Dell Networking N3000 series

Dell Networking N3000 is a series of energy-efficient and cost-effective 1GbE switches designed for modernizing and scaling network infrastructure. N3000 switches utilize a comprehensive enterprise-class Layer 2 and Layer 3 feature set, deliver consistent, simplified management and offer high-availability device and network design.

The N3000 switch series offers a power-efficient and resilient Gigabit Ethernet (GbE) switching solution with integrated 10GbE uplinks for advanced Layer 3 distribution for offices and campus networks. The N3000 switch series has high-performance capabilities and wire-speed performance utilizing a non-blocking architecture to easily handle unexpected traffic loads. Use dual internal hot-swappable 80PLUS-certified power supplies for high availability and power efficiency. The switches offer simple management and scalability via an 84Gbps (full-duplex) high-availability stacking architecture that allows management of up to 12 switches from a single IP address.

Modernize campus network architectures

Modernize campus network architectures with a power-efficient and resilient 1/10GbE switching solution with dense Power over Ethernet Plus (PoE+). Select N3000 models offer 24 or 48 ports of PoE+ to deliver clean power to network devices such as wireless access points (APs), Voice-over-IP (VoIP) handsets, video conferencing systems and security cameras. For greater interoperability in multivendor networks, all N-Series switches offer the latest open-standard protocols and include technology to interface with Cisco protocol RPVST+* and devices using CDP.

Achieve high availability and full bandwidth utilization with Multi-chassis Link Aggregation (MLAG). All N-Series switches support MLAG to create active/active loop-free redundancy without spanning tree. Server rooms can deliver reliable server and storage connectivity with features to help save time and avoid configuration errors. The N3000 series is also fully tested and validated to work with Dell EqualLogic™ PS-Series storage arrays.**

Leverage familiar tools and practices

All N-Series switches include Dell Networking OS 6 designed for easier deployment, greater interoperability and a lower learning curve for network administrators. One common command line interface (CLI) and graphic user interface (GUI) using a well-known command language gets skilled network administrators productive quickly. This allows network administrators to maintain consistent configurations by running one OS release across all N-Series products. With USB auto-configuration, network administrators can rapidly deploy mirrored configurations to numerous devices by simply inserting a USB key.

Deploy with confidence at any scale

N3000 series switches help create performance assurance with a data rate up to 260Gbps (full duplex) and a forwarding rate up to 193Mpps. Scale easily with built-in rear stacking ports. Switch stacks of up to 624 1GbE ports can be managed from a single screen using the highly-available stacking architecture for high-density aggregation with seamless redundant availability. N-Series switches help provide certainty with a lifetime warranty that covers software upgrades, hardware repair or replacement, and optics and cables purchased with the switch. Details at Dell.com/LifetimeWarranty.***

Hardware, performance and efficiency

- Up to 48 line-rate GbE ports of copper or fiber, two combo ports for fiber/copper flexibility, and two integrated 10GbE SFP+ ports.
- Up to 48 ports of PoE+ in 1RU without an external power supply.
- Up to 624 1GbE ports in a 12-unit stack for high-density, high-availability aggregation and distribution in wiring closets/MDFs. Non-stop forwarding and fast failover in stack configurations.
- Hot swappable expansion module supporting dual-port SFP+ or dual-port 10GBaseT.
- Available with dual 80PLUS-certified hot swappable power supplies. Variable speed fan operation helps decrease cooling and power costs.
- Energy-Efficient Ethernet and lower power PHYs reduce power to inactive ports and idle links, providing energy savings from the power cord to the port.
- Dell Fresh Air compliance for operation in environments up to 122°F (50°C) helps reduce cooling costs in temperature constrained deployments.

Deploying, configuring and managing

- Tool-less ReadyRails™ significantly reduces rack installation time.
- USB auto-configuration rapidly deploys the switch without setting up complex TFTP configurations or sending technical staff to remote offices.
- Plug-and-Play configuration with Dell EqualLogic iSCSI storage arrays** and one-command iSCSI setup alleviates multiple step configuration and potential configuration errors.
- Management via an intuitive and familiar CLI, embedded web server (GUI), SNMP-based management console application (including Dell OpenManage Network Manager), Telnet or serial connection.
- Private VLAN extensions and Private VLAN Edge support.
- AAA authorization, TACACS+ accounting and RADIUS support for comprehensive secure access support.
- Authentication tiering allows network administrators to tier port authentication methods such as 802.1x, MAC Authentication Bypass and Captive Portal in priority order so that a single port can provide flexible access and security.
- Achieve high availability and full bandwidth utilization with MLAG and support firmware upgrades without taking the network offline.
- Interfaces with RPVST+* protocol for greater flexibility and interoperability in Cisco networks.
- Advanced Layer 3 IPv4 and IPv6 functionality.
- Flexible routing options with policy-based routing to route packets based on assigned criteria beyond destination address.
- Remote Switch Port Analyzer (RSPAN) monitors ports across a Layer 2 domain without costly dedicated network taps.

*Available starting with Dell Networking OS 6.1 release

**Contact your Dell representative for a full list of validated storage arrays.

***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.

Specifications: Dell Networking N3000 series

Dell SKU description

N3024: 24x RJ45 10/100/1000Mb auto-sensing ports, 2x SFP+ ports, 2x GbE combo media ports, 1x hot swap expansion module bay, 1x 200W PSU included

N3024F: 24x 1000-SX (up to 500m distance) or 1000-LX (up to 10km distance) SFP GbE ports, 2x SFP+ ports, 2x GbE combo media ports, 1x hot swap expansion module bay, 1x 200W PSU included

N3024P: 24x RJ45 10/100/1000Mb PoE+ (up to 30.8W) auto-sensing ports, 2x SFP+ ports, 2x GbE combo media ports, 1x hot swap expansion module bay, 1x 715W PSU included

N3048: 48x RJ45 10/100/1000 Mb auto-sensing ports, 2x SFP+ ports, 2x GbE combo media ports, 1x hot swap expansion module bay, 1x 200W PSU included

N3048P: 48x RJ45 10/100/1000 Mb PoE+ (up to 30.8W) auto-sensing ports, 2x SFP+ ports, 2x GbE combo media ports, 1x hot swap expansion module bay, 1x 1100W PSU included

Power cords
125V, 15A, 10 feet, NEMA 5-15/C13
250V, 12A, 2 meters, C13/C14
Country- and region-specific power cord options available

Modules (optional)
2-port 10 Gigabit BASE-T RJ-45 hot swappable uplink module
2-port 10 Gigabit SFP+ hot swappable uplink module

Power supplies (optional)
200W AC hot swappable with V-Lock, adds redundancy to non-PoE switches (N3024, N3024F and N3048 only)
715W AC hot swappable, adds redundancy to N3024P (N3024P only)
1100W AC hot swappable, adds redundancy to N3048P or upgrade N3024P for additional PoE+ power (N3024P and N3048P only)

Optics (optional)
Transceiver, SFP, 100BASE-FX, 1310nm wavelength, up to 2km reach
Transceiver, SFP, 1000BASE-T
Transceiver, SFP, 1000BASE-SX, 850nm wavelength, up to 550m reach
Transceiver, SFP, 1000BASE-LX, 1310nm wavelength, up to 10km reach
Transceiver, SFP, 1000BASE-ZX, 1550nm wavelength, up to 80km reach
Transceiver, SFP+, 10GbE, LRM, 1310nm wavelength, up to 220m reach
Transceiver, SFP+, 10GbE, SR, 850nm wavelength, up to 300m reach
Transceiver, SFP+, 10GbE, LR, 1310nm wavelength, up to 10km reach
Transceiver, SFP+, 10GbE, ER, 1550nm wavelength, up to 40km reach

Cables (optional)
Stacking cable 0.25m, 1m and 3m
Dell Networking cable, SFP+ to SFP+, 10GbE, copper twinax direct attach cable, 0.5m, 1m, 3m, 5m and 7m

Physical
2 rear stacking ports (21Gbps) supporting up to 84Gbps (full-duplex)
2 integrated front 10GbE SFP+ dedicated ports
Out-of-band management port (10/100/1000BASE-T)
USB (Type A) port for configuration via USB flash drive
Auto-negotiation for speed and flow control
Auto-MDI/MDIX, port mirroring
Flow-based port mirroring
Broadcast storm control
Energy-Efficient Ethernet per port settings
Redundant variable speed fans
Air flow: I/O to power supply
RJ45 console/management port with RS232 signaling (RJ-45 to female DB-9 connector cable included)
Dual firmware images on-board

Chassis
Size (1RU): 1.7126 in x 17.0866 in x 16.0236 in (43.5 mm x 434.0 mm x 407.0 mm) (H x W x D)
Approximate weight: 13.2277lbs/6kg (N3024 and N3024F), 14.5505lbs/6.6kg (N3024P), 13.8891lbs/6.3kg (N3048), 15.2119lbs/6.9kg (N3048P)
ReadyRails rack mounting system, no tools required

Environmental
Power supply: 200W (N3024, N3024F and N3048), 715W or 1,100W (N3024P), 1,100W (N3048P)
Power supply efficiency: 80% or better in all operating modes
Max. thermal output (BTU/hr): 151.4 (N3024), 204.6 (N3024F), 4,467.1 (N3024P), 220.97 (N3048), 3,113.33 (N3048P)
Power consumption max (watts): 52.8 (N3024), 67.1 (N3024F), 1,287 (N3024P), 74.8 (N3048), 2,145 (N3048P)
Operating temperature: 32° to 122°F (0° to 50°C)
Operating relative humidity: 95%
Storage temperature: −40° to 149°F (−40° to 65°C)
Storage relative humidity: 85%

Performance
MAC addresses: 16,384
Static routes: 1,024 (IPv4)/1,024 (IPv6)
Dynamic routes: 8,160 (IPv4)/4,096 (IPv6)
Switch fabric capacity (full duplex): 212Gbps (N3024, N3024F and N3024P)
260Gbps (N3048 and N3048P)
Forwarding rate: 158Mpps (N3024, N3024F and N3024P)
193Mpps (N3048 and N3048P)
Link aggregation: 128 LAG groups, 144 dynamic ports per stack, 8 member ports per LAG
Priority queues per port: 8

Line-rate Layer 2 switching: All (non-blocking)
Line-rate Layer 3 routing: All (non-blocking)
Flash memory: 256MB
Packet buffer memory: 4MB
CPU memory: 1GB
OSPF routing interfaces: 8,160
RIP routing interfaces: 512
ECMP next hops per route: 4
ECMP groups: 64
VLAN routing interfaces: 128
VLANs supported: 4,094
Protocol-based VLANs: Supported
Multicast forwarding entries: 1,536 (IPv4), 512 (IPv6)
ARP entries: 6,144
NDP entries: 400
Access control lists (ACL): Supported
MAC and IP-based ACLs: Supported
Time-controlled ACLs: Supported
Max number of ACLs: 100
Max ACL rules system-wide: 4,096
Max rules per ACL: 1,023
Max ACL rules per interface (IPv4): 3,072 (ingress), 1,024 (egress)
Max ACL rules per interface (IPv6): 1,021 (ingress), 512 (egress)
Max VLAN interfaces with ACLs applied: 24

IEEE compliance
802.1AB	LLDP
Dell	Voice VLAN
Dell	ISDP (inter-operates with devices running CDP)
802.1D	Bridging, Spanning Tree
802.1p	Ethernet Priority (User Provisioning and Mapping)
Dell	Adjustable WRR and Strict Queue Scheduling
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)
Dell	RSTP-Per VLAN (compatible with Cisco's RPVST+)*
Dell	Spanning tree optional features: STP root guard, BPDU guard, BPDU filtering
802.1X	Network Access Control, Auto VLAN
802.2	Logical Link 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)
802.3AX	LAG Load Balancing
Dell	Mutli-Chassis LAG (MLAG)
Dell	Policy Based Forwarding
802.3az	Energy Efficient Ethernet (EEE)
802.3u	Fast Ethernet (100BASE-TX) on management ports
802.3x	Flow Control
802.3z	Gigabit Ethernet (1000BASE-X)
ANSI	LLDP-MED (TIA-1057)
Dell	EqualLogic iSCSI Auto-configuration
MTU	9,216 bytes

*Available starting with Dell Networking OS 6.1 release

RFC compliance and additional features

General Internet protocols
General Internet protocols are supported. For a detailed list, please contact your Dell representative.

General IPv4 protocols
General IPv4 protocols are supported. For a detailed list, please contact your Dell representative.

General IPv6 protocols
General IPv6 protocols are supported. For a detailed list, please contact your Dell representative.

Layer 3 functionality
1058	RIPv1	2453	RIPv2
1724	RIPv2 MIB Extension	2740	OSPFv3
1765	OSPF DB overflow	2787	VRRP MIB
1850	OSPF MIB	3101	NSSA
2082	RIP-2 MD5 Auth	3137	OSPF Stub Router Advert
2328	OSPFv2	3623	Graceful Restart
2338	VRRP	3768	VRRP
2370	Opaque LSA Option	5187	OSPFv3 Graceful Restart
Dell	Policy Based Routing		

Multicast
1112	IGMPv1	3810	MLDv2
2236	IGMPv2	3973	PIM-DM
2365	Admin scoped IP Mcast	4541	IGMP v1/v2/v3 Snooping and Querier
2710	MLDv1		
2932	IPv4 MIB	4601	PIM-SM
2933	IGMP MIB	5060	PIM MIB
3376	IGMPv3	Dell	Static IP Multicast

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)
IEEE 802.1p GMRP Dynamic L2 Multicast Registration

Quality of service
2474	DiffServ Field	2697	srTCM
2475	DiffServ Architecture	4115	trTCM
2597	Assured Fwd PHB	Dell	L4 Trusted Mode (TCP/UDP)
Dell	Port Based QoS Services Mode		
Dell	Flow Based QoS Services Mode (IPv4/IPv6)		

Network management and security
1155	SMIv1	2856	Text Conv. For High Capacity Data Types
1157	SNMPv1		
1212	Concise MIB Definitions	2863	Interfaces MIB
1213	MIB-II	2865	RADIUS
1215	SNMP Traps	2866	RADIUS Accounting
1286	Bridge MIB	2868	RADIUS Attributes for Tunnel Prot.
1442	SMIv2		
1451	Manager-to-Manager MIB	2869	RADIUS Extensions
1492	TACACS+	3410	Internet Standard Mgmt. Framework
1493	Managed objects for Bridges MIB	3411	SNMP Management Framework
1573	Evolution of Interfaces	3412	Message Processing and Dispatching
1612	DNS Resolver MIB Extensions	3413	SNMP Applications
1643	Ethernet-like MIB	3414	User-based security model
1757	RMON MIB	3415	View-based control model
1867	HTML/2.0 Forms with file upload extensions	3416	SNMPv2
1901	Community-based SNMPv2	3417	Transport Mappings
1907	SNMPv2 MIB	3418	SNMP MIB
1908	Coexistence between SNMPv1/v2	3577	RMON MIB
2011	IP MIB	3580	802.1X with RADIUS
2012	TCP MIB	3737	Registry of RMON MIB
2013	UDP MIB	4086	Randomness Requirements
2068	HTTP/1.1		
2096	IP Forwarding Table MIB	4113	UDP MIB
2233	Interfaces Group using SMIv2	4251	SSH Protocol
		4252	SSH Authentication
2246	TLS v1	4253	SSH Transport
2271	SNMP Framework MIB	4254	SSH Connection Protocol
2295	Transport Content Negotiation	4419	SSH Transport Layer Protocol
2296	Remote Variant Selection	4521	LDAP Extensions
2346	AES Ciphersuites for TLS	4716	SECSH Public Key File Format
2576	Coexistence between SNMPv1/v2/v3	6101	SSL
		6398	IP Router Alert
2578	SMIv2	Dell	Enterprise MIB supporting routing features draft-ietf-hubmib-etherif-mib-v3-00.txt (Obsoletes RFC 2665)
2579	Textual Conventions for SMIv2		
2580	Conformance Statements for SMIv2		
2613	RMON MIB	Dell	LAG MIB Support for 802.3ad functionality
2618	RADIUS Authentication MIB	Dell	sflow version 1.3 draft 5
2620	RADIUS Accounting MIB	Dell	802.1x Monitor Mode
2665	Ethernet-like Interfaces MIB	Dell	Custom Login Banners
2666	Identification of Ethernet chipsets	Dell	Dynamic ARP Inspection
2674	Extended Bridge MIB	Dell	IP Address Filtering
2737	ENTITY MIB	Dell	Tiered Authentication
2818	HTTP over TLS	Dell	RSPAN
2819	RMON MIB (groups 1, 2, 3, 9)	Beta	OpenFlow 1.0

Regulatory, environment and other compliance

Safety and emissions
Australia/New Zealand: ACMA RCA Class A
Canada: ICES Class A; cUL
China: CCC Class A; NAL
Europe: CE Class A
Japan: VCCI Class A
USA: FCC Class A; NRTL UL
Eurasia Customs Union: EAC
Germany: GS mark
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, EU, China, and India. For more country-specific RoHS compliance information, please see your Dell representative.
EU WEEE
EU Battery Directive
REACH

Energy
Japan: JEL

Certifications (available or coming soon)
Available with US Trade Agreements Act (TAA) compliance.
N-Series products have the necessary features to support a PCI compliant network topology.

Learn More at Dell.com/Networking