

# DELL POWERSWITCH Z9264F-ON



High-performance, high-density open networking 100GbE multi rate aggregation switch

The Z9264F-ON 40/100GbE fixed switch comprises Dell Technologies' latest disaggregated hardware and software data center networking solutions, providing state-of-the-art, high-density 40/100GbE ports and a broad range of functionality to meet the growing demands of today's data center environment. These innovative, next-generation open networking high-density aggregation switches offer optimum flexibility and cost-effectiveness for the web 2.0, enterprise, mid-market and cloud service providers with demanding compute and storage traffic environments.

The compact Z9264F-ON provides industry-leading density of either 64 ports of 40/100GbE in QSFP28 form factor or 128 ports of 10/25/50GbE (via breakout), in a 2RU design.

Using industry-leading hardware and a choice of Dell EMC's OS10 or select 3rd party network operating systems and tools, the Z9264F-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 Z9264F-ON model provides multi-rate speed, enabling denser footprints and simplifying migration to 100Gbps.

Priority-based flow control (PFC), data center bridge exchange (DCBX) and enhanced transmission selection (ETS) make the Z9264F-ON ideally suited for DCB environments.

Dell PowerSwitch Z9264F-ON switches support the open source Open Network Install Environment (ONIE) for zero touch installation of Dell 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 40/100GbE ToR server aggregation in high-performance data center environments at the desired fabric speed
- Small-scale Fabric implementation via the Z9264F-ON switch in leaf and spine along with S-Series 1/10/25/40GbE ToR switches enabling cost-effective aggregation of 10/25/40/50/100 uplinks

- High-density 10/25/50GbE ToR server access in high-performance data center environments
- Multi-functional 10/25/40/50/100GbE switching in High Performance Computing Clusters or other business-sensitive deployments requiring the highest bandwidth.
- iSCSI and FCOE deployment, including DCB converged lossless transactions
- L2 VXLAN support

## Key features

- 2RU high-density 40/100GbE aggregation switch with up to 64 ports of 40/100GbE (QSFP28) or up to 128 ports of 10/25/50GbE ports (using breakout cable)
- Multi-rate 100GbE 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
- 12.8Tbps non-blocking, switching fabric delivers line-rate performance under full load on Z9264F-ON
- L2 multipath support via Virtual Link Trunking (VLT) and Routed VLT support
- VXLAN gateway functionality support for bridging and routing the non-virtualized and the virtualized overlay networks with line rate performance (hardware only)
- Supports Dell SmartFabric OS10
- Converged network support for DCB, with priority flow control (802.1Qbb), ETS (802.1Qaz), DCBx and iSCSI TLV support
- 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
- L2 VXLAN support
- Tool-less enterprise ReadyRails™ 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 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
- OS10 supports Precision Time Protocol (PTP, IEEE 1588v2) to synchronize clocks on network devices\*)
- 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>Z9264F-ON</b>                | Z9264F, 64x 100GbE QSFP28, 2x AC PSU, Fan module, I/O Panel to PSU Airflow, OS10 Enterprise Edition<br>Z9264F, 64x 100GbE QSFP28, 2x AC PSU, Fan module, PSU to I/O Panel Airflow, OS10 Enterprise Edition<br>Z9264F, 64x 100GbE QSFP28, 2x AC PSU, Fan module, I/O Panel to PSU Airflow, NO-OS<br>Z9264F, 64x 100GbE QSFP28, 2x AC PSU, Fan module, PSU to I/O Panel Airflow, NO-OS<br>Z9264F, 64x 100GbE QSFP28, 2x AC PSU, Fan module, I/O Panel to PSU Airflow, OS10 Enterprise Edition. TAA Certified<br>Z9264F, 64x 100GbE QSFP28, 2x AC PSU, Fan module, PSU to I/O Panel Airflow, OS10 Enterprise Edition. TAA Certified   |
| <b>Redundant power supplies</b> | AC Power Supply, IO Panel to PSU Airflow<br>AC Power Supply, PSU to IO Panel Airflow<br>DC Power Supply, IO Panel to PSU Airflow (available as customer kit)<br>DC Power Supply, PSU to IO Panel Airflow (available as customer kit)   |
| <b>Fans</b>                     | Fan module, IO Panel to PSU Airflow<br>Fan module, PSU to IO Panel Airflow   |
| <b>Optics</b>                   | Transceiver, 100GbE, SR4 QSFP28<br>Transceiver, 100GbE, eSR4 QSFP28<br>Transceiver, 100GbE, SWDM4 QSFP28 (Duplex)<br>Transceiver, 100GbE, BiDi QSFP28 (Duplex)<br>Transceiver, 100GbE, PSM4 (500m) QSFP28<br>Transceiver, 100tGbE, CWDM4 (2Km) QSFP28<br>Transceiver, 100GbE, LR4 QSFP28<br>Transceiver, 100GbE, ER4 Lite (30Km) QSFP28<br>Transceiver, 100GbE, DWDM2 (80Km) QSFP28<br>Transceiver, 40GbE, SR4 optic QSFP+<br>Transceiver, 40GbE, eSR4 optic QSFP+<br>Transceiver, 40GbE, BiDi optic QSFP+ (Duplex)<br>Transceiver, 40GbE, SM4 optic QSFP+ (Duplex)<br>Transceiver, 40GbE, LM4 optic QSFP+ (Duplex)<br>Transceiver, 40GbE, PSM4 10Km, QSFP+<br>Transceiver, 40GbE, LR4 optic QSFP+<br>Transceiver, 40GbE, ER4 optics QSFP+ |
| <b>Cables</b>                   | 100GbE, 4x25GbE, QSFP28 to 4xSFP28, passive DAC<br>100GbE, QSFP28 to QSFP28, active optical<br>100GbE, QSFP28 to QSFP28, passive DAC<br>100GbE, 2x50GbE, 2xQSFP to 2xQSFP28, passive DAC, breakout<br>40GbE, QSFP+ to QSFP+, active optical<br>40GbE, QSFP+ to QSFP+, passive DAC<br>40GbE, MTP to 4xLC optical breakout<br>40GbE, 4x10GbE, QSFP+ to 4xSFP+, passive DAC   |
| <b>Cable management</b>         | Z9100 Cable Breakout Kit, MTP to LC (1RU 64-port LC over MMF)<br>Z9100 Cable Breakout Kit, MTP to LC (1RU 64-port LC over SMF)   |

## Technical specifications

### Physical

1 RJ45 console/management port with RS232 signaling  
64x100GE QSFP28 ports + 2xSFP+ 10GE

### Chassis

Size: 2 RU, 337" (h) x 17.04" (w) x 20.08" (d)  
(8.56h x 44.2w x 51.0 cm d)  
Weight: 44lbs (20kg)

### Environmental

Power supply: 100–240 VAC 50/60 Hz  
Max Power consumption: 1104 Watts  
Typ. Power consumption: 340 Watts  
Max Operating specifications:  
AC Max. Operating specifications:  
Operating temperature: 32° to 113°F  
(0° to 45°C)  
Operating humidity: 10 to 90% (RH),  
noncondensing  
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  
Hot swappable redundant fans

### Performance

Switch fabric capacity: 12.8Tbps (full-duplex)  
Forwarding capacity: 2900Mpps for 64<packet  
size<250 bytes, 4200Mpps when average  
packet  
size >250 bytes  
Latency: sub 500ns  
Packet buffer memory: 42MB  
CPU memory: 16GB  
MAC addresses: 160K  
ARP table: 128K  
IPv4 routes:128K  
IPv6 routes: 64K  
Multicast hosts: 32K  
Link aggregation: 64 links per group, 128  
groups  
Layer 2 VLANs: 4K  
MSTP: 64 instances  
LAG load balancing: Based on layer 2, IPv4 or  
IPv6 headers

### 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)  
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  
1588v2 PTP support  
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  
IPv6 Static Routes

### 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  
7911 BGP Add Path  
8365 EVPN (L2 VXLAN only)

### Linux Distribution

Debian Linux version 9  
Linux Kernel 4.19

### 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

## 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 Z 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

## IT Lifecycle Services for Networking

### Experts, insights and ease

Our highly trained experts, with innovative tools and proven processes, help you transform your IT investments into strategic advantages.



#### Plan & Design

Let us analyze your multivendor environment and deliver a comprehensive report and action plan to build upon the existing network and improve performance.



#### Deploy & Integrate

Get new wired or wireless network technology installed and configured with ProDeploy. Reduce costs, save time, and get up and running fast.



#### Educate

Ensure your staff builds the right skills for long-term success. Get certified on Dell Networking technology and learn how to increase performance and optimize infrastructure.



#### Manage & Support

Gain access to technical experts and quickly resolve multivendor networking challenges with ProSupport. Spend less time resolving network issues and more time innovating.



#### Optimize

Maximize performance for dynamic IT environments with Dell Optimize. Benefit from in-depth predictive analysis, remote monitoring and a dedicated systems analyst for your network.



#### Retire

We can help you resell or retire excess hardware while meeting local regulatory guidelines and acting in an environmentally responsible way.

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