M-Series Blade I/O Guide

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

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Send feedback to: BladeInterconnects@dell.com
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# Ethernet Switching

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<td><strong>Overview</strong></td>
<td>10/40GbE Switch</td>
<td>High performance blade provides maximum throughput, flexibility, and iSCSI / FCoE convergence.</td>
<td>10GbE Plug and Play</td>
<td>Converge infrastructure and connect easily to 3rd party networks with this flexible Layer 2 blade.</td>
<td>10GbE Basic</td>
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<td>1 &amp; 10GbE</td>
<td>1 &amp; 10GbE</td>
<td>1 &amp; 10GbE</td>
<td>1 &amp; 10GbE</td>
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<td>Switch fabric capacity</td>
<td>1.28 Tbps</td>
<td>1.28 Tbps</td>
<td>480 Gbps</td>
<td>288 Gbps</td>
<td>184 Gbps</td>
<td>184 Gbps</td>
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<td>Forwarding capacity (Mpps)</td>
<td>960</td>
<td>960</td>
<td>357</td>
<td>120</td>
<td>160</td>
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<tr>
<td></td>
<td>Buffer size</td>
<td>9MB</td>
<td>9MB</td>
<td>2MB</td>
<td>7MB</td>
<td>4MB</td>
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</tr>
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<td>Latency (Microseconds)</td>
<td>0.68 μs</td>
<td>0.68 μs</td>
<td>1.85 μs</td>
<td>0.6 μs</td>
<td>3.6 μs</td>
<td>3.6 μs</td>
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<td>Internal blade server ports</td>
<td>32 (10GbE)</td>
<td>32 (10GbE)</td>
<td>16 (10GbE)</td>
<td>16 (10GbE)</td>
<td>32 (1GbE)</td>
<td>16 (1GbE)</td>
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<td></td>
<td>External 1/10GbE (Base-T)</td>
<td>4 (using module)</td>
<td>4 (using module)</td>
<td>2 (using module)</td>
<td>-</td>
<td>16 fixed (1GbE)</td>
<td>4 fixed (1GbE)</td>
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<td>External 10GbE</td>
<td>8 ports using QSFP+ breakout cables (up to 24 using modules)</td>
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<td>8 fixed SFP+</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Native Fibre Channel support</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Expansion modules (FlexIO)</td>
<td>Two slots and three options (Mix or match)</td>
<td>2 port QSFP+ (10/40GbE)¹</td>
<td>4 port SFP+ (10/40GbE)¹</td>
<td>4 port Base-T (1/10GbE)²</td>
<td>One slot &amp; three options</td>
<td>4 port SFP+ (10Gb only)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>²QSFP+ port on I/O Aggregator runs breakout mode 4x10GbE only</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Two slots &amp; four options</td>
<td>(Mix or match)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>²Both devices limited to one Base-T module only. Populate second slot with another module of your choice.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Features</strong></td>
<td>DCB: PFC, DCBx &amp; ETS</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FCoE</td>
<td>Transit</td>
<td>Transit</td>
<td>Transit</td>
<td>Direct connect</td>
<td>-</td>
<td>-</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Converged iSCSI (LAN &amp; SAN)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Stacking</td>
<td>up to 6 using QSFP ports</td>
<td>2 via CLI only</td>
<td>up to 6 using SFP+ ports or SFP+ module</td>
<td>-</td>
<td>up to 12 using CX4 ports</td>
<td>up to 6 using module</td>
</tr>
<tr>
<td></td>
<td>PVST+</td>
<td>Yes</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>Simplified Networking Mode</td>
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<td>Simple Mode</td>
<td>AG Mode (NPIV) FC only</td>
<td>Simple Mode</td>
<td>Simple Mode</td>
<td>Simple Mode</td>
<td>-</td>
</tr>
<tr>
<td>Accepts Cisco Twin-ax cables</td>
<td>Coming Soon</td>
<td>Yes</td>
<td>Yes</td>
<td>Brocade cables only</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Optical transceivers supported</td>
<td>QSFP+ (SR only)</td>
<td>SFP+ (SR or LR)</td>
<td>SFP (SX, LX, and SFP to RJ45)</td>
<td>SFP+ (SR, LR, LR, LRM)</td>
<td>SFP+ (SR, LR, LR, LRM)</td>
<td>SFP+ (SR, LR, LRM)</td>
<td>SFP+ (SR, LR, LRM)</td>
</tr>
<tr>
<td></td>
<td>Max L2 &amp; L3 VLANs</td>
<td>4094 / 511</td>
<td>4094 (Layer 2 only)</td>
<td>1024 / 128</td>
<td>3583 (Layer 2 only)</td>
<td>1024 / 128</td>
<td>1024 / 128</td>
</tr>
<tr>
<td></td>
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<td>128 / 16</td>
<td>1 / 16</td>
<td>12 / 8</td>
<td>28 / 8</td>
<td>48 / 8</td>
<td>18 / 8</td>
</tr>
<tr>
<td></td>
<td>Jumbo frames (Bytes)</td>
<td>12000</td>
<td>12000</td>
<td>9216</td>
<td>9216</td>
<td>9216</td>
<td>9216</td>
</tr>
<tr>
<td></td>
<td>Max Routes (IPv4 / IPv6)</td>
<td>16000 / 4096 Future</td>
<td>-</td>
<td>8160 / 4096</td>
<td>4000</td>
<td>10000 / 3000</td>
<td>224 / 128</td>
</tr>
<tr>
<td></td>
<td>IPv4 Routing</td>
<td>RIP, OSPF</td>
<td>-</td>
<td>RIP, OSPF</td>
<td>-</td>
<td>RIP, OSPF</td>
<td>RIP, OSPF</td>
</tr>
<tr>
<td></td>
<td>IPv6 Routing</td>
<td>Future release</td>
<td>-</td>
<td>OSPF</td>
<td>-</td>
<td>OSPF</td>
<td>OSPF</td>
</tr>
<tr>
<td></td>
<td>Multicast Routing</td>
<td>IGMP, IGMP Snooping only</td>
<td>IGMP, PM, DVMRP</td>
<td>IGMP Snooping only</td>
<td>IGMP, PM, DVMRP, MLD</td>
<td>IGMP, PM, DVMRP</td>
<td>-</td>
</tr>
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Transform your Dell M1000e blade server enclosure.
### Fibre channel switching

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<th>Brocade M6505</th>
<th>Brocade M5424</th>
<th>Dell 8/4Gbps SAN module</th>
<th>Dell 8/4Gbps Pass-Through</th>
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<td><strong>Overview</strong></td>
<td>High-performance 16Gb Switch</td>
<td>Advanced 8Gb Switch</td>
<td>Basic 8Gb Switch</td>
<td>Basic 8Gb Aggregator</td>
</tr>
<tr>
<td></td>
<td>Transform SAN connectivity with maximum throughput and advanced management features for virtualized environments.</td>
<td>Connect directly to the Fibre Channel SAN, by-passing any external switches and reducing cables, optics, and management.</td>
<td>Gain the benefits of port aggregation, fail over, and redundancy without the complexities of additional SAN switches.</td>
<td>Directly connect and isolate bandwidth between servers and any Fibre Channel SAN infrastructure.</td>
</tr>
</tbody>
</table>

| **Performance** | | | | |
| --- | --- | --- | --- |
| **Speed** | 16 Gbps (multi-speed 2, 4, 8, or 16 Gbps) | 8 Gbps (multi-speed: 2, 4, or 8) | 8 Gbps (multi-speed: 2, 4, or 8) | 8 Gbps (multi-speed: 2, 4, or 8) |
| **Switch capacity (Gbps)** | 384 (768 Full Duplex) | 192 (384 Full Duplex) | 192 (384 Full Duplex) | 256 Gbps (Full Duplex) |
| **Max Buffer to Buffer Credit** | 8106 | 688 | 688 | - |
| **Latency (Microseconds)** | 0.7 μs | 0.7 μs | 0.7 μs | - |

| **Ports** | | | | |
| --- | --- | --- | --- |
| **Total ports** | 24 (16 internal & 8 external) | 24 (16 internal & 8 external) | 24 (16 internal & 8 external) | 32 (16 internal & 16 external) |
| **Port model options** | • 24 ports with eight SFP+ transceivers | • 24 ports with eight SFP+ transceivers | • 24 ports with four SFP+ transceivers | 16 ports with 16 SFP+ transceivers |
| | • 24 ports with four SFP+ transceivers | • 24 ports with two SFP+ transceivers | • 12 ports with two SFP+ transceivers | |
| | • 12 ports with two SFP+ transceivers (12 port model expands to 24 ports with on-demand license) | • 12 ports with two SFP+ transceivers (12 port model expands to 24 ports with on-demand license) | 12 ports with two SFP+ transceivers | |
| **Port Types** | D_Prot (Diagnostic Port), E_Prot, F_Prot, M_Prot (Mirror Port); self-discovery based on switch type (U_Prot); optional port type control in Brocade Access Gateway mode: F_Prot and NPIV-enabled N_Prot | FL_Prot, F_Prot, M_Prot (Mirror Port); and E_Prot; self-discovery based on switch type (U_Prot); optional port type control in Brocade Access Gateway mode: F_Prot and NPIV-enabled N_Prot | F_Prot and NPIV-enabled N_Prot | N_Prot |

| **Features** | | | | |
| --- | --- | --- | --- |
| **Security** | SSL, SSH v2, HTTPS, LDAP, RADIUS, Role-Based Access Control (RBAC), DH-CHAP (between switches and end devices), Port Binding, Switch Binding, Secure RPC, Secure Copy (SCP), Trusted Switch, IPSc; IP Filtering | Telnet, HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), Auditing, Syslog, Change Management tracking, EZSwitchSetup wizard, Brocade Advanced Web Tools, Brocade DCFM Professional/Enterprise; SMI-S compliant, SMI-S scripting toolkit, Administrative Domains | Telnet, HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), Auditing, Syslog, Change Management tracking, Administrative Domains |
| **Management** | HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), SSH: Auditing, Syslog, Brocade Advanced Web Tools, Advanced Performance Monitoring, Brocade Fabric Watch, Brocade Network Advisor SAN Enterprise or Brocade Network Advisor SAN Professional/Professional Plus; Command Line Interface (CLI); SMI-S compliant, Administrative Domains; trial licenses for add-on capabilities | | Module is unmanaged – all management occurs via HBA firmware or exterior switches |
| **Enterprise Performance Pack** | Software license option that includes Adaptive Networking, ISL Trunking, Fabric Watch, and Advanced Performance Monitoring. | | |
| **ISL Trunking** | Inter-Switch Link (ISL) Trunking allows all eight external SAN ports to be combined to form a single, logical ISL, delivering scalable I/O bandwidth utilization and load balancing with an aggregate bandwidth of 128 Gbps (M6505 model) and 64 Gbps (M5424 model). | | |
| **Maximum frame size** | 2112-byte payload | | |
| **Classes of Service** | Class 2, Class 3, and Class F (inter-switch frames) | | |
| **Data Traffic Types** | Fabric switches supporting unicast | Fabric switches supporting unicast and broadcast | | |
| **Brocade Optical Transceivers (Requires SFP LC connector)** | 16 Gbps: SWL, LWL, or ELWL | 8 Gbps: SWL or LWL | 8 Gbps: SWL or LWL | 8 Gbps: SWL (16 included) |
| | 4 Gbps: SWL, LWL, or ELWL | | |
| **Fabric Services** | Simple Name Server (SNS); Registered State Change Notification (RSCN), NTP v3, Reliable Commit Service (RCS), Dynamic Path Selection (DPS), Brocade Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning), NPIV, and FDMI | | |
## Infiniband

### Models

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<th>Mellanox 4001F</th>
<th>Mellanox 4001T</th>
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<td>Overview</td>
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<td>Mainstream Infiniband switch</td>
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<td>Performance</td>
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<tr>
<td>Speed / Bit rate</td>
<td>FDR / 56Gbps</td>
<td>FDR10 / 40Gbps</td>
</tr>
<tr>
<td>Data rate</td>
<td>56Gbps</td>
<td>40Gbps</td>
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<td>Switch capacity</td>
<td>3.58 Tbps</td>
<td>2.56 Tbps</td>
</tr>
<tr>
<td>Features</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total ports</td>
<td>32 (16 internal &amp; 16 external)</td>
<td></td>
</tr>
<tr>
<td>IBTA compliance</td>
<td>Meets Infiniband Trade Association specification 1.21 &amp; 1.3</td>
<td></td>
</tr>
<tr>
<td>Quality of Service (QoS)</td>
<td>Advanced scheduling engine supports QoS for up to 9 traffic classes and 9 virtual lanes (8 data + 1 management)</td>
<td></td>
</tr>
<tr>
<td>Linear forwarding table</td>
<td>256 to 4Kbyte MTU (Maximum Transmission Unit)</td>
<td></td>
</tr>
<tr>
<td>Multicast subnet addresses</td>
<td>48K</td>
<td></td>
</tr>
<tr>
<td>Unicast subnet addresses</td>
<td>16K</td>
<td></td>
</tr>
</tbody>
</table>

### Features

- **Twin-ax cables**
  - 1m: SFP-H10GB-CU1M
  - 3m: SFP-H10GB-CU3M
  - 5m: SFP-H10GB-CU5M
  - 7m: SFP-H10GB-ACU7M
  - 10m: SFP-H10GB-ACU10M

- **Optical transceivers supported**
  - FET-10G¹
  - SFP-10G-SR
  - SFP-10G-LR
  - SFP-10G-ER

- **Max L2 & L3 VLANs**
  - 4013
  - 1005 / 4096

- **Link Aggregation (Groups/Members)**
  - 96 / 16

- **Jumbo frames (Bytes)**
  - 9216

- **Max Routes (IPv4 / IPv6)**
  - Managed at Top-of-Rack
  - up to 11,000 (IPv4 only)

- **IPv4 Routing**
  - Managed at Top-of-Rack
  - Static routes, RIP, and EIGRP stub

- **IPv6 Routing**
  - Managed at Top-of-Rack
  - Available with additional license: Advanced IP Services feature set

- **Multicast Routing**
  - Managed at Top-of-Rack
  - IGMP, PIM, DVMRP, available with additional IP Services license

#### DCB • PFC, DCBx & ETS
- Yes

#### Converged iSCSI (LAN & SAN)
- Yes

#### Stacking (Virtual Blade Switch)
- up to 9 managed at ToR

#### PVST+
- Yes

#### Simplified Networking Mode
- Managed at Top-of-Rack

#### Twin-ax cables
- 1m: SFP-H10GB-CU1M
- 3m: SFP-H10GB-CU3M
- 5m: SFP-H10GB-CU5M
- 7m: SFP-H10GB-ACU7M
- 10m: SFP-H10GB-ACU10M

### Dell Services

**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 configure your data center infrastructure with a comprehensive set of remote and onsite deployment services.

**Managed services**
Free yourself to focus on your business and allow Dell to fully manage and monitor your multi-vendor network with triage, resolution, and 24/7 engineering support.

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

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**Notes**

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

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*FET-10G optic can only be used to connect FEX to Nexus*
M-Series I/O Modules

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

Fibre Channel
- Brocade M6505
- Brocade M5424
- FC SAN Module
- Pass Through FC8/4

1Gb Ethernet
- M6348
- M6220
- 1Gb Pass-Through
- Cisco Catalyst Blade

InfiniBand
- Mellanox M4001F
- Mellanox M4001T
Ethernet Blade I/O Modules

Product Portfolio

**Server Ports**

- **M8428-k**
  - **External Ports:**
    - (8) SFP+ 10GbE
    - (4) 8Gb FC SAN

- **Cisco Nexus B22DELL (FEX)**
  - **External Ports:**
    - (8) SFP+ 10GbE

- **M8024-k**
  - **External Ports:**
    - (4) SFP+ 1/10GbE
    - (1) Optional Module SFP+, CX4, or Base-T

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

- **I/O Aggregator**
  - **External Ports:**
    - (2) QSFP+ ports in 4x10GbE mode
    - (2) Optional Modules QSFP+, SFP+, or Base-T

- **FCF**
  - **External Ports:**
    - (2) QSFP+ ports in 4x10GbE mode

- **Integration w/ ToR**
  - **External Ports:**
    - (8) SFP+ 10GbE

- **FCoE Transit / FSB**
  - **External Ports:**
    - (2) QSFP+ ports in 4x10GbE mode

- **Cisco 3032 / 3130G/X**
  - **External Ports:**
    - (4) RJ45 GbE
    - (2) Optional Modules TwinGig

- **M6220**
  - **External Ports:**
    - (4) RJ45 GbE
    - (2) Optional Modules SFP+, CX4, Base-T, or stacking

- **M6348**
  - **External Ports:**
    - (16) RJ45 GbE
    - (2) SFP+ 10GbE
    - (2) CX4 10GbE
Converged Ethernet
**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)
- Stack up to 6 devices
- PVST+ protocol for easy integration into Cisco environments
- Converged
  - Supports DCB (protocols PFC, ETC and DCBx)
  - Converged iSCSI with EqualLogic (supports iSCSI TLV)
  - FCoE Transit Switch via FIP Snooping Bridge
- Industry standard CLI
- Enterprise class OS (FTOS)
**Adapters**

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

**12G**
- Broadcom 57810S-k
- Brocade BR1741M-k
- Intel X520-x/k
- QLogic QME8262-k

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.

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**Designed for I/O bays**

- A\(^1\)/A\(^2\)
- B\(^1\)/B\(^2\)
- C\(^1\)/C\(^2\)

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**More details in Adapter Portfolio section**

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**Optical Transceivers**

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

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**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)

---

**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

---

**SFP+ to QSFP+ Fiber Cables**

---

**QSFP+ to QSFP+ Fiber Breakout Cables**

---

**Two Integrated QSFP+ ports**

Ports are defaulted to stacking mode but mode can be changed

---

**Secondary Management Serial Port**

(Cable included)

---

**USB Port**
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 2)

• **High Port Count:**
  - 32x 10GbE internal server ports
  - Up to 16 external 10GbE ports (4 QSFP+ ports with breakout cables)

• **Two FlexIO bays enable choice**
  - 2-port 40GbE QSFP+ module (converts to 8-port 10GbE SFP+ using breakout cables)
  - 4-port 10GbE SFP+ module
  - 4-port 10GBASE-T module
    (If running Base-T module then second IO slot must be of different type due to power constraints)

• **Converged**
  - Supports DCB (protocols PFC, ETC and DCBx)
  - Converged iSCSI with EqualLogic and Compellent
  - FCoE Transit Switch via FIP Snooping Bridge
  - Industry standard CLI. Standard troubleshooting commands via CLI
PowerEdge M I/O Aggregator

Adapters

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

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

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.

SFP+ 40Gb: SR only
SFP+ to 4xSFP+ Breakout Cables
5m Passive Copper 40GBASE-CR4 10Gb

SFP+ to QSFP+ Direct Attach
1m, and 5m, Passive Copper 40GBASE-CR4
If used to connect to ToR, the ToR QSFP+ port must be in breakout mode

Optical Transceivers
SFP+ 40Gb: SR only

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

SFP+ Direct Attach Cable (Twinax)
(0.5m, 1m, 2m, 3m, 5m, 7m available)
Can operate at 10Gb and 1Gb

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

Converged
**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+, CX4, 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

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

12G
- Broadcom 57810S-k
- Brocade BR1741M-k
- Intel X520-k
- QLogic QME8262-k

The M8024-k switch supports connectivity to 10Gb-KR adapters, all of which are notated with "-k." It does not provide connectivity to legacy 10Gb-XAUI NICs/CNAs. If connected to 1Gb Ethernet Mezzanine cards or LOMs, device will auto-negotiate individual internal ports to 1Gb.

More details in Adapter Portfolio section

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

Secondary Management Serial Port (Cable included)

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

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

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

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

1GbE Optical Transceivers
SFP 1GbE: SX, LX

Fixed ports can support both SFP and SFP+ optics.
M8428-k
Converged Ethernet & Fibre Channel Switch

• Dell 10GbE Converged Network Switch
  – DCB compliant design accommodates both NIC and Fibre Channel Over Ethernet I/O

• Single wide blade I/O module supporting all 10GbE capable M1000e fabric bays

• Robust I/O bandwidth solution with 28 active fixed ports
  – 16 internal server ports
  – 8 external 10GbE SFP+ uplinks (10Gb speed only)
    › Brocade Short-wave optical transceivers / fiber
    › Brocade Long-wave optical transceivers / fiber
    › Brocade Direct-Attach copper (TwinAx) transceiver+cable (1m, 3m, and 5m)
  – 4 external 8Gbps SFP+ native Fibre Channel uplinks
    › Pre-installed 8Gbps short-wave SFP+ optical transceivers enable quick and easy cable-and-go connections
    › Long-wave SFP+ optical transceivers also available
    › Access Gateway (NPIV) or Brocade Full Fabric modes
M8428-k

**Adapters**

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

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

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.

**Designed for I/O bays**

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

**8 ports 10Gb Ethernet (DCB)**

*Brocade Optical Transceivers*
- Short Wave, Multi-Mode SFP+ Optics
- Long Wave, Multi-Mode SFP+ Optics

**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

**4 ports 8Gbps Fibre Channel**

*Brocade Optical Transceivers*
- Short Wave, Multi-Mode SFP+ Optics
- Long Wave, Multi-Mode SFP+ Optics

(Four included with every M8248-k)

More details in Adapter Portfolio section
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

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

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

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

**1Gb Ethernet mezzanine cards and LOMs are not supported.**

### Cables
- **10Gb Optical Transceivers**  
  SR & LR
- **SFP+ Direct Attach Cable (Twinax)**  
  (0.5m, 1m, 3m, 5m, 7m available)

---

18  Dell M-Series Blade I/O Guide
Cisco Nexus Blade
B22DELL Fabric Extender (FEX)

• Cisco 10GbE offering for the Dell M1000e Blade System
  – The 16 internal 10Gb or 1Gb ports and 8 external 10Gb ports enables customers to connect via 10GbE to a Cisco Nexus 5500 series Top of Rack switch

• The B22DELL FEX is only supported with these specific Cisco Nexus models:
  – Cisco Nexus 5548P, 5548UP, 5596P
  – Cisco Nexus 6001, 6004
  It cannot connect to Cisco Nexus 5010, 5020, 2000 or 7000 series switches.

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

### Adapters

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

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

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

### Optical Transceivers

**SFP+ 10Gb**:
- FET, SR, LR, ER

**SFP 1GbE**: Not supported

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

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

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

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

Can only operate at 10Gb

Cisco branded cables only

### Designed for I/O bays

<table>
<thead>
<tr>
<th>I/O Bays</th>
<th>1/A2</th>
<th>B1/B2</th>
<th>C1/C2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The minimum Cisco Nexus software versions to support the B22DELL FEX are
- 5.2(1)N1(3)
- 6.0(2)N1(2)
## Comparison of Converged Blade options

<table>
<thead>
<tr>
<th></th>
<th>Dell MXL Switch</th>
<th>Dell PowerEdge M I/O Aggregator</th>
<th>Cisco Nexus B22</th>
<th>DELL FEX</th>
<th>Dell M8024-k</th>
<th>Dell M8428-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>
<td>Ethernet / FC</td>
<td></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>
<td>16 (10GbE)</td>
<td></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>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>External 10G Ports</strong></td>
<td>Up to 24 (16 per LAG)</td>
<td>Up to</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td><strong>Flex I/O Expansion Modules</strong></td>
<td>Two slots and three options (Mix or match)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>• 2 port QSFP+ (10/40GbE) ¹</td>
<td>• 4 port SFP+ (1/10GbE)</td>
<td>• 4 port Base-T (1/10GbE) ²</td>
<td>None</td>
<td>One slot &amp; 3 options</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>²Both devices limited to one Base-T module only. Populate second slot with another module of your choice.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stacking</strong></td>
<td>6</td>
<td>2</td>
<td>n/a</td>
<td>6</td>
<td>n/a</td>
<td></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>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Managed with Active System Manager</strong></td>
<td>Coming</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Support for M420 Quarter-Height Blades on Fabric A</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>No (Not in a redundant manner)</td>
<td>No (Not in a redundant manner)</td>
<td>No (Not in a redundant manner)</td>
<td></td>
</tr>
<tr>
<td><strong>Support for MLAG (vLT/vPC)</strong></td>
<td>Coming</td>
<td>Coming</td>
<td>Yes</td>
<td>No</td>
<td>No</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>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
1Gb Ethernet

- 1/10Gb High-density M6348
- 1/10Gb Basic M6220
- 1Gb Pass-Through
- Cisco Catalyst 3130X/G & 3032
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
Works with all 1Gb Mezzanine cards and LOMs. Optimal use is with quad-port 1Gb adapters.

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

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

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

More details in Adapter Portfolio section

10Gb Optical Transceivers
SR & LR

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

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

Secondary Management Serial Port
(Cable included)
M6220

Basic 1GbE copper with FlexIO & 10GbE uplinks

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

1/10GbE

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

2 FlexIO Bays for:

- 48Gb Stacking Module
- 2 x 10Gb Optical SFP+ Uplinks
- 2 x 10GBASE-T Copper Uplinks
- 2 x 10Gb Copper CX-4 Uplinks

25 Dell M-Series Blade I/O Guide
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

Secondary Management Serial Port (Cable included)
Gb Ethernet Pass-Through

Adapters

Works with all 1Gb Mezzanine cards and LOMs.

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

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

More details in Adapter Portfolio section

Designed for I/O bays

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

1GbE Pass Through Module

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

Cisco Catalyst 3130X – 1/10Gb Switch
- Two 10GbE uplinks (X2 – CX4, SR, LRM optics)
- Four fixed 1GbE uplinks - 4xRJ45
- Virtual Blade Switch interconnect enabled

Cisco Catalyst 3130G – GbE Switch
- Up to eight GbE uplinks – fixed 4xRJ45 + up to four optional 1GbE SFPs (copper or optical)
- Virtual Blade Switch interconnect enabled

Cisco Catalyst 3032 -- Entry Level GbE Switch
- Up to eight GbE uplinks - 4xRJ45 & up to 4 SFPs (Cisco copper or optical products only)

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

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

Adapters

Works with all 1Gb Mezzanine cards and LOMs.

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

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

More details in Adapter Portfolio section

Designed for I/O bays

A1/A2
B1/B2
C1/C2

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

GbE ports (all models)
Software Upgrades
IP Services Upgrade Available

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

10GBASE-CX4 X2 Module
(for 3130X)

Secondary Management Serial Port

10GBASE-SR X2 Module or 10GBASE-LRM X2 Module
(3130X only)

SFP+

Copper
Fibre

Cables

CAT 5 Cable
CAT5 Cable
Fibre

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

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

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.

Adapters

Works with all 1Gb Mezzanine cards and LOMs.

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

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

More details in Adapter Portfolio section

Designed for I/O bays

A1/A2
B1/B2
C1/C2

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

GbE ports (all models)
Software Upgrades
IP Services Upgrade Available

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

10GBASE-CX4 X2 Module
(for 3130X)

Secondary Management Serial Port

10GBASE-SR X2 Module or 10GBASE-LRM X2 Module
(3130X only)

SFP+

Copper
Fibre

Cables

CAT 5 Cable
CAT5 Cable
Fibre

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

See also the M8428-k in the Converged Ethernet section
# M-Series Fibre Channel Comparison

<table>
<thead>
<tr>
<th>Feature</th>
<th>8/4Gbps FC SAN Module</th>
<th>8Gbps FC SAN Switch</th>
<th>16Gbps FC SAN Switch</th>
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<td><strong>Model Choices</strong></td>
<td>12-port</td>
<td>12-port, 24-port</td>
<td>12-port, 24-port</td>
</tr>
<tr>
<td><strong>Scalable Ports Upgrade</strong></td>
<td>+12-ports</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</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>NPIV</td>
<td>Brocade Switch (default)</td>
<td>Access Gateway (selectable)</td>
</tr>
<tr>
<td><strong>Connect to Cisco MDS FC SAN</strong></td>
<td>NPIV</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>Not Supported</td>
<td>Brocade Switch Mode Connect direct to Compellent</td>
<td>Brocade Switch Mode 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 - 8Gb &amp; 4Gb</td>
<td>Qlogic &amp; Emulex - 16Gb &amp; 8Gb</td>
</tr>
<tr>
<td><strong>Brocade ISL-Trunking (License option)</strong></td>
<td>Not Supported</td>
<td>Switch &amp; NPIV modes connecting to Brocade FC SAN devices 64Gb/s</td>
<td>Switch &amp; Access Gateway modes connecting to Brocade FC SAN devices 128Gb/s</td>
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<tr>
<td><strong>Brocade Advanced Performance Monitoring &amp; Brocade Fabric Watch</strong></td>
<td>Not Supported</td>
<td>Optional Available a-la-carte</td>
<td>Switch &amp; NPIV modes connecting to Brocade FC SAN devices only</td>
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<td><strong>Brocade Enterprise Performance Pack (license option bundle)</strong></td>
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<td><strong>Better</strong></td>
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<td><strong>Best</strong></td>
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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**
  *16Gb capacity functions with newer M1000e chassis using 1.1 mid-plane. Switch will function on older M1000e chassis at 8Gb speed only.
  **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

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

12G
- Qlogic QME2662 FC16
- Emulex Lpm16002 FC16
- Qlogic QME2572 FC8
- Emulex LPe1205-M FC8

*16Gbps speeds on internal ports require the enhanced midplane (1.1). The switch will auto-negotiate to 8Gbps on internal ports when using the original midplane (1.0).

Does not support 4Gb Mezzanine cards.

Available Models - Brocade M6505

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

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

Brocade 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

Designed for I/O bays

B1/B2
C1/C2

Secondary Management Serial Port

More details in Adapter Portfolio section

Cables

Fibre Channel
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

11G
- Qlogic QME2572
- Emulex LPe1205

12G
- Qlogic QME2572
- Emulex LPe1205-M
- Qlogic QME2662 (at FC8 speeds)
- Emulex LPM16002 (at FC8 speeds)

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

More details in Adapter Portfolio section

Designed for I/O bays

B1/B2

C1/C2

Brocade Transceivers
Brocade SWL or LWL 8Gb SFP+ Optics
Brocade SWL, LWL or ELWL 4Gb SFP+ Optics
Note: Requires SFP LC connector

Secondary Management Serial Port

Available Models - Brocade M5424
- 24 ports with eight SFP+ transceivers
- 24 ports with four SFP+ transceivers
- 12 ports with two SFP+ transceivers

(12 port model expands to 24 ports with on-demand license)
Dell 8/4Gbps FC SAN Module

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

SimpleConnect for SAN

Best solution for modular SAN connectivity

• Based on industry-standard NPIV (N-port ID Virtualization)

• Combines pass-through simplicity for connecting each server to any SAN fabric with beneficial I/O and cable aggregation

• Helps solve interoperability issues with heterogeneous fabrics, i.e. mixed Brocade, Cisco, etc.

• Enables scalable data center modular growth without disruption
  – Lessens RSCN traffic, addresses FCP Domain limits

• No management required

• Standard feature / mode available on M5424
Dell 8/4Gbps FC SAN Module

Adapters

11G
- Qlogic QME2572
- Emulex LPe1205

12G
- Qlogic QME2572
- Emulex LPe1205-M

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

More details in Adapter Portfolio section

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

(12 port model expands to 24 ports with on-demand license)
Dell 8/4Gbps FC Pass-Through

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

#### Adapters

**11G**
- Qlogic QME2572, - Emulex LPe1205

**12G**
- Qlogic QME25722 - Emulex LPe1205-M

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

#### More details in Adapter Portfolio section

#### Designed for I/O bays

- B1/B2
- C1/C2

#### Brocade Transceivers

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

#### Cables

Fibre Channel
InfiniBand

- 56Gb M4001F FDR
- 40Gb M4001T FDR10
Mellanox Blades

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

<table>
<thead>
<tr>
<th>Models</th>
<th>M4001F</th>
<th>M4001T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
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<td>FDR10</td>
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<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>
<td></td>
</tr>
</tbody>
</table>
Mellanox M4001F & M4001T

Adapters

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

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

More details in Adapter Portfolio section

Designed for I/O bays

B¹/B²  C¹/C²

Cables

QSFP Active Optical or QSFP Passive Copper

M4001F FDR

Not a Management Port. Debug port only

M4001T FDR10

Not a Management Port. Debug port only

QSFP Active Optical or QSFP Passive Copper
Find more topologies and guides here:
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: Nexus 5K

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: M8428-k

**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: S4810, S4820T
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
Top-of-Rack switch: S4810, S4820T
Storage: PS4410 storage blade
Optional Storage: EqualLogic External Array

**Configuration**
- Converged iSCSI to the blades and up to the Top-of-Rack switch
- MXLs are stacked, so that array to array traffic stays inside the 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

Benefits of Stacking

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

Topology / Configuration

Topology
Stacked blade switches connected directly to the Network Core switches

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

Topology Diagram

Stack and Connect Directly to Core

- Core
- VLT
- Stacked IOMs

Stack Ring 1
Stack Ring 2
LAN
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 (M8024S/M6348S/M6220S)
- Aggregate traffic from multiple downlinks to one or more uplinks by mapping internal (server) NIC ports to external (top-of-rack) switch ports
- Based on port aggregation industry standards

Benefits of Simple Switch Mode?

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

For an overview demo of Simple Switch mode, visit:
http://www.delltechcenter.com/page/PowerEdge+Blade+Demos  (English only)
Fabrics and Port Mapping
The capabilities of the enhanced midplane (1.1) are shown above.

Colors chosen to facilitate whiteboard discussions.
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
- 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.

Fabric B & C Capabilities:
- 1Gb or 10Gb Ethernet per each lane or 40Gb Ethernet using all 4 lanes
- 4Gb, 8Gb, or 16Gb Fibre Channel over 1 lane to each IOM
- 40Gb QDR, 40Gb FDR10, or 56Gb FDR InfiniBand using all 4 lanes. 20Gb DDR InfiniBand using 2 lanes.
I/O Fabric Architecture for Half-Height Blades

Fabric A:
- Dual port and Quad port 1Gb or 10Gb Ethernet adapters

Fabric B & C:
- Ethernet, Fibre Channel, &/or InfiniBand mezzanine cards
- Dual port 1Gb and 10Gb Ethernet mezzanine cards
- Quad port 1Gb Ethernet mezzanine and capable of quad port 10Gb Ethernet mezzanine
- Dual port Fibre Channel mezzanine
- Dual port InfiniBand mezzanine

Link between a dual port adapter and switch of same fabric type
Additional link provided by quad-port adapter cards and an IOM with 32 internal ports
Port Mapping of Half Height blades with Dual Port Adapters to IOMs with 16 or 32 Internal Ports

IOM ports mapped to half height blade slots

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

A1,B1,C1  A2,B2,C2
Port Mapping of Half Height blades with **Quad Port Adapters** to IOMs with 32 Internal Ports

- An IOM with 32 internal ports is required to connect to all quad port adapters
- All six IOMs have the same port mapping for half height blades
I/O Fabric Architecture for Full-Height Blades

**Fabric A:**
- Ethernet Only
- Dual port 1Gb and 10Gb Ethernet adapters
- Quad port 1Gb Ethernet and capable of quad port 10Gb Ethernet adapters

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

<table>
<thead>
<tr>
<th>Slot1</th>
<th>Slot2</th>
<th>Slot3</th>
<th>Slot4</th>
<th>Slot5</th>
<th>Slot6</th>
<th>Slot7</th>
<th>Slot8</th>
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<tbody>
<tr>
<td>IOM1 P1</td>
<td>IOM1 P2</td>
<td>IOM1 P3</td>
<td>IOM1 P4</td>
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<tr>
<td>IOM2 P1</td>
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<td>IOM2 P7</td>
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</table>

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

A1,B1,C1  A2,B2,C2
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

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<td>P28</td>
<td>P29</td>
<td>P30</td>
<td>P31</td>
<td>P32</td>
</tr>
</tbody>
</table>

IOM ports mapped to full height blade slots

A1, B1, C1

A2, B2, C2
I/O Fabric Architecture with Quarter Height Blades

**Fabric A:**
- Dual port 10Gb Ethernet LOM
- Connectivity for both LOM ports requires IOMs with 32 internal ports
- Two IOMs with only 16 internal ports will only provide a connection 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

IOM ports mapped to quarter height blade slots

- On fabric A, two IOMs with 16 internal ports provide connectivity to one port of the LOM on each quarter height blade.
- Connectivity but not redundancy (only 1 LOM port per blade is connected)
Port Mapping of Quarter Height blades to four IOMs on Fabric B&C: Full Mezz Card Port Redundancy

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

![Diagram showing port mapping to quarter height blade slots]
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</th>
<th>Cisco 3130G</th>
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# PowerEdge M1000e 10Gb Ethernet I/O Interoperability

## 10Gb Ethernet I/O Modules

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<th>MXL</th>
<th>PowerEdge M/I/O Aggregator</th>
<th>M8024-k</th>
<th>M8024</th>
<th>M8428-k</th>
<th>10Gb Pass-Through (original model)</th>
<th>10Gb Pass-Through II</th>
<th>10Gb Pass-Through -k</th>
<th>B22DELL</th>
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<tbody>
<tr>
<td>Broadcom 57710 Mezz</td>
<td>Not Compatible</td>
<td>Not Compatible</td>
<td>Not Compatible</td>
<td>✓</td>
<td>Not Compatible</td>
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<td>Broadcom 57711 Mezz</td>
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<tr>
<td>Emulex OCm10102-f-m Mezz</td>
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<tr>
<td>QLogic QME8142 Mezz</td>
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<td>✓</td>
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<tr>
<td>Intel X520 Mezz</td>
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<td>✓</td>
<td>Not Compatible</td>
<td>✓</td>
<td>✓</td>
<td>Not Compatible</td>
<td>Not Compatible</td>
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<tr>
<td>Intel X520-x/k Mezz (for 11G Servers)</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ * ✓ ✓</td>
<td></td>
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<tr>
<td>Brocade BR1741M-k Mezz</td>
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<td>✓ N/A N/A ✓ * ✓</td>
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<tr>
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<td>✓ N/A N/A ✓ * ✓</td>
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</tr>
<tr>
<td>QLogic QMD8262-k NDC</td>
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<td>Not Compatible</td>
<td>✓ N/A N/A ✓ * ✓</td>
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<tr>
<td>Broadcom 57810-k Mezz</td>
<td>✓ ✓ ✓ Not Compatible</td>
<td>Not Compatible</td>
<td>✓ N/A N/A ✓ * ✓</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Intel X520–x/k Mezz (for 12G Servers)</td>
<td>✓ ✓ ✓ Not Compatible</td>
<td>Not Compatible</td>
<td>✓ N/A N/A ✓ * ✓</td>
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</tr>
<tr>
<td>QLogic QME8262-k Mezz</td>
<td>✓ * ✓ * ✓ * Not Compatible</td>
<td>Not Compatible</td>
<td>✓ * N/A N/A ✓ * ✓</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

10GBe on fabric ‘A’ with original mid-plane (1.0) will shift down to 1Gb. Note: fabrics B & C remain 10Gb with original mid-plane (1.0)
N/A: This combination is not possible
Not Compatible: This combination will not link
✓*: In Fabric ‘A’ with original mid-plane (1.0), this combination will not link
## PowerEdge M1000e InfiniBand I/O Interoperability

<table>
<thead>
<tr>
<th>Mezzanine Cards</th>
<th>I/O Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M2401G Mellanox DDR</td>
</tr>
<tr>
<td>Mellanox DDR Connect-X</td>
<td>✓ DDR</td>
</tr>
<tr>
<td>Mellanox QDR Connect-X2</td>
<td>✓ DDR</td>
</tr>
<tr>
<td>Mellanox QDR Connect-X3</td>
<td>Not Supported</td>
</tr>
<tr>
<td>Mellanox FDR10 Connect-X3</td>
<td>Not Supported</td>
</tr>
<tr>
<td>Mellanox FDR Connect-X3</td>
<td>Not Supported</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 or M820

✓ FDR**: Not supported with original mid-plane (1.0)
## PowerEdge Blade Servers and InfiniBand Adapters

### Mezzanine Cards

<table>
<thead>
<tr>
<th>Blade Servers</th>
<th>Mellanox DDR Connect-X</th>
<th>Mellanox QDR Connect-X2</th>
<th>Mellanox QDR Connect-X3</th>
<th>Mellanox FDR10 Connect-X3</th>
<th>Mellanox FDR Connect-X3</th>
</tr>
</thead>
<tbody>
<tr>
<td>M420</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</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>✓</td>
</tr>
<tr>
<td>M820</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>
</tr>
</tbody>
</table>
### PowerEdge M1000e Fibre Channel I/O Interoperability

<table>
<thead>
<tr>
<th>Mezzanine Cards</th>
<th>I/O Modules</th>
<th>FC4 Passthrough</th>
<th>M4424 Brocade FC4</th>
<th>FC8 Passthrough</th>
<th>Dell 8/4Gbps FC SAN Module</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>
</tr>
<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 (for 11G and 12G servers)</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>QLogic QME2572 FC8 (for 11G and 12G servers)</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 LPm16002 FC16</td>
<td>Not compatible</td>
<td>Not compatible</td>
<td>✓ FC8</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>✓ FC8</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
<td>✓ FC8</td>
<td>✓ FC16*</td>
</tr>
</tbody>
</table>

✓ FC16*: 16Gbps speeds require enhanced midplane (1.1). Auto-negotiates to FC8 with original mid-plane (1.0)
# PowerEdge Blade Servers and Fibre Channel Adapters

## Mezzanine Cards for 12G Servers

<table>
<thead>
<tr>
<th>Blade Servers</th>
<th>Emulex LPe1205-M FC8</th>
<th>QLogic QME2572 FC8</th>
<th>Emulex LPm16002 FC16</th>
<th>QLogic QME2662 FC16</th>
</tr>
</thead>
<tbody>
<tr>
<td>M420</td>
<td>✓</td>
<td>✓</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>M520</td>
<td>✓</td>
<td>✓</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>M620</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>M820</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>M910</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>M915</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Includes: Server Adapter products, features, compatibility and software support matrix
12G+ M1000e Server Adapter Portfolio: Ethernet and InfiniBand

10Gb Ethernet
- Intel X520-k 2P NDC
- Intel X520-k 2P Mezz

10Gb Converged Ethernet
- Broadcom 57810S-k 2P NDC
- Broadcom 57810S-k 2P LOM
- Broadcom 57810S-k 2P Mezz

10Gb Converged Ethernet
- QLogic QMD8262-k KR NDC
- QLogic QME8262-k KR Mezz
- Brocade BR1741M-k Mezz

1Gb Ethernet
- Broadcom 5720 4P LOM
- Broadcom 5719 4P Mezz
- Intel i350 4P Mezz

QDR/FDR InfiniBand
- Mellanox CX3 FDR Mezz
- Mellanox CX3 FDR10 Mezz
## Select Network Adapters for blade servers

<table>
<thead>
<tr>
<th>Features</th>
<th>Broadcom 57810S-k NDC (Default choice)</th>
<th>Intel X520-k NDC</th>
<th>QLogic QMD8262-k NDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ports x Link Speed</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
</tr>
<tr>
<td>Supported Speed</td>
<td>1Gb, 10Gb</td>
<td>1Gb, 10Gb</td>
<td>10Gb</td>
</tr>
<tr>
<td>Chipset</td>
<td>57810S</td>
<td>X520/82599</td>
<td>P3+</td>
</tr>
<tr>
<td>ISCSI HBA</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>ISCSI Boot</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>FCoE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>FCoE Boot</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Switch Independent Partitioning</td>
<td>Yes³</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>DCB</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SR-IOV</td>
<td>Yes</td>
<td>Yes³</td>
<td>No</td>
</tr>
<tr>
<td>WOL</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PXE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>EEE</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Multi-queue² (per port)</td>
<td>128 TX, 128 RX</td>
<td>64 TX, 64 RX</td>
<td>64 TX, 64 RX</td>
</tr>
<tr>
<td>Supported Servers</td>
<td>M620, M820</td>
<td>M620, M820</td>
<td>M620, M820</td>
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</tbody>
</table>

### Strengths

- Continuity from older server designs
- Convergence features iSCSI HBA and NPAR
- Preference for Intel Ethernet solutions
- Software iSCSI and FCoE
- Trusted Storage driver stack
- Convergence features like iSCSI HBA, FCoE and NPAR

---

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

---

Select Network Adapters for blade servers

<table>
<thead>
<tr>
<th>Features</th>
<th>Broadcom 57810S-k NDC (Default choice)</th>
<th>Intel X520-k NDC</th>
<th>QLogic QMD8262-k NDC</th>
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</thead>
<tbody>
<tr>
<td>Ports x Link Speed</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
</tr>
<tr>
<td>Supported Speed</td>
<td>1Gb, 10Gb</td>
<td>1Gb, 10Gb</td>
<td>10Gb</td>
</tr>
<tr>
<td>Chipset</td>
<td>57810S</td>
<td>X520/82599</td>
<td>P3+</td>
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<td>ISCSI HBA</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>ISCSI Boot</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>FCoE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>FCoE Boot</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Switch Independent Partitioning</td>
<td>Yes³</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>DCB</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SR-IOV</td>
<td>Yes</td>
<td>Yes³</td>
<td>No</td>
</tr>
<tr>
<td>WOL</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PXE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>EEE</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Multi-queue² (per port)</td>
<td>128 TX, 128 RX</td>
<td>64 TX, 64 RX</td>
<td>64 TX, 64 RX</td>
</tr>
<tr>
<td>Supported Servers</td>
<td>M620, M820</td>
<td>M620, M820</td>
<td>M620, M820</td>
</tr>
</tbody>
</table>

### Strengths

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

Select Network Adapters for blade servers

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<thead>
<tr>
<th>Features</th>
<th>Broadcom 57810S-k NDC (Default choice)</th>
<th>Intel X520-k NDC</th>
<th>QLogic QMD8262-k NDC</th>
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<tr>
<td>Ports x Link Speed</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
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<td>1Gb, 10Gb</td>
<td>10Gb</td>
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<tr>
<td>Chipset</td>
<td>57810S</td>
<td>X520/82599</td>
<td>P3+</td>
</tr>
<tr>
<td>ISCSI HBA</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>ISCSI Boot</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>FCoE</td>
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<td>Yes</td>
</tr>
<tr>
<td>FCoE Boot</td>
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<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Switch Independent Partitioning</td>
<td>Yes³</td>
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<td>Yes</td>
</tr>
<tr>
<td>DCB</td>
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<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SR-IOV</td>
<td>Yes</td>
<td>Yes³</td>
<td>No</td>
</tr>
<tr>
<td>WOL</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PXE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>EEE</td>
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<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Multi-queue² (per port)</td>
<td>128 TX, 128 RX</td>
<td>64 TX, 64 RX</td>
<td>64 TX, 64 RX</td>
</tr>
<tr>
<td>Supported Servers</td>
<td>M620, M820</td>
<td>M620, M820</td>
<td>M620, M820</td>
</tr>
</tbody>
</table>

### Strengths

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- Preference for Intel Ethernet solutions
- Software iSCSI and FCoE
- Trusted Storage driver stack
- Convergence features like iSCSI HBA, FCoE and NPAR

---

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

<table>
<thead>
<tr>
<th>Features</th>
<th>Broadcom 57810S-k 2p 10Gb LOM</th>
<th>Broadcom 5720 4p 1Gb LOM</th>
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</thead>
<tbody>
<tr>
<td>Ports x Link Speed</td>
<td>2x10Gb</td>
<td>4x1Gb</td>
</tr>
<tr>
<td>Supported Speed</td>
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<td>1Gb</td>
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<tr>
<td>Chipset</td>
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<td>5720</td>
</tr>
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<td>Serdes</td>
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<td>No</td>
</tr>
<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>
</tr>
<tr>
<td>FCoE Boot</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Switch Independent</td>
<td>Yes(^2)</td>
<td>No</td>
</tr>
<tr>
<td>Partitioning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCB</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>SR-IOV</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>WOL</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PXE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>EEE</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Multi-queue(^3) (per port)</td>
<td>128 TX, 128 RX</td>
<td>8 TX, 8 RX</td>
</tr>
<tr>
<td>Supported Servers</td>
<td>M420</td>
<td>M520</td>
</tr>
</tbody>
</table>

1: No. of queues will vary depending upon hypervisor memory limitations
2: 4 partitions per 10Gb port
3: 8 partitions per 1Gb port
# Blade Mezzanine Card: 1Gb

<table>
<thead>
<tr>
<th>Features</th>
<th>Intel I350 4p 1Gb Mezz</th>
<th>Broadcom 5719 4p 1Gb Mezz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ports x Link speed</td>
<td>4x1Gb</td>
<td>4x1Gb</td>
</tr>
<tr>
<td>Supported Speed</td>
<td>1Gb</td>
<td>1Gb</td>
</tr>
<tr>
<td>Chipset</td>
<td>I350</td>
<td>5719</td>
</tr>
<tr>
<td>Interface</td>
<td>Serdes</td>
<td>Serdes</td>
</tr>
<tr>
<td>iSCSI HBA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>iSCSI Boot</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>FCoE</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>FCoE boot</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Switch Independent</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Partitioning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCB</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>SR-IOV</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>WOL</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PXE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>EEE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Multi-queue¹ (per</td>
<td>8 TX, 8 RX</td>
<td>8 TX, 8 RX</td>
</tr>
<tr>
<td>port)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supported Servers</td>
<td>M420, M520, M620, M820</td>
<td>M420, M520, M620, M820</td>
</tr>
<tr>
<td>Great for</td>
<td>Preference for Intel Ethernet solutions</td>
<td>Continuity from previous generation server designs</td>
</tr>
</tbody>
</table>

¹: No. of queues will vary depending upon hypervisor memory limitations
# Blade Mezzanine Card: 10Gb

<table>
<thead>
<tr>
<th>Features</th>
<th>Broadcom 57810S-k DP 10Gb</th>
<th>Intel X520 10Gb DP –x/k</th>
<th>QLogic QME8262-k</th>
<th>Brocade BR1741M-k KR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ports x Link Speed</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
<td>2x10Gb</td>
</tr>
<tr>
<td>Supported Speed</td>
<td>1Gb,10Gb</td>
<td>1Gb,10Gb</td>
<td>10Gb</td>
<td>1Gb, 10Gb</td>
</tr>
<tr>
<td>Chipset</td>
<td>57810S</td>
<td>X520</td>
<td>P3+</td>
<td>Catapult I</td>
</tr>
<tr>
<td>iSCSI HBA</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>iSCSI Boot</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>FCoE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>FCoE boot</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Switch Independent Partitioning</td>
<td>Yes³</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>DCB</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SR-IOV</td>
<td>Yes</td>
<td>Yes¹</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>WOL</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>PXE</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>
</tr>
<tr>
<td>RoCE</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Multi-queue² (per port)</td>
<td>128 TX, 128 RX</td>
<td>64 TX, 64 RX</td>
<td>64 TX, 64 RX</td>
<td>128 TX, 128 RX</td>
</tr>
<tr>
<td>Supported Servers</td>
<td>M420, M520, M620, M820, M910, M915</td>
<td>M420, M520, M620, M820, M910, M915</td>
<td>M420, M520, M620, M820, M910, M915</td>
<td>M420, M520, M620, M820, M910, M915</td>
</tr>
<tr>
<td>Great for</td>
<td>Continuity from older server designs, Convergence features, iSCSI HBA and NPAR, Future FCoE availability</td>
<td>Preference for Intel Ethernet solutions, Software iSCSI and FCoE</td>
<td>Trusted Storage driver stack, Convergence features, like iSCSI HBA, FCoE and NPAR</td>
<td>Works best with Brocade convergence switch and their management framework</td>
</tr>
</tbody>
</table>

1: Citrix Xenserver 6.0 and Linux KVM only. 63 VFs per port 2: No. of queues will vary depending upon hypervisor memory limitations 3: 4 partitions per 10Gb port
# Blade Mezzanine Card: FC8Gb and FC16Gb

<table>
<thead>
<tr>
<th>Features</th>
<th>QLogic QLE2572 FC8</th>
<th>Emulex 1205-M FC8</th>
<th>Qlogic QME2662 FC16</th>
<th>Emulex LPm16002 FC16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ports x Link speed</td>
<td>2x8Gb</td>
<td>2x8Gb</td>
<td>2x16Gb</td>
<td>2x16Gb</td>
</tr>
<tr>
<td>Supported Speed</td>
<td>4Gb, 8Gb</td>
<td>4Gb, 8Gb</td>
<td>8Gb, 16Gb</td>
<td>8Gb, 16Gb</td>
</tr>
<tr>
<td>Chipset</td>
<td>2500</td>
<td>LightPulse</td>
<td>2600</td>
<td>LightPulse</td>
</tr>
<tr>
<td>FC Boot</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Supported Servers</td>
<td>M420, M520, M620, M820</td>
<td>M420, M520, M620, M820</td>
<td>M620, M820, M910, M915</td>
<td>M620, M820, M910, M915</td>
</tr>
</tbody>
</table>
# Blade Mezzanine: InfiniBand

<table>
<thead>
<tr>
<th>Features</th>
<th>Mellanox CX3 FDR10</th>
<th>Mellanox CX3 FDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ports x Link</td>
<td>2 x 40Gb</td>
<td>2 x 56Gb</td>
</tr>
<tr>
<td>Chipset</td>
<td>CX-3</td>
<td>CX-3</td>
</tr>
<tr>
<td>Supported Protocols</td>
<td>IB</td>
<td>IB</td>
</tr>
<tr>
<td>Supported servers</td>
<td>M420, M520, M620, M820</td>
<td>M620</td>
</tr>
<tr>
<td>Great for</td>
<td>Real time market data distribution</td>
<td>HFT, co-located investment banks, algorithmic trading, low latency applications</td>
</tr>
</tbody>
</table>
## 10Gb Products with Convergence and Virtualization features

<table>
<thead>
<tr>
<th>Form Factor</th>
<th>Device Name</th>
<th>Convergence</th>
<th>Virtualization</th>
<th>Switch Independent Partitioning</th>
<th>SR-IOV</th>
<th>Virtual Queues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select Network Adapters (10Gb)</td>
<td>Broadcom 57810S-k (2x10Gb)</td>
<td>ISCSI (Offload, Boot, SW)</td>
<td>Yes</td>
<td>Yes (4 partitions per 10Gb port)</td>
<td>Yes</td>
<td>128 TX, 128 RX</td>
</tr>
<tr>
<td></td>
<td>Intel X520-k (2x10Gb)</td>
<td></td>
<td></td>
<td>No</td>
<td>Yes</td>
<td>64 TX, 64 RX</td>
</tr>
<tr>
<td>LOM (10Gb)</td>
<td>Broadcom 57810S-k (2x10Gb)</td>
<td></td>
<td></td>
<td>Yes (4 partitions per 10Gb port)</td>
<td>Yes</td>
<td>128 TX, 128 RX</td>
</tr>
<tr>
<td>10Gb Adapters/Mezz</td>
<td>Broadcom 57810S-k (2x10Gb)</td>
<td></td>
<td></td>
<td>Yes (4 partitions per 10Gb port)</td>
<td>Yes</td>
<td>128 TX, 128 RX</td>
</tr>
<tr>
<td></td>
<td>Intel X520 –x/k (2x10Gb)</td>
<td></td>
<td></td>
<td>No</td>
<td>Yes</td>
<td>64 TX, 64 RX</td>
</tr>
<tr>
<td></td>
<td>QLogic QMD8262-k (2x10Gb)</td>
<td></td>
<td></td>
<td>No</td>
<td>Yes</td>
<td>64 TX, 64 RX</td>
</tr>
<tr>
<td>Brocade BR1741M-k (2x10Gb)</td>
<td>Software iSCSI</td>
<td></td>
<td></td>
<td>Yes (4 partitions per 10Gb port)</td>
<td>No</td>
<td>64 TX, 64 RX</td>
</tr>
<tr>
<td></td>
<td>Software iSCSI</td>
<td></td>
<td></td>
<td>No</td>
<td>No</td>
<td>64 TX, 64 RX</td>
</tr>
</tbody>
</table>
## 12G Server IO Features

<table>
<thead>
<tr>
<th>Vendors</th>
<th>Chipset/ Devices</th>
<th>Speed</th>
<th>FCoE (offload, Boot)</th>
<th>ISCSI (Boot, offload, SW)</th>
<th>NPAR</th>
<th>SR-IOV</th>
<th>DCB w/ iSCSI</th>
<th>Life Cycle controller 2.0 + Real time monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadcom</td>
<td>5719/5720</td>
<td>1G</td>
<td>No</td>
<td>Software iSCSI, iSCSI Boot (W2K8, Hyper-V, RH5.7, RH5.8, RH6.1, RH6.2, SLES10 SP4 and SLES11 SP2, ESXi 4.1/5.0)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>57810S</td>
<td>10Gb</td>
<td>Yes²</td>
<td>(W2K8, Hyper-V, RH6 1/6.2, SLES11 SP2, ESXi 4.1/5.0)</td>
<td>All</td>
<td>Yes (W2K8, Hyper-V, RHEL 5.7, RH5.8, RH6.1, RH6.2, SLES11 SP2, ESXi 4.1/5.0)</td>
<td>No³ (Hardware capable)</td>
<td>Yes (W2K8, Hyper-V, RH6 1/6.2, SLES11 SP2)</td>
</tr>
<tr>
<td>Intel</td>
<td>I350</td>
<td>1G</td>
<td>No</td>
<td>Software iSCSI, iSCSI Boot (W2K8, Hyper-V, RH5.7, RH5.8, RH6.1, RH6.2, SLES10 SP4 and SLES11 SP2, ESXi 4.1/5.0)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>X520</td>
<td>10Gb</td>
<td>Software FCoE², Boot (W2K8, Hyper-V, RH5.7, RH5.8, RH6.1, RH6.2, SLES10 SP4 and SLES11 SP2, ESXi 4.1/5.0)</td>
<td>Software iSCSI, iSCSI Boot (W2K8, Hyper-V, RH5.7, RH5.8, RH6.1, RH6.2, SLES10 SP4 and SLES11 SP2, ESXi 4.1/5.0)</td>
<td>No</td>
<td>Yes (Citrix Xenserver 6.0, Linux KVM)</td>
<td>Yes (W2K8, Hyper-V, RHEL 5.7, RH5.8, RH6.1, RH6.2, SLES10 SP4 and SLES11 SP2)</td>
<td>Yes</td>
</tr>
<tr>
<td>QLogic</td>
<td>QME8262/QMD8262</td>
<td>10Gb</td>
<td>All (W2K8, Hyper-V, RH5.7, RH5.8, RH6.1, RH6.2, SLES10 SP4 and SLES11 SP2, ESXi 4.1/5.0)</td>
<td>All (W2K8, Hyper-V, RH5.7, RH5.8, RH6.1, RH6.2, SLES10 SP4 and SLES11 SP2, ESXi 4.1/5.0)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Brocade</td>
<td>BR1741M-k</td>
<td>10Gb</td>
<td>All (W2K8, Hyper-V, RH5.7, RH5.8, RH6.1, RH6.2, SLES10 SP4 and SLES11 SP2, ESXi 4.1/5.0)</td>
<td>Software iSCSI Only (W2K8, Hyper-V, RH5.7, RH5.8, RH6.1, RH6.2, SLES10 SP4 and SLES11 SP2, ESXi 4.1/5.0)</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

---

1: FCoE and DCB will be supported with software upgrade in Q2CY12
2: 10Gb Base-T devices doesn’t support FCoE due to unavailability of 10GB BT FCoE switch in the marketplace
3: SR-IOV will be supported in Q4CY12 timeframe aligning with Windows 8 release.
## Select Network Adapters – 11G vs. 12G

<table>
<thead>
<tr>
<th>Speed</th>
<th>Form Factor</th>
<th>11G</th>
<th>12G</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Gb</td>
<td>Blade NDC</td>
<td>Broadcom 5709 4P 1Gb Blade NDC (M710HD, M915 only)</td>
<td></td>
</tr>
<tr>
<td>10Gb</td>
<td>Blade NDC</td>
<td>Broadcom 57712-k 2P 10Gb KR NDC (M710HD, M915 only)</td>
<td>Broadcom 5870S-k 2P 10Gb NDC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intel X520-k 2P 10Gb NDC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>QLogic QMD8262-k 2P NDC</td>
</tr>
</tbody>
</table>
# Mezzanine Adapters - 11G vs. 12G

<table>
<thead>
<tr>
<th>Speed</th>
<th>Form factor</th>
<th>11G</th>
<th>12G&lt;sup&gt;1&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Gb</td>
<td>Blade Mezz</td>
<td>Broadcom 5709 4P Adapter Mezz</td>
<td>Broadcom 5719 4P Adapter Mezz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intel ET 4P Adapter Mezz</td>
<td>Intel I350 4P Adapter Mezz</td>
</tr>
<tr>
<td>10Gb</td>
<td>Blade Mezz</td>
<td>Emulex OCm10102-F-M 2P XAUI Mezz</td>
<td>_</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Broadcom 57711 2P XAUI Mezz</td>
<td>Broadcom 57810S-k 2P Mezz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>QLogic QME8242-k 2P Mezz</td>
<td>QLogic QME8262-k 2P Mezz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brocade BR1741M-k 2P Mezz</td>
<td>Brocade BR1741M-k 2P Mezz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intel X520 x/k 2P Mezz</td>
<td>Intel X520 x/k 2P Mezz</td>
</tr>
</tbody>
</table>

<sup>1</sup>: no iSCSI offload support with 1Gb devices
## Fibre Channel Adapters - 11G vs. 12G

<table>
<thead>
<tr>
<th>Speed</th>
<th>Form factor</th>
<th>11G</th>
<th>12G</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Gb</td>
<td>Blade Mezz</td>
<td>QLogic QME2572 2P FC8 HBA</td>
<td>QLogic QME2572 2P FC8 HBA</td>
</tr>
<tr>
<td></td>
<td>Emulex LPe1205-M 2P FC8 HBA Mezz</td>
<td>Emulex LPe1205-M 2P FC8 HBA Mezz</td>
<td></td>
</tr>
<tr>
<td>16Gb</td>
<td>Blade Mezz</td>
<td>Qlogic QME2662 FC16</td>
<td>Emulex LPm16002 FC16</td>
</tr>
</tbody>
</table>
# 12G Systems Management
## Network Device Support Matrix

<table>
<thead>
<tr>
<th>Form Factor</th>
<th>Vendor/Chipsets</th>
<th>Speed</th>
<th>LC configuration and update</th>
<th>Monitoring Support</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blade NDC</strong></td>
<td>Broadcom 57810S-k NDC</td>
<td>10GbE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Intel X520-kNDC</td>
<td>10GbE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>QLogic QMD8262-k NDC</td>
<td>10GbE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Blade LOM</strong></td>
<td>Broadcom 57810S-k LOM</td>
<td>10GbE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Broadcom 5720 LOM</td>
<td>1GbE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Blade Mezz</strong></td>
<td>Broadcom 57810S-k</td>
<td>10GbE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Broadcom 5719 Serdes</td>
<td>1GbE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Intel I350 Serdes</td>
<td>1GbE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Intel X520 x/k</td>
<td>10GbE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>QLogic QME8262-k</td>
<td>10GbE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Brocade BR1741M-k</td>
<td>10GbE</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

*Note: FC HBAs are not currently supported by LC*
## Deployment & Technical Guides

Detailed guides to help you get connected

<table>
<thead>
<tr>
<th>Product Focus</th>
<th>Document Title</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>M6220</td>
<td>Stacking PowerConnect M6220 Blade Switch</td>
<td><a href="http://del.ly/m6220stacking">http://del.ly/m6220stacking</a></td>
</tr>
<tr>
<td>M6220 and Cisco</td>
<td>VLAN Interoperability of the Dell M6220</td>
<td><a href="http://del.ly/m6220vlan">http://del.ly/m6220vlan</a></td>
</tr>
<tr>
<td>M6220, M6348, M8024, M8024-k</td>
<td>Simple Switch Mode Port Aggregation Feature</td>
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