DELLTechnologies

DELL EMC POWERSWITCH Z9332F-ON SERIES SWITCH

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

The Z9332F-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 Z9332F-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[1] (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 Z9332F-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 Z9332F-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 Z9332F-ON ideally suited for DCB environments.

The Dell EMC PowerSwitch Z9332F-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 Z9332F-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

[1] 50G breakout is a future release feature

- 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[1] (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 Z9332F-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

- Z9332F-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

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
Z9332F-ON	Z9332F, 32x 400GbE QSFP56-DD, 2x AC PSU, Fan module, I/O Panel to PSU Airflow, OS10 Enterprise Edition Z9332F, 32x 400GbE QSFP56-DD, 2x AC PSU, Fan module, I/O Panel to PSU Airflow, OS10 Enterprise Edition. TAA Certified
Redundant power supplies	AC Power Supply, IO Panel to PSU Airflow AC 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, ZR1 QSFP56-DD*, ** Transceiver, 100GbE, FR1 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 40GbE, 25GvE and 10GbE 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, 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 40GbE, 25GbE and 10GbE cables (individual 10 and 25GbE cables 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
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, 1.73"h x 17.3"w x 25.8"d (4.38h x 43.8w x 6.56d)
Weight: 22 lbs (9.98 kg)

Environmental
Power supply: 200-240 VAC 50/60 Hz
Max Power consumption: 1500 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: 10 to 90% (RH), non-condensing
Max. Non-operating specifications:
　Storage temperature: −40° to 158°F (−40° to 70°C)
　Storage humidity: 5 to 95% (RH), non-condensing
Fresh air Compliant to 45°C

Redundancy
Hot swappable redundant power (2 per switch)
Hot swappable redundant fans (7 per switch)

Performance
Switch fabric capacity: 25.6Tbps (full duplex)
Forwarding capacity: up to 5.1Tpps
Latency: sub 700ns
Packet buffer memory: 64MB
CPU memory: 32GB
MAC addresses: 8K
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

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　tRSTP
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

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

　　DELLTechnologies

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

Dell Technologies Services

Plan, deploy, manage and support your IT transformation with our top-rated services

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

Deployment
Accelerate technology adoption with ProDeploy Enterprise Suite. Trust our experts to lead deployments through planning, configuration and complex integrations.

Management
Regain control of operations with flexible IT management options. Our Residency Services help you adopt and optimize new technologies and our Managed Services allow you to outsource portions of your environment to us.

Support
Increase productivity and reduce downtime with ProSupport Enterprise Suite. Expert support backed by proactive and predictive artificial intelligence tools.

Education
Dell Technologies Education Services help you develop the IT skills required to lead and execute transformational strategies. Get certified today.

Learn more at
DellTechnologies.com/Services

Learn more at DellTechnologies.com/Networking

October 2020 | v1.8
Dell EMC Z9332F-ON Series Spec Sheet

DELLTechnologies