



Dell Networking S5000

Modular 1RU 10/40GbE and FC 2/4/8 switch

High-density 1RU 1/10GbE or 2/4/8G FC modules with four fixed 40GbE uplinks and low latency for line-rate performance, feature-rich layer 2/3 and storage networking for iSCSI, FC/FCoE and RoCE.

The Dell S5000 1RU Ethernet switch offers innovative modular, converged networking capabilities. The switch converges LAN and SAN traffic over a single 10GbE connection to help optimize server and storage connectivity in enterprise-scale data centers deploying separate networks based on different networking protocols.

Converged LAN/SAN ToR switch

The Dell S5000 is a 10/40GbE switch architected for a ToR virtualized data center environment. It provides a fully modular converged LAN/SAN switch purpose-built for applications in high-performance data center and fabric deployments. The S5000 supports LAN and native Fibre Channel ports using optional modules for maximum flexibility and scalability.

Leveraging a non-blocking, cut-through switching architecture, the S5000 provides line-rate L2 and L3 forwarding capacity with low latency to maximize network performance. The S5000 is a fully modular switch with four modular bays and four fixed 40GbE uplink ports. Each 40GbE QSFP+ uplink can also support four 10 GbE ports using a breakout cable. The S5000 supports three types of modules, including a Unified port module with 12 configurable ports for Fibre Channel 2/4/8Gbps and/or 1/10GbE SFP+, as well as SFP+ or 1/10GBASE-T Ethernet modules, each providing 12 1/10GbE ports.

The S5000 is powered by the industry-hardened, feature-rich Dell Networking OS9 (OS9) designed for maximum dependability and uptime. Virtual link trunking (VLT) provides a loop-free topology with active-active load-sharing of links from access to core. Hardware stacking using front port stacking up to six units provides maximum flexibility and scalability for data center environments. The S5000 supports Dell 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 interrelated network management tools which can be used together or independently to provide a more flexible, available and manageable network while helping to reduce operational expenses.

Key applications

- Lossless fabric for LAN/SAN deployments
- Design with the Dell Z Series core switch to create a flat, two-tier, non-blocking 1/10/40GbE data center network design
- Design a Clos fabric with S5000 switch in leaf and spine with the S Series 1/10GbE Ethernet switches for cost-effective aggregation of 10GbE uplinks
- Design with Dell N Series switches to create a modern campus network with pay-as-you-grow expansion capability or consolidate campus aggregation and small data center functionality

- High-performance SDN/OpenFlow 1.3 enabled with ability to inter-operate with industry standard OpenFlow controllers
- 1/10GBase-T and SFP+ modules available on the same ToR switch

Key features

- OS9 offers inherent stability as well as advanced monitoring and serviceability functions
- Open Automation Framework adds VM-awareness as well as automated configuration and provisioning capabilities to simplify the management of virtual network environments
- Scalable L2 and L3 Ethernet switching with QoS and a full complement of standards-based IPv4 and IPv6 features
- VLT and mVLT for layer 2 multipath
- User port stacking support for up to six units
- Support for jumbo frames for high-end server connectivity
- 128 link aggregation groups with up to eight members per group, using advanced hashing
- Fibre Channel, FCoE, FCoE transit (FIP Snooping) and NPV Proxy Gateway (NPG), Fibre Channel Forwarding (FCF)
- Full data center bridging (DCB) support for lossless iSCSI SANs, RoCE and converged network.
- Redundant, hot-swappable power supplies and fans
- I/O panel to PSU airflow or PSU to I/O panel airflow (reversible airflow)
- VRF-lite enables sharing of networking infrastructure and provides L3 traffic isolation across tenants
- 16, 28, 40, 52, 64 10GbE ports available

A modular, compact form-factor switch optimized for LAN and SAN convergence and easy 1GbE to 10GbE migration

Dell S5000 overview

Server virtualization and cloud-based deployment models are increasing IT organizations' productivity while improving their ability to respond to continuously changing business needs. However, the rate at which the technology is evolving is forcing IT departments to invest in solutions that are flexible, future-ready and cost-effective.

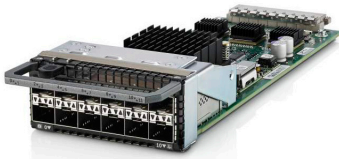
The Dell S5000 is a high-density 1RU switch that offers innovative flexibility due to its unique modular architecture. S5000 is well suited for data center access and aggregation layer deployments for physical and virtual servers and LAN and SAN convergence over lossless fabrics.

- 1RU high-density switch with four module slots and four fixed 40GbE (QSFP+) uplinks (totaling 64 10GbE ports with breakout cables)
- Three optional modules are SFP+ Ethernet, 1/10GBase-T Ethernet, and a Unified Module supporting Fibre Channel and/or SFP+ Ethernet. The Ethernet modules support 12 1/10GbE ports and the Unified Module supports up to 12 FC 2/4/8Gbps and/or 12 1/10GbE ports.
- 1.28Tbps (full-duplex) non-blocking, cut-through switching fabric delivers line-rate performance
- FCoE, iSCSI and RDMA over Converged Ethernet (RoCE) is supported on all Ethernet ports

S5000 I/O module options



Ethernet modules (above) provide 12 1/10GbE ports using SFP+ (left) or 1/10GBASE-T (right) interfaces. The Ethernet modules support Ethernet-based LAN traffic and Ethernet-based SAN traffic for FCoE and iSCSI, and RoCE.



Unified port module (above) provides up to 12 ports for 2/4/8Gbps native Fibre Channel using SFP+/SFP interface. The unified port module supports Fibre Channel-based SAN traffic as well as up to 12 FC 2/4/8 and/or 12 1/10GbE ports.

Deployment models for S5000

Dell S5000 supports deployment models for small campus core or traditional, virtualized and converged data centers.

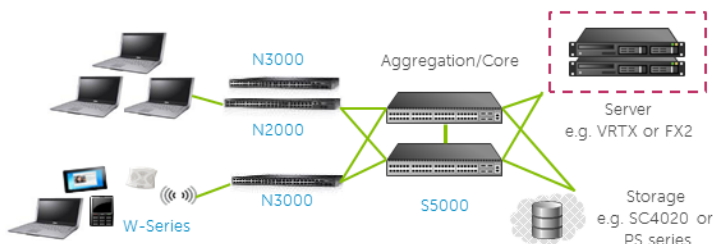


Figure 1. Campus deployment models for S5000

The flexibility of scale and types of ports offered by the S5000 make it an attractive choice for small campus core switches. Customers have the ability to connect legacy or new 1GbE switches to S5000 using 1GbE or 10GbE uplinks. Many small campuses also have a mini data center deployed within the wiring closet. In these environments, IT staff are forced to either deploy multiple switches to meet the needs of servers and storage in the wiring closet or try to fit server and storage workloads in the campus networks. With the S5000, customers have the ability to install the types of modules that best meets the needs of campus and data center workloads in the wiring closet.

Traditional Ethernet deployments

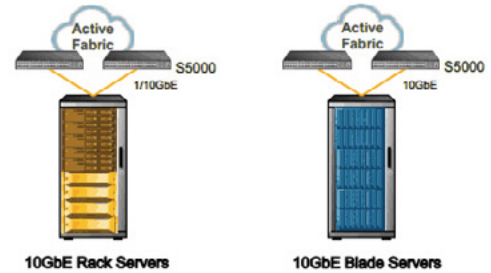


Figure 2. Redundant connections from 10GbE rack and blade servers deployed in a traditional Ethernet environment

Each server rack in this deployment model contains two S5000 switches offering redundant 10GbE connections to each server. The switches may be deployed as stand-alone switches or stacked for management simplification. Typical stacking configurations include a pair of stacked switches in each rack or two stacks of switches extending horizontally across multiple racks. In a typical single high-density server rack with redundant connections, up to 48 Dell PowerEdge rack servers or up to 96 PowerEdge Blades can be connected to a pair of S5000 in a single rack.

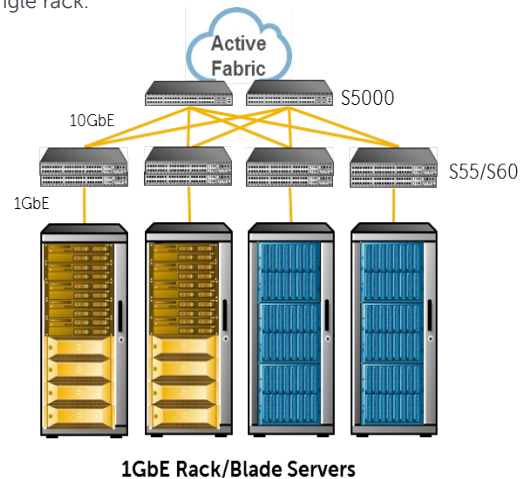
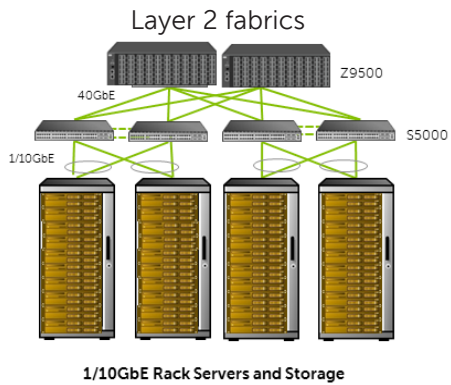


Figure 3. Large-scale 1GbE server connections

Servers with 1GbE redundant ports are connected to a pair of Dell Networking S55 or S60 1GbE switches. Using 10GbE up link connections, S55 or S60 leaf switches are connected to a pair of S5000 spine switches to form a large access layer fabric. In a typical high-density server configuration with redundant connections, up to 576 1GbE (1152 if redundancy not required) servers can be connected to a pair of S5000 switches through 24 Dell S55 or S60 switches.

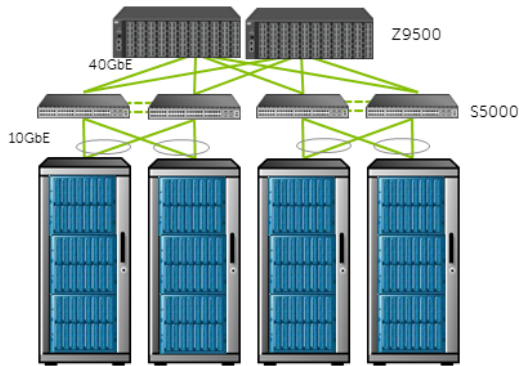


1/10GbE Rack Servers and Storage

Figure 4. 1/10GbE rack servers in a virtualized data center

Virtual Link Trunking (VLT) is a Dell Networking multi-path solution to create a dynamic or static LAG that terminates on two different VLT-enabled physical switches. VLT is a dual active control plane implementation of multi-system LAG. VLT creates a single logical view of the two physical switches for the node at the other end.

In a virtualized data center, each server can transmit a significant amount of data easily overwhelming a traditional network infrastructure. VLT-based network infrastructure provides active-active connections from the server expanding the available bandwidth while increasing network resiliency. In a typical high-density server configuration with redundant connections, up to 1188 1/10GbE servers can be connected to a pair of Z9500 switches through 66 S5000 switches.



10GbE Blade Servers and Storage

Figure 5. 10GbE blade servers in a virtualized data center

For organizations creating the next-generation architecture for their information technology, meeting performance requirements for critical workloads is paramount. Dell blade solutions combine high-speed connectivity in the form of the backplane of the Dell PowerEdge M1000e blade enclosure with the compute density of Dell blade servers. The MXL/IOA switch for M1000e blade enclosure is a 40GbE capable, modular and stackable blade switch.

In a typical high-density server configuration with redundant connections, up to 4752 10GbE servers can be connected to a pair of Z9500 switches through 58 S5000 switches.

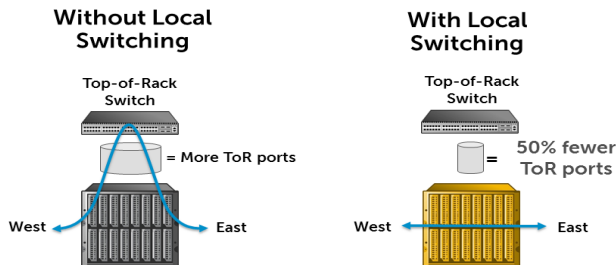


Figure 6. M1000e comparisons showing East/West traffic advantage

Modern data centers are going through a dramatic shift of traffic patterns from mostly north-south to mostly east-west traffic. Dell solutions with local switching capabilities help ensure that server to server traffic will take the least amount of hops, which can significantly enhance application performance.

LAN and SAN convergence

Organizations can take advantage of LAN/SAN convergence by deploying Internet Small Computer System Interface (iSCSI), Fibre Channel over Ethernet (FCoE), or even both network fabrics, on the DCB-enabled network. These technologies allow IT organizations to leverage a single, lossless and converged Ethernet network to enable LAN and SAN convergence.

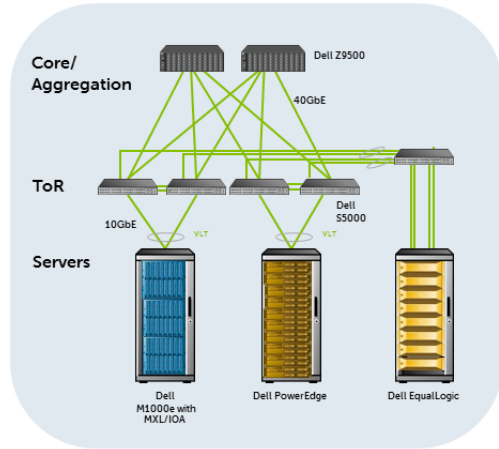


Figure 7. Lossless converged LAN and iSCSI SAN

A typical architecture will connect Dell PowerEdge rack servers directly to S5000 or M1000e blade servers through MXL/IOA blade switches to S5000. Such architecture reduces the number of server and switch optics, fiber optic cables, and number of ToR switches in the data center. This approach can result in simplification of I/O, reduced capital and operational costs, and improved IT staff productivity.

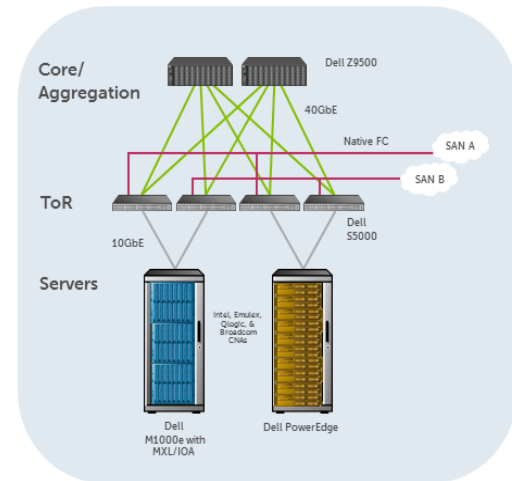


Figure 8. Lossless converged LAN and FCoE SAN

S5000 consolidates LAN and SAN networks on one physical network infrastructure while providing logical separation of LAN and SAN traffic in the network. This approach helps ensure organizations are able to connect to existing FC SANs for non-stop and optimal IT operations while extending the advantages associated with LAN and SAN convergence. A typical architecture will connect Dell PowerEdge rack servers directly to S5000 or M1000e blade servers through MXL/IOA blade switches to S5000.

S5000 acts as an FCF offering direct connectivity to FC storage or as an NPG, offering connectivity between servers and FC SANs. Using 10GbE Converged Network Adapters (CNAs) servers are able to connect to S5000 using FCoE capability. Up to 12 ports on S5000 can be configured for native Fibre Channel connectivity to FC storage, servers or SANs. All Ethernet ports can be connected to FCoE servers.

Specifications: Dell S5000 unified storage Ethernet switch

Ordering Information

S5000
 1RU, LAN/SAN Converged Switch, 4x40GbE QSFP+, 4 Modular Bays with 2x AC PSU, 2x Fan Modules, I/O to PSU Airflow, 4-Post Rack Mount Kit
 1RU, LAN/SAN Converged Switch, 4x40GbE QSFP+, 4 Modular Bays with 2x AC PSU, 2x Fan Modules, PSU to I/O Airflow, 4-Post Rack Mount Kit
 1RU, LAN/SAN Converged Switch, 4x40GbE QSFP+, 4 Modular Bays with 2x DC PSU, 2x Fan Modules, I/O to PSU Airflow, 4-Post Rack Mount Kit
 1RU, LAN/SAN Converged Switch, 4x40GbE QSFP+, 4 Modular Bays with 2x DC PSU, 2x Fan Modules, PSU to I/O Airflow, 4-Post Rack Mount Kit
 1RU, LAN/SAN Converged Switch, 4x40GbE QSFP+, 4 Modular Bays with 2x AC PSU, 2x Fan Modules, I/O to PSU Airflow, 4-Post Rack Mount Kit, TAA
 1RU, LAN/SAN Converged Switch, 4x40GbE QSFP+, 4 Modular Bays with 2x AC PSU, 2x Fan Modules, PSU to I/O Airflow, 4-Post Rack Mount Kit, TAA

Power Supplies
 S5000, AC Power Supply, I/O to PSU Airflow, 100–240V, 750W
 S5000, AC Power Supply, PSU to I/O Airflow, 100–240V, 750W
 S5000, DC Power Supply, I/O to PSU Airflow, -48 to -60V, 1100W
 S5000, DC Power Supply, PSU to I/O Airflow, -48 to -60V, 1100W

Fans
 S5000, Fan Module, I/O to PSU airflow
 S5000, Fan Module, PSU to I/O airflow

Service Side Kits
 S5000, Service Side Kit, 2x AC PSU, 2x Fan Modules, I/O to PSU Airflow
 S5000, Service Side Kit, 2x AC PSU, 2x Fan Modules, PSU to I/O Airflow
 S5000, Service Side Kit, 2x DC PSU, 2x Fan Modules, I/O to PSU Airflow
 S5000, Service Side Kit, 2x DC PSU, 2x Fan Modules, PSU to I/O Airflow

Miscellaneous
 S5000, Modular I/O Bay Blank Faceplate

Software
 Software, OS9: Dell Networking Operating System, Layer 3 Software License
 Software, OS9: iSCSI Optimized Configuration, Software License
 Software, OS9: FCoE Transit Optimized Configuration
 Software, DNOS: FC/FCoE fabric and NPIV Proxy Gateway (NPG), Software License

I/O Modules
 S5000, 12-Port Ethernet/FCoE Module 1/10GbE 1/10GbE-T Interconnect
 S5000, 12-Port Ethernet/FCoE Module, 1/10GbE SFP+ Interconnect
 S5000, 12-Port Unified Port Module, 2/4/8Gbps Native Fibre Channel or 10GbE SFP+ Interconnect

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, 40GbE QSFP+ to 1G Cu SFP adaptor, QSA
 Transceiver, SFP+, 10GbE, SR, 850nm Wavelength, 300m Reach
 Transceiver, SFP+, 10GbE, SR, 850nm Wavelength, 300m Reach, 12-pack
 Transceiver, SFP+, 10GbE, LR, 1310nm Wavelength, 10km Reach
 Transceiver, SFP+, 10GbE, ER, 1310nm Wavelength, 40km Reach
 Transceiver, SFP+, 10GbE, LRM (Long Reach Multimode) Optic, 1310nm Wavelength, 220m Reach on MMF
 Transceiver, SFP+, 8Gbps, Fibre Channel-SW, 150m Reach
 Transceiver, SFP+, 8Gbps, Fibre Channel-SW, 150m Reach, 12-pack
 Transceiver, SFP+, 8Gbps, Fibre Channel-LW, 4km Reach

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 Fibre Optic, 10m
 Cable, 40GbE QSFP+, Active Fibre Optic, 50m
 Cable, 40GbE QSFP+, Direct Attach Cable, 1m
 Cable, 40GbE QSFP+, Direct Attach Cable, 5m
 Cable, 40GbE QSFP+ to 4 x 10GbE SFP+, Active Optical Breakout Cable
 Cable, SFP+, CU, 10GbE, Direct Attach Cable, 0.5m
 Cable, SFP+, CU, 10GbE, Direct Attach Cable, 1m
 Cable, SFP+, CU, 10GbE, Direct Attach Cable, 3m
 Cable, SFP+, CU, 10GbE, Direct Attach Cable, 5m
 Cable, SFP+, CU, 10GbE, Direct Attach Cable, 7m
 Cable, SFP+ to SFP+, 10GbE, Active Optical Cable, 15m

Note: Contact Dell for a more comprehensive SKU list

Physical
 Four module slots (Optional Ethernet module or Unified port module)
 4 x 40GbE fixed QSFP+ or 1/10GBASE-T ports
 48 x 1/10GbE SFP+ with additional 16 x 10GbE SFP+ port
 12 x FC 2, 4 or 8Gbps ports
 1 RJ45 console/management port with RS232 signaling
 Size : 1RU, 1.71 x 17.4 x 28 in (4.4 mm x 441 mm x 711 mm)
 Weight: 34 lbs (15.42 kg)
 ISO 7779 A-weighted sound pressure level: 59.6 dBA at 73.4°F (23°C)
 Power supply: 100 to 240 VAC 50/60 Hz or -48 to -60 VDC
 Max. thermal output: 1878 BTU/hr
 Max. current draw per system:
 7A at 100/120 VAC, 3.5A at 200/240 VAC
 15.2A at -46 VDC, 11.7A at -60 VDC
 Max. power consumption: 550 Watts
 Typical power consumption: 250 Watts
 Max operating specifications:
 Operating temperature: 32°F to 104°F (0°C to 40°C)
 Operating humidity: 10 to 85% (RH), non-condensing
 Max non-operating specifications:
 Storage temperature: -40°C to 158°C (-40°C to 70°C)
 Storage humidity: 5 to 95% (RH), non-condensing

High-Availability
 Hot swappable redundant power supplies
 Hot swappable redundant fans
 Field replaceable I/O modules

Performance
 MAC addresses: 128K
 ARP table: 16K
 IPv4 routes: 128K
 IPv6 routes: 32K
 Switch fabric capacity:
 1.28Tbps (full-duplex)
 640Gbps (half-duplex)
 Forwarding capacity: 960Mpps
 Link aggregation: 8 links per group, 128 groups per stack
 Queues per port: 4 queues
 VLANs: 4K
 Line-rate layer 2 switching: All protocols, including IPv4
 Line-rate layer 3 routing: IPv4
 IP ACL: Ingress 1023; egress: 716
 ACLs: 2K ingress, 1k egress
 LAGs: 128 with up to 16
 LAG load balancing: Based on layer 2, IPv4 headers

Packet buffer memory: 9MB
 CPU memory: 2GB
 FCoE VLANs (Fabric Mode): 1
 FCoE VLANs (NPIV Mode): 12
 FCoE VLANs (FSB Mode): 8
 Jumbo Frames: 12,000 bytes

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 Management Ports
 802.3x Flow Control
 802.3z Gigabit Ethernet (1000BASE-X)
 ANSI/TIA-1057 LLDP-MED
 Force10 PVT+
 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 2474 Diffserv Field in IPv4 and Ipv6 Headers
 792 ICMP
 826 ARP 2596 Assured Forwarding PHB Group
 1027 Proxy ARP
 1035 DNS (client) 3164 BSD Syslog
 1042 Ethernet 3195 Reliable Delivery for Syslog
 1305 NTPv3 3246 Expedited Assured Forwarding
 1519 CIDR 4364 VRF-Lite (IPv4 VRF with OSPF, BGP, IS-IS and v4 multicast)
 1542 BOOTP (relay)
 1812 Requirements for IPv4 Routers
 1918 Address Allocation for Private Internets
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)

Security
 2865 The Use of HMAC-SHA-1-96 within ESP and AH 4250, 4251, 4252, 4253, 4254 SSHv2
 3162 RADIUS Security Architecture for IPsec 4301
 3579 RADIUS support for EAP 4302 IPsec Authentication Header
 3580 802.1X with RADIUS 4303 ESP Protocol
 3768 EAP 4807 IPsec Security Policy DB MIB
 3826 AES Cipher Algorithm in the SNMP User Based Security Model

RIP
 1058 RIPv1 2453 RIPv2

OSPF (v2/v3)
 2154 NNSA 4552 Authentication/Confidentiality for OSPFv3
 2328 OSPF Digital Signatures
 2370 Opaque LSA 5340 OSPF for IPv6

ISIS
 5301 Dynamic hostname exchange mechanism for IS-IS
 5302 Domain-wide prefix distribution with two-level IS-IS
 5303 Three way handshake for IS-IS point-to-point adjacencies
 5308 IS-IS for IPv6

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
Network convergence
 802.1Qbb Priority-Based Flow Control
 802.1Qaz Enhanced Transmission Selection (ETS)
 Data Center Bridging eXchange (DCBx)

DCBx Application TLV (iSCSI, FCoE)
 Fibre Channel over Ethernet (FCoE)
 iSCSI over DCB (lossless iSCSI)
 RDMA over Converged Ethernet (RoCE)
Fibre Channel (requires license)
 Fibre Channel Forwarding (FCF)
 NPIV Proxy Gateway (NPG)
 Fibre Channel port types: F, E, NP, VF
 Bridging to FC SAN
 Up to 12 FCoE_Maps per switch
 Fabric Shortest Path First (FSPF)
 Name server
 Zoning
FCoE features (requires license)
 FC-BB-5 support
 Native FCoE forwarding
 FCoE Initialization Protocol (FIP) v1
 Connectivity to FIP Snooping Bridge
 FCoE Transit (FIP Snooping Bridge)
 FCoE to FC Forwarding
 Dynamic FCoE to FC Load Balancing
Network management
 1155 SMlv1
 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 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
 3273 RMON High Capacity MIB
 3410 SNMPv3
 3411 SNMPv3 Management Framework Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
 3412 SNMP Applications
 3413 User-based Security Model (USM) for SNMPv3
 3414 VACM for SNMP
 3416 SNMPv2
 3417 Transport mappings for SNMP
 3418 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 Textual Conventions
 4502 RMONv2 (groups 1.2,3.9)
 5060 PIM MIB
 ANSI/TIA-1057 LLDP-MED MIB
 Del_LIT_A_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)
 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
 USGv6 Host and Router Certified on Dell Networking OS 9.5 and greater
 IPv6 Ready for both Host and Router
 UCR DD0 APL (core and distribution ALSAN switch)
Warranty
 1 year return to depot

Learn more at Dell.com/Networking.

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 dell-networking-s series-s5000-spec sheet

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