Dell Networking S4048T-ON
100M/1G/10G/40GbE top-of-rack open networking switch

High-density, 1RU 48-port 100M/1G/10G BASE-T switch with six 40GbE up-links with non-blocking line-rate performance; feature-rich Dell Networking OS.

The Dell Networking S4048T-ON switch is the industry's latest data center networking solution empowering organizations to deploy modern workloads and applications designed for the open networking era.

Businesses who have made the transition away from monolithic proprietary mainframe systems to industry standard server platforms can now enjoy even greater benefits from Dell open networking platforms. By using industry-leading hardware and a choice of leading network operating systems to simplify data center fabric orchestration and automation, organizations can tailor their network to their unique requirements and accelerate innovation.

These new offerings provide the needed flexibility to transform data centers and offer high-capacity network fabrics that are cost-effective, easy to deploy and provide a clear path to a software-defined data center of the future without having to worry about vendor lock-in.

The S4048T-ON supports the open source Open Network Install Environment (ONIE) for zero-touch installation of alternate network operating system including feature rich Dell Networking OS.

S4048T-ON supports feature-rich Dell Networking OS, VLT, network virtualization features such as VRF-lite, VXLAN Gateway and support for Dell Embedded Open Automation Framework.

• The S4048T-ON is the only switch in the industry that supports traditional network centric virtualization (VRF) and hypervisor centric virtualization (VXLAN). The switch fully supports L2 VXLAN gateway function and has hardware support for L3 VXLAN routing.
• The S4048T-ON also supports Dell Networking's Embedded Open Automation Framework, which provides enhanced network automation and virtualization capabilities for virtual data center environments.
• The Open Automation Framework comprises a suite of interrelated network management tools that can be used together or independently to provide a network that is flexible, available and manageable while helping to reduce operational expenses.

Key applications
Dynamic data centers ready to make the transition to software defined environments

• High-density 10Gbase-T ToR server access in high-performance data center environments
• Lossless iSCSI storage deployments that can benefit from innovative iSCSI & DCB optimizations that are unique only to Dell Networking switches

Energy Efficient 10GBASE-T top-of-rack switch optimized for data center efficiency.
When running the Dell Networking OS9, Active Fabric™ implementation for large deployments in conjunction with the Dell Z Series, creating a flat, two-tier, nonblocking 10/40GbE data center network design

- High-performance SDN/OpenFlow 1.3 enabled with ability to inter-operate with industry standard OpenFlow controllers
- As a high speed VXLAN Layer 2 Gateway that connects the hypervisor based overlay networks with non-virtualized infrastructure

**Key features - General**
- 48 multi-speed 100M/1G/10GbT (RJ45) ports and six 40GbE(QSFP+) uplinks or 24 10GbE (SFP+) ports with breakout cables with OS support
- 1.44Tbps (full-duplex) non-blocking switching fabric delivers line-rate performance under full load with sub 3us latency
- I/O panel to PSU airflow or PSU to I/O panel airflow
- Supports the open source ONIE for zero-touch installation of third party network operating systems
- Redundant, hot-swappable power supplies and fans
- Energy Efficient Ethernet (EEE) and other innovative power saving modes resulting in lower power consumption
- Hardware supports L3 VXLAN routing enabling line rate L3 overlay solution

1/10G BASE-T cabling distances

<table>
<thead>
<tr>
<th>Cable Type</th>
<th>1G BASE-T</th>
<th>10G BASE-T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat 6 UTP</td>
<td>100m (330 ft)</td>
<td>55m (180 ft)</td>
</tr>
<tr>
<td>Cat 6 STP</td>
<td>100m (330 ft)</td>
<td>100m (330 ft)</td>
</tr>
<tr>
<td>Cat 6 UTP</td>
<td>100m (330 ft)</td>
<td>100m (330 ft)</td>
</tr>
<tr>
<td>Cat 7</td>
<td>100m (330 ft)</td>
<td>100m (330 ft)</td>
</tr>
</tbody>
</table>

**Key features with Dell Networking OS9**

Scalable L2 and L3 Ethernet switching with QoS and a full complement of standards-based IPv4 and IPv6 features, including OSPF, BGP and PBR (Policy Based Routing) support

- VRF-lite enables sharing of networking infrastructure and provides L3 traffic isolation across tenants
- Increase VM Mobility region by stretching L2 VLAN within or across two DCs with unique VLT capabilities like Route VLT, VLT Proxy Gateway
- VXLAN gateway functionality support for bridging the nonvirtualized and the virtualized overlay networks with line rate performance.
- Embedded Open Automation Framework adding automated configuration and provisioning capabilities to simplify the management of network environments. Supports Puppet agent for DevOps
- Modular Dell Networking OS software delivers inherent stability as well as enhanced monitoring and serviceability functions.
- Enhanced mirroring capabilities including 1:4 local mirroring, Remote Port Mirroring (RPM), and Encapsulated Remote Port Mirroring (ERPM). Rate shaping combined with flow based mirroring enables the user to analyze fine grained flows
- Jumbo frame support for large data transfers
- 128 link aggregation groups with up to 16 members per group, using enhanced hashing
- Converged network support for DCB, with priority flow control (802.1Qbb), ETS (802.1Qaz), DCBx and iSCSI TLV
- S4048T-ON supports RoCE and Routable RoCE to enable convergence of compute and storage on Active Fabric
- User port stacking support for up to six units and unique mixed mode stacking that allows stacking of S4048-ON with S4048T-ON to provide combination of 10G SFP+ and RJ45 ports in a stack.

**Specifications: S4048T-ON 100M/1G/10G/40-GbE top-of-rack open networking switch**

**Ordering information**

- **S4048T-ON**
  - 48x 10GbE Base-T, 6x QSFP+, 1x AC PSU, 2x Fans, I/O Panel to PSU Airflow
  - 48x 10GbE Base-T, 6x QSFP+, 1x AC PSU, 2x Fans, PSU to I/O Panel Airflow

- **Redundant power supplies**
  - S4048T-ON, AC Power Supply, I/O Panel to PSU Airflow
  - S4048T-ON, AC Power Supply, PSU to I/O Panel Airflow

- **Fans**
  - S4048T-ON Fan Module, I/O Panel to PSU Airflow
  - S4048T-ON Fan Module, PSU to I/O Panel Airflow

- **Optics**
  - Transceiver, 40GbE QSFP+ Short Reach Optic, 850nm
  - Transceiver, 40GbE QSFP+ LR4, 10km Reach on SMF
  - Transceiver, 40GbE QSFP+ to 5G Cu SFP adapter, QSA
  - Transceiver, 40GbE QSFP+ to 10GbE Cu SFP adapter, QSA

- **Cables**
  - Cable, QSFP+ to QSFP+, 40GbE Passive Copper Direct Attach Cable, 0.5 Meter
  - Cable, QSFP+ to QSFP+, 40GbE Passive Copper Direct Attach Cable, 1 Meter
  - Cable, QSFP+ to QSFP+, 40GbE Passive Copper Direct Attach Cable, 3 Meter
  - Cable, QSFP+ to QSFP+, 40GbE Passive Copper Direct Attach Cable, 5 Meter
  - Cable, QSFP+ to QSFP+, 40GbE Passive Copper Direct Attach Cable, 7 Meter
  - Cable, QSFP+, 40GbE Active Fiber Optical Cable, 10 Meters (No optics required)
  - Cable, QSFP+, 40GbE Active Fiber Optical Cable, 50 Meters (No optics required)
  - Cable, QSFP+, 40GbE Passive Copper Direct Attach Cable, 0.5 Meter
  - Cable, QSFP+, 40GbE Passive Copper Direct Attach Cable, 1 Meter
  - Cable, QSFP+, 40GbE Passive Copper Direct Attach Cable, 3 Meter
  - Cable, QSFP+, 40GbE Passive Copper Direct Attach Cable, 5 Meter
  - Cable, QSFP+, 40GbE Passive Copper Direct Attach Cable, 7 Meter
  - Cable, QSFP+, 40GbE Active Fiber Optical Cable, 10 Meters (No optics required)
  - Cable, QSFP+, 40GbE Active Fiber Optical Cable, 50 Meters (No optics required)

- **Breakout Cable**
  - Breakout Cable, 40GbE QSFP+ to 4 x 10GbE SFP+, Active Optical Breakout Cable
IEEE compliance with Dell Networking OS9

802.1AB LLDP
802.1D Bridging, STP
802.1p L2 Prioritization
802.1Q VLAN Tagging, Double VLAN Tagging, GVRP
802.1Qbg PFC
802.1Qaz ETS
802.1s MSTP
802.1w RSTP
802.1X Network Access Control
803.2h Gigabit Ethernet (10GBASE-T)
803.2ac Frame Extensions for VLAN Tagging
803.2ad Link Aggregation with LACP
803.3d 10 Gigabit Ethernet (10GBase-X) with QSA
803.3ba 40 Gigabit Ethernet (40GBase-SR4, 40GBase-CR4, 40GBase-LR4) on optical ports
803.3u Fast Ethernet (100Base-TX)
803.3x Flow Control
803.3z Gigabit Ethernet (1000Base-X) with QSA
803.3ab Energy Efficient Ethernet
803.3T/40G MAC Addressing
803.3ICV
803.3BOOTP (v4)
803.11 Requirements for IPv4 Routers
803.19 Address Allocation for Private Internets
2474 DiffServ Field in IPv4 and IPv6 Headers
2596 Assured Forwarding PHB Group
2514 BDST Systolg
2436 Expedition Assured Forwarding
4364 VF/F-IPv6 (4364) with OSPF, BGP-LS, IS-IS, and V4 multicast (5798) VRRP
803.1 General IPv4 protocols

791 IPv4
792 ICMP
826 ARP
1027 Proxy ARP
1035 DNS (client)
1042 Ethernet Transmission
1305 NTPv3
1519 CIDR
1542 BOOTP (v4)
1812 Requirements for IPv4 Routers
1918 Address Allocation for Private Internets
2474 DiffServ Field in IPv4 and IPv6 Headers
2596 Assured Forwarding PHB Group
2514 BDST Systolg
2436 Expedition Assured Forwarding
4364 VF/F-IPv6 (4364) with OSPF, BGP-LS, IS-IS, and V4 multicast (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
2711 IPv6 Router Alert Option
4007 IPv6 Scoped Address Architecture
4213 Basic Transition Mechanisms for IPv6-Hosts and Routers
4251 IPv6 Addressing Architecture
4443 ICMP for IPv6
4861 Neighbor Discovery for IPv6
4862 IPv6 Stateless Address Autoconfiguration
5095 Deprecation of Type O Routing Headers in IPv6
IPv6 Management support (Telnet, FTP, TACACS, RADIUS, SSH, NTP)
VF/-Lite (IPv6 VF with OSPFv3, BGPv6, IS-IS)
RIP

3158 RIPv2 2453 RIPv2

OSPF (v2/v3)

1587 NSSA 4522 Authentication
2154 OSPF Digital Signatures Confidentiality for OSPFv2
2358 OSPFv3
2370 Douple USA LS 5340 OSPF for IPv6
IS-IS

1142 Base IS-IS Protocol
1195 IPv4 Routing
5301 Dynamic hostname exchange mechanism for IS-IS 5302 Domain-wide prefix distribution with two-level IS-IS

5303 3-way handshake for IS-IS pt-to-pt adjacencies
5304 IS-IS MD5 Authentication
5306 Restart signaling for IS-IS
5368 IS-IS for IPv6
5390 IS-IS point to point operation over LAN draft-ietf-sig-p2p-lan-06
5391 Draft-kaplan-sig-ext-eth-02

BGP
1997 Communities
2368 MD5
2545 BGP-4 Multiroute Extensions for IPv6 Inter-Domain Routing
2439 Route Flap Dampening
2796 Route Reflection
2842 Capabilities
2858 Multiroute Extensions
2918 Route Refresh
3065 Confederations
4560 Extended Communities
4693 4-byte ASN
5396 4-byte ASN representations

draft-ietf-idr-add-paths-04.txt ADD PATH

Multicast
1112 IGMPv4
2236 IGMPv2
3376 IGMPv3

MSDP, PIM-SM, PIM-SSM

Security
2404 The Use of HMACSHA-1-96 within ESP and AH
2865 RADIUS
3562 Radius and IPv6
3579 Radius support for EAP
3580 802.1X with RADIUS
3768 EAP
3826 AES Cipher Algorithm in the SNMP User Base
3981 Security Architecture for IPSec
4032 IPSec Authentication Header
4033 ESP Protocol
4087 IPv6 Security Policy DB MIB
4098 IPv6 Security Policy DB MIB
4105 Draft-ietf-ipv6-sm-02-new-05 PIM-SM

Data center bridging
802.1Qab Priority-Based Flow Control
802.1Qaz Enhanced Transmission Selection (ETS)
802.1Qbb Priority-Based Flow Control

DCB Application TLV (DCBx)

Network management
1155 SMX1
1157 SNMPv4
1121 Concone MIB Definitions
1215 SNMP Traps
1493 Bridges MIB
1850 OSPFv2 MIB
1901 Community-Based SNMIPv2
2011 MIB
2096 IP Forwarding Table MIB
2578 SMv2
2579 Textual Conventions for SMv2
2580 Conformance Statements for SMv2
2618 RADIUS Authentication MIB
2665 Ethernet-Related 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 (SNMPv3)
3413 SNMP Applications
3414 User-based Security Model (USM) for SNMPv3
3415 VACM for SNMP
3416 SNMPv2
3417 Transport mappings for SNMP
3418 SNMPv2
3419 SNMP MIB
3434 RMON High Capacity Alarm MIB
3584 Coexistence 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
4502 RMONv2 (groups 1,2,3,9)
5060 PIM MIB
ANSI/TIA-1057 LLDP-MED 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 MIB (version 1.3)
sFlow.org sFlowv5 MIB
sFlow.org sFlowv5 MIB (version 1.3)
DELL-NETWORKING-MSTP-MIB
DELL-NETWORKING-BGP4-V2-MIB
DELL-NETWORKING-ISIS-MIB
DELL-NETWORKING-RPSPNOOPING-MIB
DELL-NETWORKING-VIRTUAL-LINK-TRUNK-MIB
DELL-NETWORKING-DCB-MIB
DELL-NETWORKING-OPENFLOW-MIB
DELL-NETWORKING-BMP-MIB
DELL-NETWORKING-BPSTATS-MIB
Watermark 3
DELL-NETWORKING-MSTP-MIB
DELL-NETWORKING-BGP4-V2-MIB
DELL-NETWORKING-ISIS-MIB
DELL-NETWORKING-RPSPNOOPING-MIB
DELL-NETWORKING-VIRTUAL-LINK-TRUNK-MIB
DELL-NETWORKING-DCB-MIB
DELL-NETWORKING-OPENFLOW-MIB
DELL-NETWORKING-BMP-MIB
DELL-NETWORKING-BPSTATS-MIB

Regulatory compliance
Safety
CUS UL 60950-1, Second Edition
CSA 60950-1-03, Second Edition
EN 60950-1, Second Edition
IEC 60950-1, Second Edition Including All National Deviations and Group Differences
EN 60825-1, 1st Edition
EN 60825-1 Safety of Laser Products Part 1: Equipment
Classification Requirements and User’s Guide
FDA Regulation 21 CFR 1040.10 and 1040.11

Emissions
International: CISPR 22, Class A
Australia/New Zealand: AS/NZS CISPR 22: 2009, Class A
Canada: ICES-003:2016 Issue 6, Class A
Europe: EN 55022: 2010 / CISPR 22: 2008, Class A
USA: FCC CFR Part 15, Subpart B 2009, Class A

RoHS
All S-Series components are EU RoHS compliant.