DELL EMC NETWORKING MX5108n ETHERNET SWITCH

High performance 25 Gigabit Ethernet switch for single PowerEdge MX7000 chassis deployments

The Dell EMC Networking MX5108n Ethernet Switch is a high-performance, low latency single chassis 25Gbps Ethernet switch purpose-built for the PowerEdge™ MX platform providing enhanced capabilities and cost-effectiveness for enterprise and mid-market environments with traditional compute traffic environments.

Delivering industry leading performance in a blade switch, the non-blocking switching architecture in the MX5108n provides line-rate 25GbE L2 and L3 forwarding capacity with no oversubscription and a sub 800ns latency. In addition to 8 internal 25GbE ports, the MX5108n provides four 10G-BaseT, two QSFP28 100GbE, and one QSFP+ 40GbE port for uplinks.

Maximum performance and functionality

The Dell EMC Networking MX5108n is a high-performance, multi-function, 25GbE Ethernet switch designed for applications in demanding data center, cloud and computing environments. The MX5108n also supports the open source Open Network Install Environment (ONIE) for zero touch installation of alternate operating systems in future releases.

OS10 Enterprise Edition

The Dell EMC Networking OS10 Enterprise Edition is a Network Operating System supporting multiple architectures and environments. The networking world is moving from a monolithic stack to a pick-your-own-world. The OS10 solution is designed to allow multi-layered disaggregation of network functionality. While OS10 contributions to Open Source provide users freedom and flexibility to pick their own 3rd party networking, monitoring, management and orchestration applications, OS10 Enterprise Edition bundles an industry hardened networking stack featuring standard L2 and L3 protocols over a standard and well accepted CLI interface.

SmartFabric Services

Included in OS10 Enterprise Edition, SmartFabric Services provides single pane of glass management and automation across every fabric in a PowerEdge MX deployment, up to the 20 chassis Multi-Chassis Management group limit. SmartFabric Services key features include:

- I/O Aggregation to simplify connectivity to existing networks
- Integration of VLAN and automated QoS settings with Server Deployment Templates
- Fabric-wide firmware upgrades and configuration consistency checks
- Automatic topology validation – detects physical topology misconfigurations and provides corrective guidance
- Automatically heals fabric upon failure condition removal

Key applications

- Organizations looking to enter the software-defined data center era with a choice of networking technologies designed to deliver the flexibility they need
- Native 25 GbE server access in high-performance data center environments
- 25 GbE backward compatible to 10G and 1G for future proofing and data center server migration to faster uplink speeds.
- iSCSI storage deployment including DCB converged lossless transactions

Key features

- Up to 960Gbps of switching I/O bandwidth (full duplex) available and non-blocking switching fabric delivering line-rate performance under full load with sub usec latency
- Scalable L2 and L3 Ethernet switching with QoS and a full complement of standards-based IPv4 and IPv6 features, including OSPF and BGP routing support
- L2 multipath support via Virtual Link Trunking (VLT) and multiple VLT (mVLT) multi-chassis link aggregation technology
- VRF-lite enables sharing of networking infrastructure and provides L3 traffic isolation across tenants
- Jumbo frame support for large data transfers
- 128 link aggregation groups with up to sixteen members per group, using enhanced hashing
Dell EMC Networking OS10 supports converged network support for DCB, with priority flow control (802.1Qbb), ETS (802.1Qaz), DCBx and iSCSI TLV support. It also supports Routable RoCE to enable convergence of compute and storage.

**Key features with Dell EMC Networking OS10**

- Consistent DevOps framework across compute, storage and networking elements
- Standard networking features, interfaces and scripting functions for legacy network operations integration
- Standards-based switching hardware abstraction via Switch Abstraction Interface (SAI)
- Pervasive, unrestricted developer environment via Control Plane Services (CPS)
- Open and programmatic management interface via Common Management Services (CMS)
- OS10 Enterprise Edition software enables Dell EMC layer 2 and 3 switching and routing protocols with integrated IP Services, Quality of Service, Manageability and Automation features
- Platform agnostic via standard hardware abstraction layer (OCP- SAI)
- Unmodified Linux kernel and unmodified Linux distribution
- Leverage common open source tools and best-practices (data models, commit rollbacks)
- Scalable L2 and L3 Ethernet Switching with QoS, ACL and a full complement of standards based IPv4 and IPv6 features including OSPF, BGP and PBR
- Enhanced mirroring capabilities including local mirroring, Remote Port Mirroring (RPM), and Encapsulated Remote Port Mirroring (ERPM).
- Converged network support for DCB, with priority flow control (802.1Qbb), ETS (802.1Qaz), DCBx and iSCSI TLV
- Rogue NIC control provides hardware-based protection from NICS sending out excessive pause frames

### Product Description

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
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<tbody>
<tr>
<td>MX5108n Ethernet Switch</td>
<td>Transceiver, 100GbE, SR4 QSFP28&lt;br&gt;Transceiver, 100GbE, LR4 QSFP28&lt;br&gt;Transceiver, 100GbE, CWDM4 2Km QSFP28&lt;br&gt;Transceiver, 100GbE, PSM4 500m QSFP28&lt;br&gt;Transceiver, 40GbE, SR4 optic QSFP+&lt;br&gt;Transceiver, 40GbE, eSR4 optic QSFP+&lt;br&gt;Transceiver, 40GbE, LR4 optic QSFP+&lt;br&gt;Transceiver, 40GbE, BIDI optic QSFP+&lt;br&gt;Transceiver, 40GbE, PSM4 10Km QSFP+&lt;br&gt;Transceiver, 40GbE, LM4 Duplex QSFP+&lt;br&gt;Transceiver, 40GbE, SM4 Duplex QSFP+&lt;br&gt;</td>
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<tr>
<td>Optics</td>
<td>100GbE, QSFP28 to QSFP28, active optical, passive DAC&lt;br&gt;100GbE, QSFP28 to 4xSFP28 (4x10/25GbE), active optical, passive DAC&lt;br&gt;100GbE, MTP to MTP optical&lt;br&gt;100GbE, MTP to 4xLC optical breakout&lt;br&gt;40GbE, QSFP+ to QSFP+, active optical &amp; passive DAC&lt;br&gt;40GbE, QSFP+ to 4xSFP+ (4x10GbE), active optical &amp; passive DAC&lt;br&gt;</td>
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<tr>
<td>Cables</td>
<td>Dell EMC OS10 Enterprise Edition&lt;br&gt;Select third-party operating system offerings (future)&lt;br&gt;</td>
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<tr>
<td>Software</td>
<td>Select third-party operating system offerings (future)</td>
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Technical specifications

Physical
Full featured 25/100GE switch in PowerEdge MX Fabric A/B I/O sled form factor
1 USB 2.0 type A storage port
1 micro USB type B port for console/management port access

Indicators:
- Power/Health LED
- ID LED
- Link/activity LEDs

Size: 138”h x 171”w x 10.94”d
Weight: 772lbs (3.5kg)
Max. power consumption: 65 Watts
Typ. power consumption: 63.3 Watts

Max. operating specifications:
- Standard Operating Temperature 10°C to 35°C
- Operating Relative Humidity 5% to 85%, non-condensing

Max. non-operating specifications:
- Storage temperature: -40°C to 65°C (-40°F to 149°F)
- Storage humidity: 5 to 95% (RH), non-condensing

Expanded Operating Temperature, Continuous Operation: 5°C to 40°C at 5% to 85% RH with 29°C dew point

Note: Outside the standard operating temperature, the system can operate continuously in temperatures as low as 5°C and as high as 40°C. For temperature between 35°C to 40°C, de-rate maximum allowable temperature by 1°C per 175m above 950m (1°F per 319 ft)

Redundancy
Reducant Power and Cooling provided by Dell EMC PowerEdge MX7000 Chassis

Performance
Switching I/O bandwidth: 960 Gbps
Forwording capacity: Standard 363 Mpps
Latency: Sub 800ns

MAC addresses: 275K
IPv4 Unicast routes: 200K
IPv6 Unicast routes: 160K
ARP entries: 48K
Layer 2 VLANs: 4K
Layer 3 VLANs: 500
MST: 52Instances
PVST+: 128 instances
LAG: 128 groups, 16 members per LAG group
ACL Entries-Link 2 Egress: 1000
ACL Entries-Link 2 Ingress: 3000
ACL Entries-I Pv4 Egress: 3000
ACL Entries-I Pv4 Ingress: 3000
ACL Entries-I Pv6 Egress: 500
ACL Entries-I Pv6 ingress: 1500
iSCSI Number of sessions: 256
Jumbo Frames: 9K

IEEE Compliance
- 802.1AB  LLDP
- TIA-1057  LLDP-MED
- 802.3ad  Link Aggregation
- 802.1D  Bridging, STP
- 802.1p  L2 Prioritization
- 802.1Q  VLAN Tagging
- 802.1Qbb  PFC
- 802.1Gaz  ETS
- 802.1X  Network Access Control
- 802.3ac  Frame Extensions for VLAN Tagging
- 802.3x  Flow Control

Layer2 Protocols
- 802.1D  Compatible
- 802.1p  L2 Prioritization
- 802.1Q  VLAN Tagging
- 802.1s  MSTP
- 802.1w  RSTP
- 802.1T  RPVST+

VLT (Virtual Link Trunking)
VRRP Active/Active
RSTP & RPVST+
Port Mirroring on VLT ports
DCB, iSCSI, FSB on VLT
RPM/ERPM over VLT
VLT Minloss upgrade

RFC Compliance
- 768  UDP
- 793  TCP
- 854  Telnet
- 959  FTP
- 1321  MD5
- 1350  TFTP
- 2474  Differentiated Services
- 2698  Two Rate Three Color Marker
- 3164  Syslog
- 4254  SSHv3

General IPv4 Protocols
- 791  IPv4
- 792  ICMP
- 826  ARP
- 1027  Proxy ARP
- 1353  DNS (client)
- 1042  Ethernet Transmission
- 1191  Path MTU Discovery
- 1305  NTPv4
- 1519  CIDR
- 1812  Routers, Static Routes
- 1858  IP Fragment Filtering
- 1918  Address Allocation for Private Internets
- 2152  DHCPv4 (server and relay)
- 2474  Diffserv Field in IPv4 and IPv6 Headers
- 2596  Assured Forwarding PHB Group
- 3021  3-bit Prefixes
- 3195  Reliable Delivery for Syslog
- 3246  Expedited Forwarding PHB Group
- 5798  VRRPv3

General IPv6 Protocols
- 1981  Path MTU for IPv6
- 2372  IPv6 Addressing
- 2460  IPv6 Protocol Specification
- 2461  Neighbor Discovery
- 2462  Stateless Address AutoConfig
- 2463  ICMPv6
- 2464  Ethernet Transmission
- 2575  IPv6 Jumbograms
- 2674  Transmission of IPv6 Packets over Ethernet Networks
- 2711  IPv6 Router Alert
- 3543  Basic Socket Interface
- 3544  Advanced Socket, API
- 3587  Global Unicast Address Format
- 3848  Default Address Selection
- 4007  IPv6 Scoped Address Architecture
- 4213  Basic Transition Mechanisms for IPv6
- 4291  IPv6 Addressing

OSPF (V2/V3)
- 1745  OSPF/BGP interaction
- 1765  OSPF Database overflow
- 2154  OSPF with Digital Signatures
- 2328  OSPFv2
- 2370  Opaque LSA

Multicast
- 2236  IGMPv2 Snooping
- 3810  MLdV2 Snooping

Security
- 1492  TACACS (Authentication)
- 2865  RADIUS
- 3162  RADIUS and IPv6
- 3579  RADIUS support for EAP
- 3580  802.1X with RADIUS
- 3826  AES Cipher in SNMP

Control Plane, VTY ACLS
IP Access Control Lists

BGP
- 1997  Communities
- 2385  MD5
- 2439  Route Flap Damping
- 2545  BGP-4 Multiprotocol Extensions for IPv6 Inter-Domain Routing
- 2796  Route Reflection
- 2858  Multiprotocol Extensions
- 2918  Route Reflection
- 3065  Confederations
- 4271  BGP-4
- 4360  Extended Communities
- 4893  4-byte ASN
- 5596  4-byte ASN Representation
- 5692  Capabilities Advertisement
draft-ietf-idr-add-paths-04.txt ADD PATH

Linux Distribution
Debian Linux version 8
Linux Kernel 3.16

MIBS
- IP MIB
- IF MIB
- LLDP EXTN/3 MIB
- Entity MIB
- LAG MIB
- Dell-Vendor MIB
- TCP MIB
- UDP MIB
- SNMPv2 MIB

Network Management and Monitoring
SNMPv1/2c
IPv4/IPv6 Management support (Telnet, FTP, TACACS, RADIUS, SSH, NTP)
Syslog
Port Mirroring
RPM/ERPM
SIFlow
Management VRF
Support Assist (Phone Home)
RestConf API (Layer 2 features)
XML Schema
CLI Commit (Scratchpad)
Uplink Failure Detection
Object Tracking
Management VRF

Automation
- Control Plane Services APIs
- Linux Utilities and Scripting Tools
- CLI Automation (Multiline Alias)
- Ansible, Puppet, Chef, SaltStack
**Quality of Service**
- Prefix List
- Route-Map
- Rate Shaping (Egress)
- Rate Policing (Ingress)
- Scheduling Algorithms
  - Round Robin
  - Weighted Round Robin
  - Deficit Round Robin
  - Strict Priority
- Weighted Random Early Detect

**Data center bridging**
- 802.1Qbb Priority-Based Flow Control
- 802.1Qaz Enhanced Transmission Selection (ETS)
- Explicit Congestion Notification
- Data Center Bridging eXchange (DCBx)
- DCBx Application TLV (iSCSI, FCoE)

**Fibre Channel**
- FCF F-Port
- FC Zoning
- FIP Snooping

**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
- 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 300 388 V1.1.1 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

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Learn more at DellEMC.com/Networking