



Dell Networking 7000 Series

Dell™ Networking 7000 Gigabit Ethernet switches are Layer 3 scalable enterprise switches that give you the power and flexibility you need for today and the future, offering advanced switching capabilities including high-density, 10 Gigabit Ethernet uplinks, high-performance stacking, high redundancy and availability, scalable from the small business to the campus Edge.

The Dell 7000 Series switches are designed to offer secure, fixed-port Gigabit Ethernet switching solutions which deliver full wire-speed switching performance. With 24 or 48 Gigabit Ethernet ports in a 1U form factor, the 7000 series has a total switching capacity of up to 224 Gbps to support demanding network environments. The switches also offer simple management and scalability via a 128Gbps (via two stacking modules) high-availability stacking architecture that allows you to manage up to twelve switches from a single IP address, and share the upgradeable 10GbE ports across the stack for uplinks to the next layer in your network. The switches are designed with power-saving features including Energy Efficient Ethernet (IEEE 802.3az) ports to help reduce per port power consumption while decrease cooling and power costs. Select models offer 24 & 48 ports of PoE+ (IEEE 802.3at), support for high- power WLAN Access Points (WAPs), Voice over IP (VoIP) handsets, video conferencing and security cameras up to 30.8 watts of power.

High-performance and high availability for small cores and enterprise

The Networking 7000 Ethernet Switch family is designed for enterprise applications where high performance, high availability, and energy efficiency are key requirements. Operating at wire speed, the 7000 switches deliver up to 160 Mpps throughput and a data rate of up to 224 Gbps (full duplex) for both Layer 2 and Layer 3 environments.

Switch stacks up to 600 ports can be managed from a single screen using the highly-available (HA) stacking architecture, for high density aggregation with seamless redundant availability and single IP management of an entire rack. Fast stack failover enables sub-50ms failover scenarios. The 7000 family can also stack with the Dell M6348 high density Ethernet blade. The 7048R model enables a resilient HA core switch design with redundant internal power supplies and fans, reversible airflow (back-to-ports and ports-to-back model options) and dual firmware image support.

The switches also support rapid USB auto-configuration so you can rapidly deploy the switches in minutes without setting up complex TFTP configurations or sending technical staff to remote offices.

Robust security

Advanced security features of 7000 series switches help protect the network from accidental or malicious interference. Edge authentication using IEEE 802.1x provides a meaningful security solution which is centralized and easier to manage than standard ACLs, and the monitor mode of the switch allows for easier rollout of 802.1x in new environments. The 7000 series provides

password management for increased network security, encrypted management traffic through SSL or SSH and secures SNMP access by filtering hosts based upon IP address. MAC-based port security is designed to prevent unauthorized MAC addresses from accessing the network. RADIUS and TACACS+ support enables centralized, remote authentication of administrative access to the switch. Private VLANs and administrative profiles are also supported.

Other Key Features

- Up to 48 GbE ports of copper or fiber, PoE+ with 10GbE and stacking module options in a 1RU form factor
- Stack up to 576GbE ports for highest-density, demanding HA aggregation/distribution wiring closets/MDFs
- Non-stop forwarding and fast failover in stack configurations
- IPv4 and IPv6 routing, including OSPFv1/2/3 and routing enhancements and improved multicast operation
- Private VLAN extensions and Private VLAN Edge support
- Unidirectional Link Detection (UDLD) support
- AAA Authorization, TACACS+ Accounting, and RADIUS Support for comprehensive secure access support
- Pre-defined Administrative profiles/roles for switch access to management functions
- USB auto-configuration rapidly deploys the switches in minutes without setting up complex TFTP configurations or sending technical staff to remote offices.
- Manage via a standard command line interface (CLI), embedded Web server, third party SNMP-based management console applications (including Dell OpenManage Network Manager), Telnet, or serial connections.
- Designed to be easy on campus budgets with energy savings from the power cord to the ports
- Energy Efficient Ethernet (IEEE 802.3az) ports reduce per port power consumption when link is idle or if ports are inactive
- Efficient power supplies and multi-speed fan operation help decrease cooling and power costs
- Operation in environments up to 45°C, helps reduce cooling costs in temperature constrained deployments

Lifetime Warranty*

Select Dell Networking switches are backed by an industry-leading, lifetime warranty which guarantees Basic Hardware Service (repair or replacement) for life.

[Details at Dell.com/LifetimeWarranty*](https://www.dell.com/LifetimeWarranty)



Product	Dell™ Networking 7024 & 7024P	Dell™ Networking 7024F	Dell™ Networking 7048, 7048P & 7048R/RA
Port types	24 10/100/1000BASE-T auto-sensing Gigabit Ethernet switching ports; upgradeable 4x 10GbE/stacking ports; 4 Combo (SFP or 10/100/1000) Gigabit Ethernet ports; 7024P: Supplies up to 30.8 watts per port (with optional external power supply) on all 24 ports	24 1000-SX or 1000-LX Gigabit Ethernet ports; 4 Combo (SFP or 10/100/1000) Gigabit Ethernet ports; Up to 4 10-Gigabit Ethernet Ports; Distances: 1000BASE-SX: Up to 500m 1000BASE-LX: Up to 10 km	48 10/100/1000BASE-T auto-sensing Gigabit Ethernet switching ports; Upgradeable 4x 10GbE / stacking ports; 4 Combo (SFP or 10/100/1000) Gigabit Ethernet ports; 7048P: Supplies up to 30.8 watts per port (with optional external power supply) on all 48 ports
Performance	Switch Fabric Capacity 176 Gb/s, Forwarding Rate 125 Mpps, Up to 32,000 MAC Addresses		Switch Fabric Capacity 224 Gb/s Forwarding Rate 160 Mpps Up to 32,000 MAC Addresses
Port configuration	Resilient stacking up to 12 systems (with optional module); Auto-negotiation for speed, duplex mode and flow control; Auto MDI/MDIX; Port mirroring; Flow-based port mirroring; Broadcast storm control, Energy Efficient Ethernet (IEEE802.3az) per port settings (1 & 10GbE ports), Port profiles-predefined macros to help automatically configure ports, Up to 12,000 Routes Supported; UDLD		
Management	Web-based management interface, Industry-standard CLI accessible via Telnet, Out-of-Band Ethernet or Local Serial Port; SNMPv1, SNMPv2c and SNMPv3 supported; four RMON groups supported (history, statistics, alarms and events); TFTP transfers of firmware and configuration files; Dual firmware images on-board; Multiple configuration file upload/download supported; Statistics for error monitoring and performance optimization including port summary tables; BootP/DHCP IP address management supported; Syslog remote logging capabilities; LLDP-MED, SNTP, iSCSI Auto Configuration; Pre-defined roles for simplified administration of the switch (Network Admin, Network Security, Router Admin, Multicast Admin, DHCP Admin, Network Operator)		
Quality of service	8 Priority Queues per Port, Layer 2 Trusted Mode (IEEE 802.1p tagging); Layer 3 Trusted Mode (DSCP); Layer 4 Trusted Mode (TCP/UDP); Advanced Mode using Layer 2/3/4 flow-based Policies, including metering/rate limiting, marking and bandwidth guarantees; up to 100 ACLs can be used for QoS flow identification via Class-maps; Adjustable Weighted-Round-Robin (WRR) and Strict Queue Scheduling; Port-based QoS Services Mode; Flow-based QoS Services Mode, IPv4 and IPv6 support		
Security	Switch access password protection, including strong password support, User-definable settings for enabling or disabling Web, SSH, Telnet, SSL management access; Port-based MAC Address alert and lock-down, IP Address filtering for management access via Telnet, HTTP, HTTPS/SSL, SSH and SNMP; RADIUS (RFC 2865) and TACACS+ (RFC 1492) remote authentication for switch management access; SSLv3 and SSHv2 encryption for switch management traffic; Management access filtering via Management Access Profiles; IEEE 802.1x-based edge authentication; 802.1x monitor mode to aid in .1x troubleshooting, MAC and IP based ACLs, Time controlled ACLs, Dynamic ARP Inspection, Up to 100 Access Control Lists (ACLs) supported; Up to 1K rules per ACL, 8K rules total (7K Ingress rules, 1K Egress rules); AAA/ TACACS+ per-command authorization; TACACS+ accounting;		
VLAN	IEEE 802.1Q tagging and port-based, up to 1,000 user-configurable VLANs Protocol-based VLANs Dynamic VLANs with GVRP support; Private VLAN and edge extensions		
Layer 2 multicast	IGMP v1/v2/v3 snooping IGMP snooping for IP multicast support IGMP Querier Static IP Multicast		
Other switching features	Link Aggregation with support for up to 72 link aggregation groups (LAGs) per switch and up to 8 member ports per LAG (IEEE 802.3ad) Local preference for LAG; LACP support (IEEE 802.3ad) Port Mirroring Jumbo frame support up to 9K DHCP Server support, DHCP Snooping, DHCP Relay Link Layer Discovery Protocol supported (IEEE 802.1AB)		
Availability	External redundant power support with PowerConnect RPS-720 (sold separately), MPS-1000 (sold separately) Spanning Tree (IEEE 802.1D) and Rapid Spanning Tree (IEEE 802.1w) with Fast Link Support Multiple spanning trees (IEEE 802.1s) Spanning Tree optional features – STP root guard, BPDU guard, BPDU filtering Dual firmware images Configuration file upload and download (USB supported) Switch Auditing support sFlow; UDLD Supports Virtual Redundant Routing Protocol (VRRP); Cable diagnostics; SFP/SFP+ transceiver diagnostics		
Layer 3 routing protocols	Static Routes; Routing Information Protocol (RIP) v1/v2; Open Shortest Path First (OSPF) v1/v2/v3; Classless Inter-Domain Routing (CIDR); Internet Control Message Protocol (ICMP); ICMP Router Discover Protocol (IRDP); Virtual Redundant Routing Protocol (VRRP); Address Resolution Protocol (ARP); Internet Group Management Protocol (IGMP) v2; Distance-Vector Multicast Routing Protocol (DVMRP)		

© 2012 Dell Inc. All rights reserved. Dell, the DELL logo and the DELL badge are trademarks of Dell Inc. Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell disclaims proprietary interest in the marks and names of others. This document is for informational purposes only. Dell reserves the right to make changes without further notice to the products herein. The content provided is as-is and without expressed or implied warranties of any kind.

*Select Networking products carry a Lifetime Limited Warranty with Basic Hardware Service (repair or replacement) for life. Repair or replacement does not include troubleshooting, configuration, or other advanced service provided by Dell ProSupport. For more details see dell.com/lifetimewarranty

Learn more at Dell.com/Networking



Specifications: Dell 7000 high-performance 1/10 GbE Enterprise Switches

Dell SKU description

Dell 7000 Series

7024, 24x 1GbE-T ports, 4 combo ports and optional dual expansion modules
 7024F, 24x 1GbE SFP+ base ports, 4 combo ports and optional dual expansion modules
 7024P, 24x 1GbE-T PoE+ capable ports, 4 combo ports and optional dual expansion modules
 7048, 48x 1GbE-T ports, 4 combo ports and optional dual expansion modules
 7048P, 48x 1GbE-T PoE+ capable ports, 4 combo ports and optional dual expansion modules
 7048R, 48x 1GbE-T ports, 4 combo ports and optional dual expansion modules, ports-to-back airflow and redundant power supply/fan modules
 PowerConnect 7048RA, 48x 1GbE-T ports, 4 combo ports and optional dual expansion modules, back-to-ports airflow and redundant power supply/fan modules

Modules

10GbE-T Module
 2-port, Hot Swappable, 2x 10GbE-T ports (RJ45 for Cat6 cables)
 SFP+ 10GbE Module
 2-port, Hot Swappable, 2x SFP+ ports (optics or direct attach cables required)
 CX-4 Stacking Module
 2-port, Hot Swap, 64Gbps per port (0.3m cable included)

Redundant power supplies

Dual AC Power Supplies, Hot swappable (7048R, 7048R-RA only)
 MPS1000 - External Modular Power Supply for PoE+ switches: 7024P and 7048P (1000W)
 RPS720 - External Redundant Power Supply for non-PoE switches: 7024, 7024F and 7048

Optics

Transceiver, SFP, 1000BASE-SX, 850nm Wavelength, 550m Reach
 Transceiver, SFP, 1000BASE-LX, 1310nm Wavelength, 10km Reach
 Transceiver, SFP+, 10GbE, SR, Multi-Mode, 300m Reach
 Transceiver, SFP+, 10GbE, LR, Single-Mode, 10km Reach
 Transceiver, SFP+, 10GbE, LRM, Multi-Mode LC-LC, 220m Reach

Cables

CX4 Stacking Cable, 1m (requires CX4 stacking module)
 CX4 Stacking Cable, 3m (requires CX4 stacking module)
 Dell Networking SFP+ 5 m TwinAx
 Dell Networking SFP+ 1 m TwinAx
 Dell Networking SFP+ 3 m TwinAx
 Dell Networking SFP+ 5 m TwinAx
 Dell Networking SFP+ 7 m TwinAx

Physical

7024: 24 line-rate 10/100M/1GbE-T Ethernet ports, 2 module ports
 7024F: 24 line-rate 1Gb SFP+ Ethernet ports, 2 module ports
 7024P: 24 line-rate 10/100M/1GbE-T Ethernet PoE+ ports, 2 module ports
 7048: 48 line-rate 10/100M/1GbE-T Ethernet ports, 2 module ports
 7048P: 48 line-rate 10/100M/1GbE-T Ethernet PoE+ ports, 2 module ports
 7048R/RA: 48 line-rate 10/100M/1GbE-T Ethernet ports, 2 module ports, reversible airflow (configured at factory)

All switches include:

1 RJ45 console/management port with RS232 signaling
 1 RJ45 out of band OOB port
 1 USB (Type A) port for configuration

Redundancy

Hot swappable redundant power (MPS/RPS or fan/power supply modules in R models)
 Hot swappable modules

Performance

MAC addresses: 32K
 Static routes: 512 (IPv4) / 256 (IPv6)
 IPv4 routes: 12K
 IPv6 routes: 6K (shared CAM space with IPv4)
 Switch fabric capacity: up to 224Gbps (full-duplex)
 112 Gbps (half-duplex)
 Forwarding capacity: up to 160 Mpps
 Link aggregation: 8 links per group, 72 groups per stack
 Queues per port: 4 queues
 Layer 2 VLANs: 1000 simultaneous
 Line-rate Layer 2 switching: all protocols, including IPv4 and IPv6
 Line-rate Layer 3 routing: IPv4 and IPv6
 IPv4 Multicast groups: 2048 per switch
 LAG load balancing: based on Layer 2, IPv4 or IPv6 headers
 Packet buffer memory: 4MB
 CPU memory: 1GB

IEEE Compliance

802.1AB LLDP
 802.1D Bridging, Spanning Tree
 802.1p Ethernet Priority (User Provisioning and Mapping)
 802.1Q VLAN Tagging, Double VLAN Tagging, GVRP
 802.1S Multiple Spanning Tree (MSTP)
 802.1v Protocol-based VLANs
 802.1W Rapid Spanning Tree (RSTP)
 802.1X Network Access Control
 802.3 10BASE-T
 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)
 802.3z Fast Ethernet (100BASE-TX) on mgmt ports
 802.3x Flow Control
 802.3z Gigabit Ethernet (1000BASE-X) ANSI/TIA-1057
 LLDP-MED
 9.9.0 bytes

RFC and I-D Compliance

General Internet Protocols

768	UDP	856	Telnet binary transm.
783	TFTP	858	Telnet suppress option
791	IP	1321	MDA
792	ICMP	1350	TFTP v2
793	TCP	2474	Differentiated Services
854	Telnet	2475	Architecture for DS
855	Telnet option	3164	Syslog

General IPv4 Protocols

791	IPv4	2082	RIP-2 MD5 Authent.
792	ICMP	2030	SNTP v4
826	ARP	2131	DHCP (relay)
894	Transmit IP datagrams	2132	DHCP/BootP Ext.
896	Congestion Control	2328	OSPFv4
951	BootP	2338	RRRP
1027	Proxy ARP	2597	Assured Fwd PHB
1042	Ethernet Transmission	2787	RRRP MIB
1256	ICMP Router Discovery	3046	DHCP BootP Relay
1519	CIDR	3069	Private VLAN
1534	Interop BootP, DHCP	3246	Expedited Fwd PHB
1541	DHCP	3260	DiffServ updates
1542	BootP (relay)	3289	MIB for DiffServ (read)
1765	OSPF Database overflow	3768	RRRP
1812	Routers		

General IPv6 Protocols

1961	Path MTU	3484	Default Address Selct
2372	IPv6 Addressing	3493	Basic Socket interface
2460	IPv6	3513	Addressing Arch.
2461	Neighbor Discovery	3542	Advanced sockets API
2462	Stateless Address Autoconfiguration (partial)		
2464	IPv6 over Ethernet	3587	Global Unicast Address
2465	IPv6 MIB	3736	Stateless DHCPv6
2466	ICMPv6 MIB	4213	Basic Transition Mech.
2711	IPv6 Router alert	4291	Addressing Arch
2740	OSPFv3	4443	ICMPv6
3056	Connection to IPv6 Domains via IPv4 Clouds		
3315	DHCPv6		

RIP

1058	RIPv1	2082	MD5
1724	RIPv2 MIB Extension	2453	RIPv2
2080	RIPng		

OSPF

1850	OSPF MIB	3101	NSSA
2328	OSPFv2	3623	Graceful Restart
2370	Opaque LSA Option	5187	v3 Graceful Restart
2740	OSPFv3		

Multicast

1112	IGMPv1	3376	IGMPv3
2236	IGMPv2	3810	MLDv2
2365	Admin scoped IP Mcast	3973	PIM-DM
2710	MLDv1	4541	IGMPv1/v2 Snooping
2932	IPv4 MIB	4601	PIM-SM
2933	IGMP MIB	5060	PIM MIB

Draft-ietf-pim-sm-bsr-05
 Draft-ietf-idmr-dvmrp-v3-10 DVMRP
 Draft-ietf-magma-igmp-proxy-06.txt IGMP/MLD Proxying
 Draft-ietf-magma-igmpv3-and-routing-05.txt
 Draft-ietf-idmr-dvmrp-mib-11
 draft-ietf-magma-mgmd-mib-05
 draft-ietf-pim-bsr-mib-06
 IEEE 802.1ag draft 8.1 - Connectivity Fault Management (CFM)

Network Management

1155	SMIv1
1157	SNMPv1
1212	Concise MIB Definitions
1213	MIB-II
1215	SNMP Traps
1286	Bridge MIB
1442	SMIv2
1451	Manager-to-Manager MIB

1492	TACACS+
1493	Managed objects for Bridges MIB
1573	Evolution of Interfaces
1612	DNS Resolver MIB Extensions
1643	Etherlike MIB
1757	RMON MIB
1867	HTML/2.0 Forms with file upload extensions
1901	Community-based SNMPv2
1907	SNMPv2 MIB
1908	Coexistence btwn SNMPv1/v2
2011	IP MIB
2012	TCP MIB
2013	UDP MIB
2096	IP Forwarding Table MIB
2233	Interfaces Group using SMIv2
2271	SNMP Framework MIB
2576	Coexistence between SNMPv1/v2/v3 SMIv2
2578	SMIv2
2579	Textual Conventions for SMIv2
2580	Conformance Statements for SMIv2
2613	RMON MIB
2618	RADIUS Authentication MIB
2620	RADIUS Accounting MIB
2665	Ethernet-like Interfaces MIB
2666	Identification of Ethernet chipsets
2674	Extended Bridge MIB
2737	ENTITY MIB
2819	RMON MIB (groups 1, 2, 3, 9)
2863	Interfaces MIB
2865	RADIUS
2866	RADIUS Accounting
2868	RADIUS Attributes for Tunnel Prot.
2869	RADIUS Extensions
3413	SNMP Applications
3416	SNMPv2
3418	SNMP MIB
3580	802.1X with RADIUS
FASTPATH Enterprise MIB supporting Routing features draft-ietf-hubmib-etherif-mib-v3-00.txt (Obsoletes RFC 2665)	
LAG MIB	Support for 802.3ad functionality

Chassis

Size: 1 RU, 1.73" H x 17.32" W x 18.1" D
 (4.4 cm H x 44 cm W x 46 cm D)
 Approximate weight: 6.35 kg / 14 lb (7024);
 7.62 kg / 16.8 lb (7024P); 6.3 kg / 13.9 lb (7024F);
 6.77 kg / 14.92 lb (7048); 8.1 kg / 17.86 lb (7048P); 9.75 kg / 21.49 lb (7048R)
 1U, rack-mounting kit included

Environmental

Power supply: 100-240 VAC 50/60 Hz
 Power Supply Efficiency 80% or better in all operating modes
 Max. thermal output:
 7024: 300.5 BTU/hr
 7024F: 347.32 BTU/hr
 7024P: 298.8 BTU/hr
 7048: 389.84 BTU/hr
 7048P: 376.87 BTU/hr
 7048R/RA: 418.70 BTU/hr
 Power Consumption Max (Watts): 88W (7024); 101.8W (7024F); 87.5W (7024P, no PoE+ ports), 796W (7024P, all ports as PoE+); 114.3W (7048); 122.7W (7048R/RA); 114W (7048, no PoE+ ports), 930W (7048P, All ports as PoE+)
 Max. Operating specifications:
 Operating temperature: 32° to 113°F (0° to 45°C) Operating humidity: 10 to 90% (RH), non-condensing
 Max. non-operating specifications:
 Storage temperature: -4° to 158°F (-20° to 70°C) Storage humidity: 10 to 95% (RH), non-condensing

Regulatory and environment Compliance

Safety and Emissions
 Australia/New Zealand: ACMA or C-Tick Class A
 Canada: ICES Class A; SCC
 China: CNCA or CCC Class A; NAL
 Europe: CE Class A
 Japan: VCCI Class A
 USA: FCC Class A; NRTL
 Product meets EMC and safety standards in many countries inclusive of: USA, Canada, EU, Japan, China.
 For more country-specific regulatory information, and approvals, please see your Dell representative.

RoHS

Product meets RoHS compliance standards in many countries inclusive of USA, and EU. For more country-specific RoHS compliance information, please see your Dell representative.

Certifications

USGv6 testing approved
 Available with US Trade Agreements Act (TAA) compliance

Available with US Trade Agreements Act (TAA) compliance

© 2013 Dell Inc. All rights reserved. Dell, the DELL logo and the DELL badge are trademarks of Dell Inc. Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell disclaims proprietary interest in the marks and names of others. This document is for informational purposes only. Dell reserves the right to make changes without further notice to the products herein. The content provided is as-is and without expressed or implied warranties of any kind.

Learn more at Dell.com/Networking

SS743_Dell_Networking_7000_Series_042313

