



# 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 100GbE, 40GbE, 25GbE and 10GbE 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  
 1 10/100/1000BASE-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

## 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)

RRRP 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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