The PowerSwitch S5200-ON 25/100GbE fixed switches comprise Dell Technologies’ latest disaggregated hardware and software data center networking solutions, providing state-of-the-art, high-density 25/100GbE ports and a broad range of functionality to meet the growing demands of today’s data center environment. These innovative, next-generation open networking switches offer optimum flexibility and cost-effectiveness for web 2.0, enterprise, mid-market and cloud service provider with demanding compute and storage traffic environments.

The S5200-ON is a complete family of switches: 12-port, 24-port, and 48-port 25GbE/100GbE ToR switches, 96-port 25GbE/100GbE Middle of Row (MoR)/End of Row (EoR) switch, and a 32-port 100GbE Multi-Rate Spine/Leaf switch. From the compact half-rack width S5212F-ON providing an ideal form factor for hyper-converged deployments, to the high density S5296F-ON for Middle of Row deployments, the S5200-ON series offers performance and flexibility for a variety of network designs.

In addition to 100GbE Spine/Leaf deployments, the S5232F-ON can also be used in high density deployments using breakout cables to achieve up to 128 10GbE or 128 25GbE ports.

Using industry-leading hardware and a choice of Dell EMC SmartFabric OS10 or select 3rd party network operating systems and tools, the S5200-ON switches incorporate multiple architectural features that optimize data center network flexibility, efficiency and availability, including IO panel to PSU or PSU to IO panel airflow for hot/cold aisle environments, redundant, hot-swappable power supplies and fans and deliver non-blocking performance for workloads sensitive to packet loss.

Priority-based flow control (PFC), data center bridge exchange (DCBX) and enhanced transmission selection (ETS) make the S5200-ON family ideally suited for DCB environments.

Dell EMC PowerSwitch S5200-ON switches support the open source Open Network Install Environment (ONIE) for zero touch installation of Dell EMC SmartFabric OS10 networking operating system, as well as alternative network operating systems.

Key applications
- Organizations looking to enter the software-defined data center era with a choice of networking technologies designed to maximize flexibility
- High-density 10/25GbE ToR server aggregation in high-performance data center environments at the desired fabric speed with the S5248F-ON or S5296F-ON
- Low-density 10/25GbE server and storage aggregation with the S5212F-ON and S5224F-ON
- Small-scale Fabric implementation via the S5232F-ON switch in leaf and spine along with S5248F-ON 1/10/25GbE ToR switches enabling cost-effective aggregation of 10/25/40/50/100 uplinks
- Multi-functional 10/25/40/50/100GbE switching in High Performance Computing Clusters or other business-sensitive deployments requiring the highest bandwidth.
- iSCSI deployments, including DCB converged lossless transactions
- Single-pass VXLAN routing

Key features
- 1 or 2RU high-density ToR switches with up to 48 or 96 ports of 25GbE or 32 ports of 100GbE
- Multi-rate 100GbE ports support 10/25/40/50/100GbE
- 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
- Line-rate performance via non-blocking switch fabrics: 3.2Tbps (6.4Tbps full-duplex) on S5296F-ON and S5232F-ON, 2.0Tbps (4.0Tbps full-duplex) on S5248F-ON, and 1.08Tbps (2.16Tbps full-duplex) on S5224F-ON and S5212F-ON
- L2 multipath support via Virtual Link Trunking (VLT) and Routed VLT support
• VXLAN gateway functionality support for bridging and routing the non-virtualized and the virtualized overlay networks with line rate performance
• Support for Dell EMC SmartFabric OS10
• Converged network support for DCB, with priority flow control (802.1Qbb), ETS (802.1Qaz), DCBx and iSCSI TLV support
• Routable RoCE to enable convergence of compute and storage on Leaf/Spine Fabric
• IO panel to PSU airflow or PSU to IO panel airflow
• Redundant, hot-swappable power supplies and fans on most models
• Supports the open source Open Network Install Environment (ONIE) for zero touch installation of alternate network operating systems
• Tool-less enterprise ReadyRails™ mounting kits for most models reducing time and resources for switch rack installation (S5212F-ON will utilize a tandem tray for mounting)
• Power-efficient operation and Dell Fresh Air 2.0 compliant up to 45°C helps reduce cooling costs in temperature constrained deployments

Key features with Dell EMC SmartFabric 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)
• Dell EMC SmartFabric OS10 software enables Dell EMC layer 2 and 3 switching and routing protocols with integrated IP services, quality of service, manageability and automation features
• OS10 supports Precision Time Protocol (PTP, IEEE 1588v2) to synchronize clocks on network devices
• 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 Data Center Bridging, with priority flow control (802.1Qbb), ETS (802.1Qaz), DCBx and iSCSI TLV
• BGP EVPN with Integrated Routing and Bridging (IRB) in both Asymmetric and Symmetric modes, enabling controller less NVO

<table>
<thead>
<tr>
<th>Features</th>
<th>S5212F-ON</th>
<th>S5224F-ON</th>
<th>S5248F-ON</th>
<th>S5296F-ON</th>
<th>S5232F-ON</th>
</tr>
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<tbody>
<tr>
<td>Ports</td>
<td>12xSFP28</td>
<td>24xSFP28</td>
<td>48xSFP28</td>
<td>96xSFP28</td>
<td>32xQSFP28</td>
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<td></td>
<td>3xQSFP28</td>
<td>4xQSFP28</td>
<td>2xQSFP28-DD</td>
<td>8xQSFP28</td>
<td>2xSFP+</td>
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<td>Max 10GbE density</td>
<td>24</td>
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<td>80</td>
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<td>Max 25GbE density</td>
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<td>80</td>
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<td>Max 40GbE density</td>
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<td>Max 50GbE density</td>
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<td>Max 100GbE density</td>
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<tr>
<td>Throughput</td>
<td>892 Mpps</td>
<td>954 Mpps</td>
<td>1.9 Bpps</td>
<td>1.5 Bpps</td>
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<tr>
<td>Features</td>
<td>S5212F-ON</td>
<td>S5224F-ON</td>
<td>S5248F-ON</td>
<td>S5296F-ON</td>
<td>S5232F-ON</td>
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<td>Latency (nano sec)</td>
<td>906</td>
<td>881</td>
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<td>1588v2 PTP timing (hardware)</td>
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<td>Packet Buffer</td>
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<td>Maximum power</td>
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<td>Maximum current</td>
<td>2.8A@110VAC / 1.4A@220VAC</td>
<td>4.2A@110VAC / 2.1A@220VAC</td>
<td>5.8A@110VAC / 2.9A@220VAC</td>
<td>8.2A@110VAC / 4.1A@220VAC</td>
<td>5.8A@110VAC / 2.9A@220VAC</td>
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<td>Fan modules</td>
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<td>Form Factor</td>
<td>1RU (half-width)</td>
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<td>1RU</td>
<td>2RU</td>
<td>1RU</td>
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<tr>
<td>Dimensions</td>
<td>8.2”Wx19.3”D x1.6”H</td>
<td>17.1”Wx18.1”D x1.7”H</td>
<td>17.1”Wx18.1”D x1.7”H</td>
<td>17.4”Wx20.1”D x3.4”H</td>
<td>17.1”Wx18.1”D x1.7”H</td>
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<tr>
<td></td>
<td>20.9”Wx49.0”D x4.1”H (cm)</td>
<td>43.4”Wx46.0”D x4.4”H (cm)</td>
<td>43.4”Wx46.0”D x4.4”H (cm)</td>
<td>44.2”Wx51.1”D x8.7”H (cm)</td>
<td>43.4”Wx46.0”D x4.4”H (cm)</td>
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<tr>
<td>Weight</td>
<td>4.5kg (10.05lbs)</td>
<td>9.7kg (21.4lbs)</td>
<td>9.7kg (21.4lbs)</td>
<td>15.1kg (33.2lbs)</td>
<td>9.8kg (21.6lbs)</td>
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<td>Max thermal output</td>
<td>1037 BTU/h</td>
<td>1552 BTU/h</td>
<td>2208 BTU/h</td>
<td>3047 BTU/h</td>
<td>2167 BTU/h</td>
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</tbody>
</table>

**Product Description**

**S5200-ON**

S5212F, 12x 25GbE SFP28 + 3x 100GbE QSFP28, 2x AC PSU, I/O Panel to PSU Airflow, Dell EMC SmartFabric OS10

S5212F, 12x 25GbE SFP28 + 3x 100GbE QSFP28, 2x AC PSU, PSU to I/O Panel Airflow, Dell EMC SmartFabric OS10

S5212F, 12x 25GbE SFP28 + 3x 100GbE QSFP28, 2x DC PSU, I/O Panel to PSU Airflow, Dell EMC SmartFabric OS10

S5212F, 12x 25GbE SFP28 + 3x 100GbE QSFP28, 2x DC PSU, PSU to I/O Panel Airflow, Dell EMC SmartFabric OS10

S5212F, 12x 25GbE SFP28 + 3x 100GbE QSFP28, 2x AC PSU, I/O Panel to PSU Airflow, Dell EMC SmartFabric OS10, TAA

S5212F, 12x 25GbE SFP28 + 3x 100GbE QSFP28, 2x AC PSU, PSU to I/O Panel Airflow, Dell EMC SmartFabric OS10, TAA

S5224F, 24x 25GbE SFP28 + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, I/O Panel to PSU Airflow, Dell EMC SmartFabric OS10

S5224F, 24x 25GbE SFP28 + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, PSU to I/O Panel Airflow, Dell EMC SmartFabric OS10

S5224F, 24x 25GbE SFP28 + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, PSU to I/O Panel Airflow, NO-OS

S5224F, 24x 25GbE SFP28 + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, PSU to I/O Panel Airflow, NO-OS

S5224F, 24x 25GbE SFP28 + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, I/O Panel to PSU Airflow, Dell EMC SmartFabric OS10, TAA

S5224F, 24x 25GbE SFP28 + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, I/O Panel to PSU Airflow, Dell EMC SmartFabric OS10, TAA

S5248F, 48x 25GbE SFP28 + 2x 200GbE QSFP28-DD + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, I/O Panel to PSU Airflow, Dell EMC SmartFabric OS10

S5248F, 48x 25GbE SFP28 + 2x 200GbE QSFP28-DD + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, PSU to I/O Panel Airflow, Dell EMC SmartFabric OS10

S5248F, 48x 25GbE SFP28 + 2x 200GbE QSFP28-DD + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, PSU to I/O Panel Airflow, NO-OS

S5248F, 48x 25GbE SFP28 + 2x 200GbE QSFP28-DD + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, PSU to I/O Panel Airflow, NO-OS

S5248F, 48x 25GbE SFP28 + 2x 200GbE QSFP28-DD + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, PSU to I/O Panel Airflow, Dell EMC SmartFabric OS10, TAA

S5248F, 48x 25GbE SFP28 + 2x 200GbE QSFP28-DD + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, PSU to I/O Panel Airflow, Dell EMC SmartFabric OS10, TAA

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<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>S5200-ON</td>
<td>S5296F, 96x 25GbE SFP28 + 8x 100GbE QSFP28, 2x AC PSU, Fan modules, I/O Panel to PSU Airflow, Dell EMC SmartFabric OS10 S5296F, 96x 25GbE SFP28 + 8x 100GbE QSFP28, 2x AC PSU, Fan modules, PSU to I/O Panel Airflow, Dell EMC SmartFabric OS10 S5296F, 96x 25GbE SFP28 + 8x 100GbE QSFP28, 2x AC PSU, Fan modules, I/O Panel to PSU Airflow, NO-OS S5296F, 96x 25GbE SFP28 + 8x 100GbE QSFP28, 2x AC PSU, Fan modules, PSU to I/O Panel Airflow, Dell EMC SmartFabric OS10, TAA S5296F, 96x 25GbE SFP28 + 8x 100GbE QSFP28, 2x AC PSU, Fan modules, PSU to I/O Panel Airflow, Dell EMC SmartFabric OS10, TAA</td>
</tr>
<tr>
<td>Redundant power supplies</td>
<td>AC Power Supply, I/O Panel to PSU Airflow AC Power Supply, PSU to I/O Panel Airflow DC Power Supply, I/O Panel to PSU Airflow (available as custom kit) DC Power Supply, PSU to I/O Panel Airflow (available as custom kit)</td>
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<tr>
<td>Fans</td>
<td>Fan module, I/O Panel to PSU Airflow Fan module, PSU to I/O Panel Airflow</td>
</tr>
<tr>
<td>Optics</td>
<td>Transceiver, 2x100GbE, 2xSR4, QSFP28-DD Transceiver, 2x100GbE, 2xPSM4-IR, QSFP28-DD Transceiver, 2x100GbE, 2xCWDM4, QSFP28-DD Transceiver, 100GbE, SR4 QSFP28 Transceiver, 100GbE, PSM4 (500m) QSFP28 Transceiver, 100GbE, CWDM4 (2km) QSFP28 Transceiver, 100GbE, LR4 QSFP28 Transceiver, 40GbE, SR4 optic QSFP+ Transceiver, 40GbE, BIDI optic QSFP+ (Duplex) Transceiver, 40GbE, SM4 optic QSFP+ (Duplex) Transceiver, 40GbE, L4M optic QSFP+ (Duplex) Transceiver, 40GbE, PSM4 10Km, QSFP+ Transceiver, 40GbE, LR4 optic QSFP+ Transceiver, 40GbE, ER4 optics QSFP+ Transceiver, 25GbE, SR, NOF SFP28 Transceiver, 25GbE, LR, SFP28 Transceiver, 10GbE, SR SFP+, short reach Transceiver, 10GbE, LR SFP+, long reach Transceiver, 10GbE, ER SFP+, extended reach Transceiver, 10GbE, ZR SFP+ extra extended reach 10G, Transceiver, 10GBASE-T use with QSA in QSFP+ port, 30m reach on CAT6a/7 Transceiver, 1GbE, SX SFP Transceiver, 1GbE, LX SFP Transceiver, 1GbE, ZS SFP Transceiver, 1GbE, 10km, BIDI SFP Transceiver, 1GbE, 40km, BIDI SFP Transceiver, 1GbE, 80km, BIDI SFP Transceiver, 1GbE, 1000BASE-T, Gen2, SFP</td>
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<tr>
<td>Cables</td>
<td>100GbE, 4x25GbE, QSFP28 to 4xSFP28, passive DAC 100GbE, QSFP28 to QSFP28, active optical 100GbE, QSFP28 to QSFP28, passive DAC 100GbE, 2x50GbE, 2xQSFP to 2xQSFP, passive DAC, breakout 40GbE, QSFP+ to QSFP+, active optical 40GbE, QSFP+ to QSFP+, passive DAC 40GbE, MTP to 4xLC optical breakout 40GbE, 4x100GbE, QSFP+ to 4xSFP+, passive DAC</td>
</tr>
<tr>
<td>Cable management</td>
<td>Z9100 Cable Breakout Kit, MTP to LC (1RU 64-port LC over MMF) Z9100 Cable Breakout Kit, MTP to LC (1RU 64-port LC over SMF)</td>
</tr>
</tbody>
</table>
Technical specifications

**Physical**
1 RJ45 console/management port with RS232 signaling
SS212F-ON: 12x25GbE SFP28 + 3x 100GbE QSFP28
SS224F-ON: 24x25GbE SFP28 + 4x 100GbE QSFP28
SS248F-ON: 48x25GbE SFP28 + 4x 100GbE QSFP28 + 2x 2x100GbE QSFP28-DD
SS296F-ON: 96x25GbE SFP28 + 8x 100GbE QSFP28
SS232F-ON: 32x10GbE QSFP28 ports + 2xFSP+ 10GbE

**Environmental**
Power supply: 100–240 VAC 50/60 Hz
Max Operating specifications:
- AC Max. Operating specifications:
  - Operating temperature: 32° to 113°F (0° to 45°C)
  - Operating humidity: 5 to 90% (RH), non-condensing
- Max. Non-operating specifications:
  - Storage temperature: −40° to 158°F (−40° to 70°C)
  - Storage humidity: 5 to 90% (RH), non-condensing
- Fresh air Compliant to 45°C

**Redundancy**
Hot swappable redundant power
Hot swappable redundant fans (fixed power supply and fans on SS212F-ON)

**Performance**
Packet buffer memory: 32MB
CPU memory: 16GB
MSTP: 64 instances
LAG load balancing: Based on layer 2, IPv4 or IPv6 headers

**IEEE Compliance**
802.1AB LLDP
TIA-1057 LLDP-MED
802.3ad Link Aggregation
802.1D Bridging, STP
802.1p L2 Prioritization
802.1Q VLAN Tagging
802.1Qbb Priority-Based Flow Control
802.1Qaz Enhanced Transmission Selection (ETS)
802.1Qbb PFC

**OSPF**
1745 OSPF/BGP interaction
1765 OSPF Database overflow
2154 OSPF with DigitalSignatures
2328 OSPFv2
5340 OSPF for IPv6 (OSPFv3)
2370 Opaque LSA
3101 OSPF NSSA
4552 OSPFv3 Authentication

**Multicast**
4541 IGMPv1/v2/v3 and MLDv1/v2 Snooping

**Security**
2865 RADIUS
3162 Radius and IPv6

**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
1588v2 PTP support
1812 Routers, Static Routes
1858 IP Fragment Filtering
2131 DHCPv4 (server and relay)
5798 VRRPv3
3021 31-bit Prefixes
1812 Requirements for IPv4 Routers
1918 Address Allocation for Private Internets
2474 DiffServ Field in IPv4 and IPv6 Headers
2597 Assured Forwarding PHB Group
3195 Reliable Delivery for Syslog
3246 Expedited Forwarding PHB Group

**Network Management and Monitoring**
SNMPv1/v2c
IPv4/IPv6 Management support (Telnet, FTP, TACACS, RADIUS, SSH, NTP)
Syslog
Bidirectional Forwarding Detection (BFD) Automation
Control Plane Services APIs
Linux Utilities and Scripting Tools
CLI Automation (Multiline Alias)
Zero Touch Deployment (ZTDL)
Ansible, Puppet, Chef, SaltStack

**Quality of Service**
Prefix List
Route-Map
Rate Shaping (Egress)
Rate Policing (Ingress)

**Scheduler Algorithms**
Round Robin
Weighted Round Robin
Deficit Round Robin
Strict Priority
Weighted Random Early Detect

**OpenFlow 1.3 (Native)**
802.1Qbb Priority-Based Flow Control
802.1Qaz Enhanced Transmission Selection (ETS)
Explicit Congestion Notification
Data Center Bridging (DCBx)
DCBx Application TLV (iSCSI, FCoE)
RoCEv2
Software Defined Networking
OpenFlow 1.3 (Native)
MIBS
- IP MIB
- IP Forward MIB
- Host Resources MIB
- IF MIB
- LLDP EXT1/3 MIB
- Entity MIB
- LAG MIB
- Dell-Vendor MIB
- TCP MIB
- UDP MIB
- SNMPv2 MIB
- ETHERLIKE-MIB
- SFLOW-MIB
- PFC-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
- 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
- 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 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 DoD APL (core and distribution ALSAN switch

Warranty
- 1 year return to depot

Learn more at DellTechnologies.com/Networking