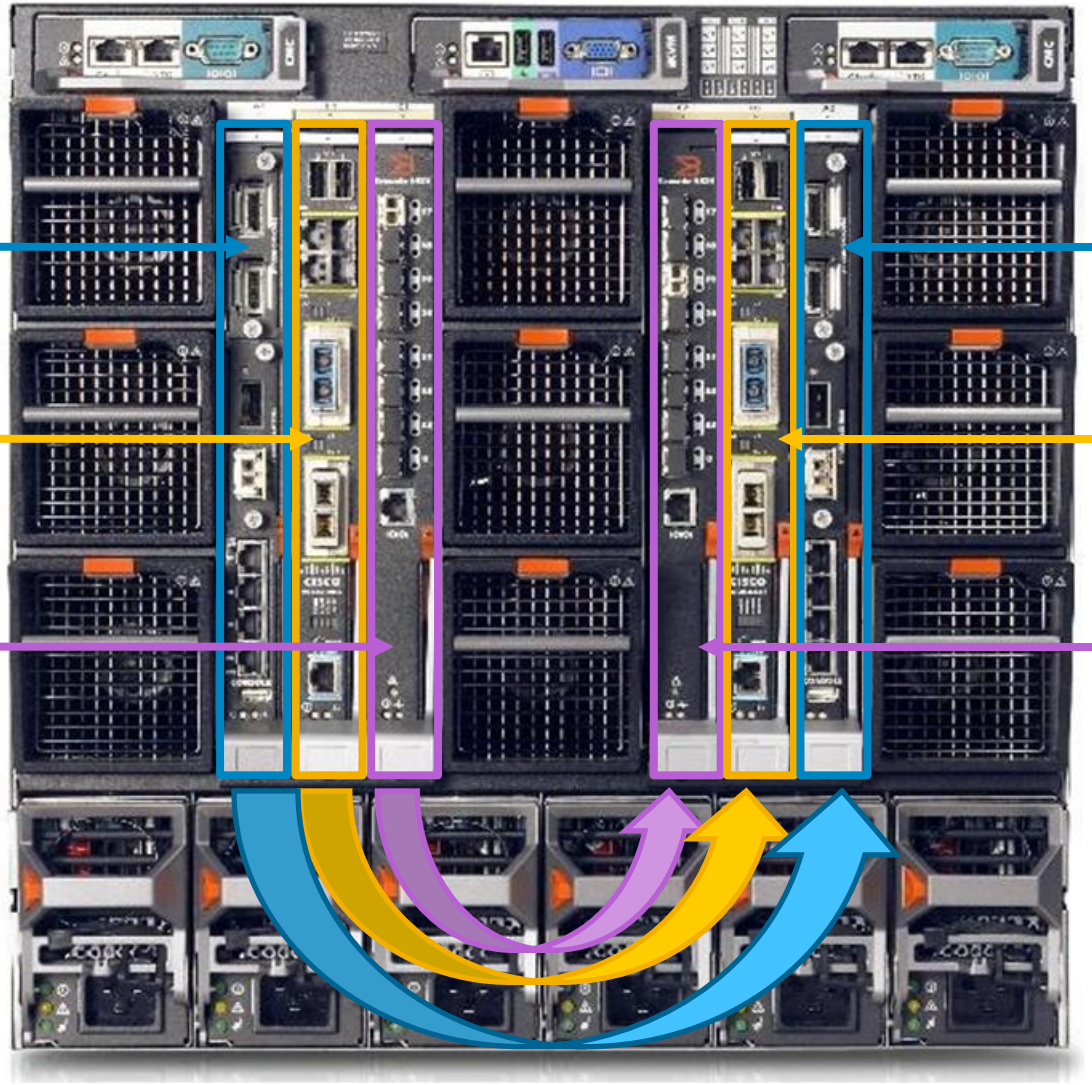
M-Series I/O Guide

I/O Connectivity Options for M1000e and M-Series Blades

February 2011

PowerEdge M1000e Redundant I/O Modules View



Fabric A1
Reserved for 1/10GbE LOMs

Fabric B1
1/10GbE, 4/8Gb FC, 20/40Gb IB

Fabric C1
1/10GbE, 4/8Gb FC, 20/40Gb IB

Fabric A2
Reserved for 1/10GbE LOMs

Fabric B2
1/10GbE, 4/8Gb FC, 20/40Gb IB

Fabric C2
1/10GbE, 4/8Gb FC, 20/40Gb IB

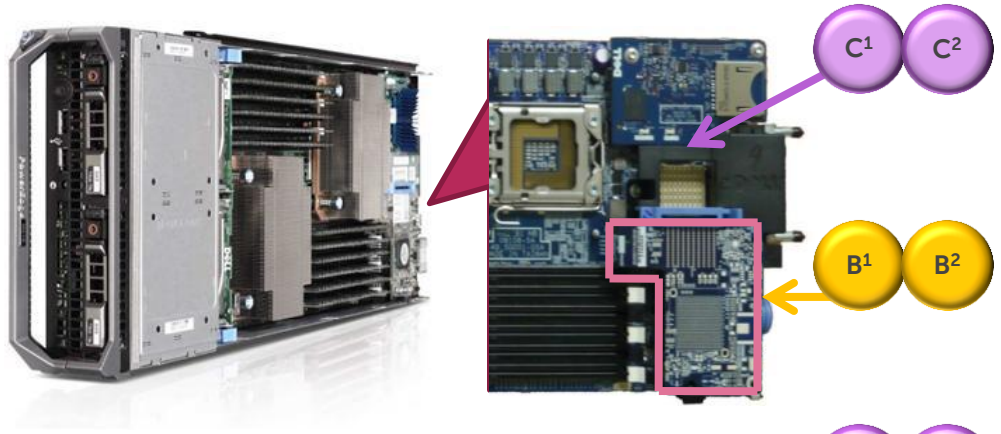
A total of 6 I/O bays per M1000e blade enclosure

Redundant I/O modules provide high-availability

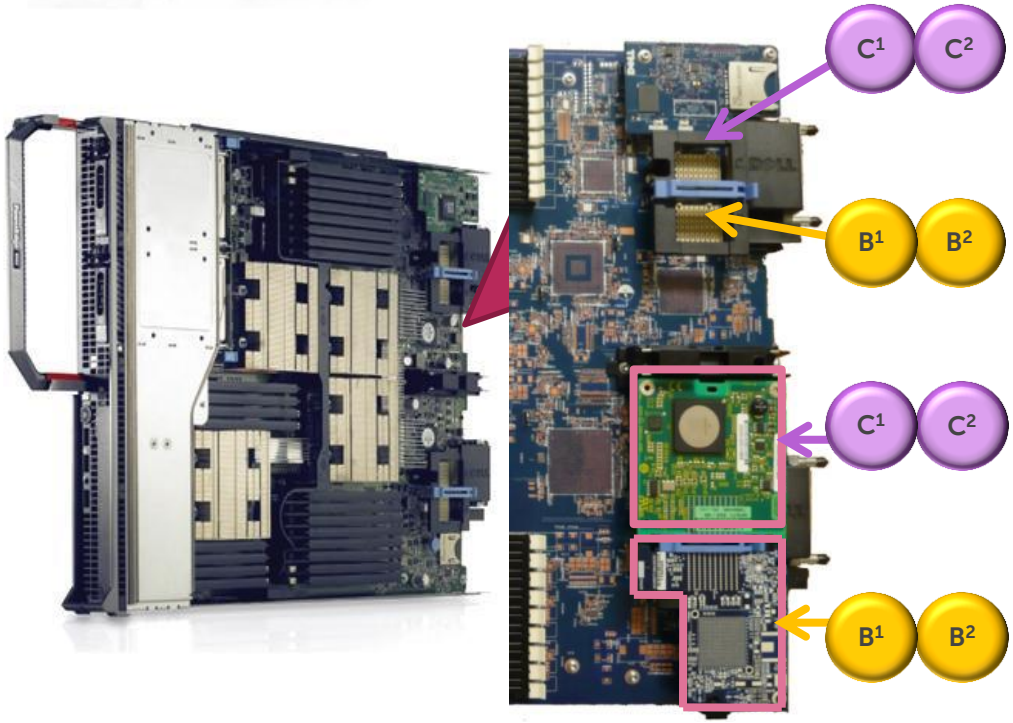
M-Series Blade I/O Fabrics

Server Models

Half Height
M605
M610 (shown)
M710HD
M610x



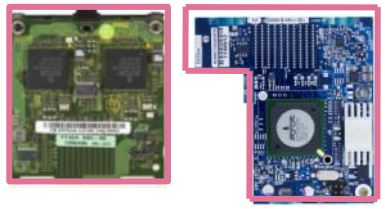
Full Height
M710
M805
M905 (shown)
M910



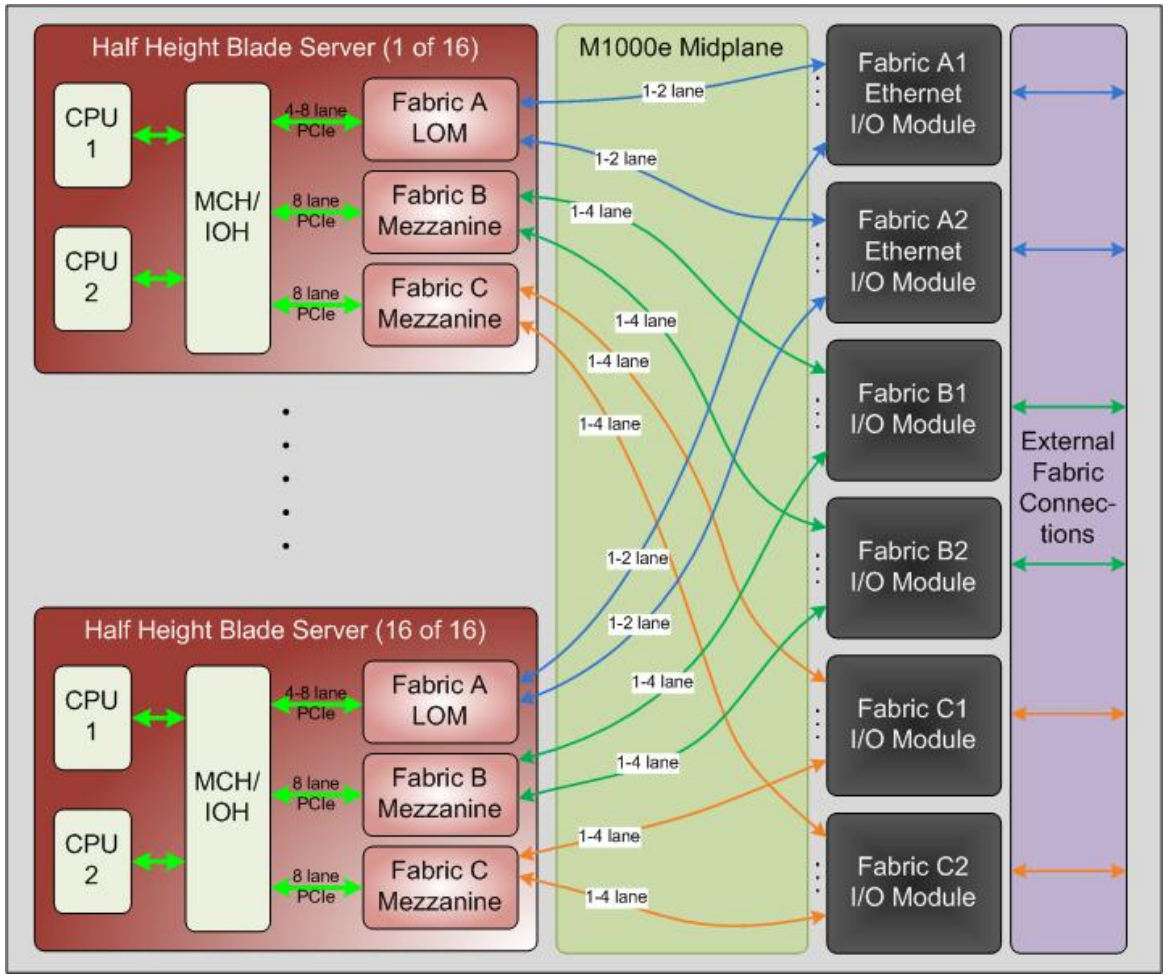
LAN-on-Motherboard NICs
- Half-height blades include one (two on M710HD) dual-port LAN-On-Motherboard 1GbE NIC and link to chassis I/O bays A1 and A2
- Full-height blades include two dual-port LAN-On-Motherboard 1GbE NICs and utilize Fabric I/O bays A1 and A2

Mezzanine Cards
- Dual port mezzanine cards map two ports – one to each of the redundant I/O modules (eg. B1 & B2) providing high availability.
- Quad port mezzanine cards map 4 ports – two to each of the redundant I/O modules, providing added bandwidth and high availability.

Mezzanine Cards



I/O Fabric Architecture for Half-Height Blades



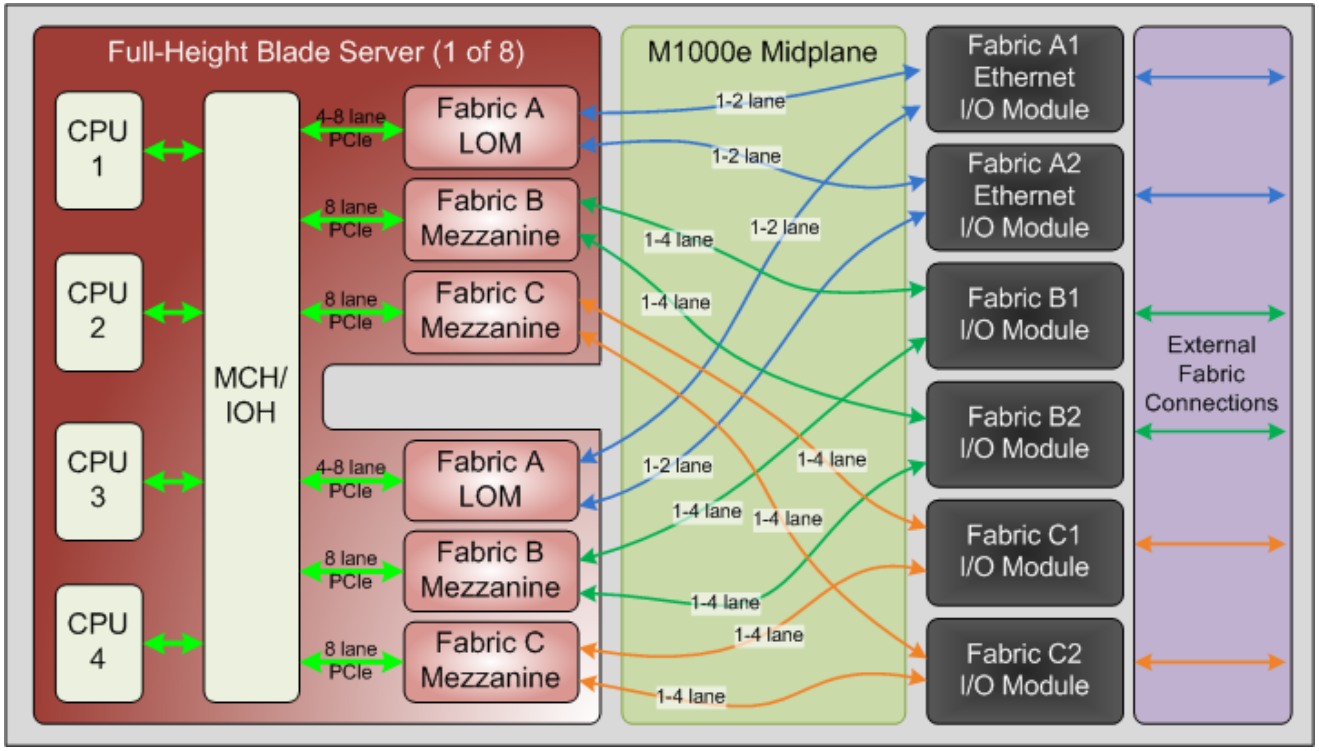
Fabric A:

- Dedicated to Ethernet LOMs: two ports per blade
  (note: M710HD supports four ports per blade)
- Each port routes to separate I/O module
- Ethernet switch or Ethernet pass-through only

Fabrics B and C:

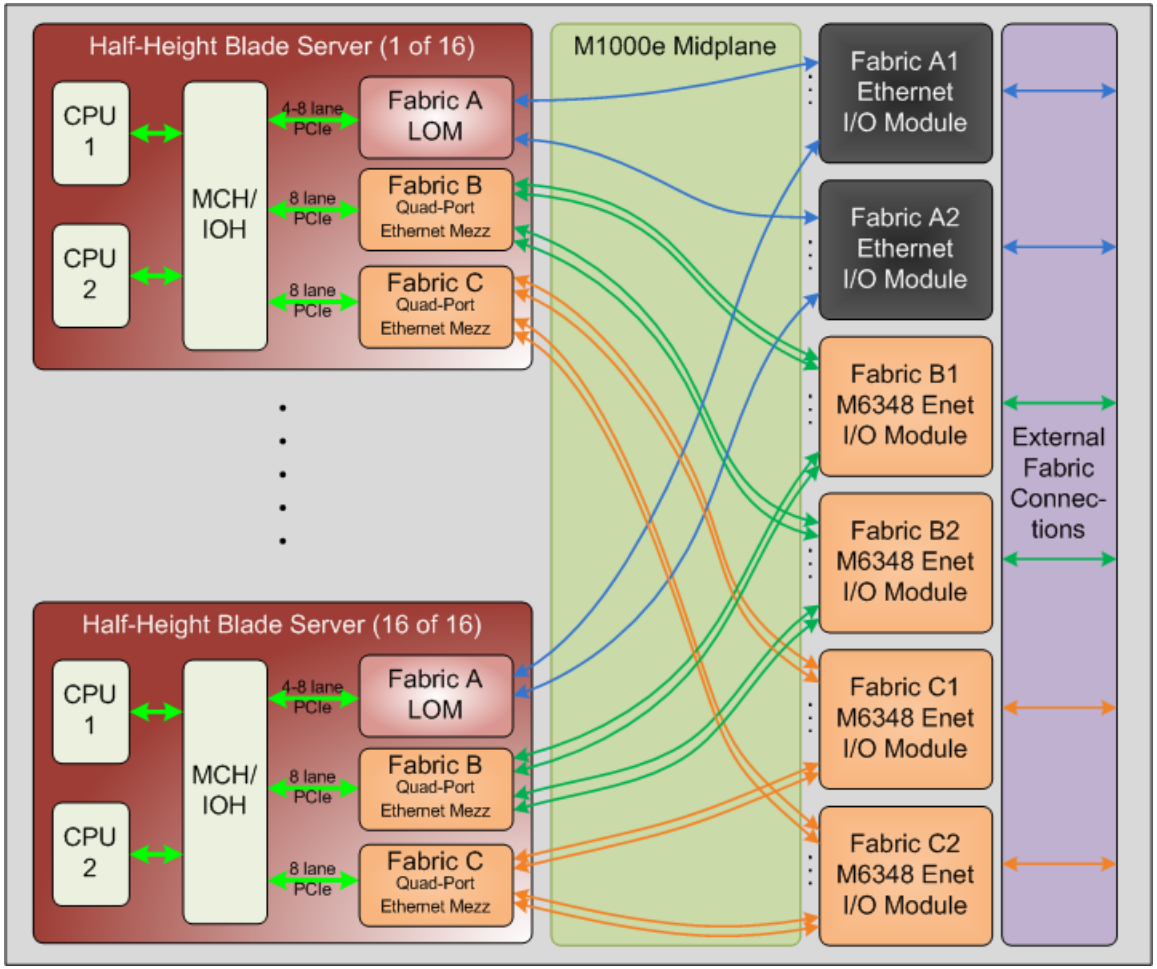
- Customizable for Ethernet, Fibre Channel, InfiniBand, or FCoE
- Two I/O mezzanine cards per blade
- Two or four ports per I/O mezzanine card
- Each card has ports linked to separate (redundant) I/O modules

I/O Fabric Architecture for Full-Height Blades



- Same fundamental architecture as half-height blades, but twice the mezz slots, twice the ports, and twice the bandwidth
- Each blade can have two physical connections to each I/O module
- Fabric A features two dual-port integrated Gigabit NICs
- I/O not dependent on number of processors

I/O Fabric Architecture with Quad-Port Mezz Cards for Maximized Port Count



- Up to 10x 1GbE ports out of each half-height blade
- Up to 20x 1GbE ports out of each full-height blade.
- Excellent for virtualization solutions built on physical GbE ports
- Unmatched port count in the industry
- Utilize Broadcom or Intel quad-port mezzanine cards with M6348 high port-count I/O Modules

FlexAddress Plus

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

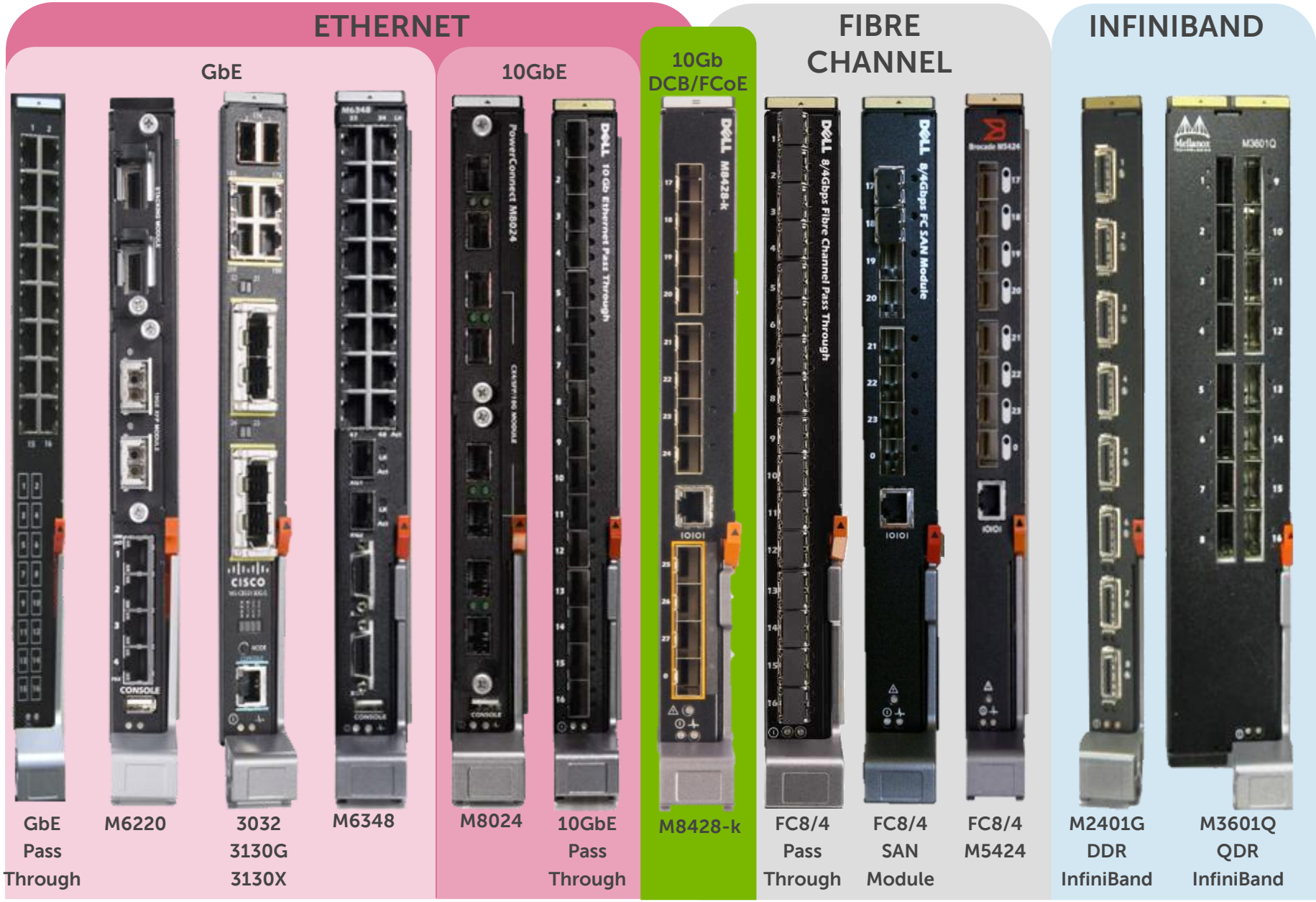
WWN/MAC Addresses — Slot 1: SLOT-01 ▲ Back to top

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

Original hardware-assigned MACs

FlexAddress-assigned MACs

M-Series I/O Module Options



Ethernet
10Gb Ethernet Convergence

SimpleConnect for LAN
PowerConnect Blade Switches

What is SimpleConnect?

- Feature included on all PowerConnect blade switches (M8024/M6348/M6220); "SimpleConnect" (locked) models also available (M8024S/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

PowerConnect M6220

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

PowerConnect M6220

Gb / 10Gb Ethernet

Mezzanine cards*

Use Broadcom 5709 or Intel Gigabit Ethernet mezzanine cards or Fabric A LOMs in PE blade servers for Gigabit Ethernet I/O connectivity

GbE LOM Fab A

Mezz Card Slot B

Mezz Card Slot C

*Quad port GbE mezz cards (Broadcom or Intel) 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 mezz connection.

Uplinks

Stacking Module, 48Gbps

Cables

Stacking Cable (1m included; 3m available)

Uplinks

PowerConnect 6xxx **SFP+** Module

Optical Transceivers

Short Range, Multi-Mode SFP+ Optics
Long Range, Multi-Mode SFP+ Optics
Long Range, Single-Mode SFP+ Optics
Short Range, Single-Mode SFP+ Optics

Cables

SFP+ Direct Attach (copper)
twin-ax cable with SFP+ connector
(0.5m, 1m, 3m, 5m, 7m available)

Uplinks

10GBase-T (Copper)
Uplink Module

(10Gb speed only)

Cables
RJ45 / Cat6a

Uplinks

10GbE Uplink Module for **CX4 Copper**

Cables
CX4 Cable for 10GbE Uplink, 12m

Cables

CAT 5

Management Port

Cable included

I/O bays

A1/A2

B1/B2

C1/C2

PowerConnect M6348

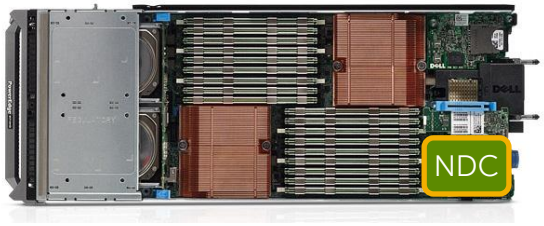
- Managed Layer 2/3 Gigabit Ethernet switch for M1000e blade enclosure
- Industry leading port availability
  - 32 internal (server) GbE ports; offering support of up to two ports per blade mezz card or NDC (i.e. with quad-port 1GbE NICs)
  - 16 external fixed 10/100/1000Mb Ethernet RJ-45 ports
  - Up 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
- For optimized use (full internal-port utilization), pair with:
  - Quad-port GbE mezz cards (Broadcom 5709 or Intel ET 82572); or
  - Quad-port NDC (Fabric A) on M710HD blade server

PowerConnect M6348

Gb / 10Gb Ethernet

Mezzanine cards*

NDC (on M710HD)



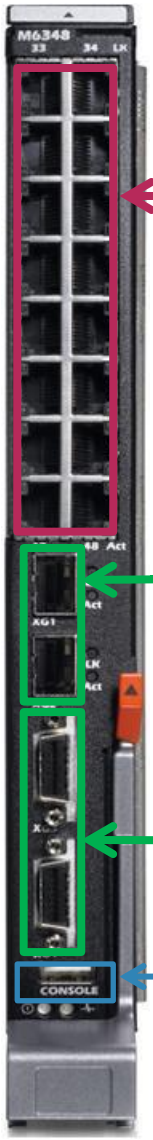
Optimal use is with quad-port 1Gb NDC (Fabric A on M710HD) or mezzanine cards from Broadcom or Intel for additional ports of 1Gb Ethernet connectivity, although can be used with any 1Gb LOM or NIC mezz card

GbE LOM Fab A

Mezz Card Slot B

Mezz Card Slot C

*Dual port GbE mezz cards or LOMs 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 mezz card only has one port out to each IO module.



Cables
CAT 5

Optical Transceivers

Short Range, Multi-Mode SFP+ Optics
Long Range, Multi-Mode SFP+ Optics
Long Range, Single-Mode SFP+ Optics

Cables

SFP+ Direct Attach (copper)
twin-ax cable with SFP+ connector
(0.5m, 1m, 3m, 5m, 7m available)

CX4 Cables
for 10GE uplinks or 32Gb M6348 stacking
(1m, 3m, 12m, 15m available)

Management Port
Cable included

I/O bays

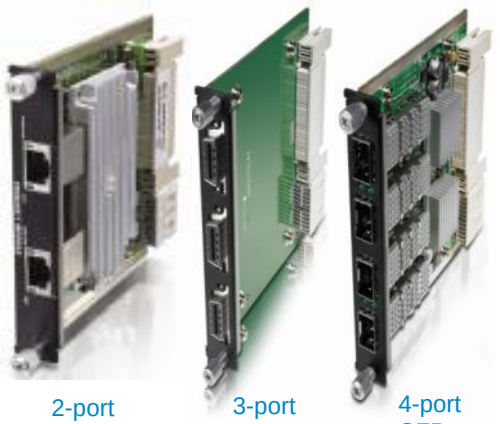
A1/A2

B1/B2

C1/C2

PowerConnect M8024

- Fully modular full wire-speed all 10Gb managed Layer 2/3 Ethernet switching
- Industry leading 24 port design features:
  - 16 internal server ports
  - Up to 8 external ports via up to two FlexIO uplink modules
- FlexIO fully modular design enables connectivity choices including SFP+, CX4, and 10GBASE-T
  - M8024 supports mixing of the FlexIO modules
- Supports Dell Simple Switch Mode



2-port 10GBASE-T | 3-port CX4 | 4-port SFP+

PowerConnect M8024

10Gb Ethernet

Mezzanine cards*

Combine the 10Gb M8024 Ethernet switch with the **Broadcom 57710/57711** or **Intel X520-x/k** dual-port 10Gb Ethernet mezz cards in PE blade servers for 10Gb from server to LAN

Mezz Card Slot B

Mezz Card Slot C

*QLogic QME8142 and Emulex OCM10102-f-m (CNA) mezz cards will function and are supported as standard 10Gb Ethernet cards with this IO module. The FCoE functionality of these cards is not supported with this IO module, but is supported with the 10Gb Ethernet Pass Through II.

If connected to 1Gb Ethernet mezz cards, M8024 will auto-negotiate individual internal ports to 1Gb.

Uplinks

10GbE SFP+ Module

Optical Transceivers

PCT 6XXX Short Range, Multi-Mode SFP+ Optics
PCT 6XXX Long Range, Multi-Mode SFP+ Optics
PCT 6XXX Long Range, Single-Mode SFP+ Optics

Cables

SFP+ Direct Attach (copper)
twin-ax cable with SFP+ connector
(0.5m, 1m, 3m, 5m, 7m available)

Uplinks

10GbE **CX4 Copper** Module

Cables

CX4 cables for 10GbE Uplink

Uplinks

10GBASE-T **Copper** Module

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

Cables

RJ45 / Cat6a

Management Port

Cable included

I/O bays

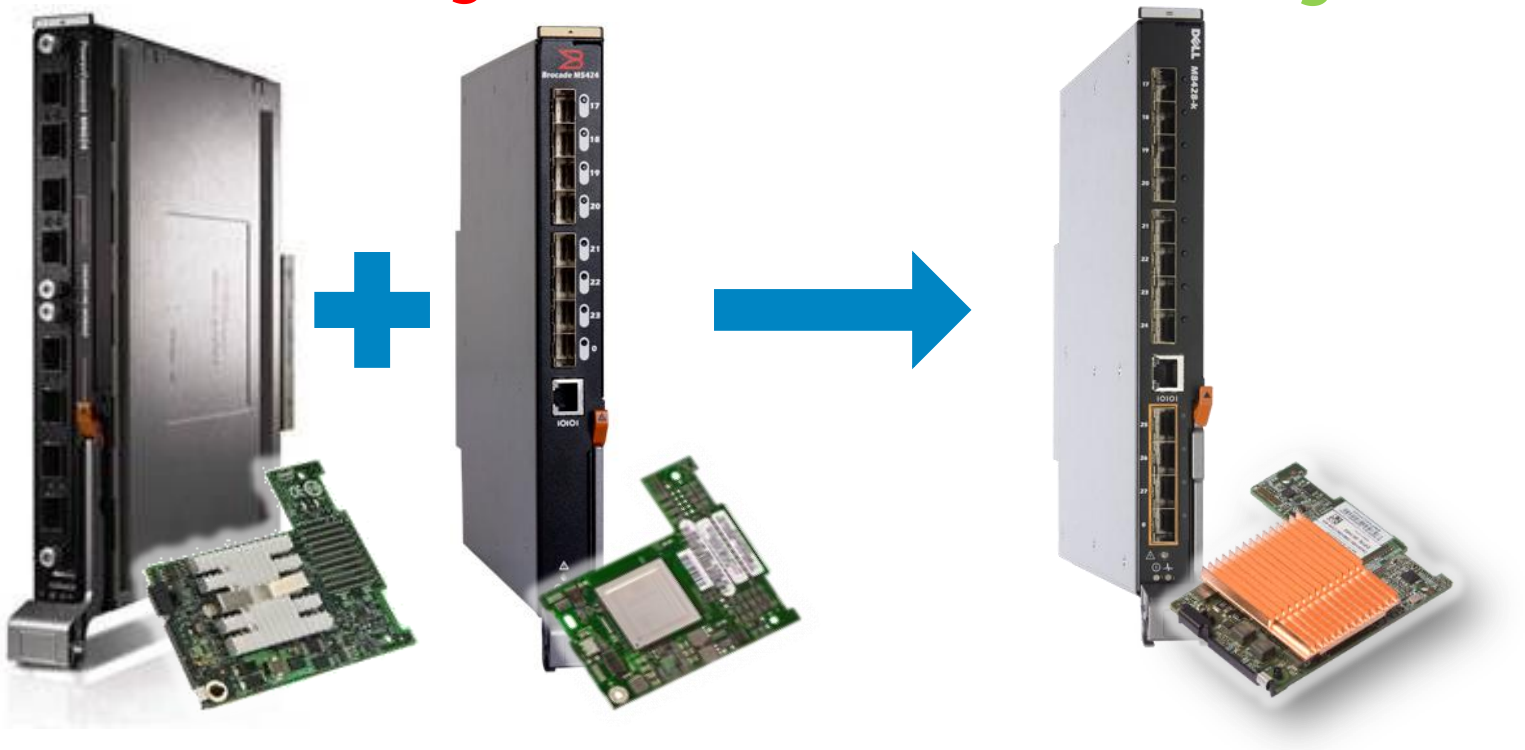
B1/B2

C1/C2

Converged Networking / FCoE

Before Convergence

After Convergence



- 50% reduction in blade server interfaces from two to one
- 50% reduction in blade switches from four to two
- 24% reduction in cables & transceivers from 32 to 24
- Frees up two I/O bays per chassis for additional I/O

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Dell M8428-k
10Gb Converged Network Switch

10Gb
Ethernet
(DCB/FCoE)

- Dell 10Gb Enhanced Ethernet 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 10Gb SFP+ Ethernet uplinks
    - Short-wave optical transceivers / fiber
    - Long-wave optical transceivers / fiber
    - 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

Dell M8428-k Converged Network Switch

10Gb Ethernet (DCB/FCoE)

Mezzanine cards

FCoE

Combine the Dell M8428-k converged network switch with the **Brocade BR1741M-k Dual Port 10Gb Converged Network Adapter (CNA) Mezzanine Card** for end-to-end convergence within M1000e

Mezz Card Slot B

Mezz Card Slot C

10Gb Ethernet (DCB)

Optical Transceivers

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

Cables

SFP+ Direct Attach (copper)
twin-ax cable with SFP+ connector
(1m, 3m, 5m available)

Management Port

8Gbps Fibre Channel

Optical Transceivers

Short Wave, Multi-Mode SFP+ Optics
(qty 4 included with every M8248-k)

Long Wave, Multi-Mode SFP+ Optics

Cables

I/O bays

B^1/B^2

C^1/C^2

Cisco Catalyst Blade Switches

Cisco Catalyst 3130X – 10G Switch

- 2x10GE uplinks (X2 – CX4, SR, LRM optics)
- Fixed 4xGE uplinks - 4xRJ45
- Virtual Blade Switch interconnect enabled

Cisco Catalyst 3130G – GE Switch

- Up to 8xGE uplinks – fixed 4xRJ45 + up to 4 optional 1GE SFPs (copper or optical)
- Virtual Blade Switch interconnect enabled

Cisco Catalyst 3032 -- Entry Level GE Switch

- Up to 8xGE uplinks - 4xRJ45 & up to 4 SFPs (copper or optical)

Virtual Blade Switch

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

Software

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

Cisco Catalyst Blade Switches

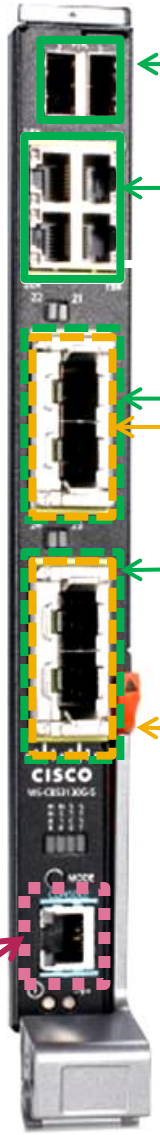
1Gb / 10Gb Ethernet

Mezzanine cards*

Use Broadcom 5709 dual port **server blade I/O Mezzanine Cards or Gigabit LOMs** in PE blade servers for Gigabit Ethernet I/O connectivity

GbE LOM Fab A | Mezz Card Slot B | Mezz Card Slot C

*Quad port GbE mezz cards (Broadcom or Intel) 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 mezz connection.



Management Port

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

GbE ports (all models)

Software Upgrades
IP Services Upgrade Available

CAT 5 Cables

TwinGig Converter (supports 2 x 1Gb SFP)

Note: 1 TwinGig connector ships by default in each switch module

Cisco SFP Modules

•GbE SFP RJ45 converter, Copper

CAT5 Cable

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

Fibre

10GBASE-CX4 X2 Module

(for 3130X)

CX4 cable, IB 4x connector

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

(3130X only)

MMF, dual SC connector

OneX SFP+ Converter Module
CVR-X2-SFP10G

(3130X only; via Dell S&P)

SFP+

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

Copper

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

Fibre

3130X 10GbE Modules

I/O bays

A1/A2

B1/B2

C1/C2

Gb Ethernet Pass Through

1Gb
Ethernet

Mezzanine cards*

Use Broadcom 5709 dual port **server blade I/O Mezzanine Cards** in PE blade servers for Gigabit Ethernet I/O connectivity

GbE LOM Fab A

Mezz Card Slot B

Mezz Card Slot C

*Quad port GbE mezz cards (Broadcom or Intel) 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 Pass Through only has one internal port per mezz connection.

Cables

CAT 5

1GbE Pass Through Module

- 16 ports correspond to 16 server blades
- Supports 10/100/1000Mb connections
  - Ethernet media speed is configured through the blade LOM firmware or by the operating system
- Transparent connection between LAN and server blades

I/O bays

A1/A2

B1/B2

C1/C2

10Gb Ethernet Pass Through

- 16 ports correspond to 16 server blades
- 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 (original model)
10Gb Ethernet Pass-Through II

10Gb Ethernet

Mezzanine cards

Combine the 10Gb Pass-Through with **Broadcom 57710 / 57711** or **Intel X520-x/k** dual-port 10Gb mezzanine cards for 10Gb Ethernet from server to LAN switch

Combine the 10Gb Pass-Through with **QLogic QME8142, Emulex OCm10102-f-m,** or **Intel X520-x/k** converged network adapters to the top-of-rack FCoE-enabled switch of your choice

Mezz Card Slot B

Mezz Card Slot C

Optical Transceivers

PCT 6XXX Short Range, Multi-Mode SFP+ Optics
PCT 6XXX Long Range, Multi-Mode SFP+ Optics[1]
PCT 6XXX Long Range, Single-Mode SFP+ Optics[2]

Cables

SFP+ Direct Attach (copper)
twin-ax cable with SFP+ connector
(0.5m, 1m, 3m, 5m, 7m available)

I/O bays

B[1]/B[2]

C[1]/C[2]

[1]LRM Optics are supported on 10Gb Ethernet Pass-Through (original model) only
[2]LR Optics are supported on 10Gb Ethernet Pass-Through II only

Fibre Channel

SimpleConnect for SAN

Dell 8/4Gbps FC SAN Module

Best solution for modular SAN connectivity

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

Dell 8/4Gbps FC SAN Module

- Base model provides 12 active ports with two external SAN 8Gb SWL optical transceivers
- Scalable to 24 active ports using 12-port *pay-as-you-grow* option kit (includes two additional 8Gb SWL SFP+ transceivers)
- Add additional 8Gb SWL SFP+ transceivers for up to 8 external SAN ports
- Ideal scalability for data centers deploying increasingly more blade enclosures while requiring FC connectivity
- Utilizes standards-based technology connecting to NPIV-enabled FC SANs
- Ideal for Dell blade enclosure connectivity to any FC SAN
- Supports 8-4-2Gbps I/O

Dell 8/4Gbps FC SAN Module

8/4Gb Fibre Channel

Mezzanine cards

Combine the M5424 with the **Qlogic QME2572 or Emulex LPe1205 Server Blade I/O Mezzanine Card** in PE blade servers for end-to-end 8Gbps I/O. FC4 mezz cards are also supported with this switch at 4Gbps.

Mezz Card Slot B

Mezz Card Slot C

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

Cables

Management Port

Base Model
Base Model includes dynamic 12-port license with **two** 8Gb SFP+ optical transceivers.

Options
Port upgrade license available to scale up to full 24 ports.
Single SFP+ optics available for use of additional external ports.

I/O bays

B¹/B²

C¹/C²

BROCADE M5424

- 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
- 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

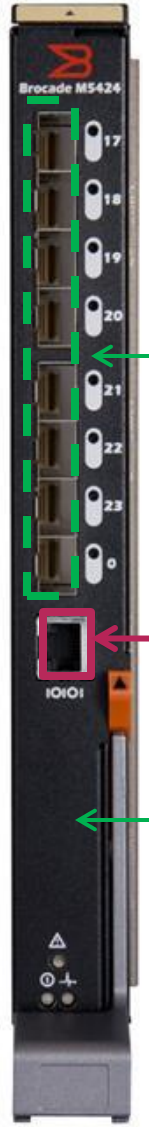
8/4Gb Fibre Channel

Mezzanine cards

Combine the M5424 with the **Qlogic QME2572 or Emulex LPe1205 Server Blade I/O Mezzanine Card** in PE blade servers for end-to-end 8Gbps I/O. FC4 mezz cards are also supported with this switch at 4Gbps.

Mezz Card Slot B

Mezz Card Slot C



Transceivers
Brocade SWL 8Gb SFP+ Optics
Brocade SWL 4Gb SFP+ Optics

Cables

Management Port

Models
Brocade M5424 24port w/ eight 8Gb SFPs plus Enterprise Performance Pack Software

Brocade M5424 24port w/ four 8Gb SFPs
Brocade M5424 12port w/two 8Gb SFPs

I/O bays

B1/B2

C1/C2

Dell 8/4Gbps Fibre Channel Pass-Through

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

Dell 8/4Gbps FC Pass-Through

8/4Gb Fibre Channel

Mezzanine cards

Combine the FC Pass-Through with the **Qlogic QME2572** or **Emulex LPe1205 Mezzanine Card** for end-to-end 8Gbps FC connectivity

Mezz Card Slot B

Mezz Card Slot C

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

Cables

I/O bays

B^1/B^2

C^1/C^2

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

InfiniBand

Mellanox 2401G

DDR InfiniBand Switch

- For high performance computing (HPC) and low latency applications
- Available in redundant switch configuration for fully non-blocking InfiniBand solution
- Links with Mellanox ConnectX or ConnectX2 DDR mezz card
(interoperable at 20Gb with Mellanox ConnectX or ConnectX2 QDR mezz card)

Internal Ports	16
External Ports	8
Speed	4x DDR Double Data Rate
Throughput	20Gb/s per port

Mellanox M2401G

20 Gbps InfiniBand

Mezzanine cards

ConnectX DDR (LFF†)

ConnectX2 DDR (SFF†)

Combine the M2401G with **Mellanox ConnectX** or **ConnectX2 DDR InfiniBand Mezzanine Cards** for end-to-end 20Gbps. This switch can also connect to Mellanox ConnectX/ConnectX2 QDR InfiniBand Mezzanine Cards for 20Gbps performance.

Mezz Slot B (SFF†)

Mezz Slot C (SFF/LFF†)

†LFF = large form factor / SFF = small form factor

Cables

CX4 Cables

*QDR IB mezz cards (ConnectX or ConnectX2) will function and are fully supported with this switch. In such configurations, the mezz card will run at DDR speed (20Gbps) rather than the full-capability QDR (40Gbps).

I/O bays

B1/B2

C1/C2

Mellanox 3601Q

QDR InfiniBand Switch

- For high performance computing (HPC) and low latency applications
- Fully non-blocking QDR IB solution
- Dual-wide I/O module occupies two chassis I/O bays
(factory installable in Fabric C1, occupying C1/B1)
- Links with Mellanox ConnectX or ConnectX2 QDR mezz card
(interoperable at 20Gb with Mellanox ConnectX or ConnectX2 DDR mezz card)

Internal Ports	16
External Ports	16
Speed	4x QDR Quad Data Rate
Throughput	40Gb/s per port

Mellanox M3601Q

40/20 Gbps InfiniBand

Mezzanine cards

ConnectX QDR (LFF†)

ConnectX2 QDR (SFF†)

Combine the M3601Q with **Mellanox ConnectX** or **ConnectX2 QDR InfiniBand Mezzanine Cards** for end-to-end 40Gbps. This switch can also connect to Mellanox ConnectX/ConnectX2 DDR InfiniBand Mezzanine Cards for 20Gbps performance.

Mezz Slot B (SFF†)

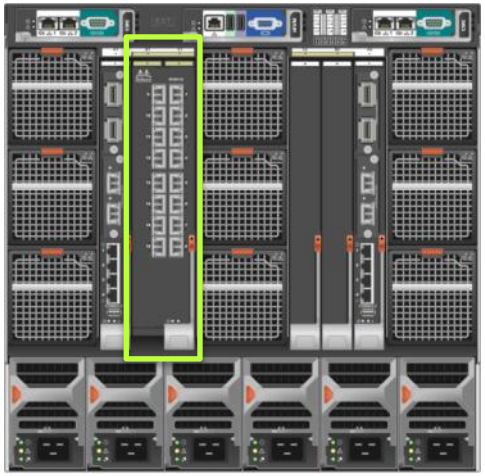
Mezz Slot C (SFF/LFF†)

†LFF = large form factor / SFF = small form factor

Cables

QSFP Active Optical
OR
QSFP Passive Copper

Sample configuration with dual-wide M3601Q in Fabric C (occupies C1+B1)



I/O bays

B¹ (+A¹)

B² (+C²)

C¹ (+B¹)

NOTE: Only 1 QDR mezzanine card per half-height blade server and only 1 M3601Q QDR switch per M1000e blade chassis can be configured from the Dell factory.
Additional/redundant configurations are supported via Custom Factory Integration (CFI) or on-site installation.