



# DELL EMC NETWORKING S5048F-ON

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

The Dell EMC S5048-ON 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 S5048F-ON 25GbE switch is Dell's latest disaggregated hardware and software data center networking solution that provides 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 S5048F-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's OS9 or select 3rd party network operating systems and tools, the S5048F-ON delivers non-blocking performance\* for workloads sensitive to packet loss. The compact S5048F-ON model provides multi rate speed enabling denser footprints and simplifying migration to 25GbE server connections and 100GbE fabrics.

Priority-based flow control (PFC), data center bridge exchange (DCBX) and enhanced transmission selection (ETS) make the S5048F-ON an excellent choice for DCB environments.

## Maximum performance and functionality

The Dell EMC Networking S-Series S5048F-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 S5048F-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
- 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 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 10/25/40/50/100 GbE
- 3.6 Tbps (full-duplex) non-blocking, store and forward switching fabric delivers line-rate performance under full load\*
- 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
- VRF-lite enables sharing of networking infrastructure and provides L3 traffic isolation across tenants
- Open Automation Framework adding automated configuration and provisioning capabilities to simplify the management of network environments
- 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
- 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 (Dell EMC Fresh Air 2.0 compliant)
- Converged network support for DCB and ECN capability
- Supports the open source Open Network Install Environment (ONIE) for zero touch installation of alternate network operating systems
- FCoE transit (FIP Snooping)

\*non-blocking performance is for packet sizes larger than 250B

Product	Description
<b>S5048F-ON</b>	S5048F, 48x 25GbE SFP+, 6x 100GbE QSFP28, 2x AC PSU, 4x Fans, I/O Panel to PSU Airflow S5048F, 48x 25GbE SFP+, 6x 100GbE QSFP28, 2x AC PSU, 4x Fans, PSU to I/O Panel Airflow S5048F, 48x 25GbE SFP+, 6x 100GbE QSFP28, 2x AC PSU, 4x Fans, I/O Panel to PSU Airflow - TAA S5048F, 48x 25GbE SFP+, 6x 100GbE QSFP28, 2x AC PSU, 4x Fans, PSU to I/O Panel Airflow - TAA S5048F, 48x 25GbE SFP+, 6x 100GbE QSFP28, 2x DC PSU, 4x Fans, PSU to I/O Panel Airflow – NEBS Level 3 Certified**
<b>Redundant power supplies</b>	S5048F, AC Power Supply, IO Panel to PSU Airflow S5048F, AC Power Supply, PSU to IO Panel Airflow S5048F, DC Power Supply, PSU to IO Panel Airflow**
<b>Fans</b>	S5048F fan module, IO Panel to PSU Airflow S5048F fan module, PSU to IO Panel Airflow
<b>Optics</b>	Transceiver, 100GbE, SR4 QSFP28 Transceiver, 100GbE, LR4 QSFP28 Transceiver, 100GbE, SWDM4 QSFP28 to LC duplex (**) Transceiver, 100GbE, PSM4 10Km QSFP28 (**) Transceiver, 100GbE, CWDM4 2Km QSFP28 (**) Transceiver, 100GbE, PSM4 500m QSFP28 (**) Transceiver 100GbE, ER4Lite 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/BiDi QSFP+ Transceiver, 25GbE, SR4 SFP28 Transceiver, 25GbE, eSR SFP28 Transceiver, 25GbE, LR4 SFP28 Transceiver, 25GbE, SR4 SFP28 NOF Transceiver, 10GbE, SR SFP+ Transceiver, 10GbE, LR SFP+ Transceiver, 10GbE, ER SFP+ Transceiver, 10GbE, ZR SFP+ Transceiver, 10GbE, 10GBASE-T SFP+, Copper Transceiver, 1GbE, SX SFP Transceiver, 1GbE, LX SFP Transceiver, 1GbE, ZX SFP Transceiver, 1GbE, BiDi SFP (10km/40km/80km) Transceiver, 1GbE, 1000BASE-T SFP, Copper
<b>Cables</b>	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 10GbE SFP+ to SFP+, passive DAC, 1M, 3M, 5M, 7M 10GbE SFP+ to SFP+, active optical cable, 2M, 3M, 5M, 7M, 10M, 15M, 20M

\*\*future deliverable

## 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" d  
(4.4 h x 43.4 w x 45.7 cm d)  
Weight: 22lbs (9.98kg)  
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: 573 Watts (AC)  
Typ. power consumption: 288 Watts (AC) with all optics loaded  
Max. operating specifications:  
Operating temperature: 32° to 113°F (0° to 45°C)  
Operating humidity: 10 to 90% (RH), non-condensing  
Fresh Air Compliant to 45°C  
Max. non-operating specifications:  
Storage temperature: –40° to 158°F (–40° to 70°C)  
Storage humidity: 5 to 95% (RH), non-condensing

### Redundancy

Two hot swappable redundant power supplies  
Hot swappable redundant fans

### Performance

Switch fabric capacity: 3.6Tbps  
Forwarding capacity: Up to 2,678 Mpps  
Packet buffer memory: 22MB (16MB supported in initial release)  
CPU memory: 8GB  
MAC addresses: 132K (in scaled-l2-switch mode)  
ARP table: 82K (in scaled-l3-hosts mode)  
IPv4 routes: Up to 128K  
IPv6 routes: Up to 64K (20k currently supported)  
Multicast hosts: Up to 8K  
Link aggregation: 128 groups, 32 members per LAG group  
Layer 2 VLANs: 4K  
MSTP: 64 instances  
LAG Load Balancing: Based on layer 2, IPv4 or IPv6 header, or tunnel inner header contents  
QoS data queues: 8  
QoS control queues: 12  
QoS: 1024 entries per Tile  
Ingress ACL: 1024 entries per Tile  
Egress ACL: 1k entries per Tile  
Pre-Ingress ACL: 1k entries per Tile

### 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) 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  
Force10 PVST+  
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  
1542 BOOTP (relay)  
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  
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  
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)

### RIP

1058 RIPv1  
2453 RIPv2

### OSPF (v2/v3)

1587 NSSA (not supported in OSPFv3)  
1745 OSPF/BGP interaction  
1765 OSPF Database overflow  
2154 MD5  
2328 OSPFv2  
2370 Opaque LSA  
3101 OSPF NSSA  
3623 OSPF Graceful Restart (Helper mode)\*

### BGP

1997 Communities  
2385 MD5  
2439 Route Flap Damping  
2545 BGP-4 Multiprotocol Extensions for IPv6 Inter-Domain Routing  
2796 Route Reflection  
2842 Capabilities  
2858 Multiprotocol Extensions  
2918 Route Refresh  
3065 Confederations  
4271 BGP-4  
4360 Extended Communities  
4893 4-byte ASN  
5396 4-byte ASN Representation  
5492 Capabilities Advertisement

### Multicast

1112 IGMPv1  
2236 IGMPv2  
3376 IGMPv3  
MSDP  
PIM-SM  
PIM-SSM

### 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  
2096 IP Forwarding Table MIB  
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  
3273 RMON High Capacity MIB  
3410 SNMPv3  
3411 SNMPv3 Management Framework  
3412 Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)  
3413 SNMP Applications  
3414 User-based Security Model (USM) for SNMPv3  
3415 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  
 Dell\_ITA.Rev\_1.1 MIB  
 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)  
 DELL-NETWORKING-BGP4-V2-MIB  
 (draft-ietf-idr-bgp4-mibv2-05)  
 DELL-NETWORKING-IF-EXTENSION-MIB  
 DELL-NETWORKING-LINK-AGGREGATION-MIB  
 DELL-NETWORKING-COPY-CONFIG-MIB  
 DELL-NETWORKING-PRODUCTS-MIB  
 DELL-NETWORKING-CHASSIS-MIB  
 DELL-NETWORKING-SMI  
 DELL-NETWORKING-TC  
 DELL-NETWORKING-TRAP-EVENT-MIB  
 DELL-NETWORKING-SYSTEM-COMPONENT-MIB  
 DELL-NETWORKING-FIB-MIB  
 DELL-NETWORKING-FPSTATS-MIB  
 DELL-NETWORKING-ISIS-MIB  
 DELL-NETWORKING-FIPSNOOPING-MIB  
 DELL-NETWORKING-VIRTUAL-LINK-TRUNK-MIB  
 DELL-NETWORKING-DCB-MIB  
 DELL-NETWORKING-OPENFLOW-MIB  
 DELL-NETWORKING-BMP-MIB  
 DELL-NETWORKING-BPSTATS-MIB

**Security**  
 draft-grant-tacacs-02 TACACS+  
 2404 The Use of HMACSHA-1-96 within ESP and AH  
 2865 RADIUS  
 3162 Radius and IPv6  
 3579 RADIUS support for EAP  
 3580 802.1X with RADIUS  
 3768 EAP  
 3826 AES Cipher Algorithm in the SNMP User Base Security Model  
 4250, 4251, 4252, 4253, 4254 SSHv2  
 4301 Security Architecture for IPSec  
 4302 IPSec Authentication Header  
 4807 IPsecv Security Policy DB MIB

**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\*)

\*Future release

\*\*Packet sizes over 147 Bytes

## 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  
 IEC 62368-1  
 FDA Regulation 21 CFR 1040.10 and 1040.11

### Emissions & Immunity

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

## IT Lifecycle Services for Networking

### Experts, insights and ease

Our highly trained experts, with innovative tools and proven processes, help you transform your IT investments into strategic advantages.



#### Plan & Design

Let us analyze your multivendor environment and deliver a comprehensive report and action plan to build upon the existing network and improve performance.



#### Deploy & Integrate

Get new wired or wireless network technology installed and configured with ProDeploy. Reduce costs, save time, and get up and running fast.



#### Educate

Ensure your staff builds the right skills for long-term success. Get certified on Dell EMC Networking technology and learn how to increase performance and optimize infrastructure.



#### Manage & Support

Gain access to technical experts and quickly resolve multivendor networking challenges with ProSupport. Spend less time resolving network issues and more time innovating.



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Maximize performance for dynamic IT environments with Dell EMC Optimize. Benefit from in-depth predictive analysis, remote monitoring and a dedicated systems analyst for your network.



#### Retire

We can help you resell or retire excess hardware while meeting local regulatory guidelines and acting in an environmentally responsible way.

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