Dell Networking Z9100-ON

High-performance 10/25/40/50/100GbE multi-rate top-of-rack open networking fixed switch featuring Dell Networking OS9

Data center optimized

The Dell Networking Z9100-ON is a 10/25/40/50/100GbE top-of rack (ToR) fixed switch purpose-built for applications in high-performance data center and computing environments.

Leveraging a non-blocking switching architecture, the Z9100-ON delivers line-rate L2 and L3 forwarding capacity to maximize network performance. The compact Z9100-ON design provides industry-leading density of either 32 ports of 100GbE, 64 ports of 50GbE, 32 ports of 40GbE, 128 ports of 25GbE or 128 ports 10GbE and two SFP+ ports of 10GbE/1GbE/100MbE to conserve rack space while enabling denser footprints and simplifying migration to 100Gbps in the data center core. Priority-based flow control (PFC), data center bridge exchange (DCBX) and enhanced transmission selection (ETS) make the Z9100-ON ideally suited for DCB environments. In addition, the Z9100-ON incorporates multiple architectural features that optimize data center network flexibility, efficiency and availability, including redundant, hot-swappable power supplies and fans.

These new offerings provide the flexibility to transform data centers and offer high-capacity network fabrics that are easy to deploy, cost-effective and provide a clear path to a software-defined data center. The Dell Z9100-ON supports the industry standard Open Network Install Environment (ONIE) for zero touch installation of alternate network operating systems. This document refers to this ON switch preloaded with the Dell Networking OS. Characteristic of any ONIE device, other ONIE load images may be loaded by the operator.

Key applications

- Active Fabric™ implementation using high-density multi rate 10/25/40/50/100GbE ToR server aggregation in high-performance data center environments at the desired fabric speed
- Small-scale Active Fabric implementation via the Z9100-ON switch in leaf and spine along with S-Series 1/10/40GbE ToR switches enabling cost-effective aggregation of 10/40/50/100GbE uplinks
- High-performance SDN/OpenFlow 1.3.1 enabled with ability to inter-operate with industry standard OpenFlow controllers*
- Use as a high-speed VXLAN Layer 2 Gateway that connects the hypervisor based overlay networks with non-virtualized infrastructure

Key features

- 1RU high-density 10/25/40/50/100GbE fixed switch with choice of up to 32 ports of 100GbE (QSFP28), 64 ports of 50GbE (QSFP+), 32 ports of 40GbE (QSFP+), 128 ports of 25GbE (QSFP+) or 128+2 ports of 10GbE (using breakout cable)
- Up to 6.4Tbps of switching I/O bandwidth (full duplex) available and non-blocking switching fabric delivering line-rate performance under full load with sub usec latency
- 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
- L2 multipath support via Virtual Link Trunking (VLT) and multiple VLT (mVLT) multi-chassis link aggregation technology
- VRF-lite enables sharing of networking infrastructure and provides L3 traffic isolation across tenants
- Open Automation Framework adding automated configuration and provisioning capabilities to simplify the management of network environments
- Jumbo frame support for large data transfers
- 128 link aggregation groups with up to eight members per group, using enhanced hashing
- Redundant, hot-swappable power supplies and fans
- I/O panel to power supply airflow or power supply to I/O panel airflow
- 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

A high-density, multi-rate fabric switch providing 10, 25, 40, 50 and 100GbE options for the open networking revolution

Note: Limited 50G support available on initial release.
* OpenFlow will be available as beta at product launch with full support following on subsequent release.

Ordering information

Z9100-ON

AC base normal airflow	32-port 100G QSFP28, 2 AC PS, 5 fan subsys w/airflow from I/O PNL to PS
AC base reverse airflow	32-port 100G QSFP28, 2 AC PS, 5 fan subsys w/airflow from PS to I/O PNL

(TAA versions also available)

Fans

Fan spare normal airflow	Fan with airflow from I/O PNL to PS
Fan spare reverse airflow	Fan with airflow from PS to I/O PNL

Power supplies

AC PS spare normal airflow	AC power supply with airflow from I/O PNL to PS
AC PS spare reverse airflow	AC power supply with airflow from PS to I/O PNL
DC PSU spare normal airflow	DC PSU with airflow from I/O PNL to PSU
DC PSU spare reverse airflow	DC PSU with airflow from PSU to I/O PNL

Dell branded optics

Transceiver, 100GbE, SR4 QSFP28
Transceiver, 100GbE, LR4 QSFP28
Transceiver, 100GbE, LR4Lite QSFP28
Transceiver, 100GbE, PSM4** 10Km QSFP28(*)
Transceiver, 100GbE, CWDM4 2Km QSFP28(*)
Transceiver, 100GbE, PSM4 500m QSFP28(*)
Transceiver, 40GbE, SR4 optic QSFP+
Transceiver, 40GbE, eSR4 optic QSFP+
Transceiver, 40GbE, LR4 optic QSFP+
Transceiver, 40GbE, ER4 optics QSFP+
Transceiver, 40GbE, PSM4 10Km, QSFP+
Transceiver, 40GbE, PSM4-LR MPO 10Km QSFP+ to LC
Transceiver, 40GbE, LM4 / SM4 Duplex QSFP+

Dell branded cables

100GbE, 4x25GbE, QSFP28 to 4xSFP28, passive DAC
100GbE, QSFP28 to QSFP28, active optical
100GbE, QSFP28 to QSFP28, passive DAC
100GbE, 2x50GbE, QSFP28 to 2xQSFP28, passive DAC, breakout(**)
40GbE, QSFP+ to QSFP+, active optical
40GbE, QSFP+ to QSFP+, passive DAC
40GbE, MTP to 4xLC optical breakout
40GbE, 4x10GbE, QSFP+ to 4xSFP+, passive DAC

Cable management

Z9100 Cable Breakout Kit, MTP to LC (1RU 64-port LC over MMF)
Z9100 Cable Breakout Kit, MTP to LC (1RU 64-port LC over SMF)
Z9100 Cable Breakout Kit, MTP to LC (1RU 48-port LC over MMF)

Software

L3 Dell Networking OS software license	Z9100 series: Dell Networking operating system software license for advanced l3 features, latest version
Dell Networking OS Software License	Z9100 series: Dell Networking operating system software license, latest version

Select third-party operating system offerings

Note: in-field change of airflow direction only supported when unit is powered down and all fan and power supply units are replaced with airflow moving in a uniform direction.

Power supplies

AC Power Supply, I/O Panel to PSU Airflow
AC Power Supply, PSU to I/O Panel Airflow
DC PSU, I/O Panel to PSU Airflow
DC PSU, PSU to I/O Panel Airflow

Fans

Z9100-ON Fan Module, I/O Panel to PSU Airflow
Z9100-ON Fan Module, PSU to I/O Panel Airflow

Dell branded optics

Transceiver, 100GbE, QSFP28, SR4 optic, 850nm wavelength, 70m/100m Reach on OM3/OM4
Transceiver, 100GbE, QSFP28, LR4 optic, 1310nm wavelength, 2Km/10Km Reach on SMF
Transceiver, 100GbE, QSFP28 LR4Lite optic, 1310nm wavelength, 2Km reach on SMF
Transceiver, 100GbE, QSFP28, PSM4 optic with pigtail, 1490nm wavelength, 10Km Reach on SMF
Transceiver, 100GbE, QSFP28, CWDM4 optic, 1271/1291/1311/1331nm wavelength, 2Km Reach on SMF (**)
Transceiver, 100GbE, QSFP28, PSM4 optic, 1310nm wavelength, 500m Reach on SMF (**)
Transceiver, 40GbE, QSFP+, SR4 optic, 850nm Wavelength, 100m/150m Reach on OM3/OM4
Transceiver, 40GbE, QSFP+, eSR4 optic, 850nm Wavelength, 300m/400m Reach on OM3/OM4
Transceiver, 40GbE, QSFP+, LR4 optic, 1310nm wavelength, 10Km Reach on Single Mode Fiber
Transceiver, 40GbE, QSFP+, PSM4 optic with pigtail, 1490nm wavelength, 10Km Reach on SMF
Transceiver, 40GbE, QSFP+, PSM4-LR optic, 1310nm wavelength, MPO, 10Km Reach on SMF
Transceiver, 40GbE, QSFP+, LM4 optic, 1271/1291/1311/1331nm wavelength, LC, 140m/160m Reach on OM3/OM4

Dell branded cables

100GbE, 2x50GbE, QSFP28 to 2xQSFP+, passive DAC, breakout (**)
100GbE, 4x25GbE, QSFP28 to 4xSFP28, passive DAC, breakout
100GbE, QSFP28 to QSFP28, active optical, 10m and 50m
100GbE, QSFP28 to QSFP28, passive DAC, 1m, 2m, 3m, 5m
40GbE, QSFP+ to QSFP+, active optical, 10m and 50m
40GbE, QSFP+ to QSFP+, passive DAC, 1m, 2m, 3m, 5m, 7m
40GbE, MTP to 4xLC optical breakout, SMF, 5m (PSM4-LR optic not included)
40GbE, 4x10GbE, QSFP+ to 4xSFP+, passive DAC, breakout, 1m, 3m, 5m, 7m

Software

Dell Networking Operating System OS9 Software, Z9100-ON
Dell Networking Advanced L3 features, Z9100-ON
Select third-party offering systems available

Note: In-field change of airflow direction only supported under controlled environment.

Physical

Compact full featured fixed 10/25/40/100GE switch
1 RJ45 console/management port with RS232 signaling
1 10/100/1000bT Ethernet for management
1 USB 2.0 type A storage port
1 micro USB type B port for console/management port access
2 SFP+ 10GbE/1GbE ports for data access
Size: 1 RU, 1.72"h x 17.1"w x 18"d
Weight: 22 lbs (9.98 kg)
Power supply: 100–240 VAC 50/60 Hz
Max. power consumption: 606 Watts
Typ. power consumption: 288 Watts
Max. operating specifications:
  Operating temperature: 32°F to 113°F (0°C to 45°C)
  Operating humidity: 10 to 90% (RH), non-condensing
Max. non-operating specifications:
  Storage temperature: –40°F to 158°F (–40°C to 70°C)
  Storage humidity: 5 to 95% (RH), non-condensing
Fresh Air Compliant to 45°C
ReadyRails rack mounting system, no tools required

Redundancy

Two hot swappable power supplies with integrated fans
Hot swappable redundant fans

Performance

Switching I/O bandwidth	6.4Tbps
Forwarding capacity	Up to 4400 Mpps
MAC addresses:	160K
IPv4 Unicast routes:	128K
IPv6 Unicast routes:	64K
IPv4 Multicast routes:	64K

* Future deliverable
** Supported in future release

IPv6 Multicast routes:	32K
Multicast Hosts:	8K
ARP entries:	128K
Layer 2 VLANs:	4K per port
Layer 3 VLANs:	512 per system
MST:	64 instances
PVST+:	128 instances
LAG:	128 groups, 16 members per LAG group
LAG load balancing:	Based on layer 2, IPv4 or IPv6 headers
Latency:	L2: 300ns, L3: 400ns
Packet buffer memory:	16MB
CPU memory:	8GB
QOS data queues:	8
QOS control queues:	12
QOS:	Default 768 entries scalable to 2.5K
Ingress ACL:	64K
Egress ACL:	4K

IEEE compliance

802.1AB LLDP
802.1D Bridging, STP
802.1p L2 Prioritization
802.1Q VLAN Tagging, Double VLAN Tagging, GVRP
802.1Qbb PFC
802.1Qaz ETS
802.1s MSTP
802.1w RSTP
802.1X Network Access Control
802.3ab Gigabit Ethernet (1000BASE-T) or breakout
802.3ac Frame Extensions for VLAN Tagging
802.3ad Link Aggregation with LACP
802.3ae 10 Gigabit Ethernet (10GBase-X)
802.3ba 40 Gigabit Ethernet (40GBase-SR4, 40GBase-CR4, 40GBase-LR4, 100GBase-SR10, 100GBase-LR4, 100GBase-ER4) on optical ports
802.3bj 100 Gigabit Ethernet
802.3u Fast Ethernet (100Base-TX) on mgmt ports
802.3x Flow Control
802.3z Gigabit Ethernet (1000Base-X) with QSA
ANSI/TIA-1057 LLDP-MED
Force10 PVST+
Jumbo MTU support 9,416 bytes

RFC and I-D compliance

General Internet protocols

768 UDP
793 TCP
854 Telnet
959 FTP

General IPv4 protocols

791 IPv4
792 ICMP
826 ARP
1027 Proxy ARP
1035 DNS (client)
1042 Ethernet Transmission
1305 NTPv3
1519 CIDR
1542 BOOTP (relay)
1812 Requirements for IPv4 Routers
1918 Address Allocation for Private Internets
2474 Diffserv Field in IPv4 and Ipv6 Headers
2596 Assured Forwarding PHB Group
3164 BSD Syslog
3195 Reliable Delivery for Syslog
3246 Expedited Assured Forwarding
4364 VRF-lite (IPv4 VRF with OSPF and BGP)
5798 VRRP

General IPv6 protocols

1981 Path MTU Discovery Features
2460 Internet Protocol, Version 6 (IPv6) Specification
2464 Transmission of IPv6 Packets over Ethernet Networks
2710 Multicast Listener Discovery (MLD) for IPv6
2711 IPv6 Router Alert Option
3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6
4007 IPv6 Scoped Address Architecture
4213 Basic Transition Mechanisms for IPv6 Hosts and Routers
4291 IPv6 Addressing Architecture
4443 ICMP for IPv6
4861 Neighbor Discovery for IPv6
4862 IPv6 Stateless Address Autoconfiguration
5095 Deprecation of Type 0 Routing Headers in IPv6
IPv6 Management support (telnet, FTP, TACACS, RADIUS, SSH, NTP)

Security

2404 The Use of HMACSHA-1-96 within ESP and AH
2865 RADIUS
3162 Radius and IPv6
3579 Radius support for EAP
3580 802.1X with RADIUS
3768 EAP
3826 AES Cipher Algorithm in the SNMP User Base Security Model
4250, 4251, 4252, 4253, 4254 SSHv2
4301 Security Architecture for IPSec
4302 IPSec Authentication Header
4303 ESP Protocol
4807 IPsecv Security Policy DB MIB

RIP

1058 RIPv1
2453 RIPv2

OSPF (v2/v3)

1587 NSSA 4552 Authentication/
2154 OSPF Digital Signatures Confidentiality for
2328 OSPFv2 OSPFv3
2370 Opaque LSA 5340 OSPF for IPv6

BGP

1997 Communities
2385 MD5
2545 BGP-4 Multiprotocol Extensions for IPv6 Inter-Domain Routing
2439 Route Flap Damping
2796 Route Reflection
2842 Capabilities
2858 Multiprotocol Extensions
2918 Route Refresh
3065 Confederations
4360 Extended Communities
4893 4-byte ASN
5396 4-byte ASN representations
draft-ietf-idr-bgp4-20 BGPv4
draft-michaelson-4byte-as-representation-05
4-byte ASN Representation (partial)
draft-ietf-idr-add-paths-04.txt ADD PATH

Multicast

1112 IGMPv1
2236 IGMPv2
3376 IGMPv3
MSDP
draft-ietf-pim-sm-v2-new-05
PIM-SMw

Data center bridging

802.1Qbb Priority-Based Flow Control
802.1Qaz Enhanced Transmission Selection (ETS)
Data Center Bridging eXchange (DCBx)
DCBx Application TLV (iSCSI, FCoE)

Network management

1155 SMIv1
1157 SNMPv1
1212 Concise MIB Definitions
1215 SNMP Traps
1493 Bridges MIB
1850 OSPFv2 MIB

1901 Community-Based SNMPv2
2011 IP MIB
2096 IP Forwarding Table MIB
2578 SMIv2
2579 Textual Conventions for SMIv2
2580 Conformance Statements for SMIv2
2618 RADIUS Authentication MIB
2665 Ethernet-Like Interfaces MIB
2674 Extended Bridge MIB
2787 VRRP MIB
2819 RMON MIB (groups 1, 2, 3, 9)
2863 Interfaces MIB
3273 RMON High Capacity MIB
3410 SNMPv3
3411 SNMPv3 Management Framework
3412 Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
3413 SNMP Applications
3414 User-based Security Model (USM) for SNMPv3
3415 VACM for SNMP
3416 SNMPv2
3417 Transport mappings for SNMP
3418 SNMP MIB
3434 RMON High Capacity Alarm MIB
3584 Coexistance between SNMP v1, v2 and v3
4022 IP MIB
4087 IP Tunnel MIB
4113 UDP MIB
4133 Entity MIB
4292 MIB for IP
4293 MIB for IPv6 Textual Conventions
4502 RMONv2 (groups 1,2,3,9)
5060 PIM MIB
ANSI/TIA-1057 LLDP-MED MIB
Dell_ITA.Rev_1_1 MIB
draft-grant-tacacs-02 TACACS+
draft-ietf-idr-bgp4-mib-06 BGP MIBv1
IEEE 802.1AB LLDP MIB
IEEE 802.1AB LLDP DOT1 MIB
IEEE 802.1AB LLDP DOT3 MIB
sFlow.org sFlowv5
sFlow.org sFlowv5 MIB (version 1.3)
FORCE10-BGP4-V2-MIB Force10 BGP MIB (draft-ietf-idr-bgp4-mibv2-05)
FORCE10-IF-EXTENSION-MIB
FORCE10-LINKAGG-MIB
FORCE10-COPY-CONFIG-MIB
FORCE10-PRODUCTS-MIB
FORCE10-SS-CHASSIS-MIB
FORCE10-SMI
FORCE10-TC-MIB
FORCE10-TRAP-ALARM-MIB
FORCE10-FORWARDINGPLANE-STATS-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

Learn More at Dell.com/Networking

December 2015 | Version 1.7
Dell-Networking-Z Series-Z9100-ON-Spec Sheet