Dell Networking MXL blade switch

For Dell M1000e blade enclosures

Expand the value of your blade investment. The Dell Networking MXL blade switch delivers performance and scalability in a flexible package to meet the shifting demands of your business and data center as it transitions to 1/10/40GbE.

The Dell Networking MXL blade switch provides 1/10GbE connectivity on server-facing ports for up to 32 M-Series blade servers equipped with the latest KR-based 10GbE network daughter or mezzanine cards. The MXL switch offers 1/10/40GbE connectivity on the uplinks to interface with a top of rack switch, directly to the core, or directly to an Ethernet-based SAN. The MXL switch also has enhanced bandwidth, performance and flexibility to satisfy the changing demands of data centers embracing virtualization, network convergence and other I/O-intensive applications or workloads.

Flexibility and pay as you grow

The Dell Networking MXL blade switch provides rich functionality using 1/10/40GbE, addressing the diverse needs of environments ranging from data centers, large enterprises, government networks, education/research and high-performance computing. The MXL switch supports 32 internal 1/10GbE ports as well as two fixed 40GbE QSFP+ ports and offers two bays for optional FlexIO modules. Uplinks via the FlexIO modules can be added or swapped as needed to ensure your business has room to grow. Choose from 2-port QSFP+, 4-port SFP+, 4-port 10GBase-T FlexIO or 4-port FC modules. The MXL switch provides the flexibility to mix and match the FlexIO module types.

The MXL blade switch is an industry-first, 40GbE-capable, modular and stackable blade switch for the M1000e chassis.

High-performing architecture and Ethernet stacking

The MXL switch is an industry-first, 40GbE-capable, modular and stackable blade switch for the M1000e chassis. Ethernet stacking using two 40GbE ports enables scalable network switch growth for up to six interconnected blade switches that are managed as one logical device. Both stacking across chassis and local switching of traffic within the chassis offer high performance, efficiency and lower TCO.

Powerful and robust OS

Dell Networking Operating System 9 (OS9) is a robust and scalable operating system comprised of feature-rich Layer 2 and Layer 3 switching and routing functionality using industry standard command line interface. Deployed by some of the most demanding data center customers, the MXL switch brings this high-performing and resilient OS9 to the M1000e chassis.

Built-in convergence capabilities

The MXL switch is fully IEEE data center bridging (DCB) compliant, supporting iSCSI, NAS and FCoE transit. With the optional FC FlexIO module, the MXL switch is transformed into an NPIV Proxy Gateway capable of bridging Ethernet and Fibre Channel. Converged networking lowers costs by immediately reducing infrastructure requirements for blade servers and interconnects. In addition to infrastructure savings, convergence reduces complexity, simplifies management and increases efficiency in data center operations.

	4-port FC module	4-port SFP+ module	4-port 10GBASE-T module	2-port QSFP+ module
Model				
Module differentiator	Designed to deliver four ports of 8Gb Fibre Channel bandwidth (NPG mode only). NPIV Proxy Gateway* (NPG) offering gateway capabilities to existing SAN fabrics.	Provides 4 ports of SFP+ 10Gb connectivity. Supports optical and DAC cable media.	Provides 4 ports of 10GBASE-T connectivity. Supports copper media over relatively longer distance. Maximum of one 10GBASE-T module per MXL (other module bay can be populated).	Provides 2 ports of QSFP+ connectivity for 2 40Gb connections. When the ports are in breakout mode, it provides 8 ports of 10Gb Ethernet while only using 2 cables.
Port speed	2/4/8/Gb	10Gb/1Gb	100Mb/1Gb/10Gb (supports auto negotiation)	10Gb/40Gb
Protocol support	Native Fibre Channel	Ethernet	Ethernet	Ethernet
Media types	2/4/8Gb FC SFP+ Optics	Optical Tranceivers SFP+ 10Gb: SR, LR SFP 1 GBE: SX, LX SFP to RJ45 converter 10000Base-T (only capable of 1Gbps) SFP+ Direct Attach Cable (Twinax)	RJ45/Cat6a Copper	QSFP+ to 4xSFP+ Breakout Cables 5m Passive Copper QSFP+ to QSFP+ Direct Attach 1m and 5m, Passive Copper Optical Transceivers SFP+ 40Gb: SR only QSFP+ to QSFP+ Fiber Cables QSFP+ to 4xSFP+ Fiber Breakout Cables

*The Dell FC FlexIO module uses NPIV Proxy Gateway (NPG) technology, which provides the capability to use converged FCoE inside the M1000e chassis while maintaining traditional unconverged Ethernet and native Fibre Channel outside of the M1000e. With the FC FlexIO module, the MXL provides bridging capabilities between Ethernet and Fibre Channel via FCoE. The MXL manages the following items when the FC FlexIO module is installed:

1. DCB (PFC, ETS and DCBx)
2. FIP discovery and initialization
3. FLOGI and FDISC conversion process
4. FIP keep alives

For communication outside the chassis, the MXL directs all Ethernet traffic out the external Ethernet ports (these ports can be in DCB or non-DCB mode) and convert all FCoE packets to native FC packets and directs them out the native Fibre Channel ports of the FC FlexIO module(s). The MXL acts as an NPG connecting the converged network adapters (CNAs) in the servers to the external Fibre Channel fabric. When the FC FlexIO module is installed, the MXL appears as an FCF to the CNAs while the FC FlexIO ports appear as NPIV N_ ports (i.e. HBA ports) to the external Fibre Channel Fabric.

Note: The MXL NPIV Proxy Gateway does not currently provide fabric services.

Specifications: Dell Networking MXL blade switch

Port attributes
Up to 32 line-rate 10GbE KR ports
2 line-rate fixed 40GbE QSFP+ ports
2 optional FlexIO plug-in modules with flexible media choices:
- 2-port QSFP+ 40GbE module
- 4-port SFP+ 10GbE module
- 4-port 10GBase-T 10GbE copper module (1/10Gb, only 1 module per MXL is supported)
- 4-port 2/4/8Gb FC FlexIO module

1 USB (Type A) port for storage
1 USB (Type A) port for console/management

Performance

MAC addresses:	128K
IPv4 routes:	16K
Switch fabric capacity:	1.28Tbps (full-duplex)
Forwarding capacity:	960Mpps
Link aggregation:	Up to 16 members per group, 128 LAG groups
Queues per port:	4 queues
VLANs:	4094
Line-rate Layer 2 switching:	All protocols, including IPv4
Line-rate Layer 3 routing:	IPv4 and IPv6
ACLs:	2K ingress, 1K egress
Packet buffer memory:	9MB
CPU memory:	2GB

Stacking
Stacked units: Up to 6 MXLs (using 40GbE ports only)
Stacking bandwidth: Up to 320Gbps (using 2 x 40GbE ring)
Stacking topology: Ring and daisy chain
Virtual Link Trunking (VLT): mVLT and L2/L3 over VLT

IEEE compliance

802.1AB	LLDP
802.1p	L2 Prioritization
802.3ab	Gigabit Ethernet (1000Base-T)
802.3ad	Link Aggregation with LACP
802.3ae	10GbE (10GBase-X)
802.3ba	40GbE (40GBase-SR4, 40GBase-CR4) on optical ports
802.3u	Fast Ethernet (100Base-TX)
802.3x	Flow Control
802.3z	Gigabit Ethernet (1000Base-X)
ANSI/TIA-1057	LLDP-MED
MTU	12KB

Availability
802.1D Bridging, STP
802.1s MSTP
802.1w RSTP
2338 VRRP

Layer 3 routing
1058 RIPv1
2453 RIPv2
2154 MD5 (OSPF)
1587 NSSA (OSPF)
2328 OSPFv2
2740 OSPFv3
4222 Prioritization and congestion avoidance
4552 OSPFv3 IPsec authentication

BGP
1997 BGP Communities
2385 BGP MD5
2439 BGP Route Flap Damping
2796 BGP Route Reflection
2918 BGP Route Refresh
3065 BGP Confederations
4360 BGP Extended Communities
4893 BGP 4-byte ASN
5396 BGP 4-byte ASN representations
draft-ietf-idr-restart-06 BG P Graceful Restart
1195 Routing IPv4 with IS-IS
5308 Routing IPv6 with IS-IS

VLAN
802.1Q VLAN Tagging, Double VLAN Tagging, GVRP
802.3ac Frame Extensions for VLAN Tagging
Force10 PVST+
Native VLAN

Data center bridging
IEEE 802.1Qbb Priority-Based Flow Contrl (PFC)
IEEE 802.1Qaz Enhanced Transmission Selection (ETS)
Data Center Bridging eXchange (DCBx)
DCBx Application TLV (iSCSI, FCoE)

Fiber channel
NPIV Proxy Gateway (NPG)
Fiber Channel port types : N
Bridging to FC SAN
Up to 8 FCoE_Maps per switch

FCoE features
Native FCoE forwarding
FCoE Initialization Protocol (FIP) v1
FCoE Transit (FIP Snooping Bridge)
FCoE to FC Forwarding
Dynamic FCoE to FC Load Balancing

Open automation
Bare metal provisioning
Virtual server networking
Smart scripting

Security options
854 Telnet
959 FTP
1321 MD5
1350 TFTP
2474 Differentiated Services
2856 RADIUS
3164 Syslog
4254 SSHv2
draft-grant-tacacs-02
TACACS+
4807 IPSec SPD MIB
4301 IPSec

General IPv4 protocols
768 UDP
791 IPv4
792 ICMP
793 TCP
826 ARP
1027 Proxy ARP
1035 DNS (client)
1042 Ethernet Transmission
1191 Path MTU Discovery
1305 NTPv3
1519 CIDR
1542 BOOTP (relay)
1812 Routers
1858 IP Fragment Filtering
2131 DHCP (relay, client, server)
3021 31-bit Prefixes
3046 DHCP Option 82
3069 Private VLAN
3128 Tiny Fragment Attack Protection

General IPv6 protocols
2460 IPv6
1858 IP Fragment Filtering
2461 Neighbor Discovery
2675 Jumbograms (partial)
3587 Global Unicast Address Format
2462 Stateless Address Autoconfiguration (partial)
4291 Addressing
2463 ICMPv6
4861 IPv6 Host for management port
1981 IPv6 Path MTU discovery

Multicast
1112 IGMPv1
3569 SSM for IPv4
2236 IGMPv2
4541 IGMPv1/v2 Snooping
3376 IGMPv3
draft-ietf-pim-sm-v2-new-05 PIM-SM

SDN/Openflow
Openflow standard 1.0 with extensions

Network management
1155 SMIv1
1156 Internet MIB
1157 SNMPv1
1212 Concise MIB Definitions
1215 SNMP Traps
1493 Bridges MIB
1850 OSPFv2 MIB
1901 Community-based SNMPv2
2011 IP MIB
2012 TCP MIB
2013 UDP MIB
2096 IP Forwarding Table MIB
2570 SNMPv3
2571 Management Frameworks
2572 Message Processing and Dispatching
2575 SNMPv3 VACM
2576 Coexistence Between SNMPv1/v2/v3
2578 SMIv2
2579 Textual Conventions for SMIv2
2580 Conformance Statements for SMIv2
2618 RADIUS Authentication MIB
2665 Ethernet-like Interfaces MIB
2787 VRRP MIB
2819 RMON MIB (groups 1, 2, 3, 9)
2863 Interfaces MIB
3273 RMON High Capacity MIB
3416 SNMPv2
3418 SNMP MIB
3434 RMON High Capacity Alarm MIB
ANSI/TIA-1057 LLDP-MED MIB
IEEE 802.1AB LLDP MIB
IEEE 802.1AB LLDP DOT1 MIB
IEEE 802.1AB LLDP DOT3 MIB
sFlow.org sFlowv5
FORCE10-IF-EXTENSION-MIB
FORCE10-LINKAGG-MIB
FORCE10-COPY-CONFIG-MIB
FORCE10-MON-MIB
FORCE10-PRODUCTS-MIB
FORCE10-MS-CHASSIS-MIB
FORCE10-SMI
FORCE10-SYSTEM-COMPONEN-MIB
FORCE10-TC-MIB
FORCE10-TRAP-ALARM-MIB
FORCE10-FIPSNOOPING-MIB
FORCE10-DCB-MIB
LLDP-EXT-DOT1-DCBX-MIB
IEEE8021-PFC-MIB
DELLI_ITA.REV_1_1.MIB
F10-JUMPSTART-MIB
FORCE10-MSTP-MIB

Chassis
Single-wide I/O module for M1000e blade enclosure

Environmental
Power supply: 100–240V AC 50/60Hz
Max. thermal output: 955.36 BTU/h
Max. current draw per system: 2A at 100/120V AC, 1A at 200/240V AC
Max. power consumption: 123 Watts
ISO 7779 A-weighted sound pressure level: 59.6dBA at 73.4°F (23°C)
Operating temperature: 32° to 104°F (0° to 40°C)
Operating humidity: 10 to 85% (RH), non-condensing
Max. non-operating specifications:
- Storage temperature: –40° to 158°F (–40° to 70°C)
- Storage humidity: 5 to 95% (RH), non-condensing

Regulatory and environment compliance
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 Optical Fibre Communication Systems
FDA Regulation 21 CFR 1040.10 and 1040.11
Emissions
Australia/New Zealand: AS/NZS CISPR 22: 2006, Class A
Canada: ICES-003, Issue-4, Class A
Europe: EN 55022: 2006+A1:2007 (CISPR 22: 2006), Class A
Japan: VCCI V3/2009 Class A
USA: FCC CFR 47 Part 15, Subpart B:2009, Class A
EN 300 386 V1.4.1:2008 EMC for Network Equipment
EN 55024: 1998 + A1: 2001 + A2: 2003
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
All components are RoHS compliant

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