



# 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 100 or up to 144 ports of 10/25/50\*(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 (802.1Qaz), DCBx and iSCSI TLV

Product	Description
<b>Z9432F-ON</b>	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
<b>Dell SW Configurations</b>	Dell EMC SmartFabric OS10 Enterprise SONiC Distribution by Dell Technologies** No OS - ONIE bootloader only
<b>Redundant power supplies</b>	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**
<b>Fans</b>	Fan module, IO Panel to PSU Airflow Fan module, PSU to IO Panel Airflow
<b>Optics</b>	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 QSA adapter)
<b>Cables</b>	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 4xSFP28, 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 QSA adapter)
<b>Cable management</b>	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

**Physical**

1 RJ45 console/management port with RS232 signaling and Micro USB-B port  
 110/100/1000BASE-T Ethernet for management  
 1 USB 2.0 type A storage port  
 32x400GbE QSFP56-DD ports + 2xSFP+ 10GbE

**Chassis**

Size: 1 RU, 1.72”h x 17.3”w x 21.7”d (4.35h x 43.8w x 55.0d)

Weight: 22 lbs (9.98 kg)

**Environmental**

Power supply: 100-240 VAC 50/60H\*\*\*

Max Power consumption: 1404 Watts

Typ. Power consumption: 900 Watts

Max Operating specifications:

AC Max. Operating specifications:  
 Operating temperature: 32° to 113°F (0° to 45°C)  
 Operating humidity: 5 to 90% (RH), non-condensing

Max. Non-operating specifications:

Storage temperature: 70° to 158°F (-40° to 70°C)  
 Storage humidity: 5 to 95% (RH), non-condensing

Fresh air Compliant to 45°C

Support AC both lowline and highline power modes

**Redundancy**

Hot swappable redundant power (2 per switch, 1 + 1 redundancy except with using lowline power)\*\*\*

Hot swappable 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  
 CPU memory: 32GB DDR4 ECC  
 MAC addresses: 156K  
 ARP table: 16K standalone, 8K shared  
 IPv4 routes: up to 400K (ALPM)  
 IPv6 routes: 300K  
 Multicast hosts: 1K  
 Multicast IPv6 Routes : 4K  
 Layer 2 VLANs: 4K  
 MSTP: 64 instances  
 LAG load balancing: Based on layer 2, IPv4 or IPv6 headers  
 Timing Card PTP/1588 and Sync-E  
 Trusted Platform Module  
 Supports up to 4 ports of 20W optics when in IO/PSU airflow direction  
 Supports up to 15W optics in all QSFP56-DD ports

**Following SW information relative to Dell EMC SmartFabric OS10:**

**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  
 802.1Qaz ETS

802.1X Network Access Control  
 802.3ac Frame Extensions for VLAN Tagging  
 802.3x Flow Control  
 802.3by Optical fiber, twinax and backplane 25 Gigabit Ethernet

**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 SSHv2

**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 CIDR  
 1812 Routers, Static Routes  
 1858 IP Fragment Filtering  
 2131 DHCPv4 (server and relay)  
 5798 VRRPv3  
 3021 31-bit Prefixes  
 1812 Requirements for IPv4 Routers  
 1918 Address Allocation for Private Internets  
 2474 Diffserv Field in IPv4 and Ipv6 Headers  
 2597 Assured Forwarding PHB Group  
 3195 Reliable Delivery for Syslog  
 3246 Expedited Forwarding PHB Group  
 VRF (BGPv4/v6)

**General IPv6 Protocols**

1981 Path MTU for IPv6  
 2372 IPv6 Addressing  
 2460 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  
 3493 Basic Socket Interface  
 4291 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 DHCPv6 Relay

**OSPF**

1745 OSPF/BGP interaction  
 1765 OSPF Database overflow  
 2154 OSPF with DigitalSignatures  
 2328 OSPFv2  
 5340 OSPF for IPv6 (OSPFv3)  
 2370 Opaque LSA  
 3101 OSPF NSSA  
 4552 OSPFv3 Authentication

**Multicast**

2236 IGMPv2 Snooping  
 3810 MLDv2 Snooping

**Security**

2865 RADIUS  
 3162 Radius and IPv6  
 3579 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 Damping  
 2796 Route Reflection  
 2918 Route Refresh  
 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  
 draft-ietf-idr-add-paths-04.txt ADD PATH

**Linux Distribution**

Debian Linux version 8  
 Linux Kernel 3.16

**Network Management and Monitoring**

SNMPv1/2c  
 IPv4/IPv6 Management support (Telnet, FTP, TACACS, RADIUS, SSH, NTP)  
 Syslog  
 Port Mirroring  
 RPM/ERPM  
 3176 SFlow  
 Support Assist (Phone Home)  
 RestConf APIs (Layer 2 features)  
 XML Schema  
 CLI Commit (Scratchpad)  
 Uplink Failure Detection  
 Object Tracking  
 Bidirectional Forwarding Detection (BFD)  
**Automation**  
 Control Plane Services APIs  
 Linux Utilities and Scripting Tools  
 CLI Automation (Multiline Alias)  
 Zero Touch Deployment (ZTD)  
 Ansible, Puppet, Chef, SaltStack

\*\*\* 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

802.1Qbb Priority-Based Flow Control  
802.1Qaz Enhanced Transmission  
    Selection (ETS)  
Explicit Congestion Notification  
Data Center Bridging eXchange (DCBx)  
DCBx Application TLV (iSCSI, FCoE)  
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  
EN 60825-2 Safety of Laser Products Part 2:  
    Safety of 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:  
    2011, Class A

## Immunity

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

## 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



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