



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
Z9432F-ON	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
Dell SW Configurations	Dell EMC SmartFabric OS10 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 QSA 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 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)
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

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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Dell Technologies Consulting Services provides industry professionals with a wide range of tools and the experience you need to design and execute plans to transform your business.

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