DELL EMC NETWORKING S5148F-ON SERIES SWITCH

Programmable high-performance open networking top-of-rack switch with native 25G server ports and 100G network fabric connectivity

The Dell EMC S5148 switch is an innovative, future-ready Top-of-Rack (ToR) open networking switch providing excellent capabilities and cost-effectiveness for the enterprise, mid-market, Tier2 cloud and NFV service providers with demanding compute and storage traffic environments.

The S5148F-ON 25GbE switch is Dell EMC's latest disaggregated hardware and software data center networking solution that provides state-of-the-art data plane programmability, backward compatible 25GbE server port connections, 100GbE uplinks, storage optimized architecture, and a broad range of functionality to meet the growing demands of today's data center environment now and in the future.

The compact S5148F-ON model design provides industry-leading density with up to 72 ports of 25GbE or up to 48 ports of 25GbE and 6 ports of 100GbE in a 1RU form factor.

Using industry-leading hardware and a choice of Dell EMC's OS10 or select 3rd party network operating systems and tools, the S5148F-ON Series offers flexibility by provision of configuration profiles and delivers non-blocking performance for workloads sensitive to packet loss. The compact S5148F-ON model provides multi rate speed enabling denser footprints and simplifying migration to 25GbE server connections and 100GbE fabrics.

Data plane programmability allows the S5148F-ON to meet the demands of the converged software defined data center by offering support for any future or emerging protocols, including hardware-based VXLAN (Layer 2 and Layer 3 gateway) support. Priority-based flow control (PFC), data center bridge exchange (DCBX) and enhanced transmission selection (ETS) make the S5148F-ON an excellent choice for DCB environments.

The Dell EMC S5148F-ON model supports the open source Open Network Install Environment (ONIE) for zero touch installation of alternate network operating systems.

Maximum performance and functionality

The Dell EMC Networking S-Series S5148F-ON is a high-performance, multi-function, 10/25/40/50/100 GbE ToR switch purpose-built for applications in high-performance data center, cloud and computing environments.

In addition, the S5148F-ON 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.

Key applications

- Organizations looking to enter the software-defined data center era with a choice of networking technologies designed to deliver the flexibility they need
- Use cases that require customization to any packet processing steps or supporting new protocols
- Native high-density 25 GbE ToR server access in high-performance data center environments
- 25 GbE backward compatible to 10G and 1G for future proofing and data center server migration to faster uplink speeds.
- Capability to support mixed 25G and 10G servers on front panel ports without any limitations
- iSCSI storage deployment including DCB converged lossless transactions
- Suitable as a ToR or Leaf switch in 100G Active Fabric implementations
- As a high speed VXLAN L2/L3 gateway that connects the hypervisor-based overlay networks with non-virtualized
- infrastructure
- Emerging applications requiring hardware support for new protocols

Key features

- 1RU high-density 25/10/1 GbE ToR switch with up to forty eight ports of native 25 GbE (SFP28) ports supporting 25 GbE without breakout cables
- Multi-rate 100GbE ports support 10/25/40/50 GbE
- 3.6 Tbps (full-duplex) non-blocking, cut-through switching fabric delivers line-rate performance under full load**
- Programmable packet modification and forwarding
- Programmable packet mirroring and multi-pathing
- Converged network support for DCB and ECN capability
- IO panel to PSU airflow or PSU to IO panel airflow
- Redundant, hot-swappable power supplies and fans
- IEEE 1588v2 PTP hardware support
- Supports the open source Open Network Install Environment (ONIE) for zero touch installation of alternate network operating systems

- FCoE transit (FIP Snooping)
- 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 (reversable airflow)
- VRF-lite enables sharing of networking infrastructure and provides L3 traffic isolation across tenants
- 16, 28, 40, 52, 64 10GbE ports available

Key features with Dell EMC Networking OS10

- Consistent DevOps framework across compute, storage and networking elements
- Standard networking features, interfaces and scripting functions for legacy network operations integration
- Standards-based switching hardware abstraction via Switch Abstraction Interface (SAI)
- Pervasive, unrestricted developer environment via Control Plane Services (CPS)
- Open and programmatic management interface via Common Management Services (CMS)

- OS10 Premium Edition software enables Dell EMC layer 2 and 3 switching and routing protocols with integrated IP Services, Quality of Service, Manageability and Automation features
- Platform agnostic via standard hardware abstraction layer (OCP-SAI)
- Unmodified Linux kernel and unmodified Linux distribution
- OS10 Open Edition software decoupled from L2/L3 protocol stack and services
- Leverage common open source tools and best-practices (data models, commit rollbacks)
- Increase VM Mobility region by stretching L2 VLAN within or across two DCs with unique VLT capabilities
- Scalable L2 and L3 Ethernet Switching with QoS, ACL and a full complement of standards based IPv4 and IPv6 features including OSPF, BGP and PBR
- Enhanced mirroring capabilities including local mirroring, Remote Port Mirroring (RPM), and Encapsulated Remote Port Mirroring (ERPM).
- Converged network support for DCB, with priority flow control (802.1Qbb), ETS (802.1Qaz), DCBx and iSCSI TLV
- Rogue NIC control provides hardware-based protection from NICS sending out excessive pause frames

Product	Description
S5148F-ON	S5148F, 48x 25GbE SFP+, 6x 100GbE QSFP28, 2x AC PSU, 4x Fans, I/O Panel to PSU Airflow S5148F, 48x 25GbE SFP+, 6x 100GbE QSFP28, 2x AC PSU, 4x Fans, PSU to I/O Panel Airflow S5148F, 48x 25GbE SFP+, 6x 100GbE QSFP28, 2x AC PSU, 4x Fans, I/O Panel to PSU Airflow - TAA S5148F, 48x 25GbE SFP+, 6x 100GbE QSFP28, 2x AC PSU, 4x Fans, PSU to I/O Panel Airflow - TAA S5148F, 48x 25GbE SFP+, 6x 100GbE QSFP28, 2x DC PSU, 4x Fans, PSU to I/O Panel Airflow – NEBS Level 3 Certified*
Redundant power supplies	S5100, AC Power Supply, IO Panel to PSU Airflow S5100, AC Power Supply, PSU to IO Panel Airflow S5100, DC Power Supply, PSU to IO Panel Airflow*
Fans	S5100 fan module, IO Panel to PSU Airflow S5100 fan module, PSU to IO Panel Airflow
Optics	Transceiver, 100GbE, SR4 QSFP28 Transceiver, 100GbE, LR4 QSFP28 Transceiver, 100GbE, LR4Lite QSFP28 Transceiver, 100GbE, PSM4 10Km QSFP28 (*) Transceiver, 100GbE, CWDM4 2Km QSFP28 (*) Transceiver, 100GbE, PSM4 500m QSFP28 (*) Transceiver, 40GbE, SR4 optic QSFP+ Transceiver, 40GbE, eSR4 optic QSFP+ Transceiver, 40GbE, LR4 optic QSFP+ Transceiver, 40GbE, ER4 optics QSFP+ Transceiver, 40GbE, PSM4 10Km, QSFP+ Transceiver, 40GbE, PSM4-LR MPO 10Km QSFP+ to LC Transceiver, 40GbE, LM4 / SM4 Duplex QSFP+ Transceiver, 25GbE, SR4 SFP28 Transceiver, 25GbE, LR4 SFP28 Transceiver, 10GbE, SR4 SFP+ Transceiver, 10GbE, LR4 SFP+ Transceiver, 1GbE, SR4 SFP+ Transceiver, 1GbE, LR4 SFP+

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Product	Description
Cables	100GbE, 4x25GbE, QSFP28 to 4xSFP28, passive DAC 100GbE, QSFP28 to QSFP28, active optical 100GbE, QSFP28 to QSFP28, passive DAC 100GbE, 2x50GbE, QSFP28 to 2xQSFP28, passive DAC, breakout (*) 40GbE, QSFP+ to QSFP+, active optical 40GbE, QSFP+ to QSFP+, passive DAC 40GbE, MTP to 4xLC optical breakout 40GbE, 4x10GbE, QSFP+ to 4xSFP+, passive DAC 25GbE SFP28 to SFP28, passive DAC, 1M, 2M, 3M, 5M 25GbE SFP28 to SFP28, active optical cable, 7M, 10M, 15M, 20M

Technical specifications

Physical
48 line-rate 25 Gigabit Ethernet SFP28 ports
6 line-rate 100 Gigabit Ethernet QSFP28 ports
1 RJ45 console/management port with RS232 signaling
1 Micro-USB type B optional console port
1 10/100/1000 Base-T Ethernet port used as management port
1 USB type A port for the external mass storage
Size: 1 RU, 1.72 h x 17.1 w x 18.1" d (4.4 h x 43.4 w x 46 cm d)
Weight: 22lbs (9.97kg)
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: 1956 BTU/h
Max. current draw per system:
    5.73A/4.8A at 100/120V AC
    2.87A/2.4A at 200/240V AC
Max. power consumption: 516 Watts (AC)
Typ. power consumption: 421 Watts (AC) with all optics loaded
Max. operating specifications:
    Operating temperature: 32° to 113°F (0° to 45°C)
    Operating humidity: 5 to 90% (RH), non-condensing
Fresh Air Compliant to 45C
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 supplies
Hot swappable redundant fans

Performance
Switch fabric capacity: 3.6Tbps
Packet buffer memory: 16MB
CPU memory: 16GB
MAC addresses: Up to 512K
ARP table: Up to 256K
IPv4 routes: Up to 128K
IPv6 routes: Up to 64K
Multicast hosts: Up to 64K
Link aggregation: Unlimited links per group, up to 36 groups
Layer 2 VLANs: 4K
MSTP: 64 instances
LAG Load Balancing: User Configurable (MAC, IP, TCP/UDPport)

IEEE Compliance
802.1AB   LLDP
TIA-1057   LLDP-MED
802.1s   MSTP
802.1w   RSTP

802.3ab   Gigabit Ethernet (1000Base-T)
802.3ad   Link Aggregation with LACP
802.3ae   10 Gigabit Ethernet (10GBase-X)
802.3ba   40 Gigabit Ethernet (40GBase-X)
802.3i   Ethernet (10Base-T)
802.3u   Fast Ethernet (100Base-TX)
802.3z   Gigabit Ethernet (1000BaseX)
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
PVST+
802.1X   Network Access Control
802.3ab   Gigabit Ethernet (1000BASE-T) or breakout
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, 100GBase-SR10, 100GBase-LR4, 100GBase-ER4) on optical ports
802.3bj   100 Gigabit Ethernet
802.3u   Fast Ethernet (100Base-TX) on mgmt ports
802.3x   Flow Control
802.3z   Gigabit Ethernet (1000Base-X) with QSA
ANSI/TIA-1057 LLDP-MED
Jumbo MTU support 9,416 bytes

Layer2 Protocols
4301 Security Architecture for IPSec*
4302 IPSec Authentication Header*
4303 ESP Protocol*
802.1D   Compatible
802.1p   L2 Prioritization
802.1Q   VLAN Tagging
802.1s   MSTP
802.1w   RSTP
802.1t   RPVST+
802.3ad   Link Aggregation with LACP
VLT   Virtual Link Trunking

RFC Compliance
768   UDP
793   TCP
854   Telnet
959   FTP
1321   MD5
1350   TFTP
2474   Differentiated Services
2698   Two Rate Three Color Marker
3164   Syslog
4254   SSHv2

General IPv4 Protocols
791   IPv4
792   ICMP
826   ARP
1027   Proxy ARP
1035   DNS (client)
1042   Ethernet Transmission
1191   Path MTU Discovery
1305   NTPv4
1519   CIDR
1812   Routers
1858   IP Fragment Filtering
2131   DHCP (server and relay)
5798   VRRP
3021   31-bit Prefixes
3046   DHCP Option 82 (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
3195   Reliable Delivery for Syslog
3246   Expedited Assured Forwarding
4364   VRF-lite (IPv4 VRF with OSPF and BGP)*

General IPv6 Protocols
1981   Path MTU Discovery*
2460   IPv6
2461   Neighbor Discovery*
2462   Stateless Address AutoConfig
2463   ICMPv6
2464   Ethernet Transmission
2675   Jumbo grams
3587   Global Unicast Address Format
4291   IPv6 Addressing
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
5095   Deprecation of Type 0 Routing Headers in IPv6
IPv6 Management support (telnet, FTP, TACACS, RADIUS, SSH, NTP)

OSPF (v2/v3)
1587   NSSA
1745   OSPF/BGP interaction
1765   OSPF Database overflow
2154   MD5
2328   OSPFv2
2370   Opaque LSA
3101   OSPF NSSA
3623   OSPF Graceful Restart (Helper mode)*

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BGP

1997	Communities
2385	MD5
2439	Route Flap Damping
2796	Route Reflection
2842	Capabilities
2918	Route Refresh
3065	Confederations
4271	BGP-4
4360	Extended Communities
4893	4-byte ASN
5396	4-byte ASN Representation
5492	Capabilities Advertisement

Linux Distribution

Debian Linux version 8.4
Linux Kernel 3.16

MIBS

IP MIB– Net SNMP
IP Forward MIB– Net SNMP
Host Resources MIB– Net SNMP
IF MIB – Net SNMP
LLDP MIB
Entity MIB
LAG MIB
Dell-Vendor MIB
TCP MIB – Net SNMP
UDP MIB – Net SNMP
SNMPv2 MIB – Net SNMP

Network Management

SNMPv1/2
SSHv2
FTP, TFTP, SCP
Syslog
Port Mirroring
RADIUS
802.1X
Support Assist (Phone Home)
Netconf APIs
XML Schema
CLI Commit (Scratchpad)

Automation

Control Plane Services APIs
Linux Utilities and Scripting Tools

Quality of Service

Access Control Lists
Prefix List
Route-Map
Rate Shaping (Egress)
Rate Policing (Ingress)
Scheduling Algorithms
   Round Robin
   Weighted Round Robin
   Deficit Round Robin
   Strict Priority
Weighted Random Early Detect

Security

2865	RADIUS
3162	Radius and IPv6
4250, 4251, 4252, 4253, 4254	SSHv2

*Future release
**Packet sizes over 147 Bytes

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*)

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 & Immunity

EMC compliance
FCC Part 15 (CFR 47) (USA) Class A
ICES-003 (Canada) Class A
EN55032: 2015 (Europe) Class A
CISPR32 (International) Class A
AS/NZS CISPR32 (Australia and New Zealand) Class A
VCCI (Japan) Class A
KN32 (Korea) Class A
CNS13438 (Taiwan) Class A
CISPR22
EN55022
EN61000-3-2
EN61000-3-3
EN61000-6-1
EN300 386
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

NEBS

GR-63-Core
GR-1089-Core
ATT-TP-76200
VZ.TPR.9305

RoHS

RoHS 6 and China RoHS compliant

Certifications

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

Warranty

1 Year Return to Depot

Learn more at DellEMC.com/Networking

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