



Force10

# Dell Force10 S-Series

## S4810 High-Performance 10/40 GbE Top-of-Rack Switch

High-density, 1RU 48-port 10 GbE switch with four 40GbE uplinks and ultra-low-latency, non-blocking performance to ensure line-rate performance; feature-rich Dell Force10 Operating System (FTOS); and storage optimization for iSCSI, FCoE Transit, and DCB.

### Ultra-low-latency, data center optimized

The Dell Force10 S-Series S4810 is an ultra low-latency 10/40 GbE 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 S4810 delivers line-rate L2 and L3 forwarding capacity with ultra low-latency to maximize network performance. The compact S4810 design provides industry-leading density of 48 dual-speed 1/10 GbE (SFP+) ports as well as four 40 GbE QSFP+ uplinks to conserve valuable rack space and simplify the migration to 40 Gbps in the data center core (Each 40 GbE QSFP+ uplink can support four 10 GbE ports with a breakout cable). Priority-based Flow Control (PFC), Data Center Bridge Exchange (DCBX), Enhance Transmission Selection (ETS), coupled with ultra low latency and line rate throughput, make the S4810 ideally suited for iSCSI storage, FCoE Transit & DCB environments. In addition, the S4810 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, and redundant, hot-swappable power supplies and fans.

The S4810 also supports Dell Force10's Open Automation Framework, which provides advanced network automation and virtualization capabilities for virtual data center environments. The Open Automation Framework is comprised of a suite of inter-related network management tools that can be used together or independently to provide a network that is more flexible, available and manageable while reducing operational expenses.

### Key applications

- Ultra-low-latency 10 GbE switching in HPCC, high-speed trading, or other business-sensitive deployments that require the highest bandwidth and lowest latency
- High-density 10 GbE ToR server aggregation in high-performance data center environments
- Design with the E-Series or Z-Series core switch/router to create a flat, two-tier, non-blocking 1/10/40 GbE data center network design
- Design a distributed core Clos fabric with S4810 switch in leaf and spine with the S-Series 1/10GbE ToR switches for cost-effective aggregation of 10 GbE uplinks
- Regular iSCSI Storage deployment
- Enterprise iSCSI (iSCSI over DCB)
- FIP Snooping Bridge as part of storage solution

### Key features

- 1RU high-density 10/40 GbE ToR switch with 48 dual-speed 1/10 GbE (SFP+) ports and four 40 GbE (QSFP+) uplinks (totaling 64 10 GbE ports with breakout cables)
- 1.28 Tbps (full-duplex) non-blocking, cut-through switching fabric delivers line-rate performance under full load with 800ns latency
- Scalable L2 and L3 Ethernet switching with QoS and a full complement of standards-based IPv4 and IPv6 features
- IO panel to PSU airflow or PSU to IO panel airflow
- Open Automation Framework adds VM-awareness as well as automated configuration and provisioning capabilities to simplify the management of virtual network environments
- Modular Dell Force10 Operating System (FTOS) software delivers inherent stability as well as advanced monitoring and serviceability functions
- Supports jumbo frames for high-end server connectivity
- 128 link aggregation groups with up to 8 members per group, using advanced hashing
- Redundant, hot-swappable power supplies and fans
- Hardware support for DCB
- Low power consumption
- VLT & eVLT: multi-chassis link to enable up to 576 10GE (3:1 over subscription)
- User Port stacking support for up to 6 units
- Support IPv6 Layer 2 and FIPS certification

Ultra low latency  
10GbE Top-of-Rack  
switch optimized for  
data center efficiency

# Specifications: S4810 High-Performance 10/40 GbE Top-of-Rack Switch

## Dell SKU description

### S4810

S4810, 48 x 10GbE SFP+, 4 x QSFP+, 1 x AC PSU, 2 x Fans, IO Panel to PSU Airflow  
 S4810, 48 x 10GbE SFP+, 4 x QSFP+, 1 x AC PSU, 2 x Fans, PSU to IO Panel Airflow  
 S4810, 48 x 10GbE SFP+, 4 x QSFP+, 1 x AC PSU, 2 x Fans, PSU to IO Panel Airflow, Rear Mnt Bracket  
 S4810, 48 x 10GbE SFP+, 4 x QSFP+, 1 x DC PSU, 2 x Fans, IO Panel to PSU Airflow  
 S4810, 48 x 10GbE SFP+, 4 x QSFP+, 1 x DC PSU, 2 x Fans, PSU to IO Panel Airflow  
 S4810, 48 x 10GbE SFP+, 4 x QSFP+, 1 x AC PSU, 2 x Fans, IO panel to PSU Airflow (Normal), TAA/FIPS/USGv6-L2  
 S4810, 48 x 10GbE SFP+, 4 x QSFP+, 1 x AC PSU, 2 x Fans, PSU to IO Panel Airflow (Reverse), TAA/FIPS/USGv6-L2  
 S4810, 48 x 10GbE SFP+, 4 x QSFP+, 1 x AC PSU, 2 x Fans, IO Panel to PSU (Normal) Airflow, TAA/FIPS/USGv6-L2  
 S4810, 48 x 10GbE SFP+, 4 x QSFP+, 1 x AC PSU, 2 x Fans, PSU to IO Panel (Reverse) Airflow, TAA/FIPS/USGv6-L2

### Redundant power supplies

S4810, AC Power Supply, IO Panel to PSU Airflow  
 S4810, AC Power Supply, PSU to IO Panel Airflow  
 S4810, DC Power Supply, IO Panel to PSU Airflow  
 S4810, DC Power Supply, PSU to IO Panel Airflow

### Fans

S4810 fan module, IO Panel to PSU Airflow  
 S4810 fan module, PSU to IO SR4 Panel Airflow

### Optics

Transceiver, QSFP+, 40GbE SR Optics, 850nm Wavelength, 100-150m Reach on OM3/OM4  
 Transceiver, QSFP+, 40GbE eSR Optics, 850nm Wavelength, 300-400m Reach on OM3/OM4  
 Transceiver, SFP+, 10GbE, SR, 850nm Wavelength, 300m Reach  
 Transceiver, SFP+, 10GbE, LR, 1310nm Wavelength, 10km Reach  
 Transceiver, SFP+, 10GbE, DWDM, ITU Channel 17-61, 40km Reach  
 Transceiver, SFP, 1000BASE-SX, 850nm Wavelength, 550m Reach  
 Transceiver, SFP, 1000BASE-LX, 1310nm Wavelength, 10km Reach  
 Transceiver, SFP, 1000BASE-T  
 Transceiver, SFP+, 10GbE, ER, 1310nm Wavelength, 40km Reach  
 Transceiver, SFP+ LRM (Long Reach Multimode) Optic, 10GbE, 1310nm Wavelength, 220m Reach on MMF

### Cables

Cable, 40GbE MTP to 4xLC 5M Optical Breakout Cable (optics not included)  
 Cable, 40GbE QSFP+ to 4xSFP+ 5M Direct Attach Breakout Cable  
 Cable, 40GbE QSFP+, Active Fiber Optic, 10m  
 Cable, 40GbE QSFP+, Active Fiber Optic, 50m  
 Cable, 40GbE QSFP+, Direct Attach Cable, 1m  
 Cable, 40GbE QSFP+, Direct Attach Cable, 5m  
 Cable, SFP+, CU, 10GbE, Direct Attach Cable, 0.5m  
 Cable, SFP+, CU, 10GbE, Direct Attach Cable, 1m  
 Cable, SFP+, CU, 10GbE, Direct Attach Cable, 2m  
 Cable, SFP+, CU, 10GbE, Direct Attach Cable, 5m  
 Cable, SFP+, CU, 10GbE, Direct Attach Cable, 7m

### Software

Software, FTOS – Force10 Operating System Software, S4810  
 Software, Force10, iSCSI-Optimized Configuration, S4810  
 Software, Force10, FCOE-Optimized Configuration, S4810

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

## Physical

48 line-rate 10 Gigabit Ethernet SFP+ ports  
 4 line-rate 40 Gigabit Ethernet QSFP+ ports  
 1 RJ45 console/management port with RS232 signaling  
 Size: 1 RU, 1.73 h x 17.32 w x 18.11" d (4.4 h x 44 w x 46 cm d)  
 Weight: 14.39 lbs (6.54 kg)  
 ISO 7779 A-weighted sound pressure level: 59.6 dBA at 73.4°F (23°C)  
 Power supply: 100–240 VAC 50/60 Hz  
 Max. thermal output: 1194 BTU/h  
 Max. current draw per system:  
 4A at 100/120 VAC 2A at 200/240 VAC  
 10A at 36 VDC 5A at 72 VDC  
 Max. power consumption: 350 Watts (AC), 300 Watts (DC)  
 Typ. power consumption: 220 Watts  
 Max. operating specifications:  
 Operating temperature: 32° to 104°F (0° to 40°C)  
 Operating humidity: 10 to 85% (RH), non-condensing  
 Max. non-operating specifications:  
 Storage temperature: –40° to 158°F (–40° to 70°C)  
 Storage humidity: 5 to 95% (RH), non-condensing

## Redundancy

Hot swappable redundant power  
 Hot swappable redundant fans

## Performance

MAC addresses: 128K  
 IPv4 routes: 16K  
 IPv6 routes: 8K (shared CAM space with IPv4)  
 Switch fabric capacity: 1.28 Tbps (full-duplex)  
 640 Gbps (half-duplex)

Forwarding capacity: 960 Mpps  
 Link aggregation: 8 links per group, 128 groups per stack  
 Queues per port: 4 queues  
 Layer 2 VLANs: 4K  
 MSTP: 64 instances  
 Line-rate Layer 2 switching: all protocols, including IPv4 and IPv6  
 Line-rate Layer 3 routing: IPv4 and IPv6  
 IPv4 host table size: 8K  
 IPv6 host table size: 4K  
 IPv4 Multicast table size: 4K  
 LAG load balancing: based on Layer 2, IPv4 or IPv6 headers  
 Latency: sub 700ns  
 Packet buffer memory: 9MB  
 CPU memory: 2GB

## IEEE Compliance

802.1AB LLDP  
 802.1ag Connectivity fault Management  
 802.1D Bridging, STP  
 802.1p L2 Prioritization  
 802.1Q VLAN Tagging, Double VLAN Tagging, GVRP  
 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) 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 1350 TFTP  
 793 TCP 2474 Differentiated Services  
 854 Telnet 3164 Syslog  
 959 FTP 5880 BFD  
 1321 MD5

### General IPv4 Protocols

791 IPv4 1812 Routers  
 792 ICMP 1858 IP Fragment Filtering  
 826 ARP 2131 DHCP (relay)  
 1027 Proxy ARP 2338 VRRP  
 1035 DNS (client) 3021 31-bit Prefixes  
 1042 Ethernet Transmission 3046 DHCP Option 82  
 1305 NTPv3 3069 Private VLAN  
 1519 CIDR 3128 Tiny Fragment Attack Protection  
 1542 BDOOP (relay)

### General IPv6 Protocols

2460 IPv6 1858 IP Fragment Filtering  
 2461 Neighbor Discovery 2675 Jumbograms  
 2462 Stateless Address 3587 Global Unicast Address Format Addressing  
 2463 Autoconfiguration (partial) 4291

### RIP

1058 RIPv1 2453 RIPv2

### OSPF

2154 MD5 3623 Graceful Restart  
 1587 NSSA 4222 Prioritization and  
 2328 OSPFv2 Congestion Avoidance  
 2370 Opaque LSA

### BGP

1997 Communities  
 2385 MD5  
 RFC 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-ietf-idr-restart-06 Graceful Restart  
 draft-michaelsen-4byte-as-representation-05  
 4-byte ASN Representation (partial)

### IS-IS

RFC 1195 Routing IPv4 with IS-IS  
 RFC 5308 Routing IPv6 with IS-IS

### Multicast

1112 IGMPv1 3569 SSM for IPv4

2236 IGMPv2 4541 IGMPv1/v2  
 Snooping  
 3376 IGMPv3  
 draft-ietf-pim-sm-v2-new-05 PIM-SM

## Network Management

1155 SMIv1  
 1156 Internet MIB  
 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  
 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  
 ruzin-mstp-mib-02 MSTP MIB (traps)  
 sFlow.org sFlow5  
 sFlow.org sFlow5 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-MON-MIB  
 FORCE10-PRODUCTS-MIB  
 FORCE10-SS-CHASSIS-MIB  
 FORCE10-SMI  
 FORCE10-SYSTEM-COMPONENT-MIB  
 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: 2009, 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:2009, 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.

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