Dell Force10 MXL 10/40GbE Switch
For Dell M1000e Blade Enclosures

Expand the value of your blade investment with Dell Force10 MXL 10/40GbE switch, delivering performance and scalability in a flexible package that are designed to meet the shifting demands of your business and data center as it transitions from 1GbE to 1/10/40GbE. The MXL 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 cards (NDCs) or mezzanine cards. The 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 Force10 MXL switch has enhanced bandwidth, performance, and flexibility to satisfy the changing demands of data centers embracing virtualization, network convergence, and other I/O-intensive applications/workloads.

Flexibility and Pay As You Grow With FlexIO Modules
The Dell Force10 MXL 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. To ensure room to grow with your business, uplinks via the FlexIO modules can be added or swapped as needed in the future. Choose from 2-port QSFP+, 4-port SFP+ or 4-port 10GBASE-T FlexIO modules to expand and aggregate (bi-directional) bandwidth up to 160 Gigabit per second. The MXL switch provides the flexibility to mix and match the FlexIO module types.

High Performing Architecture & Ethernet Stacking
The MXL switch is an industry first 40GbE capable, modular, and stackable blade switch for the M1000e chassis. Ethernet stacking using 2 x 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 and efficiency and lower TCO.

Powerful and Robust OS
Dell Force10 Operating System (FTOS) is a robust and scalable operating system that comprises of feature rich Layer 2 and Layer 3 switching and routing functionality using industry standard CLI. The MXL switch brings this high performing and resilient FTOS deployed by some of today’s most demanding DC customers to the M1000e chassis.

Built-in Convergence Capabilities
The MXL switch is full IEEE DCB compliant for converged IO switch supporting iSCSI, NAS, converged Ethernet and Fibre-Channel based storage applications. With more matured DCB standards and improved hardware support for DCB (DCBx, PFC, and ETS), the MXL switch conforms to requirements enabling greater capabilities. Converged networking translates to customer savings as customers can immediately reduce infrastructure requirements for blade servers and interconnects. In addition to infrastructure savings, convergence reduces complexity, simplifies management, and optimizes data center operations with efficiency.
Specifications: Dell Force10 MXL 10/40GbE 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)
- 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: 1.28 Tbps (full-duplex)
- Forwarding capacity: 960 Mpps
- 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: all protocols, including IPv4
- 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

IEEE Compliance
- B02.1A8 LLDP
- B02.1p L2 Prioritization
- B02.3ab Gigabit Ethernet (1000BASE-T)
- B02.3ad Link Aggregation with LACP
- B02.5ae 10 Gigabit Ethernet (10GBASE-Z)
- B02.5ba 40 Gigabit Ethernet (40GBase-CR4) on optical ports
- B02.5u Fast Ethernet (100BASE-TX)
- B02.3x Flow Control
- B02.3z Gigabit Ethernet (1000BASE-X)
- ANSI/TIA-1057 LLDP-MED
- MTU: 12K bytes

Availability
- B02.1D Bridging, STP
- B02.1s MSTP
- B02.1w RSTP
- 2338 VRRP

Layer 3 routing
- 1058 RpIPv4
- 2453 RpIPv6
- 2154 MDS (OSPF)
- 1587 NSSA (OSPF)
- 2328 OSPFv2
- 4222 Prioritization and Congestion Avoidance

VLAN
- B02.1Q VLAN Tagging, Double VLAN Tagging, GVRP
- B02.3ac Frame Extensions for VLAN Tagging
- Force10 PVST+
- Native VLAN

Storage
- DCB
- DCBx
- iSCSI
- FIP snooping

Open Automation
- Bare Metal Provisioning

Security options
- 854 Telnet
- 959 FTP
- 1221 MD5
- 1350 TFTP
- 2474 Differentiated Services
- 2856 RADIUS
- 3164 Syslog
- 4254 SSHv2
- draft-grant-tacacs+02
- TACACS+

General IPv4 Protocols
- 768 UDP
- 791 IPv4
- 972 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

Network Management
- 1185 SMIv2
- 1156 Internet
- 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 SMv2
- 2579 Textual Conventions for SMv2
- 2580 Conformance Statements for SMv2
- 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 B02.1AB LLDP MIB
- IEEE B02.1AB LLDP Dot1 MIB
- IEEE B02.1AB LLDP Dot3 MIB
- sFlow.org sFlowv5
- FORCE10-IF-EXTENSION-MIB
- FORCE10-LINKAGG-MIB
- FORCE10-FIPSNOOPING-MIB
- FORCE10-TC-MIB
- FORCE10-TRAP-ALARM-MIB
- FORCE10-TRAP-ALARM-MIB
- FORCE10-ADIT-MIB
- FORCE10-ATTACH-MIB
- FORCE10-COPY-CONFIG-MIB
- FORCE10-DCB-MIB
- FORCE10-FIPSNOOPING-MIB
- FORCE10-LLDP-EXT-DOT1-DCBX-MIB
- IEEE8021-PFC-MIB
- DELLl_ITA.REV_1_1.MIB
- F10-JUMPSTART-MIB
- FORCE10-MSTP-MIB
- FORCE10-SYSTEM-COMPONENT-MIB
- FORCE10-TC-MIB
- FORCE10-TRAP-ALARM-MIB
- FORCE10-FIPSNOOPING-MIB
- FORCE10-DCB-MIB
- LLDP-EXT-DOT1-DCBX-MIB
- IEEE8021-PFC-MIB
- DELLl_ITA.REV_1_1.MIB
- F10-JUMPSTART-MIB
- FORCE10-MSTP-MIB

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

Environmental
- Power supply: 100–240 VAC 50/60 Hz
- Max. power consumption: 123 Watts
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- ISO 7799 A-weighted sound pressure level: 59.6 dBA at 75.4°F (23°C)
- Temperature: 32° to 104°F (0° to 40°C)
- Humidity: 10 to 85% (RH), non-condensing
- Max. non-operating specifications:
  - Storage temperature: -40° to 158°F ( -40° to 70°C)
  - Storage humidity: 9 to 95% (RH), non-condensing

Regulatory and environment Compliance
- UL/CUSA 60950-1, Second Edition
- EN 60950-1, Second Edition
- IEC 60950-1, Second Edition including all National Deviations and Group Differences
- 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
- Japan: VCCI V3/2009 Class A
- USA: FCC CFR 47 Part 15, Subpart B:2009, Class A
- EN 300 386 V1.1.2:2008 EMC for Network Equipment
- 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: Surge
- EN 61000-4-6: Low Frequency Conducted Immunity
- All components are RoHS compliant

Learn more at Dell.com/Networking

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