M-Series Blade
I/O Guide

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

September 2017

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## Blade Interconnects

### M-Series Blade I/O Guide

Transform your Dell M1000e blade server enclosure. 

**Ethernet Switching**

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<th>MXL</th>
<th>I/O Aggregator</th>
<th>M8024-k</th>
<th>M6348</th>
<th>M6220</th>
<th>10Gb Pass-Through</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10/40GbE Switch</strong></td>
<td>High performance blade provides maximum throughout, flexibility, and (i)SCSI/FCoe convergence.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>10GbE Plug and Play</strong></td>
<td>Converge infrastructure and connect easily to third-party networks with this flexible Layer 2 blade.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>10GbE Basic</strong></td>
<td>Transition to 10GbE connectivity and extend an available iSCSI/FCoE fabric with this Layer 2/3 switch.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>1GbE High-density</strong></td>
<td>Leverage existing Ethernet cabling to enable broader scalability in the data center with this Layer 2/3 switch.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1GbE Basic</strong></td>
<td>Flexible Layer 2/3 switch with dual expansion slots allowing you to customize connectivity options.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Direct connection</strong></td>
<td>Transparently connect 16 Dell blade servers into the LAN of your choice at 10Gb speeds.</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

### Performance

<table>
<thead>
<tr>
<th></th>
<th>Speeds</th>
<th>Switch fabric capacity</th>
<th>Forwarding capacity (Mpps)</th>
<th>Buffer size</th>
<th>Latency (Microseconds)</th>
<th>1GbE Plug and Play</th>
<th>1GbE Basic</th>
<th>10GbE Pass-Through</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1, 10, or 40GbE</td>
<td>1.28Tbps</td>
<td>480Gbps</td>
<td>357</td>
<td>1.85 µs</td>
<td>10/40GbE</td>
<td>10GbE</td>
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<td>10GbE</td>
<td>10GbE</td>
</tr>
</tbody>
</table>

### Ports

<table>
<thead>
<tr>
<th></th>
<th>Internal blade server ports</th>
<th>External 1GbE (Base-T)</th>
<th>External 10GbE</th>
<th>External 40GbE (QSFP+)*</th>
<th>Native Fibre Channel support</th>
<th>Expansion modules (FlexIO)</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>32 (10GbE)</td>
<td>4 (using modules)</td>
<td>8 ports using QSFP+ breakout cables (up to 24 using modules)</td>
<td>2 integrated QSFP+ (up to 6 using modules)</td>
<td>Up to 8 FC ports (8Gb)</td>
<td>2 slots and 4 options (mix or match)</td>
<td>DCB: FCoE, DCBx, and ETS</td>
</tr>
<tr>
<td></td>
<td>32 (10GbE)</td>
<td>4 (using modules)</td>
<td>8 ports using QSFP+ breakout cables (up to 16 using modules)</td>
<td>2 integrated QSFP+ fixed in breakout mode (up to 6 using modules)</td>
<td>Up to 8 FC ports (8Gb)</td>
<td>2 slots and 4 options (mix or match)</td>
<td>DCB: FCoE, DCBx, and ETS</td>
</tr>
<tr>
<td></td>
<td>16 (10GbE)</td>
<td>2 (using modules)</td>
<td>8 fixed SFP+ ports (1/10Gb) (Add 4 more 10Gb ports using module)</td>
<td>4 fixed SFP+ ports (1/10Gb)</td>
<td>-</td>
<td>1 slot and 2 options</td>
<td>Not suitable for iSCSI/FCoE and DCBx</td>
</tr>
<tr>
<td></td>
<td>32 (10GbE)</td>
<td>4 (using modules)</td>
<td>16 fixed (1GbE)</td>
<td>2 fixed SFP+ and 2 fixed CX4</td>
<td>-</td>
<td>2 slots and 4 options (mix or match)</td>
<td>Not suitable for iSCSI/FCoE and DCBx</td>
</tr>
<tr>
<td></td>
<td>32 (10GbE)</td>
<td>4 (using modules)</td>
<td>16 fixed (1GbE)</td>
<td>4 (using modules)</td>
<td>-</td>
<td>2 slots and 4 options (mix or match)</td>
<td>Not suitable for iSCSI/FCoE and DCBx</td>
</tr>
<tr>
<td></td>
<td>16 (10GbE)</td>
<td>2 (using modules)</td>
<td>16 fixed (1GbE)</td>
<td>16 fixed SFP+ (supports 10GbE only)</td>
<td>-</td>
<td>2 slots and 4 options (mix or match)</td>
<td>Not suitable for iSCSI/FCoE and DCBx</td>
</tr>
</tbody>
</table>

### Optical transceivers supported

- **QSFP+ (SR only)**
  - SFP+ (SR or LR)
  - SFP+ (SR, LR, LRM)
  - SFP+ (SR, LR, LRM)
  - SFP+ (SR, LR, LRM)
- **SFP+ (LR, LRM)**
  - SFP+ (LR, LRM)
  - SFP+ (LR, LRM)
  - SFP+ (SR, LR, LRM)
  - SFP+ (SR, LR, LRM)
- **Optics work in fixed ports only**
  - SFP+ (SR, LR, LRM)
  - SFP+ (SR, LR, LRM)
  - SFP+ (SR, LR, LRM)
  - SFP+ (SR, LR, LRM)

### Max L2 and L3 VLANs

- **Max L2 and L3 VLANs**
  - Max L2 and L3 VLANs: 4094/511
  - Max L2 and L3 VLANs: 4094 (Layer 2 only)
  - Max L2 and L3 VLANs: 1024/128
  - Max L2 and L3 VLANs: 1024/128
  - Max L2 and L3 VLANs: 1024/128
  - Max L2 and L3 VLANs: 1024/128

### Multicast Routing

- **Multicast Routing**
  - IGMP
  - IGMP snooping only
  - IGMP, PM, DVMRP
  - IGMP, PM, DVMRP, MLD
  - IGMP, PM, DVMRP
### Fibre Channel Switching

<table>
<thead>
<tr>
<th>Models</th>
<th>Brocade M6505</th>
<th>Brocade M5424</th>
<th>Dell 8/4Gbps Pass-Through Module</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High performance 16Gb Switch</strong></td>
<td>Transform SAN connectivity with maximum throughput and advanced management features for virtualized environments.</td>
<td>Connect directly to the Fibre Channel SAN, bypassing any external switches and reducing cables, optics, and management.</td>
<td>Directly connect and isolate bandwidth between servers and any Fibre Channel SAN infrastructure.</td>
</tr>
<tr>
<td><strong>Fibre Channel Switching Models</strong></td>
<td>Brocade M6505</td>
<td>Brocade M5424</td>
<td>Dell 8/4Gbps Pass-Through Module</td>
</tr>
<tr>
<td><strong>Performance</strong></td>
<td><strong>Speeds</strong></td>
<td>16Gbps (multi-speed 2, 4, 8, or 16Gbps)</td>
<td>8Gbps (multi-speed 2, 4, or 8Gbps)</td>
</tr>
<tr>
<td><strong>Switch capacity (Gbps)</strong></td>
<td>384 (768 full duplex)</td>
<td>192 (384 full duplex)</td>
<td>256 (full duplex)</td>
</tr>
<tr>
<td><strong>Max Buffer to Buffer Credit</strong></td>
<td>8106</td>
<td>688</td>
<td>-</td>
</tr>
<tr>
<td><strong>Latency (Microseconds)</strong></td>
<td>0.7 µs</td>
<td>0.7 µs</td>
<td>-</td>
</tr>
<tr>
<td><strong>Ports</strong></td>
<td><strong>Total ports</strong></td>
<td>24 (16 internal and 8 external)</td>
<td>24 (16 internal and 8 external)</td>
</tr>
<tr>
<td><strong>Port model options</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Port types</strong></td>
<td>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</td>
<td>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</td>
<td>N_Port</td>
</tr>
<tr>
<td><strong>Features</strong></td>
<td><strong>Security</strong></td>
<td>SSL, SSH v2, HTTPS, LDAP, RADIUS, Role-Based Access Control (RBAC), On-ChIP (between switches and end devices), Port Binding, Switch Binding, Secure RPC, Secure Copy (SCP), Trusted Switch, IPSec, IP Filtering</td>
<td>-</td>
</tr>
<tr>
<td><strong>Management</strong></td>
<td>HTTP, SNMP v1/v3 (FE MB, FC Management MB), 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); SM-S compliant, Administrative Domains; trial licenses for add-on capabilities</td>
<td>Telnet, HTTP, SNMP v1/v3 (FE MB, FC Management MB); Auditing, Syslog, Change Management tracking; EZSwitchSetup wizard; Brocade Advanced Web Tools, Brocade DCFM Professional/Enterprise, SM-S compliant, SM-S scripting toolkit, Administrative Domains</td>
<td>Module is unmanaged – all management occurs via HBA firmware or external switches</td>
</tr>
<tr>
<td><strong>Enterprise Performance Pack</strong></td>
<td>Software license option that includes Adaptive Networking, ISL Trunking, Fabric Watch, and Advanced Performance Monitoring</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>ISL Trunking</strong></td>
<td>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)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Maximum frame size</strong></td>
<td>2112-byte payload</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Classes of service</strong></td>
<td>Class 2, Class 3, and Class F (inter-switch frames)</td>
<td>Fabric Switches supporting unicast</td>
<td>Fabric switches supporting unicast and broadcast</td>
</tr>
<tr>
<td><strong>Data traffic types</strong></td>
<td>Fabric Switches supporting unicast</td>
<td>Fabric switches supporting unicast and broadcast</td>
<td>-</td>
</tr>
<tr>
<td><strong>Brocade optical transceivers (requires SFP LC connector)</strong></td>
<td>16Gbps: SWL, LWL, or ELWL</td>
<td>8Gbps: SWL or LWL</td>
<td>8Gbps: SWL, LWL, or ELWL</td>
</tr>
<tr>
<td><strong>Fabric Services</strong></td>
<td>Simple Name Server (SNS), Registered State Change Notification (RSCN), NTP v-3, Reliable Commit Service (RCS), Dynamic Path Selection (DPS), Brocade Advanced Zoning (default zoning, port/VWN zoning, broadcast zoning), NPIV, and FDMI</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
### Blade Interconnects
#### M-Series Blade I/O Guide

**Cisco Models**

<table>
<thead>
<tr>
<th>Model</th>
<th>B22DELL FEX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10GbE Fabric Extender</strong></td>
<td>Acts as a remote line card of the parent Nexus switch fabric.</td>
</tr>
</tbody>
</table>

**Performance**

<table>
<thead>
<tr>
<th>Speeds</th>
<th>100GbE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch fabric capacity</td>
<td>160Gbps</td>
</tr>
<tr>
<td>Forwarding capacity (Mpps)</td>
<td>297</td>
</tr>
<tr>
<td>Latency (Microseconds)</td>
<td>0.8 µs</td>
</tr>
</tbody>
</table>

**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

**Twin-ax cables**

- 1m: SFP-H10GB-CU1M
- 3m: SFP-H10GB-CU3M
- 5m: SFP-H10GB-CU5M
- 7m: SFP-H10GB-CU7M
- 10m: SFP-H10GB-CU10M

**Optical transceivers supported**

- FET-10G
- SFP-10G-SR
- SFP-10G-LR
- SFP-10G-ER

**Simplified Networking Mode**

Managed at top-of-rack

**InfiniBand Models**

<table>
<thead>
<tr>
<th>Model</th>
<th>Mellanox 4001F</th>
<th>Mellanox 4001T</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High performance InfiniBand switch</strong></td>
<td><strong>Mainstream InfiniBand switch</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Performance**

| Speed / Bit rate | FDR/56 Gbps | FDR10/40Gbps |
| Data rate | 56Gbps | 40Gbps |
| Switch capacity | 3.56Tbps | 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 capabilities

**Optics/cables**

- QSFP active optical or passive fiber

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

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*Availability and terms of Dell Services vary by region. For more information, visit Dell.com/service descriptions
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
Converged Ethernet

10/40Gb Switch MXL
10Gb Plug and Play M-IOA
10Gb Basic M8024-k
10Gb Pass-Through
10Gb B22DELL FEX
MXL – 10/40GbE blade

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**

**10G**
- Cavium QLogic 57810S-k
- Cavium QLogic 57840S-k
- Emulex OCM14102-AS-D
- Emulex OCM14102B-NS-D
- Emulex OCM14102B-Nb-D
- Emulex OCM14102B-Nb-D
- Emulex OCM14102B-UJ-D
- Emulex OCM14102B-UJ-D
- Emulex OCM14102B-US-D
- Intel X520-sR

**14G**
- Cavium QLogic 57810S-k
- Intel X520-sR
- Intel X710-k
- Mellanox CX-3 DP 10Gbe
- Mellanox CX-3 Pro DP 10Gbe

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

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

**More details in Adapter Portfolio section**

**Designed for I/O bays**

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

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

**4 port FC Module**

**2 port QSFP+ Module**

**Secondary Management Serial Port**
(Cable included)

**USB Port**

**Optical Transceivers**
- SFP+ 10Gb: SR, LR
- SFP+ 1GbE: SX, LX

**SFP to RJ45 converter**
- 1000Base-T (only capable of 1Gbps)
- (0.5m, 1m, 2m, 3m, 5m, 7m available)
- Can operate at 10G and 1Gb

**SFP+ Direct Attach Cable (Twinax)**
- RJ45 / Cat6a Copper
- 10Gb/1Gb
- (supports auto-negotiation)

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

**QSFP+ to 4xSFP+ Breakout Cables**
- 5m Passive Copper
- 40GBASE-CR4 10Gb

**QSFP+ to QSFP+ Direct Attach**
- 1m, and 5m, Passive Copper
- 40GBASE-CR4 40Gb

**Optical Transceivers**
- SFP+ 40Gb: SR only

**QSFP+ to QSFP+ Fiber Cables**

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

FlexIO modules do not have to be the same.
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

**13G**
- Cavium QLogic 57810S-k
- Cavium QLogic 57840S-a
- Emulex OCm14102-AN-D
- Emulex OCm14102-BN-ID
- Emulex OCm14102-N8-D
- Emulex OCm14102-N9-D
- Emulex OCm14102-U4-D
- Emulex OCm14102-U5-D
- Intel X520-k
- Mellanox CX-3 DP 10GbE
- Mellanox CX-3 Pro DP 10GbE

**40G**
- Cavium QLogic 57810S-k
- Intel X710-k
- Mellanox CX-3 Pro DP 10GbE

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

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

---

#### More details in Adapter Portfolio section

#### Designed for I/O bays

- **A1/A2**
- **B1/B2**
- **C1/C2**

---

#### FlexIO modules do not have to be the same

#### Optical Transceivers

- **SFP+ 10Gb:** SR, LR
- **SFP 1GbE:** SX, LX

#### SFP to RJ45 converter

1000Base-T (only capable of 1Gbps)

#### SFP+ Direct Attach Cable (Twinax)

(0.5m, 1m, 2m, 3m, 5m, 7m available) Can operate at 10Gb and 1Gb

#### RJ45 / Cat6a Copper

10Gb/1Gb (supports auto-negotiation)

#### Optical Transceivers

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

#### QSFP+ to 4xSFP+ Breakout Cables

- 5m Passive Copper
  - 40GBASE-CR4 10Gb

#### QSFP+ to QSFP+ Direct Attach

- 1m, and 5m, Passive Copper
  - 40GBASE-CR4 40Gb

#### SFP+ to QSFP+ Breakout Cables

#### QSFP+ to QSFP+ Fiber Cables

---

#### Two Integrated QSFP+ ports

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

#### Secondary Management Serial Port (Cable included)

#### USB Port
M8024-k

Fully modular full wire-speed 10GbE managed Layer 2/3 Ethernet switching

Converged
- Supports DCB (protocols PFC and DCBx)
- FCoE Transit Switch via FIP Snooping Bridge (not supported in Simple Switch Mode)
- Stack up to 6 devices using SFP+ fixed ports or SFP+ module (not supported in Simple Switch Mode)

24 port design features:
- 16 internal 10Gb server ports
- 4 integrated external SFP+ ports (multi-speed 1/10Gb)
- Up to 4 additional external ports via FlexIO modules

FlexIO fully modular design enables connectivity choices including SFP+, and 10GBASE-T

Default mode of operation is Simple Switch Mode (port aggregator); user-configurable to full switch mode

Provides connectivity for the latest 10Gb-KR NICs and CNAs, including those supporting Switch Independent Partitioning
### Adapters

<table>
<thead>
<tr>
<th>13G</th>
<th>14G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cavium QLogic 57810S-k</td>
<td>Cavium QLogic 57810S-k</td>
</tr>
<tr>
<td>Cavium QLogic 57840S-k (links 2 ports)</td>
<td>Cavium QLogic 57840S-k (links 2 ports)</td>
</tr>
<tr>
<td>Emulex OCm14102-N5-D</td>
<td>Emulex OCm14102-N5-D</td>
</tr>
<tr>
<td>Emulex OCm14102B-N5-D</td>
<td>Emulex OCm14102B-N5-D</td>
</tr>
<tr>
<td>Emulex OCm14102-N6-D</td>
<td>Emulex OCm14102-N6-D</td>
</tr>
<tr>
<td>Emulex OCm14102B-N6-D</td>
<td>Emulex OCm14102B-N6-D</td>
</tr>
<tr>
<td>Emulex OCm14102-U4-D</td>
<td>Emulex OCm14102-U4-D</td>
</tr>
<tr>
<td>Emulex OCm14102B-U4-D</td>
<td>Emulex OCm14102B-U4-D</td>
</tr>
<tr>
<td>Emulex OCm14102-US-D</td>
<td>Emulex OCm14102-US-D</td>
</tr>
<tr>
<td>Intel X710-k</td>
<td>Intel X710-k</td>
</tr>
<tr>
<td>Mellanox CX-3 DP 10GbE</td>
<td>Mellanox CX-3 Pro DP 10GbE</td>
</tr>
</tbody>
</table>

Supports connectivity to 10Gb-KR adapters, all of which are noted 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

### Converged

- **10GBase-T Copper Module**
  - Supports auto-negotiation to 100Mb/1Gb

- **10GbE SFP+ Module**
  - (10Gb only)

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

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

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

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

- **1GbE Optical Transceivers**
  - SFP 1GbE: SX, LX
  - Fixed ports can support both SFP and SFP+ optics

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

### More Details

**Designed for I/O bays**

- **A1/A2**
- **B1/B2**
- **C1/C2**

- **Secondary Management Serial Port**
  - (Cable included)

- **Uplinks**
  - RJ45 / Cat6a

- **Cables**
  - **10GbE**
  - **SFP**

- **Uplinks**
  - **10GbE**
  - **SFP+**

- **FlexIO** modules cannot support both SFP and SFP+ optics while the fixed ports can support both SFP and SFP+ optics.
10Gb Ethernet Pass Through -k

16 ports correspond to 16 server blades
  • Only supports -k mezz cards

16 external 10GbE SFP+ ports
  • Supports 10Gb connections ONLY

Supports DCB/CEE and FCoE
  • Connect to top-of-rack FCoE switches and Converged Network Adapters (CNA's) in individual blades

Transparent connection between blade servers and external LAN
10Gb Ethernet Pass Through -k

**Adapters**

**13G**
- Cavium QLogic 57810S-k
- Cavium QLogic 57840S-k (Links 2 ports)
- 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-US-D
- Emulex OCm14102B-US-D
- Intel X710-k
- Mellanox CX-3 DP 10GbE
- Mellanox CX-3 Pro DP 10GbE

**14G**
- Cavium QLogic 57810S-k
- Intel X520-k
- Intel X710-k
- Mellanox CX-3 Pro DP 10GbE

Supports connectivity to 10Gb-KR adapters, all of which are notated with "-k." It does not provide connectivity to legacy 10Gb-XAUI NICs/CNAs. 1Gb Ethernet mezzanine cards and LOMs are not supported.

**More details in Adapter Portfolio section**

**Designed for I/O bays**

- A1/A2
- B1/B2
- C1/C2

**10Gb Optical Transceivers**
- SR & LR

**SFP+ Direct Attach Cable (Twinax)**
- (0.5m, 1m, 3m, 5m, 7m available)
Cisco Nexus B22DELL Fabric Extender

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 specific Cisco Nexus models:
- Cisco Nexus 5500, 5600, 6000, and 9000 Series switches
  It cannot connect to Cisco Nexus 5010, 5020, 2000 or 7000 series switches.

Managed from the Nexus Top of Rack
- B22DELL FEX is managed at the top of rack and not managed at the M1000e nor the FEX device itself
- Acts as a line card to supported Nexus Series switches
Cisco Nexus B22DELL Fabric Extender

**Adapters**

**10G**
- Cavium QLogic 57810S-k
- Cavium QLogic 57840S-x (Links 2 ports)
- Emulex OCM14102-N6-D
- Emulex OCM14102B-N6-D
- Emulex OCM14102-N6-D
- Emulex OCM14102B-N6-D
- Emulex OCM14102-U4-D
- Emulex OCM14102B-U4-D
- Emulex OCM14102-US-D
- Emulex OCM14102B-US-D
- Intel X320-x/v
- Intel X710-k
- Mellanox CX-3 DP 10GbE
- Mellanox CX-3 Pro DP 10GbE

**14G**
- Cavium QLogic 57810S-k
- Intel X320-x/v
- Intel X710-k
- Mellanox CX-3 Pro DP 10GbE

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**

**Converged**

**Compatible Parent Switches**

- Nexus 5548P Switch
- Nexus 5548UP Switch
- Nexus 5596UP Switch
- Nexus 56128P Switch
- Nexus 5624Q Switch
- Nexus 5648Q Switch
- Nexus 5672-16G Switch
- Nexus 5672UP Switch
- Nexus 5696Q Switch
- Nexus 6001P Switch
- Nexus 6004 Switch
- Nexus 6004-EF Switch
- Nexus 93180YC-EX Switch
- Nexus 9372PX Switch
- Nexus 9372PX-E Switch
- Nexus 9396PX Switch

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

Customers should verify parent switch compatibility with Cisco.

This is not a usable port. There is no management serial port on the B22DELL (external or 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
- SPF 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.
## Comparison of Converged Blade options

<table>
<thead>
<tr>
<th>Model</th>
<th>Dell MXL Switch</th>
<th>Dell PowerEdge M I/O Aggregator</th>
<th>Cisco Nexus B22DELL FEX</th>
<th>Dell M8024-k</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overview</strong></td>
<td>10/40GbE Switch</td>
<td>10GbE Plug &amp; Play</td>
<td>10GbE Extender</td>
<td>10GbE Basic</td>
</tr>
<tr>
<td><strong>Server Ports Supported</strong></td>
<td>32 (10GbE)</td>
<td>32 (10GbE)</td>
<td>16 (10GbE)</td>
<td>16 (10GbE)</td>
</tr>
<tr>
<td><strong>External 40G Ports (QSFP+)</strong></td>
<td>2 Fixed – 6 Total</td>
<td>2 Fixed – 6 Total (Note: QSFP+ ports run in breakout mode 4x10GbE only)</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td><strong>External 10G Ports</strong></td>
<td>24 (16 per LAG)</td>
<td>24 (16 in a single LAG)</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td><strong>Flex I/O Expansion Modules</strong></td>
<td>Two slots and four options (Mix or match)</td>
<td>None</td>
<td>One slot &amp; 2 options</td>
<td>None &lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>• 2 port QSFP+ (10/40GbE)</td>
<td>None</td>
<td>• 4 port SFP+ (10GbE)</td>
<td>• 2 port Base-T (1/10Gb)</td>
</tr>
<tr>
<td></td>
<td>• 4 port SFP+ (1/10GbE)</td>
<td>None</td>
<td>• 4 port Base-T (1/10GbE)</td>
<td>• 2 port Base-T (1/10Gb)</td>
</tr>
<tr>
<td></td>
<td>• 4 port FC8 (2/4/8Gb)</td>
<td>None</td>
<td>• 4 port FC8 (2/4/8Gb)</td>
<td>• 2 port Base-T (1/10Gb)</td>
</tr>
<tr>
<td><strong>Stacking</strong></td>
<td>6</td>
<td>n/a</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>East-west traffic support</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>No (All traffic is forwarded to Nexus Top-of-Rack / End-of-Row)</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Support for M420 Quarter-Height Blades on Fabric A</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Not in a redundant manner</td>
<td>Not in a redundant manner</td>
</tr>
<tr>
<td><strong>Support for MLAG (vLT/vPC)</strong></td>
<td>Yes (Enabled via CLI)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Support for quad-port GbE and 10Gb LOM/Mezz</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
1Gb Ethernet

1/10Gb High-density M6348
1/10Gb Basic M6220
1Gb Pass-Through
M6348
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.

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)

More details in Adapter Portfolio section

Designed for I/O bays
A¹/A²
B¹/B²
C¹/C²
**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**
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

1/10GbE
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

**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
# M-Series Fibre Channel Comparison

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

**13G**
- Emulex LPe1205-M FC8
- Emulex LPrm15002B-D FC8
- Emulex LPm16002B FC16
- QLogic QME2572 FC8
- QLogic QME2662 FC16

**14G**
- Emulex LPe1205-M 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

- B1/B2
- C1/C2

### Brocade Transceivers

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

Note: Requires SFP LC connector

### 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

**13G**
- Emulex LPe1205-M FC8
- Emulex LPm15002B-D FC8
- Emulex LPm16002B FC16
- QLogic QME2572 FC8
- QLogic QME2662 FC16

**14G**
- Emulex LPe1205-M FC8
- Emulex LPm16002B FC16
- QLogic QME2572 FC8
- QLogic QME2662 FC16

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

### Designed for I/O bays

- **B¹/B²**
- **C¹/C²**

### More details in Adapter Portfolio section

### 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)

### Cables

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

Note: Requires SFP LC connector

**Secondary Management Serial Port**
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

13G & 14G
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.

Adapters Designed for I/O bays

B1/B2
C1/C2

More details in Adapter Portfolio section

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

Cables
InfiniBand
Mellanox Blades

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

<table>
<thead>
<tr>
<th></th>
<th>M4001F</th>
<th>M4001T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>FDR</td>
<td>FDR10</td>
</tr>
<tr>
<td>Data rate</td>
<td>56Gbps</td>
<td>40Gbps</td>
</tr>
<tr>
<td>Total ports</td>
<td>32 (16 internal and 16 external)</td>
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</tr>
</tbody>
</table>
Mellanox M4001F & M4001T

Adapters
Combine the with Mellanox ConnectX3 InfiniBand mezz cards for end to end FDR or FDR10.
FDR10 not supported on 14G servers.
QDR ConnectX3 and QDR ConnectX2 cards are fully supported with these switches. They will connect at QDR speeds.

More details in Adapter Portfolio section

Designed for I/O bays

M4001F FDR
Not a Management Port. Debug port only

M4001T FDR10
Not a Management Port. Debug port only

Cables
QSFP Active Optical or QSFP Passive Copper

Cables
QSFP Active Optical or QSFP Passive Copper
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

Rapid EqualLogic Configuration Portal
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
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
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
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
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.
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
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

Fabric A1
Reserved for 1/10GbE LOMs or Select Network Adapters

Fabric B1
1/10/40 GbE, 4/8/16Gb FC, 20/40/56Gb IB

Fabric C1
1/10/40 GbE, 4/8/16Gb FC, 20/40/56Gb IB

Fabric A2
Reserved for 1/10GbE LOMs or Select Network Adapters

Fabric B2
1/10/40 GbE, 4/8/16Gb FC, 20/40/56Gb IB

Fabric C2
1/10/40 GbE, 4/8/16Gb FC, 20/40/56Gb IB

Colors chosen to facilitate whiteboard discussions.

The capabilities of the enhanced midplane (1.1) are shown above
M-Series Blade I/O Fabrics

Quarter Height Blades
- One dual port LOM
- IOM with 32 internal ports (M6348 or Dell Force10 MXL) is needed to connect all LOM ports on all blades
- 2 x 32 port IOMs needed to connect the 2 LOM ports on each blade
- One fabric B OR fabric C mezzanine card

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

Full Height Blades
- Two Select Network Adapters or LOMs
- Two fabric B mezzanine cards
- Two fabric C mezzanine cards
M1000e Midplane Mapping and Capabilities

Fabric A Capabilities:
- Up to 2 lanes to each IOM
- 1Gb or 10Gb Ethernet per each lane

Fabric B & C Capabilities:
- 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

- 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

- 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

![Diagram showing port mapping](image)
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

- 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

- Link between a dual port adapter and switch of same fabric type
- Additional link provided by quad-port adapter cards and an IOM with 32 internal ports
- Redundant LOM link that requires an IOM with 32 internal ports. There will be no connection on this link with IOMs with only 16 ports
Port Mapping of Quarter Height blades to two IOMs with 32 Internal Ports on Fabric A: Full LOM Port Redundancy

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

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

- 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
Dell PowerEdge M1000e I/O Interoperability Guide
# PowerEdge M1000e 1Gb Ethernet I/O Interoperability

<table>
<thead>
<tr>
<th>Adapters</th>
<th>1GbE Pass-Through</th>
<th>M6348</th>
<th>M6220</th>
<th>Cisco 3032 (EOL)</th>
<th>Cisco 3130G (EOL)</th>
<th>Cisco 3130X (EOL)</th>
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</table>
## PowerEdge M1000e 10Gb Ethernet I/O Interoperability

### 10Gb Ethernet I/O Modules

<table>
<thead>
<tr>
<th>NDC Adapters</th>
<th>MXL</th>
<th>PowerEdge M I/O Aggregator</th>
<th>M8024-k (EOL)</th>
<th>M8428-k (EOL)</th>
<th>10Gb Pass-Through (Original Model/ EOL)</th>
<th>10Gb Pass-Through II (EOL)</th>
<th>10Gb Pass-Through-k</th>
<th>Cisco B22DELL</th>
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</table>

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.
### 10Gb Ethernet I/O Modules

<table>
<thead>
<tr>
<th>Mezzanine Cards</th>
<th>MXL</th>
<th>PowerEdge M I/O Aggregator</th>
<th>M8024-k</th>
<th>M8024 (EOL)</th>
<th>M8428-k (EOL)</th>
<th>10Gb Pass-Through (Original Model/EOL)</th>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Not Compatible</td>
<td>✓</td>
<td>N/A</td>
<td>N/A</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

*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).*

*Not Compatible*

*This combination is not possible*

*N/A*

*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

<table>
<thead>
<tr>
<th>Mezzanine Cards</th>
<th>M2401G Mellanox DDR (EOL)</th>
<th>M3601Q Mellanox QDR (EOL)</th>
<th>M4001Q Mellanox QDR (EOL)</th>
<th>M4001T Mellanox FDR10</th>
<th>M4001F Mellanox FDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mellanox DDR ConnectX</td>
<td>✓ DDR</td>
<td>✓ DDR</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>Mellanox QDR ConnectX-2</td>
<td>✓ DDR</td>
<td>✓ QDR</td>
<td>✓ QDR</td>
<td>✓ QDR</td>
<td>✓ QDR</td>
</tr>
<tr>
<td>Mellanox QDR ConnectX-3</td>
<td>Not Supported</td>
<td>✓ QDR</td>
<td>✓ QDR</td>
<td>✓ QDR*</td>
<td>✓ QDR</td>
</tr>
<tr>
<td>Mellanox FDR10 ConnectX-3</td>
<td>Not Supported</td>
<td>✓ QDR</td>
<td>✓ QDR</td>
<td>✓ FDR10</td>
<td>✓ FDR10</td>
</tr>
<tr>
<td>Mellanox FDR ConnectX-3</td>
<td>Not Supported</td>
<td>✓ QDR</td>
<td>✓ QDR</td>
<td>✓ FDR10</td>
<td>✓ FDR**</td>
</tr>
</tbody>
</table>

✓ **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

<table>
<thead>
<tr>
<th>Blade Servers</th>
<th>Mellanox DDR ConnectX</th>
<th>Mellanox QDR ConnectX-2</th>
<th>Mellanox QDR ConnectX-3</th>
<th>Mellanox FDR10 ConnectX-3</th>
<th>Mellanox FDR ConnectX-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>M420</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td></td>
<td></td>
<td>Not Supported</td>
</tr>
<tr>
<td>M520</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td></td>
<td></td>
<td>Not Supported</td>
</tr>
<tr>
<td>M620</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td></td>
<td></td>
<td>Not Supported</td>
</tr>
<tr>
<td>M630</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td></td>
<td>Not Supported</td>
</tr>
<tr>
<td>M640</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>M820</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td></td>
<td></td>
<td>Not Supported</td>
</tr>
<tr>
<td>M830</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td></td>
<td>Not Supported</td>
</tr>
<tr>
<td>M910</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>Not Supported</td>
</tr>
<tr>
<td>M915</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>Not Supported</td>
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</table>
# PowerEdge M1000e Fibre Channel I/O Interoperability

<table>
<thead>
<tr>
<th>Mezzanine Cards</th>
<th>Fibre Channel I/O Modules</th>
<th>FC4 Passthrough (EOL)</th>
<th>M4424 Brocade FC4 (EOL)</th>
<th>FC8 Passthrough</th>
<th>Dell 8/4Gbps FC SAN Module (EOL)</th>
<th>M5424 Brocade FC8</th>
<th>M6505 Brocade FC16*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emulex FC4</td>
<td>✓ FC4</td>
<td>✓ FC4</td>
<td>✓ FC4</td>
<td>✓ FC4</td>
<td>✓ FC4</td>
<td>✓ FC4</td>
<td>Not Compatible</td>
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<tr>
<td>QLogic FC4</td>
<td>✓ FC4</td>
<td>✓ FC4</td>
<td>✓ FC4</td>
<td>✓ FC4</td>
<td>✓ FC4</td>
<td>✓ FC4</td>
<td>Not Compatible</td>
</tr>
<tr>
<td>Emulex LPe1205-M FC8</td>
<td>✓ FC4</td>
<td>✓ FC4</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
</tr>
<tr>
<td>Emulex LPm15002B-D FC8</td>
<td>Not Compatible</td>
<td>Not Compatible</td>
<td>Not Compatible</td>
<td>Not Compatible</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
</tr>
<tr>
<td>QLogic QME2572 FC8</td>
<td>✓ FC4</td>
<td>✓ FC4</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
</tr>
<tr>
<td>Emulex LPm16002B-D FC16</td>
<td>Not Compatible</td>
<td>Not Compatible</td>
<td>Not Compatible</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
<td>✓ FC16*</td>
</tr>
<tr>
<td>QLogic QME2662 FC16</td>
<td>Not Compatible</td>
<td>Not Compatible</td>
<td>Not Compatible</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
<td>✓ FC16*</td>
</tr>
</tbody>
</table>

* The M6505 requires the enhanced midplane (1.1) for the M1000e chassis. The switch will not function with the original midplane (1.0)
## PowerEdge Blade Servers and Fibre Channel Adapters

<table>
<thead>
<tr>
<th>Blade Servers</th>
<th>Fibre Channel Mezzanine Cards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Emulex LPe1205-M FC8</td>
</tr>
<tr>
<td>M420</td>
<td>✓</td>
</tr>
<tr>
<td>M520</td>
<td>✓</td>
</tr>
<tr>
<td>M620</td>
<td>✓</td>
</tr>
<tr>
<td>M630</td>
<td>✓</td>
</tr>
<tr>
<td>M640</td>
<td>✓</td>
</tr>
<tr>
<td>M820</td>
<td>✓</td>
</tr>
<tr>
<td>M830</td>
<td>✓</td>
</tr>
<tr>
<td>M910</td>
<td>✓</td>
</tr>
<tr>
<td>M915</td>
<td>✓</td>
</tr>
</tbody>
</table>
Server Adapter Portfolio

Includes: Server Adapter products, features, compatibility and software support matrix
11G/12G/13G/14G 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 X520-2P Mezz
- Mellanox ConnectX-3 Mezz
- Mellanox ConnectX-3 Pro Mezz

Fibre Channel
- Emulex LPe1205-M FC8
- Emulex LPe15002B-D FC8
- Emulex LPe16002B-D FC16
- QLogic QME2672 FC8
- QLogic QME2662 FC16

10Gb Converged Ethernet
- Brocade BR1741M-k Mezz
- Cavium QLogic 57810S-k 2P NDC
- Cavium QLogic 57810S-k 2P LOM
- Cavium QLogic 57810S-k 2P Mezz
- Cavium QLogic 57840S-k 4P NDC
- 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

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

<table>
<thead>
<tr>
<th>Features</th>
<th>Intel X520-k NDC</th>
<th>Intel X710-k NDC</th>
<th>Cavium QLogic 57810S-k NDC</th>
<th>Cavium QLogic 57840S-k NDC</th>
<th>QLogic QMD8262-k NDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ports x Link speed</td>
<td>2x10Gb</td>
<td>2x10Gb or 4x10Gb</td>
<td>2x10Gb</td>
<td>4x10Gb</td>
<td>2x10Gb</td>
</tr>
<tr>
<td>Supported speed</td>
<td>1Gb, 10Gb</td>
<td>10Gb</td>
<td>1Gb, 10Gb</td>
<td>1Gb, 10Gb</td>
<td>10Gb</td>
</tr>
<tr>
<td>Chipset</td>
<td>X520/82599</td>
<td>X710</td>
<td>57810S</td>
<td>57810S</td>
<td>P3+</td>
</tr>
<tr>
<td>iSCSI HBA</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>iSCSI Boot</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>FCoE</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>FCoE Boot</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Switch independent NIC partitioning</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>DCB</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SR-IOV</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>WOL</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PXE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>EEE</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Multi-queue(^\text{a}) (per port)</td>
<td>64 TX, 64 RX</td>
<td>128 TX, 128 RX</td>
<td>128 TX, 128 RX</td>
<td>128 TX, 128 RX</td>
<td>64 TX, 64 RX</td>
</tr>
<tr>
<td>Supported servers</td>
<td>M620, M820, M630, M830, M640</td>
<td>M630, M830, M640</td>
<td>M620, M820, M630, M830, M640</td>
<td>M620, M820, M630, M830</td>
<td>M620, M820</td>
</tr>
<tr>
<td>Strengths</td>
<td>Preference for Intel Ethernet solutions, Software iSCSI and FCoE</td>
<td>Preference for Intel Ethernet solutions, Software iSCSI and FCoE</td>
<td>Continuity from older server designs, Convergence features FCoE, iSCSI HBA, and NPAR</td>
<td>High port count, Convergence features FCoE, iSCSI HBA, and NPAR</td>
<td>Trusted storage driver stack, Convergence features FCoE, iSCSI HBA, and NPAR</td>
</tr>
</tbody>
</table>

\(^\text{a}\)Citrix XenServer 6.0 and Linux KVM only. 63 VFs per port.  
\(^\text{b}\)Number of queues will vary depending on hypervisor memory limitations.
## 10Gb Select Network Adapters (NDC) for blade servers

### Emulex

<table>
<thead>
<tr>
<th>Features</th>
<th>Emulex OCM14102-U2-D NDC</th>
<th>Emulex OCM14102-U4-D NDC</th>
<th>Emulex OCM14102B-U4-D NDC</th>
<th>Emulex OCM14102-N6-D NDC</th>
<th>Emulex OCM14102B-N6-D NDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ports x Link speed</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
</tr>
<tr>
<td>Supported speed</td>
<td>10Gb</td>
<td>10Gb</td>
<td>10Gb</td>
<td>10Gb</td>
<td>10Gb</td>
</tr>
<tr>
<td>Chipset</td>
<td>Skyhawk</td>
<td>Skyhawk</td>
<td>Skyhawk</td>
<td>Skyhawk</td>
<td>Skyhawk</td>
</tr>
<tr>
<td>iSCSI HBA</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>iSCSI Boot</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>FCoE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>FCoE Boot</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Switch independent NIC partitioning</td>
<td>Yes (4 per 10Gb port)</td>
<td>Yes (8 per 10Gb port)</td>
<td>Yes (8 per 10Gb port)</td>
<td>Yes (8 per 10Gb port)</td>
<td>Yes (8 per 10Gb port)</td>
</tr>
<tr>
<td>DCB</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SR-IOV</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>WOL</td>
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<td>Yes</td>
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<td>PXE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>EEE</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Multi-queue1 (per port)</td>
<td>128 TX, 128 RX</td>
<td>128 TX, 128 RX</td>
<td>128 TX, 128 RX</td>
<td>128 TX, 128 RX</td>
<td>128 TX, 128 RX</td>
</tr>
<tr>
<td>Supported servers</td>
<td>M620, M620</td>
<td>M630, M830</td>
<td>M630, M830</td>
<td>M630, M830</td>
<td>M630, M830</td>
</tr>
<tr>
<td>Strengths</td>
<td>Convergence features FCoE, iSCSI HBA, and NPAR</td>
<td>Convergence features FCoE, iSCSI HBA, and NPAR</td>
<td>Convergence features FCoE, iSCSI HBA, and NPAR</td>
<td>NPAR EP, RoCE support</td>
<td>NPAR EP, RoCE support</td>
</tr>
</tbody>
</table>

1Number of queues will vary depending on hypervisor memory limitations.
# 10Gb mezzanine cards for blade servers

## Intel / Mellanox / QLogic

<table>
<thead>
<tr>
<th>Features</th>
<th>Intel X520-x/k</th>
<th>Mellanox ConnectX-3-k</th>
<th>Mellanox ConnectX-3 Pro-k</th>
<th>Cavium QLogic 57810S-k</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ports x Link speed</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
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<td>Supported speed</td>
<td>10Gb</td>
<td>10Gb</td>
<td>10Gb</td>
<td>10Gb</td>
</tr>
<tr>
<td>Chipset</td>
<td>X520</td>
<td>ConnectX-3</td>
<td>ConnectX-3 Pro</td>
<td>57810S</td>
</tr>
<tr>
<td>iSCSI HBA</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>iSCSI Boot</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>FCoE</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>FCoE Boot</td>
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<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Switch independent NIC partitioning</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes4 per 10Gb port</td>
</tr>
<tr>
<td>DCB</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>SR-IOV</td>
<td>Yes¹</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>WOL</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PXE</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>EEE</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>RoCE</td>
<td>No</td>
<td>Yes</td>
<td>Yes, RoCEv2</td>
<td>No</td>
</tr>
<tr>
<td>Multi-queue² (per port)</td>
<td>64 TX, 64 RX</td>
<td>128 TX, 128 RX</td>
<td>128 TX, 128 RX</td>
<td>128 TX, 128 RX</td>
</tr>
<tr>
<td>Supported servers</td>
<td>M420, M520, M620, M820, M910, M919, M630, M830, M640</td>
<td>M420, M520, M620, M820, M630, M830</td>
<td>M630, M630, M830, M640</td>
<td>M420, M520, M620, M820, M630, M830, M640</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Features</th>
<th>Emulex OCm14102-U3-D</th>
<th>Emulex OCm14102-U5-D</th>
<th>Emulex OCm14102B-U5-D</th>
<th>Emulex OCm14102-N5-D</th>
<th>Emulex OCm14102B-N5-D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ports x Link speed</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
</tr>
<tr>
<td>Supported speed</td>
<td>10Gb</td>
<td>10Gb</td>
<td>10Gb</td>
<td>10Gb</td>
<td>10Gb</td>
</tr>
<tr>
<td>Chipset</td>
<td>Skyhawk</td>
<td>Skyhawk</td>
<td>Skyhawk</td>
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<td>iSCSI HBA</td>
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<td>Yes</td>
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<td>FCoE</td>
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<td>Switch independent NIC partitioning</td>
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<td>Yes 8 per 10Gb port</td>
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<td>Yes 8 per 10Gb port</td>
<td>Yes 8 per 10Gb port</td>
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<td>EEE</td>
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<td>RoCE</td>
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<td>Yes, RoCE v2</td>
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<tr>
<td>Supported servers</td>
<td>M420, M520</td>
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<td>M630, M830</td>
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¹Number of queues will vary depending on hypervisor memory limitations.
10Gb mezzanine cards for blade servers

End-of-Life Cards

<table>
<thead>
<tr>
<th>Features</th>
<th>Brocade BR1741M-k (EOL)</th>
<th>Qlogic QME8262-k (EOL)</th>
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<tbody>
<tr>
<td>Ports x Link speed</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
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<tr>
<td>Supported speed</td>
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<td>Chipset</td>
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<td>Interface</td>
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<td>iSCSI HBA</td>
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<tr>
<td>iSCSI Boot</td>
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<td>FCoE</td>
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<tr>
<td>FCoE Boot</td>
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<td>Yes</td>
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<tr>
<td>Switch independent NIC partitioning</td>
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<tr>
<td>DCB</td>
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<td>Yes</td>
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<tr>
<td>SR-IOV</td>
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<td>WOL</td>
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<tr>
<td>PXE</td>
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<td>Yes</td>
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<tr>
<td>EEE</td>
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<td>No</td>
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<tr>
<td>RoCE</td>
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<td>No</td>
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<tr>
<td>Multi-queue¹ (per port)</td>
<td>128 TX, 128 RX</td>
<td>128 TX, 128 RX</td>
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<tr>
<td>Supported servers</td>
<td>M420, M520, M620, M820, M910, M915</td>
<td>M420, M520, M620, M820, M910</td>
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¹Number of queues will vary depending on hypervisor memory limitations.
1Gb and 10Gb LOMs for Blade Servers

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<tr>
<th>Features</th>
<th>QLogic 57810S-k 2 port 10Gb LOM</th>
<th>Broadcom 5720 4 port 1Gb LOM</th>
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<td>1Gb</td>
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<td>Chipset</td>
<td>57810S</td>
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<td>Interface</td>
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<td>Serdes</td>
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<td>iSCSI Boot</td>
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<td>FCoE</td>
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<td>Switch independent NIC partitioning</td>
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<td>4 per 10Gb port</td>
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<td>Yes</td>
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<tr>
<td>Multi-queue¹ (per port)</td>
<td>128 TX, 128 RX</td>
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<tr>
<td>Supported servers</td>
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<td>M520</td>
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¹Number of queues will vary depending on hypervisor memory limitations.
# 1Gb Select Network Adapters (NDC) for blade servers

<table>
<thead>
<tr>
<th>Features</th>
<th>Intel I350 4 port 1Gb NDC</th>
<th>Broadcom 5720 4 port 1Gb NDC</th>
</tr>
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<tbody>
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<td>Ports x Link speed</td>
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<tr>
<td>Chipset</td>
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<td>5720</td>
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<tr>
<td>Interface</td>
<td>Serdes</td>
<td>Serdes</td>
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<tr>
<td>iSCSI HBA</td>
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<td>No</td>
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<tr>
<td>iSCSI Boot</td>
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<td>Yes</td>
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<tr>
<td>FCoE</td>
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<td>No</td>
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<tr>
<td>FCoE Boot</td>
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<td>No</td>
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<tr>
<td>Switch independent NIC partitioning</td>
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<td>No</td>
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<td>Yes</td>
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<tr>
<td>EEE</td>
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<td>Yes</td>
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<tr>
<td>Multi-queue¹ (per port)</td>
<td>8 TX, 8 RX</td>
<td>8 TX, 8 RX</td>
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<tr>
<td>Supported servers</td>
<td>M630, M830 M840</td>
<td>M620, M820 M630 M830 M840</td>
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</table>

¹Number of queues will vary depending on hypervisor memory limitations.
1Gb mezzanine cards for blade servers

<table>
<thead>
<tr>
<th>Features</th>
<th>Intel I350 4 port mezz</th>
<th>Broadcom 5719 4 port mezz</th>
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<tr>
<td>Ports x Link speed</td>
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<td>1Gb</td>
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<td>Chipset</td>
<td>I350</td>
<td>5719</td>
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<td>Interface</td>
<td>Serdes</td>
<td>Serdes</td>
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<td>iSCSI HBA</td>
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<td>iSCSI Boot</td>
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<td>Yes</td>
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<td>FCoE Boot</td>
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<td>Yes</td>
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<tr>
<td>EEE</td>
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<td>Yes</td>
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<tr>
<td>Multi-queue¹ (per port)</td>
<td>8 TX, 8 RX</td>
<td>8 TX, 8 RX</td>
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<tr>
<td>Supported servers</td>
<td>M420, M520, M620, M820</td>
<td>M420, M520, M620, M820</td>
</tr>
<tr>
<td></td>
<td>M630, M640</td>
<td>M630, M640</td>
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¹Number of queues will vary depending on hypervisor memory limitations.
Fibre Channel mezzanine cards for blade servers

<table>
<thead>
<tr>
<th>Features</th>
<th>QLogic QME2572 FC8</th>
<th>Emulex LPe1205-M FC8</th>
<th>Emulex LPm15002B-D FC8</th>
<th>QLogic QME2662 FC16</th>
<th>Emulex LPm16002B-D FC16</th>
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<tbody>
<tr>
<td>Ports x Link speed</td>
<td>2x8Gb</td>
<td>2x8Gb</td>
<td>2x8Gb</td>
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<td>4Gb, 8Gb</td>
<td>4Gb, 8Gb</td>
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<td>Chipset</td>
<td>2500</td>
<td>LightPulse</td>
<td>Lancer G5</td>
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<td>Supported servers</td>
<td>M420, M520, M620, M820, M630, M830, M640</td>
<td>M420, M520, M620, M820, M630, M830</td>
<td>M420, M520, M620, M820, M630, M830</td>
<td>M620, M820, M910, M915, M630, M830</td>
<td>M620, M820, M630, M830</td>
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InfiniBand mezzanine cards for blade servers

<table>
<thead>
<tr>
<th>Features</th>
<th>Mellanox ConnectX-3 FDR10</th>
<th>Mellanox ConnectX-3 FDR</th>
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<tr>
<td>Ports x Link speed</td>
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<td>Chipset</td>
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<td>CX-3</td>
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<td>Supported Protocols</td>
<td>InfiniBand</td>
<td>InfiniBand</td>
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<td>Supported servers</td>
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<td>M620, M630, M640</td>
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<tr>
<td>Great for</td>
<td>Real time market data distribution</td>
<td>HFT, co-located investment banks, algorithmic trading, low latency applications</td>
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### Select Network Adapters – 11G, 12G, 13G, 14G

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<th>12G</th>
<th>13G</th>
<th>14G</th>
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<tbody>
<tr>
<td>1Gb</td>
<td>Blade NDC</td>
<td>Blade NDC (M710HD, M915 only)</td>
<td>Broadcom 5720 4P 1Gb</td>
<td>Broadcom 5720 4P 1Gb</td>
<td>Broadcom 5720 4P 1Gb</td>
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<td></td>
<td>Intel I350 4P 1Gb</td>
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<tr>
<td>10Gb</td>
<td>Blade NDC</td>
<td>Broadcom 57712-k 2P 10Gb KR NDC (M710HD, M915 only)</td>
<td>QLogic 57810S-k 2P 10Gb NDC</td>
<td>QLogic 57810S-k 2P 10Gb NDC</td>
<td>Cavium QLogic 57810S-k 2P 10Gb NDC</td>
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<td></td>
<td>Intel X520-k 2P 10Gb NDC</td>
<td>QLogic 57840S-k 4P 10Gb NDC</td>
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<td>Intel X520-k 2P 10Gb NDC</td>
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<td>Emulex Ocm14102-U2-D 2P 10Gb NDC</td>
<td>QLogic QMD8262-k 2P 10Gb NDC</td>
<td>Intel X710-k 2P/4P 10Gb NDC</td>
<td>Intel X710-k 2P/4P 10Gb NDC</td>
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<td>Emulex Ocm14102-U4-D 2P 10Gb NDC</td>
<td>Emulex Ocm14102B-U4-D 2P 10Gb NDC</td>
<td>Emulex Ocm14102-N6-D 2P 10Gb NDC</td>
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# Ethernet Mezzanine Cards – 11G, 12G, 13G, 14G

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<th>12G&lt;sup&gt;1&lt;/sup&gt;</th>
<th>13G</th>
<th>14G</th>
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<tbody>
<tr>
<td>1Gb</td>
<td>Blade Mezz</td>
<td>Broadcom 5709 4P 1Gb Adapter Mezz</td>
<td>Broadcom 5719 4P 1Gb Adapter Mezz</td>
<td>Broadcom 5719 4P 1Gb Adapter Mezz</td>
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<td>Intel ET 4P 1Gb Adapter Mezz</td>
<td>Intel I350 4P 1Gb Adapter Mezz</td>
<td>Intel I350 4P 1Gb Adapter Mezz</td>
<td>Intel I350 4P 1Gb Adapter Mezz</td>
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<td>10Gb</td>
<td>Blade Mezz</td>
<td>QLogic 57711 2P 10Gb XAUI Mezz</td>
<td>QLogic 57810S-k 2P 10Gb Mezz</td>
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<td>QLogic QME8242-k 2P 10Gb Mezz</td>
<td>QLogic QME8262-k 2P 10Gb Mezz</td>
<td>Mellanox ConnectX-3-K 2P 10Gb Mezz</td>
<td>Mellanox ConnectX-3-K 2P 10Gb Mezz</td>
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<td></td>
<td>Brocade BR1741M-k 2P 10Gb Mezz</td>
<td>Brocade BR1741M-k 2P 10Gb Mezz</td>
<td>Mellanox ConnectX-3 Pro 2P 10Gb Mezz</td>
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<td>Intel X520 x/k 2P 10Gb Mezz</td>
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<td>Emulex OCm10102-F-M 2P XAUI Mezz</td>
<td>Emulex OCm14102-U3-D 2P 10Gb Mezz</td>
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<td>Mellanox ConnectX-3-K 2P 10Gb Mezz</td>
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<td>Emulex OCm14102B-U5-D 2P 10Gb Mezz</td>
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</table>

<sup>1</sup>No iSCSI offload support with 1Gb devices
<table>
<thead>
<tr>
<th>Speed</th>
<th>Form Factor</th>
<th>11G</th>
<th>12G, 13G</th>
<th>14G</th>
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<tbody>
<tr>
<td>8Gb</td>
<td>Blade Mezz</td>
<td>QLogic QME2572 2P FC8 HBA</td>
<td>QLogic QME2572 2P FC8 HBA</td>
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<td>Emulex LPe1205-M 2P FC8 HBA</td>
<td>Emulex LPe1205-M 2P FC8 HBA</td>
<td>Emulex LPe1205-M 2P FC8 HBA</td>
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<td>Emulex LPm15002B-D 2P FC8 HBA (13G only)</td>
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<tr>
<td>16Gb</td>
<td>Blade Mezz</td>
<td>QLogic QME2662 2P FC16 HBA</td>
<td>QLogic QME2662 2P FC16 HBA</td>
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<td>Emulex LPm16002B-D 2P FC16 HBA</td>
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<td>Emulex LPm16002B-D 2P FC16 HBA</td>
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## Systems Management
### Network Device Support Matrix

<table>
<thead>
<tr>
<th>Form Factor</th>
<th>Vendor/Chipset</th>
<th>Speed</th>
<th>LC configuration and update</th>
<th>Monitoring support</th>
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<tbody>
<tr>
<td>Blade NDC</td>
<td>Emulex OCm14102-U2-D</td>
<td>10GbE</td>
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<td>Emulex OCm14102-N6-D</td>
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<td>Emulex OCm14102B-N6-D</td>
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# Systems Management
## Network Device Support Matrix

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<th>Form Factor</th>
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<th>Speed</th>
<th>LC configuration and update</th>
<th>Monitoring support</th>
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<td>Broadcom 5719 Serdes</td>
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<td>QLogic QME2662</td>
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</table>
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
F 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?

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:

  ![Diagram of chassis with 8x M610 1Gb LOMs, 2x 1GbE IOMs, 1x M1000e Chassis](image1)

- Add:

  ![Diagram of enhanced midplane](image2)

- Discard / Re-purpose:

  ![Diagram of standard midplane](image3)

  - 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

<table>
<thead>
<tr>
<th>Product Focus</th>
<th>Document Title</th>
<th>Link</th>
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</thead>
<tbody>
<tr>
<td>M6220</td>
<td>Stacking PowerConnect M6220 Blade Switch</td>
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<td>M6220 and Cisco</td>
<td>MSTP Interoperability of the Dell 6200 &amp; M6220 Series Switches</td>
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<td>M6220, M6348, M8024</td>
<td>CLI Transition Guide for Dell 7000, 8024, M8024, M6348, M6220 switches</td>
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<td>M6348 and Cisco Catalyst</td>
<td>Deployment of Dell M6348 Blade Switch With Cisco 4900M Catalyst Switch (using Simple Mode)</td>
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<td>M8024-k</td>
<td>End-to-end deployment using SIP and M8024-k</td>
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<td>Deployment of Dell M8024-k Blade Switch with Cisco Nexus 5000 Series Switch (in Simple Mode)</td>
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<td>Dell EqualLogic</td>
<td>EqualLogic Compatibility Matrix</td>
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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: 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 IPv6 compatibility

This product is End of Life. This page is for historical reference.
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
A1/A2
B1/B2
C1/C2

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

SFP ports (all models)

Software Upgrades
IP Services Upgrade Available

CAT 5 Cables

Cisco SFP Modules
- GbE SFP RJ45 converter, Copper
- GbE SFP, LC connector, SWL (multimode)
- GbE SFP, LC connector, LWL (single mode)

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

10GBASE-CX4 X2 Module
(for 3130X)

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

10GBASE-MM Port SFP+ Converter Module
CVR-X2-SFP10G
Not sold by Dell - purchase elsewhere

Secondary Management Serial Port

3130X Modules

1/10GbE
M8428-k
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

This product is End of Life. This page is for historical reference.
This product is End of Life. This page is for historical reference.

**M8428-k**

**Adapters**

**10G**
- Broadcom 57710-k
- Brocade BR1741M-k
- Intel X520-k
- QLogic QME8242-k

**12G**
- Brocade BR1741M-k
- Emulex OC1m1402-U2-D
- Emulex OC1m1402-U3-D
- Intel X520-k
- QLogic 57810G-k
- QLogic 57840S-k
- QLogic QME8262-k

**13G**
- Emulex OC1m1402-U4-D
- Emulex OC1m1402-U5-D
- Intel X710-k
- Mellanox CX-4 DP 10Gbe
- QLogic 57810G-k
- QLogic 57840S-k

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

10Gb Ethernet mezzanine cards and LOMs are not supported.

**More details in Adapter Portfolio section**

**Designed for I/O**

- A1/A2
- B1/B2
- C1/C2

**8 ports 10Gb Ethernet (DCB)**
- Brocade Optical Transceivers
- Short Wave, Multi-Mode SFP+ Optics
- Long Wave, Multi-Mode SFP+ Optics

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

10Gb speed only

**Secondary Management Serial Port**

**4 ports 8Gbps Fibre Channel**
- Brocade Optical Transceivers
  - Speeds: 8, 4, 2 Gbps
  - Short Wave, Multi-Mode SFP+ Optics
  - (Four included with every M8248-k)

- Long Wave, Multi-Mode SFP+ Optics

**Converged**
## Revision History

<table>
<thead>
<tr>
<th>Date</th>
<th>Changes</th>
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</table>
| September 20, 2017 | • Updated Cisco B22DELL FEX parent switch compatibility on pages 17 and 18  
• Added 14G adapter compatibility                                      |
| September 19, 2016 | • Published with Dell-EMC branding  
• Corrected M6505 midplane requirement on page 68.  
• Corrected a numerical reference in the FlexIO heading on pages 3 and 19.   |
| July 1, 2016    | • 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   | • Removed verbiage “12G adapters” on page 69.                                                                                               |
| June 26, 2015   | • Corrected the number of stack units for M/IOA to 6  
• Updated Systems Management Matrix                                       |
| June 9, 2015    | • Updated Broadcom naming of 10Gb cards to QLogic  
• Updated additional cards for 13G launch (Mellanox ConnectX-3, Intel 710-K)             |
| May 1, 2015     | • Corrected QME8626-K on 13G  
• Added 13G compatibility  
• Made changes to Emulex OCm14102-xx-x for consistency  
• Added 13G section to each blade                                        |
| December 17, 2014 | • Mellanox ConnectX-3 information updated                                                                                                 |
| December 8, 2014 | • 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)     |