DELL EMC POWERSWITCH
Z9432F-ON SERIES SWITCH

High-performance, high-density open networking 400GbE multi rate aggregation switch

The Z9432F-ON 100/400GbE fixed switch comprises Dell Technologies’ latest disaggregated hardware and software data center networking solutions, providing state-of-the-art, high-density 100/400 GbE ports and a broad range of functionality to meet the growing demands of today’s data center environment. This innovative, next-generation open networking high-density aggregation switch offers optimum flexibility and cost-effectiveness for the web 2.0, enterprise, mid-market and cloud service provider with demanding compute and storage traffic environments.

The compact PowerSwitch Z9432F-ON provides industry-leading density of either 32 ports of 400GbE in QSFP56-DD form factor or 128 ports of 100GbE or up to 144 ports of 10/25/50GbE*(via breakout), in a 1RU design.

Using industry-leading hardware and a choice of Dell EMC SmartFabric OS10 or select 3rd party network operating systems and tools, the Z9432F-ON switch incorporates multiple architectural features that optimize data center network flexibility, efficiency and availability, including IO panel to PSU airflow or PSU to IO panel airflow* for hot/ cold aisle environments, redundant, hot-swappable power supplies and fans and delivers non-blocking performance for workloads sensitive to packet loss. The compact Z9432F-ON model provides multi-rate speed, enabling denser footprints and simplifying migration to 400Gbps.

Priority-based flow control (PFC), data center bridge exchange (DCBX) and enhanced transmission selection (ETS) make the Z9432F-ON ideally suited for DCB environments.

The Dell EMC PowerSwitch Z9432F-ON switch supports the open source Open Network Install Environment (ONIE) for zero touch installation of Dell EMC SmartFabric OS10 networking operating system, as well as of alternative network operating systems.

Key applications
- Organizations looking to enter the software-defined data center era with a choice of networking technologies designed to maximize flexibility
- High-density multi-rate 100/400GbE ToR server aggregation in high-performance data center environments at the desired fabric speed
- Small-scale Fabric implementation via the Z9432F-ON switch in leaf and spine along with S-Series 10/25/40/50/100GbE ToR switches enabling cost-effective aggregation of 100/400 uplinks
- High-density 10/25/40/50/100GbE ToR server access in high-performance data center environments
- Multi-functional 10/25/40/50/100/400GbE switching in High Performance Computing Clusters or other business-sensitive deployments requiring the highest bandwidth.
- iSCSI and FCOE deployment, including DCB converged lossless transactions

Key features
- 1RU high-density 100/400GbE aggregation switch with up to 32 ports of 400GbE (QSFP56-DD) or up to 128 ports of 100GbE or up to 144 ports of 10/25/50GbE*(using breakout cable)
- Multi-rate 400GbE ports support 10/25/40/50/100GbE. 40GbE ports support 10/40GbE
- 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
- 25.6Tbps non-blocking (full duplex), switching fabric delivers line-rate performance under full load on Z9432F-ON
- L2 multipath support via Virtual Link Trunking (VLT) and Routed VLT support
- Support for Dell EMC SmartFabric OS10
- Converged network support for DCB, with priority flow control (802.1Qbb), ETS (802.1Qaz), DCBx and iSCSI TLV support
- Z9432F-ON supports Routable RoCE to enable convergence of compute and storage on Active Fabric
- IO panel to PSU airflow or PSU to IO panel airflow*
- Redundant, hot-swappable power supplies and fans
- Supports the open source Open Network Install Environment (ONIE) for zero touch installation of alternate network operating systems
- Accelerated mounting kits reducing time and resources for switch rack installation
- Power-efficient operation up to 45°C helping reduce cooling costs in temperature-constrained deployments

* 50G breakout is a future release feature
Key features with Dell EMC SmartFabric 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)
- Dell EMC SmartFabric OS10 software enables Dell Technologies’ Layer 2 and 3 switching and routing protocols with integrated IP services, quality of service, manageability and automation features
- Increase VM Mobility region by stretching L2 VLAN within or across two DCs with unique VLT capabilities
- 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 Data Center Bridging, with priority flow control (802.1Qbb), ETS (802.1Gaz), DCBx and iSCSI TLV

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
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<tbody>
<tr>
<td>Z9432F-ON</td>
<td>Z9432F, 32x 400GbE QSFP56-DD, 2x AC PSU, Fan module, I/O Panel to PSU Airflow Z9432F, 32x 400GbE QSFP56-DD, 2x AC PSU, Fan module, I/O Panel to PSU Airflow, TAA Certified Z9432F, 32x 400GbE QSFP56-DD, 2x AC PSU, Fan module, PSU to I/O Panel Airflow Z9432F, 32x 400GbE QSFP56-DD, 2x AC PSU, Fan module, PSU to I/O Panel Airflow, TAA Certified</td>
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Dell SW Configurations

Enterprise SONiC Distribution by Dell Technologies**
No OS - ONIE bootloader only

Redundant power supplies

AC Power Supply, IO Panel to PSU Airflow
AC Power Supply, PSU to IO Panel Airflow
DC Power Supply, IO Panel to PSU Airflow**
DC Power Supply, PSU to IO Panel Airflow**

Fans

Fan module, IO Panel to PSU Airflow
Fan module, PSU to IO Panel Airflow

Optics

Transceiver, 400GbE, SR8 QSFP56-DD
Transceiver, 400GbE, SR4.2 QSFP56-DD**
Transceiver, 400GbE, eDR4 (2 km) QSFP56-DD
Transceiver, 400GbE, FR4 QSFP56-DD
Transceiver, 400GbE, LR4 QSFP56-DD**
Transceiver, 400GbE, ZR QSFP56-DD**
Transceiver, 100GbE, FR QSFP28
Transceiver, 100GbE, SR4 QSFP28
Transceiver, 100GbE, eSR4 QSFP28
Transceiver, 100GbE, SWDM4 QSFP28 (Duplex)
Transceiver, 100GbE, BIDI QSFP28 (Duplex)
Transceiver, 100GbE, BIDI-ON QSFP28 (Duplex)**
Transceiver, 100GbE, PSM4 (500 m) QSFP28
Transceiver, 100GbE, CWDM4 (2 km) QSFP28
Transceiver, 100GbE, LR4 QSFP28
Transceiver, 100GbE, ER4 Lite (30 km) QSFP28

Note that QSFP56-DD multi-rate ports also support our existing line of 2x100GbE (QSFP28-DD), 100GbE (QSFP28), 40GbE (QSFP+, 25GbE (SFP28) and 10GbE (SFP+) optics (individual 10 and 25GbE require the use of a GSA adapter)

Cables

400GbE, QSFP56-DD to QSFP56-DD, active optical 400GbE, QSFP56-DD to QSFP56-DD, passive DAC 400GbE, QSFP56-DD to QSFP56-DD, active DAC 400GbE, 4x100GbE, QSFP56-DD to 4xQSFP28, active DAC 100GbE, 4x25GbE, QSFP28 to 4xQSFP28, passive DAC 100GbE, QSFP28 to QSFP28, active optical 100GbE, QSFP28 to QSFP28, passive DAC

Note that QSFP56-DD multi-rate ports also support our existing line of 100GbE, 40GbE, 25GbE and 10GbE cables (individual 10 and 25GbE require the use of a GSA adapter)

Cable management

Cable Breakout solution for MTP12 to 4xLC and MTP24 to 2xMTP12 or 4xLC available. See separate Structured Cabling offering.

* Note that units configured in the PSU to IO airflow direction are subject to tighter restrictions for power consumptions on cables and optics used for 400GbE ports

** Available post launch
### Technical specifications

**Physical**
- 1 RU 45 console/management port with RS232 signaling and Micro USB-B port
- 10/100/1000BASE-T Ethernet for management
- 1 USB 2.0 type A storage port
- 32x400GE QSFP56-DD ports + 2xSFP+
  - 10GbE

**Chassis**
- Size: 1RU, 1.72”h x 17.3”w x 21.7”d
  - (43.5h x 43.8w x 55.0d)
- Weight: 22 lbs (9.98 kg)

**Environmental**
- Power supply: 100-240V AC 50/60Hz
- Max Power consumption: 1404 Watts
- Typ. Power consumption: 900 Watts
- Operating temperature: 32°C to 113°F
- Operating humidity: 5 to 90% (RH), non-condensing
- Storage temperature: 70° to 158°F
- Storage humidity: 5 to 95% (RH), non-condensing
- Fresh air Compliant to 45°C
- Support AC both lowline and highline power modes

**Redundancy**
- Hot swapable redundant power (2 per switch, 1 + 1 redundancy except with using lowline power)***
- Hot swapable redundant fans (7 per switch, 6 + 1 redundancy)

**Performance**
- Switch fabric capacity: 25.6Tbps (full duplex)
- Forwarding capacity: 5.2Bpps
- Latency: sub 850ns
- Packet buffer memory: 132MB
- NPU Pipeline is programmable capable using NPL
- CPU: Intel Denverton C3758 8 Core @ 2.2GHz
- Memory: 32GB DDR4 ECC
- CPU: Intel Denverton C3758 8 Core @ 2.2GHz
- NPU Pipeline is programmable capable using NPL
- Packet buffer memory: 132MB

**RFC Compliance**
- 768: UDP
- 793: TCP
- 854: Telnet
- 959: FTP
- 1321: MD5
- 1350: TFTP
- 2474: Differentiated Services
- 2698: Two Rate Three Color Marker
- 3184: Syslog
- 4254: SSHv2
- 4254: SSHv3

**General IPv4 Protocols**
- 791: IPv4
- 792: ICMP
- 826: ARP
- 1027: Proxy ARP
- 1035: DNS (client)
- 1042: Ethernet Transmission
- 1191: Path MTU Discovery
- 1305: NTPv4
- 1519: CDR
- 1812: Routers, Static Routes
- 1858: IP Fragment Filtering
- 2131: DHCPv4 (server and relay)
- 5798: VRRPv3
- 3021: 31-bit Prefixes
- 1812: Requirements for IPv4 Routers
- 1818: Address Allocation for Private Internets
- 2474: Differentiated Services
- 2597: Two Rate Three Color Marker
- 2698: Two Rate Three Color Marker
- 3101: OSPF NSSA
- 2307: OSPF with DigitalSignatures
- 2328: OSPFv2
- 2328: OSPFv3
- 2370: Opaque LSA
- 3101: OSPFv3 Authentication

**General IPv6 Protocols**
- 1981: Path MTU for IPv6
- 2372: IPv6 Addressing
- 2466: IPv6 Protocol Specification
- 2461: Neighbor Discovery
- 2462: Stateless Address AutoConfig
- 2711: IPv6 Router alert
- 2463: ICMPv6
- 2464: Ethernet Transmission
- 2675: IPv6 Jumbograms
- 3484: Default Address Selection
- 3483: Basic Socket Interface
- 4231: Addressing Architecture
- 3542: Advanced Sockets API
- 3587: Global Unicast Address Format
- 4291: IPv6 Addressing
- 2464: Transmission of IPv6 Packets over Ethernet Networks
- 2711: IPv6 Router Alert Option
- 4007: IPv6 Scoped Address Architecture
- 4213: Transition Mechanisms for IPv6
- Hosts and Routers
- 3633: DCHPv6 Relay

**OSPF**
- 1745: OSPFv2/BGP interaction
- 1765: OSPF Database overflow
- 2154: OSPF with DigitalSignatures
- 2328: OSPFv2
- 5340: OSPF for IPv6 (OSPFv3)
- 2570: Opaque LSA
- 3101: OSPFv3 Authentication

**Multicast**
- 2236: IGMPv2 Snooping
- 3810: MLDv2 Snooping

**Security**
- 2865: RADIUS
- 3185: Radius and IPv6
- 6579: Radius support for EAP
- 3580: 802.1X with RADIUS
- 3826: AES Cipher in SNMP
- 1492: TACACS (Authentication, Accounting)

**Control Plane, VTY & SNMP ACLs**
- IP Access Control Lists

**BGP**
- 1997: Communities
- 2385: MD5
- 2439: Route Flap Dampening
- 2796: Route Reflector
- 3065: Confederations
- 4271: BGP-4
- 2545: BGP-4 Multiprotocol Extensions for IPv6 Inter-Domain Routing
- 2858: Multiprotocol Extensions
- 4360: Extended Communities
- 4893: 4-byte ASN
- 5396: 4-byte ASN Representation
- 5492: Capabilities Advertisement
- 5492: Capabilities Advertisement

**Linux Distribution**
- Debian Linux version 8

**Network Management and Monitoring**
- SNMPv1/2c
- IPv4/IPv6 Management support (Telnet, FTP, TACACS, RADIUS, SSH, NTP)
- Syslog
- Port Mirroring
- RPM/ERPM

**Network Management and Monitoring**
- 3176: SFlow
- 3176: Port Mirroring
- 3176: Syslog
- 3176: TACACS, RADIUS, SSH, NTP

**IPv6 Addressing**
- 2464: Transmission of IPv6 Packets over Ethernet Networks

**IPv6 Routing**
- 2711: IPv6 Router Alert Option
- 4007: IPv6 Scoped Address Architecture
- 4213: Transition Mechanisms for IPv6
- Hosts and Routers

**Automation**
- Control Plane Services APIs
- Linux Utilities and Scripting Tools
- C Configuration (Multiline Alias)
- Zero Touch Deployment (ZTD)
- Ansible, Puppet, Chef, SaltStack

**SmartFabric OS10: IEEE compliance**
- 802.1AB: LLDP
- 802.1AD: LLDP-MED
- 802.1S: Link Aggregation Control Protocol
- 802.1Q: VLAN Tagging
- 802.1Qbb: PFC
- 802.1Qaz: ETS

*** 100-127 lowline power solution is non-redundant
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
802.1Qaz Enhanced Transmission Selection (ETS)
Explicit Congestion Notification
Data Center Bridging eXchange (DCBx)
802.1Qbb Priority-Based Flow Control
802.1Qaz Enhanced Transmission Selection (ETS)
RoCEv2

Software Defined Networking
OpenFlow 1.3 (Native)
MIBS
IP MIB
IP Forward MIB
Host Resources MIB
IF MIB
LLDP EXT1/3 MIB
Entity MIB
LAG MIB
Dell-Vendor MIB
TCP MIB
UDP MIB
SNMPv2 MIB
ETHERLIKE-MIB
SFLOW-MIB
PFC-MIB

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
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: 2011, Class A

Immunity
EN 300 388 V1.4.1:2008 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: EFT
EN 61000-4-5: Surge
EN 61000-4-6: Low Frequency Conducted Immunity

RoHS
All S Series components are EU RoHS compliant.

Certifications
Available with US Trade Agreements Act (TAA) compliance
USGv6 Host and Router Certified on Dell Networking OS 9.5 and greater
IPv6 Ready for both Host and Router
UCR DoD APL (core and distribution)
ALSAN switch

Warranty
1 year return to depot constrained

Learn more at DellTechnologies.com/Networking