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.

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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: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
802.1AB   LLDP
802.1p   L2 Prioritization
802.3ab   Gigabit Ethernet (1000BASE-T)
802.3ad   Link Aggregation with LACP
802.3ae   10 Gigabit Ethernet (10GBASE-X)
802.3ba   40 Gigabit Ethernet (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   12K bytes

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
4222 Prioritization and Congestion Avoidance

VLAN
802.1Q VLAN Tagging, Double VLAN Tagging, GVRP
802.3ac 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
1321 MD5
1350 TFTP
2474 Differentiated Services
2856 RADIUS
3164 Syslog
4254 SSHv2
draft-grant-tacacs-02
TACACS+

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

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
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. thermal output: 955.36 BTU/h
Max. current draw per system: 2 A at 100/120 VAC, 1 A at 200/240 VAC
Max. power consumption: 123 Watts
ISO 7779 A-weighted sound pressure level: 59.6 dBA 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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