



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	BOOFP (relay)		

### General IPv6 Protocols

2460	IPv6	1858	IP Fragment Filtering
2461	Neighbor Discovery (partial)	2675	Jumbograms
2462	Stateless Address Autoconfiguration (partial)	3587	Global Unicast Address Format
2463	ICMPv6	4291	Addressing

### RIP

1058	RIPv1	2453	RIPv2
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### OSPF

2154	MD5	3623	Graceful Restart
1587	NSSA	4222	Prioritization and Congestion Avoidance
2328	OSPFv2		
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
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2236	IGMPv2	4541	IGMPv1/v2 Snooping
3376	IGMPv3		
draft-ietf-pim-sm-v2-new-05	PIM-SM		

## Network Management

1155	SMlv1		
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	SMlv2		
2579	Textual Conventions for SMlv2		
2580	Conformance Statements for SMlv2		
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
rugin-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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