ¹ | 13G |
|-------|-------------|-----------------------------------|------------------------------------|--------------------------------------|
| 1Gb | Blade Mezz | Broadcom 5709 4P 1Gb Adapter Mezz | Broadcom 5719 4P 1Gb Adapter Mezz | Broadcom 5719 4P 1Gb Adapter Mezz |
| | | Intel ET 4P 1Gb Adapter Mezz | Intel i350 4P 1Gb Adapter Mezz | Intel I350 4P 1Gb Adapter Mezz |
| 10Gb | Blade Mezz | QLogic 57711 2P 10Gb XAUI Mezz | QLogic 57810S-k 2P 10Gb Mezz | QLogic 57810S-k 2P 10Gb Mezz |
| | | QLogic QME8242-k 2P 10Gb Mezz | QLogic QME8262-k 2P 10Gb Mezz | Mellanox ConnectX-3-K 2P 10Gb Mezz |
| | | Brocade BR1741M-k 2P 10Gb Mezz | Brocade BR1741M-k 2P 10Gb Mezz | Mellanox ConnectX-3 Pro 2P 10Gb Mezz |
| | | Intel x520 x/k 2P 10Gb Mezz | Intel x520 x/k 2P 10Gb Mezz | Intel x520 x/k 2P 10Gb Mezz |
| | | Emulex OCm10102-F-M 2P XAUI Mezz | Emulex OCm14102-U3-D 2P 10Gb Mezz | Emulex OCm14102-U5-D 2P 10Gb Mezz |
| | | | Mellanox ConnectX-3-K 2P 10Gb Mezz | Emulex OCm14102B-U5-D 2P 10Gb Mezz |
| | | | | Emulex OCm14102-N5-D 2P 10Gb Mezz |
| | | | Emulex OCm14102B-N5-D 2P 10Gb Mezz | |

¹No iSCSI offload support with 1Gb devices

Fibre Channel Mezzanine Cards – 11G, 12G, 13G

| Speed | Form Factor | 11G | 12G, 13G |
|-------|-------------|-----------------------------|--|
| 8Gb | Blade Mezz | QLogic QME2572 2P FC8 HBA | QLogic QME2572 2P FC8 HBA |
| | | Emulex LPe1205-M 2P FC8 HBA | Emulex LPe1205-M 2P FC8 HBA |
| | | | Emulex LPm15002B-D 2P FC8 HBA (13G only) |
| 16Gb | Blade Mezz | | QLogic QME2662 2P FC16 HBA |
| | | | Emulex LPm16002B-D 2P FC16 HBA |



Systems Management Network Device Support Matrix

| Form Factor | Vendor/Chipset | Speed | LC configuration and update | Monitoring support |
|------------------|-----------------------|-------|-----------------------------|--------------------|
| Blade NDC | Emulex OCm14102-U2-D | 10GbE | Yes | Yes |
| | Emulex OCm14102-N6-D | 10GbE | Yes | Yes |
| | Emulex OCm14102B-N6-D | 10GbE | Yes | Yes |
| | Emulex OCm14102-U4-D | 10GbE | Yes | Yes |
| | Emulex OCm14102B-U4-D | 10GbE | Yes | Yes |
| | Intel X520-k | 10GbE | Yes | Yes |
| | Intel X710-k | 10GbE | Yes | Yes |
| | QLogic 57840S-k | 10GbE | Yes | Yes |
| | QLogic QMD8262-k | 10GbE | Yes | Yes |
| QLogic 57810S-k | 10GbE | Yes | Yes | |
| Blade LOM | Broadcom 5720 | 1GbE | Yes | Yes |
| | QLogic 57810S-k | 10GbE | Yes | Yes |



Systems Management Network Device Support Matrix

| Form Factor | Vendor/Chipset | Speed | LC configuration and update | Monitoring support |
|-----------------------|-------------------------|-------|-----------------------------|--------------------|
| Blade Mezz | Broadcom 5719 Serdes | 1GbE | Yes | Yes |
| | Brocade BR1741M-k | 10GbE | No | No |
| | Emulex OCm14102-U3-D | 10GbE | Yes | Yes |
| | Emulex OCm14102-N5-D | 10GbE | Yes | Yes |
| | Emulex OCm14102B-N5-D | 10GbE | Yes | Yes |
| | Emulex OCm14102-U5-D | 10GbE | Yes | Yes |
| | Emulex OCm14102B-U5-D | 10GbE | Yes | Yes |
| | Emulex LPe1205-M | FC8 | No | No |
| | Emulex LPm15002B-D | FC8 | Yes | Yes |
| | Emulex LPm16002B-D | FC16 | Yes | Yes |
| | Intel I350 Serdes | 1GbE | Yes | Yes |
| | Intel X520 x/k | 10GbE | Yes | Yes |
| | Mellanox ConnectX-3 | 10GbE | Yes | Yes |
| | Mellanox ConnectX-3 | FDR | No | No |
| | Mellanox ConnectX-3 | FDR10 | No | No |
| | Mellanox ConnectX-3 Pro | 10GbE | Yes | Yes |
| | QLogic 57810S-k | 10GbE | Yes | Yes |
| | QLogic QME8262-k | 10GbE | Yes | Yes |
| | QLogic QME2572 | FC8 | Yes | No |
| | QLogic QME2662 | FC16 | Yes | Yes |



XAUI – KR Transition

Midplane Enhancement

10GbE KR Midplane for the M1000e

M1000e chassis shipped after January 2011 utilize new 10GbE technology

- M-series technology transition from 10Gb XAUI to 10Gb KR. Switches and mezzanine cards/LOMs must be the same type to talk to each other (i.e., all XAUI or all KR)
- 10GbE LOM/NDC (Fabric A) on M710HD blade server is only supported with M1000e chassis shipped after January 2011



XAUI-XAUI and KR-KR Interoperability

- All 10GbE I/O Modules launched prior to 2011 are XAUI-based
 - M8024, 10Gb Pass-through, 10Gb Pass-through II
- All 10GbE mezzanine cards launched prior to 2011 are XAUI-based
 - Broadcom 57711, QLogic QME8142, Emulex OCm10102-f-m, Intel X520
 - Intel X520-x/k can function as XAUI or as KR
- All 10GbE IOMs launched in 2011 or later are KR-based
 - Dell M8428-k, PowerConnect M8024-k
- All 10GbE mezzanine cards and LOMs launch in 2011 or later are KR-based
 - M710HD LOM risers
 - Brocade BR1741M-k, QLogic QME8242-k
- All KR-based products include the notation “-k”
- For detailed 10Gb NIC/LOM compatibility with XAUI/KR, refer to the [Dell PowerEdge M1000e I/O Interoperability Guide](#)



Frequently Asked Questions

Q: Can I upgrade my existing chassis with the new midplane?

A: To help customers get the most out of their existing blade deployments, we generally do not recommend an upgrade. There is a “customer kit” of the enhanced midplane with service installation available for customers who require the upgrade and for whom it makes sense.

Q: Will XAUI and KR components interoperate at 1Gb?

A: In many cases, yes, but to avoid the exceptions and potential negative experiences, we recommend only matching up XAUI mezzanine cards with XAUI I/O modules and KR LOMs and mezzanine cards with KR I/o modules.

Q: Will I be able to tell whether a chassis has the standard or enhanced midplane?

A: Yes, via the CMC on the Chassis Health Summary screen. IOM bay labels on the rear of the chassis will also change to reflect 10Gb support on Fabric A.

Q: Can I use KR-based mezzanine cards and switches on fabrics B and C of my existing chassis?

A: Yes. Fabrics B and C fully support 10GbE KR on any midplane.

Q: Do these midplane and XAUI-KR changes impact any other currently shipping I/O modules?

A: No. Gigabit Ethernet switches, FC4/8 switches, and QDR/DDR IB switches are not affected by the XAUI to KR transition or the midplane transition. Note that these changes do not impact support for the M710HD when configured with 4x1GbE LOMs.



Why should I not upgrade my existing chassis?

Maximize ROI of existing chassis/blades/switches by maintaining 1Gb Fabric A on existing chassis and deploying 10Gb Fabric A solutions on new installations.

For customers with installed M-series blades:

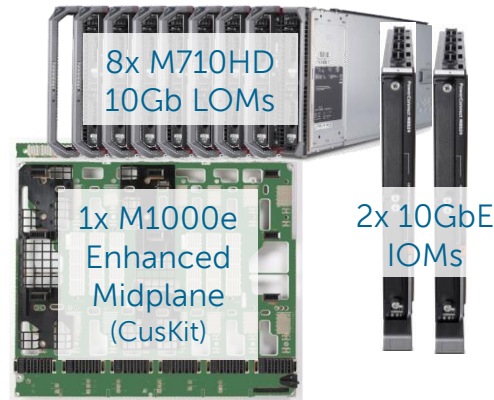
- Existing 1Gb Fabric A switches and LOMs will see no benefit from a midplane upgrade
- An upgrade would require a new midplane, Services installation, new 10Gb Fabric A switches resulting in unused 10Gb capability on ports used by existing 1Gb LOMs

Considerations for customers interested in a midplane upgrade:

Customers starting with this:

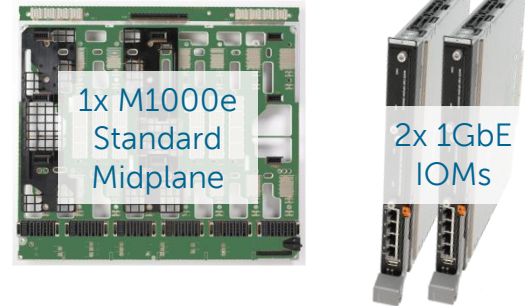


Add:



+Midplane Installation Service

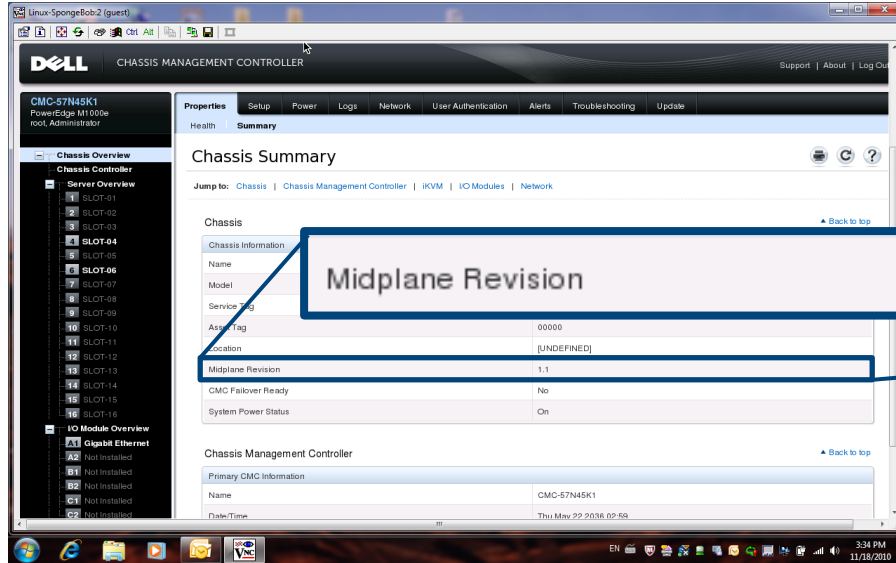
Discard / Re-purpose:



- Half the internal ports of 10GbE IOM will run at 1Gb (with installed M610 1Gb LOMs), i.e. diminished benefit of 10Gb upgrade
- Enhanced midplane can be replaced by customer on-site, but will require chassis downtime (including all installed servers)

Identifying the Midplane Version

CMC GUI (Chassis Summary)

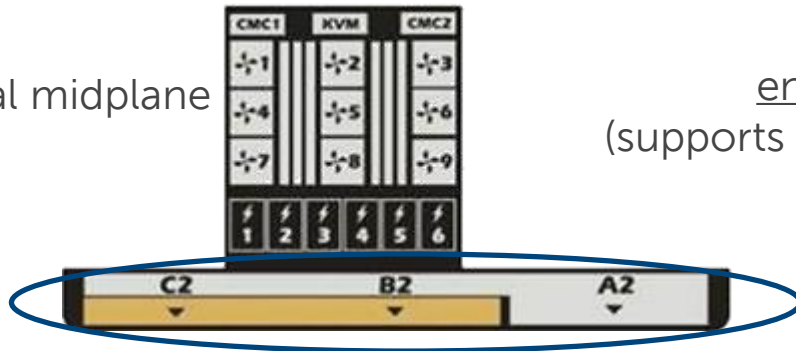


1.0 = original midplane
1.1 = enhanced midplane
(supports 10Gb on Fabric A)

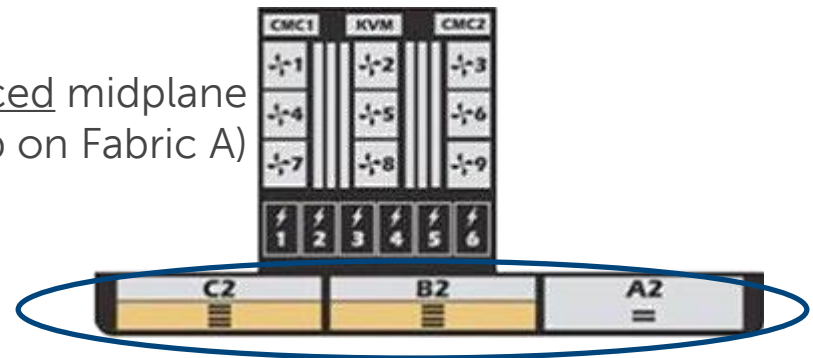
via CLI:
`racadm getsysinfo # search/grep for 'Midplane Revision'`

M1000e I/O bay labeling (rear of chassis)

original midplane



enhanced midplane
(supports 10Gb on Fabric A)



Deployment and Technical Guides



Deployment and 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 Aggregation 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/bladeeqintegration |
| 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/m8024kcisconexusimple |
| 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 PTM | 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 13th 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 to better understand Dell's product and solution offerings. Simply go online or download the new Interactive tool and you are ready to begin.

Dell Enterprise Demo Page:

<http://www.dellenterprisedemos.com/>



Legacy Products



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
 - Add advanced IP routing and IPvt6 compatibility



Cisco Catalyst Blade Switches

Adapters

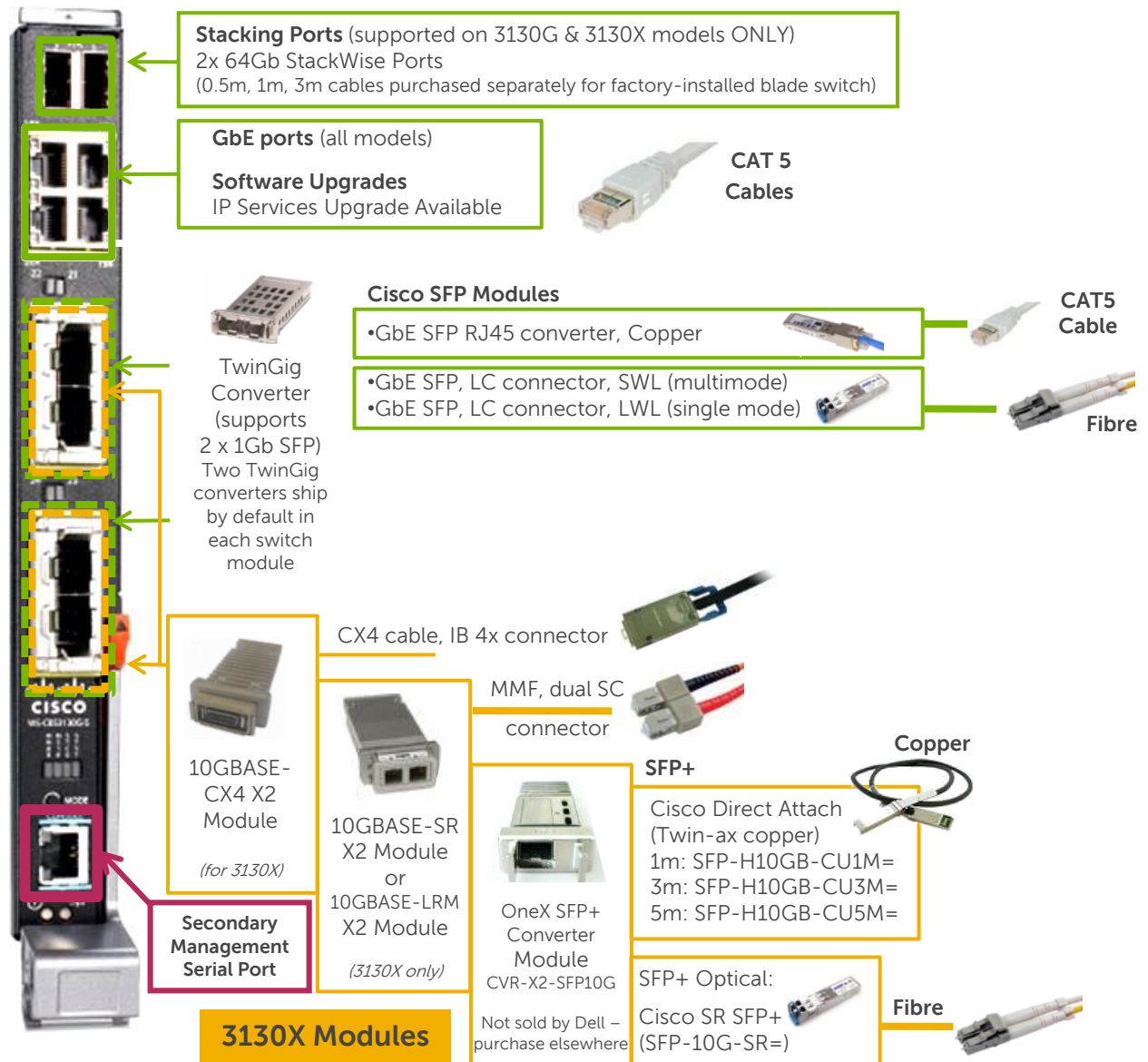
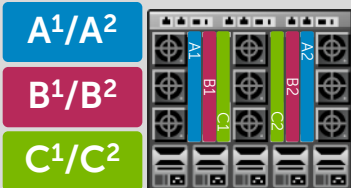
Works with all 1Gb Mezzanine cards and LOMs.

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



M8428-k

Converged

Converged Ethernet and 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

Adapters

11G

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

12G

- Brocade BR1741M-k
- Emulex OCm1402-U2-D
- Emulex OCm1402-U3-D
- Intel X520-x/k
- QLogic 57810S-k
- QLogic 57840S-k
- QLogic QME8262-k

13G

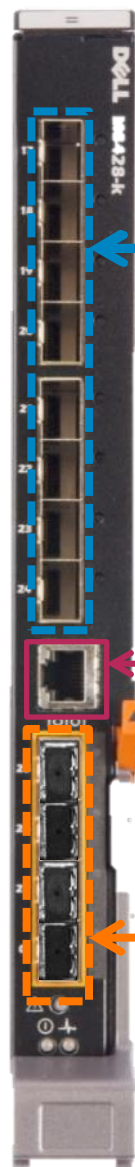
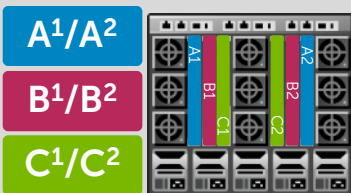
- Emulex OCm1402-U4-D
- Emulex OCm1402-U5-D
- Intel X710-k
- Mellanox CX-4 DP 10GbE
- QLogic 57810S-k
- QLogic 57840S-k

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

1Gb Ethernet mezzanine cards and LOMs are not supported.

More details in Adapter Portfolio section

Designed for I/O bays



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)



Cables



Long Wave, Multi-Mode SFP+ Optics



Revision History

| Date | Changes |
|-------------------|---|
| July 1, 2016 | <ul style="list-style-type: none">• Removed 11G adapters from switch pages for space• Added new Emulex adapters• Added Mellanox ConnectX-3 Pro adapter• Minor updates and corrected errors. Graphical formatting. Reworked tables. |
| July 14, 2015 | <ul style="list-style-type: none">• Removed verbiage "12G adapters" on page 69. |
| June 26, 2015 | <ul style="list-style-type: none">• Corrected the number of stack units for M/IOA to 6• Updated Systems Management Matrix |
| June 9, 2015 | <ul style="list-style-type: none">• Updated Broadcom naming of 10Gb cards to QLogic• Updated additional cards for 13G launch (Mellanox ConnectX-3, Intel 710-K) |
| May 1, 2015 | <ul style="list-style-type: none">• Corrected QME8626-K on 13G• Added 13G compatibility for Wave• Made changes to Emulex OCm14102-xx-x for consistency• Added 13G section to each blade |
| December 17, 2014 | <ul style="list-style-type: none">• Mellanox ConnectX-3 information updated |
| December 8, 2014 | <ul style="list-style-type: none">• Added NEW section on 1.0 to 1.1 mid-plane upgrade recommendation• Removed references to Dell 8/4 Gbps SAN Module (EOL)• Added 12G and 13G related NDC and Mezz to 10Gb interop matrix (Emulex) |
| January 9, 2014 | <ul style="list-style-type: none">• 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 (EOL). Note the 3130G and 3130X are still being sold• Made a correction that states that the M6505 requires the enhanced midplane (1.1) and will not function with the original midplane (1.0) |





The power to do more