DELL EMC NETWORKING S4048T-ON SWITCH

Energy-efficient 10GBASE-T top-of-rack switch optimized for data center efficiency

The Dell EMC 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 EMC 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. High-capacity network fabrics are cost-effective and easy to deploy, providing a clear path to the software-defined data center of the future with no vendor lock-in.

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

High density 1/10G BASE-T switch

The Dell EMC Networking S-Series S4048T-ON is a high-density 100M/1G/10G/40GbE top-of-rack (ToR) switch purpose-built for applications in high-performance data center and computing environments. Leveraging a non-blocking switching architecture, the S4048T-ON delivers line-rate L2 and L3 forwarding capacity within a conservative power budget. The compact S4048T-ON design provides industry-leading density of 48 dual-speed 1/10G BASE-T (RJ45) ports, as well as six 40GbE QSFP+ up-links to conserve valuable rack space and simplify the migration to 40Gbps in the data center core. Each 40GbE QSFP+ up-link can also support four 10GbE (SFP+) ports with a breakout cable. In addition, the S4048T-ON incorporates multiple architectural features that optimize data center network flexibility, efficiency and availability, including I/O panel to PSU airflow or PSU to I/O panel airflow for hot/cold aisle environments, and redundant, hot-swappable power supplies and fans. 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 VX-LAN gateway function and has hardware support for L3 VXLAN routing.
- The S4048T-ON also supports Dell EMC 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 interre-lated 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

When running the Dell Networking OS9, Active Fabric™ implementation for large deployments in conjunction with the Dell EMC 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 ovelray networks with nonvirtualized infrastructure

Key features - general

- 48 dual-speed 1/10GbE (SFP+) ports and six 40GbE (QSFP+) uplinks (totaling 72 10GbE ports with breakout cables) with OS support
- 1.44Tbps (full-duplex) non-blocking switching fabric delivers line-rate performance under full load with sub 600ns latency
- I/O panel to PSU airflow or PSU to I/O panel airflow
- Supports the open source ONIE for zero-touch
- installation of alternate network operating systems
- Redundant, hot-swappable power supplies and fans
- Low power consumption
- Support for multi-tenancy lilke VXLAN and NVGRE in hardware

Key features with Dell EMC 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

- 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 Routed 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.

1/10G BASE-T cabling distances		
Cable Type	1G BASE-T	10G BASE-T
Cat 6 UTP	100m (330 ft)	55m (180 ft)
Cat 6 STP	100m (330 ft)	100m (330 ft)
Cat 6A UTP	100m (330 ft)	100m (330 ft)
Cat 7	100m (330 ft)	100m (330 ft)

Product	Description
S4048T	S4048T, 48x 10GBASE-T, 6x QSFP+, 2x AC PSU, 2x fans, I/O Panel to PSU Airflow S4048T, 48x 10GBASE-T, 6x QSFP+, 2x AC PSU, 2x fans, PSU to I/O Panel Airflow
Redundant power supplies	S4048T, AC Power Supply, I/O Panel to PSU Airflow S4048T, AC Power Supply, PSU to I/O Panel Airflow
Fans	S4048T Fan Module, I/O Panel to PSU Airflow S4048T Fan Module, PSU to I/O Panel Airflow
Optics	Transceiver,40GE QSFP+ Short Reach Optic,850nm wavelength,100-150m reach on OM3/OM4 Transceiver, 40GbE QSFP+ ESR, 300m reach on OM3 / 400m on OM4 Transceiver, 40GbE QSFP+ PSM4 with 1m pigtail to male MPO SMF, 2km reach Transceiver, 40GbE QSFP+ PSM4 with 5m pigtail to male MPO SMF, 2km reach Transceiver, 40GbE QSFP+ PSM4 with 15m pigtail to male MPO SMF, 2km reach Transceiver, 40GbE QSFP+ LR4, 10km reach on SMF Transceiver, 40GbE QSFP+ to 1G Cu SFP adapter, QSA 1 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 3 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 5 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 7 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 10 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 25 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 50 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 75 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 100 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics

Product	Description
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, 40GbE QSFP+ to 4 x 10GbE SFP+, Active Optical Breakout Cable Cable, 40GbE (QSFP+) to 4 x 10GbE SFP+ Passive Copper Breakout Cable, 0.5 Meters Cable, 40GbE (QSFP+) to 4 x 10GbE SFP+ Passive Copper Breakout Cable, 1 Meter Cable, 40GbE (QSFP+) to 4 x 10GbE SFP+ Passive Copper Breakout Cable, 3 Meters Cable, 40GbE (QSFP+) to 4 x 10GbE SFP+ Passive Copper Breakout Cable, 5 Meters Cable, 40GbE (QSFP+) to 4 x 10GbE SFP+ Passive Copper Breakout Cable, 7 Meters Cable, 40GbE MTP (QSFP+) to 4xLC Optical Connectors, 1M(QSFP+,SFP+ Optics REQ,not incl) Cable, 40GbE MTP (QSFP+) to 4xLC Optical Connectors, 3M(QSFP+,SFP+ Optics REQ,not incl) Cable, 40GbE MTP (QSFP+) to 4xLC Optical Connectors, 5M(QSFP+,SFP+ Optics REQ,not incl) Cable, 40GbE MTP (QSFP+) to 4xLC Optical Connectors, 7M(QSFP+,SFP+ Optics REQ,not incl)
Software	L3 Dell Networking OS S4048T: Dell Networking software license operating system software license for advanced L3 features, latest version S4048T: Dell Networking software license Dell Networking OS operating system software license, latest version 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
Supported operating systems	Cumulus Linux OS Big Switch Networks Switch Light OS Dell Networking Operating System v9 Pluribus OS

Technical specifications

Physical

48 fixed 10GBase-T ports supporting 100M/1G/10G speeds
6 fixed 40 Gigabit Ethernet QSFP+ ports
1 RJ45 console/management port with RS232 signaling
1 USB 2.0 type A to support mass storage device
1 Micro-USB 2.0 type B Serial Console Port
1 8 GB SSD Module
Size: 1RU, 1.71 x 17.09 x 18.11"
(4.35 x 43.4 x 46 cm (H x W x D)
Weight: 23 lbs (10.43kg)
ISO 7779 A-weighted sound pressure level: 65 dB at 77°F (25°C)
Power supply: 100–240V AC 50/60Hz
Max. thermal output: 1568 BTU/h
Max. current draw per system:
4.6 A at 460W/100VAC,
2.3 A at 460W/200VAC
Max. power consumption: 460 Watts
Typical power consumption: 338 Watts
Max. operating specifications:
Operating temperature: 32°F to 113°F (0°C to 45°C)
Operating humidity: 5 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

Redundancy

Hot swappable redundant power
Hot swappable redundant fans

Performance General

Switch fabric capacity:
1.44Tbps (full-duplex)
720Gbps (half-duplex)
Forwarding Capacity: 1080 Mpps
Latency: 2.8 us
Packet buffer memory: 16MB
CPU memory: 4GB

OS9 Performance:

MAC addresses: 160K
ARP table 128K
IPv4 routes: 128K
IPv6 hosts: 64K
IPv6 routes: 64K
Multicast routes: 8K
Link aggregation: 16 links per group, 128 groups
Layer 2 VLANs: 4K
MSTP: 64 instances
VRF-Lite: 511 instances
LAG load balancing: Based on layer 2, IPv4 or IPv6 headers Latency: Sub 3us
QOS data queues: 8
QOS control queues: 12
Ingress ACL: 16K
Egress ACL: 1K
QoS: Default 3K entries scalable to 12K

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
802.1Qbb	PFC
802.1Qaz	ETS
802.1s	MSTP
802.1w	RSTP
802.1X	Network Access Control
802.3ab	Gigabit Ethernet (1000BASE-T)
802.3ac	Frame Extensions for VLAN Tagging
802.3ad	Link Aggregation with LACP
802.3ae	10 Gigabit Ethernet (10GBase-X) with QSA

802.3ba 40 Gigabit Ethernet (40GBase-SR4, 40GBase-CR4, 40GBase-LR4) on optical ports
802.3u Fast Ethernet (100Base-TX)
802.3x Flow Control
802.3z Gigabit Ethernet (1000Base-X) with QSA
802.3az Energy Efficient Ethernet
ANSI/TIA-1057 LLDP-MED
Force10 PVST+
Max MTU 9216 bytes

RFC and I-D compliance with Dell Networking OS9

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, BGP, 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
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)
VRF-Lite (IPv6 VRF with OSPFv3, BGPv6, IS-IS)

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

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
5308 IS-IS for IPv6
5309 IS-IS point to point operation over LAN
draft-isis-igp-p2p-over-lan-06
draft-kaplan-isis-ext-eth-02

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, PIM-SM, PIM-SSM

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
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)
DELL-NETWORKING-SMI
DELL-NETWORKING-TC
DELL-NETWORKING-CHASSIS-MIB
DELL-NETWORKING-PRODUCTS-MIB
DELL-NETWORKING-SYSTEM-COMPONENT-MIB
DELL-NETWORKING-TRAP-EVENT-MIB
DELL-NETWORKING-COPY-CONFIG-MIB
DELL-NETWORKING-IF-EXTENSION-MIB
DELL-NETWORKING-FIB-MIB

DELL-NETWORKING-FPSTATS-MIB
DELL-NETWORKING-LINK-AGGREGATION-MIB
DELL-NETWORKING-MSTP-MIB
DELL-NETWORKING-BGP4-V2-MIB
DELL-NETWORKING-ISIS-MIB
DELL-NETWORKING-FIPSNOOPING-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
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

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+AC:2011 / CISPR 22: 2008, Class A
Japan: VCCI V-3/2014.04, Class A & V4/2012.04
USA: FCC CFR 47 Part 15, Subpart B:2009, Class A

RoHS

All S-Series components are EU RoHS compliant.

Certifications

Japan: VCCI V3/2009 Class A
USA: FCC CFR 47 Part 15, Subpart B:2009, Class A
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

Immunity

EN 300 386 V1.6.1 (2012-09) EMC for Network Equipment\
EN 55022, Class A
EN 55024: 2010 / CISPR 24: 2010
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

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 EMC 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 EMC 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.

Learn more at
Dell.com/lifecycleservices

Learn more at Dell.com/Networking

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