DELL EMC 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.

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.

- Seamless 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.

Key Fabric Vision features include:

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

Product	Description
MXG610s Fibre Channel IO Module	
Total Fibre Channel Ports	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 minimezzanine 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
Supported Optics	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 1x4 Breakout) Transceiver, 32Gbps FC, SW4 QSFP (supports 1x4 Breakout)
ANSI Fibre Channel protocol	Fibre Channel Physical and Signaling Interface standard (FC-PH)
Modes of operation	Fibre Channel Class 2 and Class 3
Fabric initialization	Complies with FC-SW-3 Rev. 6.6
Scalability	Full-fabric architecture with a maximum of 239 switches
Certified maximum	6,000 active nodes, 56 switches, 19 hops in a Fabric OS® fabrics
ISL trunking	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®
Max. Switching bandwidth	1024 Gbps (32 * 32 Gbps) in Full Fabric Switch mode
Max. Throughput	512 Gbps (16 * 32 Gbps) in Access Gateway mode (default mode)
Maximum port-to-port latency	Latency for locally switched ports is ≤ 900 ns (including FEC)
Maximum frame size	2,112-byte payload
Frame buffers	2,000 dynamically allocated
Classes of services	Class 2, Class 3, Class F (inter-switch frames)
Port types	F_Port, E_Port, M_Port, D_Port (ClearLink Diagnostic Port), N_Port
Data traffic types	Fabric switch supporting unicast
Fabric Services 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; NTPv3; Registered State Change Notification (RSCN); Reliable Commit Service (RCS); Simple Name Server (SNS); Read Diagnostics Parameter (RDP), VM Insight
Supported management software	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
Security	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
Management access	1 micro USB type B port for console/management
Diagnostic	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
    MXSeries 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 & Immunity

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 MXG610s 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.

Learn more at DellTechnologies.com/Services
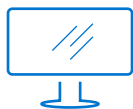
Learn more about Dell EMC Networking solutions

Contact a Dell Technologies Expert

View more resources

Join the conversation with @DellNetworking

D&LL Technologies