Dell Networking S6000

High-performance 10/40GbE top-of-rack switch for virtualized data centers

High-density 40GbE switch (32 ports of 40GbE or 96 ports of 10GbE[1] and eight ports of 40GbE) with high performance for ToR, MoR and EoR deployments. The S6000 includes feature-rich Dell FTOS, VLT, and built-in network virtualization features with support for Dell Open Automation Framework.

Data center optimized

The Dell Networking S Series S6000 is a 10/40GbE top-of-rack (ToR) switch purpose-built for applications in high-performance data center and computing environments. Leveraging a non-blocking, cut-through switching architecture, the S6000 delivers line-rate L2 and L3 forwarding capacity to maximize network performance. The compact S6000 design provides industry-leading density of 32 ports of 40GbE or 96 ports of 10GbE[1] and eight additional ports of 40GbE to conserve rack space while enabling denser footprints and simplifying migration to 40Gbps in the data center core. Priority-Based Flow Control (PFC), Data Center Bridge Exchange (DCBX) and Enhanced Transmission Selection (ETS) make the S6000 ideally suited for DCB environments. In addition, the S6000 incorporates multiple architectural features that optimize data center network flexibility, efficiency and availability, including redundant, hot-swappable power supplies and fans.

The S6000 also supports Dell Networking's Open Automation Framework, which provides enhanced network automation and virtualization capabilities for virtual data center environments. The Open Automation Framework comprises a suite of inter-related 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. Furthermore, built-in support for key network virtualization and software-defined networking initiatives help enable customers with future-ready agility, optimized for virtual services deployment and delivery.

Key applications

- High-density 10/40GbE ToR server aggregation in high-performance data center environments
- Active Fabric™ implementation for large deployments in conjunction with the Dell Z9000, creating a flat, two-tier, non-blocking[2] 10/40GbE data center network design
- Small-scale Active Fabric implementation via the S6000 switch in leaf and spine along with S Series 1/10GbE ToR switches enabling cost-effective aggregation of 10/40GbE uplinks
- iSCSI storage deployment including DCB converged lossless transactions

Key features

- 1RU high-density 10/40GbE ToR switch with 32 ports of 40GbE (QSFP+) or 96 ports of 10GbE[1] and eight ports of 40GbE
- Up to 2.56Tbps of switching I/O bandwidth (full-duplex) and available non-blocking[2] cut-through switching fabric delivering line-rate performance under full load[2] with sub 600ns 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
- VXLAN gateway functionality[3] support for optimized virtual operation
- Open Automation Framework adding automated configuration and provisioning capabilities to simplify the management of network environments
- Modular Dell FTOS software delivering inherent stability as well as enhanced monitoring and serviceability functions
- 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
- Converged network support for DCB, with priority flow control (802.1Qbb), ETS (802.1Qaz), DCBx and iSCSI TLV support
- 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

Industry-leading high-density 1RU 10/40GbE. Purpose-built for virtualized data centers.[4]

1 Using QSFP+ breakout cables (available separately)
2 Performance rated over aggregate operation and with average packet transfers greater than 200 bytes
3 Future feature
4 AD: G13001816

Specifications: S6000 GbE switches

Ordering information

S6000
32-Port 40G QSFP+ Ports, Redundant AC PS, Fan Subsys, w/ Airflow from I/O PNL to PS PNL
32-Port 40G QSFP+ Ports, Redundant AC PS, Fan Subsys, w/ Airflow from PS PNL to I/O PNL
32-Port 40G QSFP+ Ports, Redundant DC PS, Fan Subsys, w/ Airflow from I/O PNL to PS PNL
32-Port 40G QSFP+ Ports, Redundant DC PS, Fan Subsys, w/ Airflow from PS PNL to I/O PNL
32-Port 40G QSFP+ Ports, Redundant AC PS, Fan Subsys, w/ Airflow from I/O PNL to PS PNL—TAA
32-Port 40G QSFP+ Ports, Redundant AC PS, Fan Subsys, w/ Airflow from PS PNL to I/O PNL—TAA

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

Fans
S6000 Fan Module, I/O Panel to PSU Airflow
S6000 Fan Module, PSU to I/O Panel Airflow

Optics
Transceiver, QSFP+, 40GbE, SR4 Optics, 850nm Wavelength, 100–150m Reach on OM3/OM4
Transceiver, QSFP+, 40GbE, eSR4 Optics, 850nm Wavelength, 300–400m Reach on OM3/OM4
Transceiver, QSFP+, 40GbE, LR4 Optics, 10Km Reach on Single Mode Fiber
Transceiver, QSFP+, 40GbE, PSM4 Optics 1490nm

Cables
Cable, 40GbE QSFP+, Active Fiber Optic, 10M and 50M
Cable, 40GbE QSFP+, Direct Attach Cable, for 0.5M, 1M, 3M, 5M, 7M Cable, 40GbE MTP to 4 x LC 5M Optical Breakout Cable (optics not included)
Cable, 40GbE QSFP+ to 4xSFP+ 5M Direct Attach Breakout Cable

Software
Software, FTOS: Dell Networking Operating System Software, S6000

Note: In-field change of airflow direction not supported.

Physical
32 line-rate 40 Gigabit Ethernet QSFP+ ports
1 RJ45 console/management port with RS232 signaling
1 USB 2.0 type A storage port
1 USB 2.0 type B console port
Size: 1 RU, 1.71 x 17.08 x 18.11"
Weight: 16.12 lbs (7.32 kg)
Power supply: 100–240 VAC 50/60 Hz
Max. power consumption: 371 Watts
Typ. power consumption: 220 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
Hot swappable redundant power
Hot swappable redundant fans

Performance
MAC addresses:	160K
ARP table:	48K
IPv4 routes:	16K
IPv6 hosts:	24K
IPv6 routes:	8K
Multicast hosts:	8K
Switching I/O bandwidth	2.56Tbps (Full-Duplex)
Link aggregation:	8 links per group, 128 groups per stack
Layer 2 VLANs:	4K
MST:	64 instances
LAG load balancing:	Based on layer 2, IPv4 or IPv6 headers
Latency:	Sub 600ns
Packet buffer memory:	12MB
CPU memory:	4GB
QOS data queues:	8
QOS control queues:	12
QOS:	Default 768 entries scalable to 2.5K
Ingress ACL:	2.5K
Egress ACL:	1K

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)
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) on optical ports
802.3u Fast Ethernet (100Base-TX) on mgmt ports
802.3x Flow Control
802.3z Gigabit Ethernet (1000Base-X)
ANSI/TIA-1057 LLDP-MED
Force10 PVST+
MTU 12,000 bytes

RFC and I-D compliance

General Internet protocols
768	UDP		854	Telnet
793	TCP		959	FTP

General IPv4 protocols
791	IPv4		1042	Ethernet Transmission
792	ICMP		1305	NTPv3
826	ARP		1519	CIDR
1027	Proxy ARP		1542	BOOTP (relay)
1035	DNS (client)			

General IPv6 protocols
1981	Path MTU Discovery		IPv6	Management
	Features			(telnet, FTP, TACACS,
2460	(partial)			RADIUS, SSH, NTP)
2461	IPv6 Neighbor Discovery (partial)		2462	Stateless Address Autoconfiguration (partial)

RIP
1058	RIPv1		2453	RIPv2

OSPF
1587	NSSA		2328	OSPFv2
2154	MD5		2370	Opaque LSA

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
2012   TCP MIB
2013   UDP MIB
2096   IP Forwarding Table MIB
2570   SNMPv3
2571   Management Frameworks
2572   Message Processing and Dispatching
2576   Coexistence Between SNMPv1/v2/v3
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
2865   RADIUS
3273   RMON High Capacity MIB
3416   SNMPv2
3418   SNMP MIB
3434   RMON High Capacity Alarm MIB
3580   802.1X with RADIUS
4133   Entity MIB
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)
SSHv2 RFC 4250, 4251, 4252, 4253, 4254
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

3 Future feature

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