



# DELL EMC NETWORKING MXG610s FIBRE CHANNEL SWITCH

Fibre Channel IO Module for MX7000 chassis deployments

The Dell EMC Networking MXG610s 32G Fibre Channel IO Module for the PowerEdge MX7000 is the right choice for mission-critical applications accessing data on external storage. The MXG610s provides industry-leading performance with the latest generation of Fibre Channel. It empowers enterprises to dynamically scale connectivity and bandwidth with Ports-on-Demand (PoD), provides consolidated management for an agile management structure and simplified server and storage connectivity, and employs a responsive design which protects enterprise's infrastructure with inherent security and with non-disruptive upgrades to NVMe over Fibre Channel.

The MXG610s is a high-throughput, high-density, low-latency Fibre Channel IO Module purpose-built for the PowerEdge MX7000, optimized for flash storage and highly virtualized server environments. MXG610s enables enterprise and mid-market companies to cost-effectively integrate Dell EMC's latest MX7000 chassis into industry leading 32 and 16 Gbps Fibre Channel networks. Organizations gain the best of both worlds: cost effective connectivity while leveraging the industry's highest-performance storage networking technology.

The MXG610s enables seamless integration of Dell EMC MX7000 chassis into existing Dell EMC Connectrix or Brocade storage networking environments, allowing customers to leverage Brocade's advanced fabric services, benefitting from the improved storage network performance, visibility and reliability.

The MXG610s comes in three models to meet the specific needs of organizations: 8-port, 16-port, and 16-port enterprise licensed models.

## **Dynamically scale, accelerate operations, and protect infrastructure**

The Dell EMC Networking MXG610s has a flexible architecture which enables enterprises to dynamically scale connectivity and bandwidth with the latest generation of Fibre Channel for the PowerEdge MX7000. The MXG610s features up to 32 Fibre Channel ports, which auto-negotiate to 32, 16, or 8 Gbps speed. The MXG610s offers 16 internal server facing ports

which auto-negotiate between 32 Gbps and 16 Gbps, allowing customers to implement the right bandwidth for their needs today, with the ability to increase that bandwidth in the future with Ports-on-Demand capability. There are 8 external SFP+ ports that operate at 8Gbps, 16Gbps, or 32Gbps speed, and 2 external QSFP+ ports offer 4 ports each operate at 16Gbps or 32Gbps speed. The QSFP ports enable aggregation of Fibre Channel traffic, resulting in a lower cost with fewer SFPs, less cabling, and lower power consumption. Additionally, the QSFP ports can be used for connectivity between MX7000 chassis as well as to aggregate traffic via Inter-Switch Links (ISL) between Connectrix or Brocade storage networking products that support QSFP ports.

Administrators can achieve optimal bandwidth utilization, high availability, and load balancing by combining up to eight ISLs to form a single 256 Gbps logical trunk. Moreover, exchange-based Dynamic Path Selection (DPS) optimizes fabric-wide performance and load balancing by automatically routing data to the most efficient, available path in the fabric. Access Gateway mode simplifies server and storage connectivity in blade environments by enabling increased fabric connectivity, greater scalability and reduced management complexity.

The MXG610s provides agile management to accelerate an organization's operations with simple, seamless integration into enterprise's existing storage network infrastructures. The network analytics capabilities included in Brocade™ Fabric Vision™ technology and VMware integrations provide the foundational network analytics to intelligently manage today's dynamic and ever evolving data center environments.

The MXG610s has a responsive design which protects enterprises' infrastructure with inherent Fibre Channel security and is ready for NVMe over Fibre Channel when organizations choose to implement that next generation storage protocol.

The Dell EMC Networking MXG610s combines market leading Gen 6 throughput, high-density, and low latency with an affordable form factor, making it ideal choice for enterprises incorporating the MX7000 into their data center infrastructure.

## Flash-ready performance optimized for high-density VM environments

The expanded use of high-performance Flash storage and increased VM densities are taxing legacy storage networks. In contrast, Gen 6 (32 Gbps) Fibre Channel technology is purpose-built for flash storage and is designed to support the demanding network environments driven by the combination of flash storage and high-density VM environments.

The latest generation of Fibre Channel leverages a rich heritage of innovation to deliver industry-leading reliability for the world's most demanding data centers. Fibre Channel delivers flash-ready performance, with up to 4X better performance with Gen 6 (32 Gbps), and is the storage network of choice because it provides

- Operational stability: Always-on architecture with industry-leading availability.
- Seamless scalability: Capable of supporting tens of thousands of servers and storage connections.
- Security by design: With managed access on isolated networks.

### Key Fabric Vision features include:

Feature	Description
<b>IO Insight</b>	Automatically detect degraded storage IO performance with integrated device latency and IOPS monitoring
<b>VM Insight*</b>	Seamlessly monitors end-to-end VM performance through standards-based VM tagging
<b>Dashboards</b>	Customizable health and performance dashboards, with critical information on a single screen
<b>MAPS</b>	Automation that simplifies policy-based monitoring and alerting
<b>Fabric Performance Monitoring</b>	Quickly detects and clearly alerts admins to high levels of latency, helping to identify/quarantine slow-drain devices
<b>COMPASS</b>	Simplifies SAN configuration and maintains operational consistency
<b>Flow Vision</b>	Identifies, monitors, and analyzes the performance of various storage traffic
<b>Clearlink Diagnostics</b>	Cable and optic diagnostics to accelerate SAN deployments

\* Not yet supported on Dell EMC Storage

## Three models for maximum flexibility

The Dell EMC MXG610s Fibre Channel I/O module is available in three models: 8-port, 16-port, and 16-port enterprise licensed models.

All models provide the flexibility of connection to installed Connectrix and other Brocade Fibre Channel networks in native Full Fabric Switch mode, as well as to third-party fabrics such as Cisco with Access Gateway (NPIV) mode.

The 16-port enterprise model is the best fit for enterprise customers that deploy the MX7000 into densely populated blade servers or installed Connectrix or Brocade storage network environments. It includes eight SWL optical transceivers (SFP+) which auto-negotiate to 32/16/8 Gbps FC, and includes Inter-Switch Links (ISL) Trunking, Fabric Vision and Extended Fabric licenses pre-installed.

- ISL Trunking provides the ability to aggregate multiple physical links into on logical link for enhanced network performance and fault tolerance. ISL Trunking also operates in Brocade Access Gateway mode.
- Extended Fabric provides switched fabric connectivity to move more data over longer distances at a lower cost. It extends all the scalability, reliability, and performance benefits of Fibre Channel storage networks beyond traditional distance limitations, and enables innovative business continuity and disaster recovery solutions for fast, reliable data replication and backup across metropolitan distances.
- Fabric Vision technology (described above)

The 16-port model is the best fit for deployment with third party storage networks with densely populated blade servers. It includes four SWL optical transceivers (SFP+) which auto-negotiate to 32/16/8 Gbps FC. The 16-port model does not include the enterprise software bundle.

The 8-port model is a good fit to directly attach an external storage array, especially in branch offices or deployments where a sparsely populated chassis will be utilized. It includes two SWL optical transceivers (SFP+) which auto-negotiate to 32/16/8 Gbps FC. The 8-port model does not include the enterprise software bundle.

Both the 8-port and 16-port models can be upgraded to the optional enterprise software bundle which includes ISL Trunking, Fabric Vision and Extended Fabric licenses.

## Dell EMC Networking MXG610s technical specifications

Product	Description
<b>MXG610s Fibre Channel IO Module</b>	
<b>Total Fibre Channel Ports</b>	Up to 16 internal server facing and up to 16 external fabric facing ports (8-port increments through dynamic Ports on Demand (POD) license. The 16 internal server facing ports operate at either 16 Gbps or 32 Gbps speed depending on the mini-mezzanine adapter, and do not require any optical transceivers. The 16 external fabric facing ports are available in two different port types: 8 external SFP+ ports operate at 8Gbps, 16Gbps, or 32Gbps speed 2 external QSFP+ ports offer 4 ports each operate at 16Gbps or 32Gbps speed
<b>Supported Optics</b>	Transceiver, 16Gbps FC, SWL SFP Transceiver, 16Gbps FC, LWL SFP Transceiver, 32Gbps FC, SWL SFP Transceiver, 32Gbps FC, LWL SFP Transceiver, 16Gbps FC, SW4 QSFP (supports 4x1 Breakout) Transceiver, 32Gbps FC, SW4 QSFP (supports 4x1 Breakout)
<b>ANSI Fibre Channel protocol</b>	Fibre Channel Physical and Signaling Interface standard (FC-PH)
<b>Modes of operation</b>	Fibre Channel Class 2 and Class 3
<b>Fabric initialization</b>	Complies with FC-SW-3 Rev. 6.6
<b>Scalability</b>	Full-fabric architecture with a maximum of 239 switches
<b>Certified maximum</b>	6,000 active nodes, 56 switches, 19 hops in a Fabric OS® fabrics
<b>ISL trunking</b>	Frame-based trunking with up to eight ports per ISL trunk for an up to 256 Gbps per ISL; supporting trunk Exchange-based load balancing across ISLs with DPS included in Fabric OS®
<b>Max. Switching bandwidth</b>	1024 Gbps (32 * 32 Gbps) in Full Fabric Switch mode
<b>Max. Throughput</b>	512 Gbps (16 * 32 Gbps) in Access Gateway mode (default mode)
<b>Maximum port-to-port latency</b>	Latency for locally switched ports is ≤ 900 ns (including FEC)
<b>Maximum frame size</b>	2,112-byte payload
<b>Frame buffers</b>	2,000 dynamically allocated
<b>Classes of services</b>	Class 2, Class 3, Class F (inter-switch frames)
<b>Port types</b>	F_Port, E_Port, M_Port, D_Port (ClearLink Diagnostic Port), N_Port
<b>Data traffic types</b>	Fabric switch supporting unicast
<b>Fabric Services</b> Note: Some fabric services do not apply or are unavailable in Access Gateway mode.	Monitoring and Alerting Policy Suite (MAPS); Flow Vision; Brocade Adaptive Networking (Traffic Isolation, QoS); Fabric Performance Impact (FPI) Monitoring; Slow Drain Device Quarantine (SDDQ); Brocade Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning, peer zoning, target-driven zoning); Dynamic Fabric Provisioning (DFP); Dynamic Path Selection (DPS); Brocade Extended Fabrics; Enhanced BB credit recovery; FDMI; Frame Redirection; Frame-based Trunking; FSPF; Brocade ISL Trunking; Management Server; NPIV; NTP v3; Registered State Change Notification (RSCN); Reliable Commit Service (RCS); Simple Name Server (SNS); Read Diagnostics Parameter (RDP), VM Insight
<b>Supported management software</b>	HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), SSH; Auditing, Syslog; Brocade Advanced Web Tools; Command Line Interface (CLI); SMI-S compliant; Administrative Domains; trial licenses for add-on capabilities
<b>Security</b>	DH-CHAP (between switches and end devices), FCAP switch authentication; HTTPS, IPsec, IP filtering, LDAP with IPv6, OpenLDAP, Port Binding, RADIUS, TACACS+, User-defined Role-Based Access Control (RBAC), Secure Copy (SCP), Secure RPC, Secure Syslog, SFTP, SSH v2, SSL, Switch Binding, Trusted Switch
<b>Management access</b>	1 micro USB type B port for console/management
<b>Diagnostic</b>	ClearLink optics and cable diagnostics, including electrical/optical loopback, link traffic/latency/distance; flow mirroring; built-in flow generator; POST and embedded online/offline diagnostics, including environmental monitoring, Fcping and Pathinfo (FC traceroute), frame viewer, non-disruptive daemon restart, optics health monitoring, power monitoring, RAStrace logging, and Rolling Reboot Detection (RRD)

## Technical specifications

### Physical

Full featured Gbps Fibre Channel IO Module in MX-Series I/O Sled form factor

1 micro USB type B port for console/management port access

Size: 1.08 "h x8.44" w x 9.49 " d

Weight: 3.79lbs (1.72kg)

Max. power consumption: 60 Watts

Typ. power consumption: 57 Watts

Max. operating specifications:

Standard Operating Temperature -5°C to 50°C (23°F to 122°F)

Operating Relative Humidity 5% to 95%, noncondensing

Max. non-operating specifications:

Storage temperature: -40°C to 70°C (-40°F to 158°F)

Storage humidity: 5% to 95% (RH) with 33°C (91°F) maximum dew point

Expanded Operating Temperature, Continuous Operation: 5°C to 50°C at 5% to 85% RH with 29°C dew point

### Redundancy

Redundant Power and Cooling provided by Dell EMC PowerEdge MX7000 Chassis

### Regulatory compliance

#### Safety

UL/CSA 60950-1, Second Edition

EN 60950-1, Second Edition

IEC 60950-1, Second Edition Including all National Deviations and Group Differences

EN 60825-1 Safety of Laser Products Part 1:

Equipment Classification Requirements and User's Guide

EN 60825-2 Safety of Laser Products Part 2:

Safety of Optical Fiber Communication Systems

FDA Regulation 21 CFR 1040.10 and 1040.11

#### Emissions

Australia/New Zealand: AS/NZS CISPR 32:2015, Class A

Canada: ICES-3/NMB-3, Class A

Europe: EN 55024:2010 (CISPR 24:2010), Class A

Japan: VCCI V-3/2010.04 Class A

USA: FCC CFR 47 Part 15, Subpart B:2011, Class A

#### Immunity

EN 300 386 V1.6.1 EMC for Network Equipment  
EN 55024:2010

EN 61000-3-2: Harmonic Current Emissions

EN 61000-3-3: Voltage Fluctuations and Flicker

EN 61000-4-2: ESD

EN 61000-4-3: Radiated Immunity

EN 61000-4-4: EFT

EN 61000-4-5: Surge

EN 61000-4-6: Low Frequency Conducted Immunity

#### RoHS

EN 50581:2012 All S9999 components are EU RoHS compliant

\* partial support

## IT Lifecycle Services for Networking

### Experts, insights and ease

Our highly trained experts, with innovative tools and proven processes, help you transform your IT investments into strategic advantages.



#### Plan & Design

Let us analyze your multivendor environment and deliver a comprehensive report and action plan to build upon the existing network and improve performance.



#### Deploy & Integrate

Get new wired or wireless network technology installed and configured with ProDeploy. Reduce costs, save time, and get up and running fast.



#### Educate

Ensure your staff builds the right skills for long-term success. Get certified on Dell EMC Networking technology and learn how to increase performance and optimize infrastructure.



#### Manage & Support

Gain access to technical experts and quickly resolve multivendor networking challenges with ProSupport. Spend less time resolving network issues and more time innovating.



#### Optimize

Maximize performance for dynamic IT environments with Dell EMC Optimize. Benefit from in-depth predictive analysis, remote monitoring and a dedicated systems analyst for your network.



#### Retire

We can help you resell or retire excess hardware while meeting local regulatory guidelines and acting in an environmentally responsible way.

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