



# DELL EMC POWERSWITCH S4048T-ON SWITCH

## Energy-efficient 10GBASE-T top-of-rack switch optimized for data center efficiency

The Dell EMC PowerSwitch S4048T-ON switch is the industry's latest data center networking solution, empowering organizations to deploy modern workloads and applications designed for the open networking era.

Businesses who have made the transition away from monolithic proprietary mainframe systems to industry standard server platforms can now enjoy even greater benefits from Dell Technologies' open networking platforms. By using industry-leading hardware and a choice of leading network operating systems to simplify data center fabric orchestration and automation, organizations can tailor their network to their unique requirements and accelerate innovation.

These new offerings provide the needed flexibility to transform data centers. High-capacity network fabrics are cost-effective and easy to deploy, providing a clear path to the software-defined data center of the future with no vendor lock-in. The S4048T-ON supports the open source Open Network Install Environment (ONIE) for zero-touch installation of alternate network operating systems, including feature rich Dell EMC Networking OS9 and Dell EMC SmartFabric OS10.

### High density 1/10G BASE-T switch

The Dell EMC PowerSwitch S-Series S4048T-ON is a high-density 100M/1G/10G/40GbE top-of-rack (ToR) switch purpose-built for applications in high-performance data center and computing environments. Leveraging a non-blocking switching architecture, the S4048T-ON delivers line-rate L2 and L3 forwarding capacity within a conservative power budget. The compact S4048T-ON design provides industry-leading density of 48 dual-speed 1/10G BASE-T (RJ45) ports, as well as six 40GbE QSFP+ up-links to conserve valuable rack space and simplify the migration to 40Gbps in the data center core. Each 40GbE QSFP+ up-link can also support four 10GbE (SFP+) ports with a breakout cable. In addition, the S4048T-ON incorporates multiple architectural features that optimize data center network flexibility, efficiency and availability, including I/O panel to PSU airflow or PSU to I/O panel airflow for hot/cold aisle environments, and redundant, hot-swappable power supplies and fans. S4048T-ON supports feature-rich Dell EMC Networking OS9 and Dell EMC SmartFabric OS10, VLT, network virtualization features such as VRF-lite, VXLAN Gateway and support for Dell Embedded Open Automation Framework.

- The S4048T-ON is the only switch in the industry that supports traditional network-centric virtualization (VRF) and hypervisor centric virtualization (VXLAN). The switch fully supports L2 VXLAN gateway function and has hardware support for L3 VXLAN routing.

- The S4048T-ON also supports Dell Technologies' Embedded Open Automation Framework, which provides enhanced network automation and virtualization capabilities for virtual data center environments.
- The Open Automation Framework comprises a suite of interrelated network management tools that can be used together or independently to provide a network that is flexible, available and manageable while helping to reduce operational expenses.

### Key applications

Dynamic data centers ready to make the transition to software-defined environments

- High-density 10Gbase-T ToR server access in high-performance data center environments
- Lossless iSCSI storage deployments that can benefit from innovative iSCSI & DCB optimizations that are unique only to Dell Networking switches
- When running the Dell EMC Networking OS9, Active Fabric™ implementation for large deployments in conjunction with the Dell EMC Z-Series, creating a flat, two-tier, nonblocking 10/40GbE data center network design:
  - High-performance SDN/OpenFlow 1.3 enabled with ability to inter-operate with industry standard OpenFlow controllers
  - As a high speed VXLAN Layer 2 Gateway that connects the hypervisor based overlay networks with nonvirtualized infrastructure

### Key features - general

- 48 dual-speed 1/10GbE (SFP+) ports and six 40GbE (QSFP+) uplinks (totaling 72 10GbE ports with breakout cables) with OS support
- 1.44Tbps (full-duplex) non-blocking switching fabric delivers line-rate performance under full load with sub 600ns latency I/O panel to PSU airflow or PSU to I/O panel airflow
- Supports the open source ONIE for zero-touch installation of alternate network operating systems
- Redundant, hot-swappable power supplies and fans
- Low power consumption
- Support for multi-tenancy like VXLAN and NVGRE in hardware

## Key features with Dell EMC Networking OS9

- Scalable L2 and L3 Ethernet switching with QoS and a full complement of standards-based IPv4 and IPv6 features, including OSPF, BGP and PBR (Policy Based Routing) support
- VRF-lite enables sharing of networking infrastructure and provides L3 traffic isolation across tenants
- Increase VM Mobility region by stretching L2 VLAN within or across two DCs with unique VLT capabilities like Routed VLT, VLT Proxy Gateway
- VXLAN gateway functionality support for bridging the nonvirtualized and the virtualized overlay networks with line rate performance
- Embedded Open Automation Framework adding automated configuration and provisioning capabilities to simplify the management of network environments
- Supports Puppet agent for DevOps
- Modular Dell EMC Networking OS software delivers inherent stability as well as enhanced monitoring and serviceability functions
- Enhanced mirroring capabilities including 1:4 local mirroring, Remote Port Mirroring (RPM), and Encapsulated Remote Port Mirroring (ERPM).
  - Rate shaping combined with flow based mirroring enables the user to analyze fine grained flows
  - Jumbo frame support for large data transfers
  - 128 link aggregation groups with up to 16 members per group, using enhanced hashing
  - Converged network support for DCB, with priority flow control (802.1Qbb), ETS (802.1Qaz), DCBx and iSCSI TLV
  - S4048T-ON supports RoCE and Routable RoCE to enable convergence of compute and storage on Active Fabric
  - User port stacking support for up to six units and unique mixed mode stacking that allows stacking of S4048-ON with S4048T-ON to provide combination of 10G SFP+ and RJ45 ports in a stack

### 1/10G BASE-T cabling distances

Cable Type 1G	BASE-T 10G	BASE-T
<b>Cat 6 UTP</b>	100m (330 ft)	55m (180 ft)
<b>Cat 6 STP</b>	100m (330 ft)	100m (330 ft)
<b>Cat 6A UTP</b>	100m (330 ft)	100m (330 ft)
<b>Cat 7</b>	100m (330 ft)	100m (330 ft)

Product	Description
<b>S4048T</b>	S4048T, 48x 10GBASE-T, 6x QSFP+, 2x AC PSU, 2x fans, I/O Panel to PSU Airflow S4048T, 48x 10GBASE-T, 6x QSFP+, 2x AC PSU, 2x fans, PSU to I/O Panel Airflow
<b>Redundant power supplies</b>	S4048T, AC Power Supply, I/O Panel to PSU Airflow S4048T, AC Power Supply, PSU to I/O Panel Airflow
<b>Fans</b>	S4048T Fan Module, I/O Panel to PSU Airflow S4048T Fan Module, PSU to I/O Panel Airflow
<b>Optics</b>	Transceiver, 40GE QSFP+ Short Reach Optic, 850nm wavelength, 100-150m reach on OM3/OM4 Transceiver, 40GbE QSFP+ ESR, 300m reach on OM3 / 400m on OM4 Transceiver, 40GbE QSFP+ PSM4 with 1m pigtail to male MPO SMF, 2km reach Transceiver, 40GbE QSFP+ PSM4 with 5m pigtail to male MPO SMF, 2km reach Transceiver, 40GbE QSFP+ PSM4 with 15m pigtail to male MPO SMF, 2km reach Transceiver, 40GbE QSFP+ LR4, 10km reach on SMF Transceiver, 40GbE QSFP+ to 1G Cu SFP adapter, QSA 1 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 3 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 5 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 7 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 10 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 25 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 50 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 75 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics 100 meter QSFP+ to QSFP+ OM3 MTP Fiber Cable. Requires QSFP+ Optics

Product	Description
<b>Cables</b>	<p>Cable, QSFP+ to QSFP+, 40GbE Passive Copper Direct Attach Cable, 0.5 Meter</p> <p>Cable, QSFP+ to QSFP+, 40GbE Passive Copper Direct Attach Cable, 1 Meter</p> <p>Cable, QSFP+ to QSFP+, 40GbE Passive Copper Direct Attach Cable, 3 Meter</p> <p>Cable, QSFP+ to QSFP+, 40GbE Passive Copper Direct Attach Cable, 5 Meter</p> <p>Cable, QSFP+ to QSFP+, 40GbE Passive Copper Direct Attach Cable, 7 Meter</p> <p>Cable, QSFP+, 40GbE, Active Fiber Optical Cable, 10 Meters (No optics required)</p> <p>Cable, QSFP+, 40GbE, Active Fiber Optical Cable, 50 Meters (No optics required)</p> <p>Cable, 40GbE QSFP+ to 4 x 10GbE SFP+, Active Optical Breakout Cable</p> <p>Cable, 40GbE (QSFP+) to 4 x 10GbE SFP+ Passive Copper Breakout Cable, 0.5 Meters</p> <p>Cable, 40GbE (QSFP+) to 4 x 10GbE SFP+ Passive Copper Breakout Cable, 1 Meter</p> <p>Cable, 40GbE (QSFP+) to 4 x 10GbE SFP+ Passive Copper Breakout Cable, 3 Meters</p> <p>Cable, 40GbE (QSFP+) to 4 x 10GbE SFP+ Passive Copper Breakout Cable, 5 Meters</p> <p>Cable, 40GbE (QSFP+) to 4 x 10GbE SFP+ Passive Copper Breakout Cable, 7 Meters</p> <p>Cable, 40GbE MTP (QSFP+) to 4xLC Optical Connectors, 1M(QSFP+,SFP+ Optics REQ,not incl)</p> <p>Cable, 40GbE MTP (QSFP+) to 4xLC Optical Connectors, 3M(QSFP+,SFP+ Optics REQ,not incl)</p> <p>Cable, 40GbE MTP (QSFP+) to 4xLC Optical Connectors, 5M(QSFP+,SFP+ Optics REQ,not incl)</p> <p>Cable, 40GbE MTP (QSFP+) to 4xLC Optical Connectors, 7M(QSFP+,SFP+ Optics REQ,not incl)</p>
<b>Software</b>	<p>L3 Dell EMC Networking OS</p> <p>S4048T: Dell EMC Networking software license operating system software license for advanced L3 features, latest version</p> <p>S4048T: Dell EMC Networking software license</p> <p>Dell EMC Networking OS operating system software license, latest version</p> <p>Note: in-field change of airflow direction only supported when unit is powered down and all fan and power supply units are replaced with airflow moving in a uniform direction</p>
<b>Supported operating systems</b>	<p>Big Switch Networks Switch Light OS</p> <p>Dell EMC Networking OS9 and Dell EMC SmartFabric OS10</p> <p>Pluribus OS</p>

## Technical specifications

<p><b>Physical</b></p> <p>48 fixed 10GBase-T ports supporting 100M/1G/10G speeds</p> <p>6 fixed 40 Gigabit Ethernet QSFP+ ports</p> <p>1 RJ45 console/management port with RS232 signaling</p> <p>1 USB 2.0 type A to support mass storage device</p> <p>1 Micro-USB 2.0 type B Serial Console Port</p> <p>18 GB SSD Module</p> <p>Size: 1RU, 1.71 x 17.09 x 18.11" (4.35 x 43.4 x 46 cm) (H x W x D)</p> <p>Weight: 23 lbs (10.43kg)</p> <p>ISO 7779 A-weighted sound pressure level: 65 dB at 77°F (25°C)</p> <p>Power supply: 100–240V AC 50/60Hz</p> <p>Max. thermal output: 1568 BTU/h</p> <p>Max. current draw per system: 4.6 A at 460W/100VAC, 2.3 A at 460W/200VAC</p> <p>Max. power consumption: 460 Watts</p> <p>Typical power consumption: 338 Watts</p> <p>Max. operating specifications: Operating temperature: 32°F to 113°F (0°C to 45°C) Operating humidity: 5 to 90% (RH), non-condensing</p> <p>Max. non-operating specifications: Storage temperature: –40°F to 158°F (–40°C to 70°C)</p>	<p>Storage humidity: 5 to 95% (RH), non-condensing</p> <p><b>Redundancy</b></p> <p>Hot swappable redundant power</p> <p>Hot swappable redundant fans</p> <p><b>Performance General</b></p> <p>Switch fabric capacity: 1.44Tbps (full-duplex) 720Gbps (half-duplex)</p> <p>Forwarding Capacity: 1080 Mpps</p> <p>Latency: 2.8 us</p> <p>Packet buffer memory: 16MB</p> <p>CPU memory: 4GB</p> <p><b>OS9 Performance:</b></p> <p>MAC addresses: 160K</p> <p>ARP table 128K</p> <p>IPv4 routes: 128K</p> <p>IPv6 hosts: 64K</p> <p>IPv6 routes: 64K</p> <p>Multicast routes: 8K</p> <p>Link aggregation: 16 links per group, 128 groups</p> <p>Layer 2 VLANs: 4K</p> <p>MSTP: 64 instances</p> <p>VRF-Lite: 511 instances</p> <p>LAG load balancing: Based on layer 2, IPv4 or IPv6 headers</p> <p>Latency: Sub 3us</p> <p>QOS data queues: 8</p> <p>QOS control queues: 12</p>	<p>Ingress ACL: 16K</p> <p>Egress ACL: 1K</p> <p>QoS: Default 3K entries scalable to 12K</p> <p><b>IEEE compliance with Dell EMC Networking OS9</b></p> <p>802.1AB LLDP</p> <p>802.1D Bridging, STP</p> <p>802.1p L2 Prioritization</p> <p>802.1Q VLAN Tagging, Double VLAN Tagging, GVRP</p> <p>802.1Qbb PFC</p> <p>802.1Qaz ETS</p> <p>802.1s MSTP</p> <p>802.1w RSTP</p> <p>802.1X Network Access Control</p> <p>802.3ab Gigabit Ethernet (1000BASE-T)</p> <p>802.3ac Frame Extensions for VLAN Tagging</p> <p>802.3ad Link Aggregation with LACP</p> <p>802.3ae 10 Gigabit Ethernet (10GBase-X) with QSA</p> <p>802.3ba 40 Gigabit Ethernet (40GBase-SR4, 40GBase-CR4, 40GBase-LR4) on optical ports</p> <p>802.3u Fast Ethernet (100Base-TX)</p> <p>802.3x Flow Control</p> <p>802.3z Gigabit Ethernet (1000Base-X) with QSA</p> <p>802.3az Energy Efficient Ethernet</p> <p>ANSI/TIA-1057 LLDP-MED</p> <p>Force10 PVST+</p> <p>Max MTU 9216 bytes</p>
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**RFC and I-D compliance with  
Dell EMC Networking OSS**

**General Internet protocols**

768 UDP  
793 TCP  
854 Telnet  
959 FTP

**General IPv4 protocols**

791 IPv4  
792 ICMP  
826 ARP  
1027 Proxy ARP  
1035 DNS (client)  
1042 Ethernet Transmission  
1305 NTPv3  
1519 CIDR  
1542 BOOTP (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  
3164 BSD Syslog  
3195 Reliable Delivery for Syslog  
3246 Expedited Assured Forwarding  
4364 VRF-lite (IPv4 VRF with OSPF, BGP, IS-IS and V4 multicast)  
5798 VRRP

**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)

**RIP**

1058 RIPv1 2453 RIPv2  
OSPF (v2/v3)

1587 NSSA 4552 Authentication/  
2154 OSPF Digital Signatures

Confidentiality for  
2328 OSPFv2 OSPFv3  
2370 Opaque LSA 5340 OSPF for IPv6

**IS-IS**

1142 Base IS-IS Protocol  
1195 IPv4 Routing  
5301 Dynamic hostname exchange mechanism for IS-IS  
5302 Domain-wide prefix distribution with two-level IS-IS

5303 3-way handshake for IS-IS pt-to-pt adjacencies  
5304 IS-IS MD5 Authentication  
5306 Restart signaling for IS-IS  
5308 IS-IS for IPv6  
5309 IS-IS point to point operation over LAN  
draft-isis-igp-p2p-over-lan-06  
draft-kaplan-isis-ext-eth-02

**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, PIM-SM, PIM-SSM

**Security**

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  
4303 ESP Protocol  
4807 IPsecv Security Policy DB MIB  
draft-ietf-pim-sm-v2-new-05 PIM-SMw

**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)

**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 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-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)  
DELL-NETWORKING-SMI  
DELL-NETWORKING-TC  
DELL-NETWORKING-CHASSIS-MIB  
DELL-NETWORKING-PRODUCTS-MIB  
DELL-NETWORKING-SYSTEM-COMPONENTMIB  
DELL-NETWORKING-TRAP-EVENT-MIB  
DELL-NETWORKING-COPY-CONFIG-MIB  
DELL-NETWORKING-IF-EXTENSION-MIB  
DELL-NETWORKING-FIB-MIB  
DELL-NETWORKING-FPSTATS-MIB  
DELL-NETWORKING-LINK-AGGREGATIONMIB  
DELL-NETWORKING-MSTP-MIB  
DELL-NETWORKING-BGP4-V2-MIB  
DELL-NETWORKING-ISIS-MIB  
DELL-NETWORKING-FIPSNOOPIING-MIB

DELL-NETWORKING-VIRTUAL-LINK-TRUNKMIB  
DELL-NETWORKING-DCB-MIB  
DELL-NETWORKING-OPENFLOW-MIB  
DELL-NETWORKING-BMP-MIB  
DELL-NETWORKING-BPSTATS-MIB

#### Regulatory compliance

##### Safety

CUS UL 60950-1, Second Edition  
CSA 60950-1-03, Second Edition  
EN 60950-1, Second Edition  
IEC 60950-1, Second Edition Including All  
National Deviations and Group Differences  
EN 60825-1, 1st Edition  
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

International: CISPR 22, Class A  
Australia/New Zealand: AS/NZS CISPR 22:  
2009, Class A  
Canada: ICES-003:2016 Issue 6, Class A  
Europe: EN 55022: 2010+AC:2011 / CISPR 22:  
2008, Class A  
Japan: VCCI V-3/2014.04, Class A &  
V4/2012.04  
USA: FCC CFR 47 Part 15, Subpart B:2009,  
Class A

##### RoHS

All S-Series components are EU RoHS compliant.

##### Certifications

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

##### Immunity

EN 300 386 V1.6.1 (2012-09) EMC for Network  
Equipment  
EN 55022, Class A  
EN 55024: 2010 / CISPR 24: 2010  
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



Plan, deploy, manage and support  
your IT transformation with our  
top-rated services

##### Consulting

Dell Technologies Consulting  
Services provides industry  
professionals with a wide range of  
tools and the experience you need  
to design and execute plans to  
transform your business.

##### Deployment

Accelerate technology adoption  
with ProDeploy Enterprise  
Suite. Trust our experts to lead  
deployments through planning,  
configuration and complex  
integrations.

##### Management

Regain control of operations with  
flexible IT management options. Our  
Residency Services help you adopt  
and optimize new technologies  
and our Managed Services allow  
you to outsource portions of your  
environment to us.

##### Support

Increase productivity and reduce  
downtime with ProSupport  
Enterprise Suite. Expert support  
backed by proactive and predictive  
artificial intelligence tools.

##### Education

Dell Technologies Education  
Services help you develop the IT  
skills required to lead and execute  
transformational strategies. Get  
certified today.

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