



# DELL EMC NETWORKING N3000 SERIES SWITCHES

## Energy-efficient, cost-effective 1GbE switches for modernizing and scaling network infrastructure

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 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. Note: With OS 6.5.1.x and higher, max stack for N3000 series is 8; however, N3000E series and N3132PX-ON support max stack of 12 members. N3000 series can be stacked with N3000E series; however, stack size is limited to 8 and active VLANs to 1024.

### 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+) and PoE 60W. Select N3000 models offer 24 or 48 ports of PoE+, or up to 32 ports of PoE 60W 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, N3000 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). N3000 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. N3000 supports VRF-lite, allowing it to be partitioned into multiple virtual routers with isolated control and data planes on the same physical switch. The N3000 series is also fully tested and validated to work with Dell EMC EqualLogic™ PS-Series storage arrays.\*

### Leverage familiar tools and practices

All N-Series switches include Dell EMC Networking OS 6, designed for easier deployment, greater interoperability and a lower learning curve for network administrators. OS 6 common command line interface (CLI) and graphic user interface (GUI) are intuitive, so skilled network administrators can get productive quickly. Select N3000 switches now support the Open Network Install Environment (ONIE), enabling installation of alternate network operating systems.

\*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 EMC ProSupport.

### Deploy with confidence at any scale

N3000 series switches help create performance assurance with a data rate up to 328Gbps (full duplex) and a forwarding rate up to 428Mpps. 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. The N-Series switches' lifetime warranty covers software upgrades, hardware repair or replacement, and optics and cables purchased with the switch. Details at [Dell.com/LifetimeWarranty](http://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+ or 32 ports of PoE 60W in 1RU without an external power supply.
- Up to eight 2.5/5GbE ports delivering additional bandwidth for Wave 2 wireless access points.
- 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 EMC Fresh Air compliance for operation in environments up to 113°F (45°C) reduces cooling costs.

### Deploying, configuring and managing

- USB auto-configuration rapidly deploys the switch without complex TFTP configurations or sending technical staff to remote offices.
- Plug-and-Play configuration with Dell EMC 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 EMC OpenManage Network Manager), Telnet or serial connection.
- Private VLAN extensions and Private VLAN Edge support.

Product	Description
<b>N3000 series</b>	<p>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</p> <p>N3024ET-ON: 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, 2Gb memory and 1Gb of flash</p> <p>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</p> <p>N3024EF-ON: 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, 2Gb memory and 1Gb of flash</p> <p>N3024P: 12x RJ45 10/100/1000Mb PoE+ (up to 30.8W) auto-sensing ports, 12x RJ45 10/100/1000Mb PoE 60W auto-sensing ports, 2x SFP+ ports, 2x GbE combo media ports, 1x hot swap expansion module bay, 1x 715W PSU included (requires C15 plug)</p> <p>N3024EP-ON: 12x RJ45 10/100/1000Mb PoE+ (up to 30.8W) auto-sensing ports, 12x RJ45 10/100/1000Mb PoE 60W auto-sensing ports, 2x SFP+ ports, 2x GbE combo media ports, 1x hot swap expansion module bay, 1x 715W PSU included (requires C15 plug), 2Gb memory and 1Gb of flash</p> <p>N3048: 48x 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</p> <p>N3048ET-ON: 48x 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, 2G memory and 1Gb of flash</p> <p>N3048EP-ON: 48x RJ45 10/100/1000Mb PoE+ (up to 30.8W) auto-sensing ports; first twelve RJ45 10/100/1000Mb can provide PoE 60W auto-sensing ports, 2x SFP+ ports, 2x GbE combo media ports, 1x hot swap expansion module bay, 1x 1100W PSU included (requires C15 plug); 2GB memory and 1GB flash</p> <p>N3048P: 48x RJ45 10/100/1000Mb PoE+ (up to 30.8W) auto-sensing ports; first twelve RJ45 10/100/1000Mb PoE 60W auto-sensing ports, 2x SFP+ ports, 2x GbE combo media ports, 1x hot swap expansion module bay, 1x 1100W PSU included (requires C15 plug)</p> <p>N3132PX-ON: 24x RJ45 10/100/1000Mb PoE 60W auto-sensing ports, 8x RJ45 10/100/1000/2500/5000Mb PoE 60W auto-sensing ports, 4x SFP+ ports, 1x hot swap expansion module bay, 1x 1100W PSU included (requires C15 plug)</p>
<b>Power cords</b>	<p>C13 to NEMA 5-15, 3M</p> <p>C13 to C14, 2M</p> <p>C15 to NEMA 5-15, 2M (C15 for POE N-Series only)</p>
<b>Modules (optional)</b>	<p>2-port 10 Gigabit BASE-T RJ-45 hot swappable uplink module</p> <p>2-port 10 Gigabit SFP+ hot swappable uplink module</p> <p>2-port 40 Gigabit QSFP+ hot swappable module (N3132PX-ON only)</p> <p>Stacking module (N3132PX-ON only)</p>
<b>Power supplies (optional)</b>	<p>200W AC hot swappable with V-Lock, adds redundancy to non- PoE switches (N3024, N3024ET-ON, N3024F, N3024EF-ON, and N3048 and N3048ET-ON only)</p> <p>715W AC hot swappable, adds redundancy to N3024P and N3024EP-ON (N3024P only)</p> <p>1100W AC hot swappable, adds redundancy to N3048P and N3048EP-ON or upgrade N3024P and N3024EP-ON for additional PoE+ power (N3024P, N3024EP-ON, N3048P, N3048EP-ON, N3132PX-ON only)</p>
<b>Optics (optional)</b>	<p>Transceiver, SFP, 100BASE-FX, 1310nm wavelength, up to 2km reach</p> <p>Transceiver, SFP, 1000BASE-T</p> <p>Transceiver, SFP, 1000BASE-SX, 850nm wavelength, up to 550m reach</p> <p>Transceiver, SFP, 1000BASE-LX, 1310nm wavelength, up to 10km reach</p> <p>Transceiver, SFP, 1000BASE-ZX, 1550nm wavelength, up to 80km reach</p> <p>Transceiver, SFP+, 10GbE, LRM, 1310nm wavelength, up to 220m reach</p> <p>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</p>
<b>Cables (optional)</b>	<p>Stacking cable 0.25m, 1m and 3m</p> <p>Dell EMC Networking cable, SFP+ to SFP+, 10GbE, copper twinax direct attach cable, 0.5m, 1m, 3m, 5m and 7m</p>

# Technical specifications

## Physical

2 rear stacking ports (21Gbps) supporting up to 84Gbps (full duplex) (N3132PX-ON requires optional stacking module)

2 integrated front 10GbE SFP+ dedicated ports (N3132PX-ON includes 4 integrated SFP+ 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

Switching engine model: Store and forward

**Chassis**

Size (1RU, H x W x D):

- 1.7126 in x 17.0866 in x 6.0236 in (43.5 mm x 434.0 mm x 407.0 mm)
- (Power supply handle adds 1.38 in or 35 mm)

Approximate weight:

- 13.2277lbs/6kg (N3024, N3024ET-ON, and N3024F and N3024EF-ON),
- 14.5505lbs/6.6kg (N3024P and N3024EP-ON),
- 13.8891lbs/6.3kg (N3048 and N3048ET-ON),
- 15.2119lbs/6.9kg (N3048P & N3048EP-ON),
- 15.7lbs/7.12kg (N3132PX-ON)

ReadyRails rack mounting system, no tools required

## Environmental

**Power supply:**

- 200W (N3024, N3024ET-ON, N3024F, N3024EF-ON, and N3048 and N3048ET-ON)
- 715W or 1,100W (N3024P and N3024EP-ON)
- 1,100W (N3048P, N3048EP-ON and N3132PX-ON)

**Power supply efficiency:** 80% or better in all operating modes

**Max. thermal output (BTU/hr):**

- 151.4 (N3024, N3024ET-ON),
- 204.6 (N3024F, N3024EF-ON),
- 4,467.1 (N3024P, N3024EP-ON),
- 220.97 (N3048, N3048ET-ON),
- 3,113.33 (N3048P, N3048EP-ON),
- 7216.68 (N3132PX-ON)

**Power consumption max (watts):**

- 52.8 (N3024, N3024ET-ON),
- 671 (N3024F, N3024EF-ON),
- 1,287 (N3024P, N3024EP-ON),
- 74.8 (N3048, N3048ET-ON),
- 2,145 (N3048P, N3048EP-ON),
- 2,115 (N3132PX-ON)

**Operating temperature:** 32° to 113°F (0° to 45°C)

**Operating relative humidity:** 95%

**Storage temperature:** -40° to 149°F (-40° to 65°C)

**Storage relative humidity:** 85%

## Performance

MAC addresses: 32K

Static routes: 1,024 (IPv4)/1,024 (IPv6)

Dynamic routes: 8,160 (IPv4)/4,096 (IPv6)

Switch fabric capacity:

- 212Gbps (N3024, N3024ET-ON, N3024F, N3024EF-ON, and N3024P, and N3024EP-ON) (full duplex)
- 260Gbps (N3048, N3048ET-ON, N3048EP-ON and N3048P)
- 328Gbps (N3132PX-ON)

**Forwarding rate:**

- 158Mpps (N3024, N3024ET-ON, N3024F, N3024EF-ON, N3024EP-ON and N3024P)
- 193Mpps (N3048, N3048ET-ON, N3048EP-ON and N3048P)
- 428Mpps (N3132PX-ON)

**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 (512MB for N3132PX-ON)

**Packet buffer memory:** 4MB (5MB for N3132PX-ON)

**CPU memory:** 1GB (2GB for N3132PX-ON)

**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)

802.3at PoE+ (N3024P, N3024EP-ON, N3048EP-ON and N3048P)

802.3AX LAG Load Balancing

Dell EMC Multi-Chassis LAG (MLAG)

Dell EMC 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 EMC EqualLogic iSCSI Auto-configuration

MTU 9,216 bytes

## RFC compliance and additional features

### General Internet protocols

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

### General IPv4 protocols

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

### General IPv6 protocols

General IPv6 protocols are supported. For a detailed list, please contact your Dell EMC 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	4271 BGP
Dell Policy Based Routing	5187 OSPFv3 Graceful Restart

### 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	4601 PIM-SM
2932 IPv4 MIB	5060 PIM MIB
2933 IGMP 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
Dell Port Based QoS Services (TCP/UDP) Mode	
Dell Red/WRED	
Dell Flow Based QoS Services	
Dell Audio Video Bridging Mode (IPv4/IPv6)	
Dell UDLD	

1155	SMIPv1	2674	Extended Bridge MIB
1157	SNMPv1	2737	ENTITY MIB
1212	Concise MIB Definitions	2818	HTTP over TLS
1213	MIB-II	2819	RMON MIB (groups 1, 2, 3, 9)
1215	SNMP Traps	2856	Text Conv. For High Capacity Data Types
1286	Bridge MIB	2863	Interfaces MIB
1442	SMIPv2	2865	RADIUS
1451	Manager-to-Manager MIB	2866	RADIUS Accounting
1492	TACACS+	2868	RADIUS Attributes for Tunnel Prot.
1493	Managed objects for Bridges MIB	2869	RADIUS Extensions
1573	Evolution of Interfaces	3410	Internet Standard Mgmt. Framework
1612	DNS Resolver MIB Extensions	3411	SNMP Management Framework
1643	Ethernet-like MIB	3412	Message Processing and Dispatching
1757	RMON MIB	3413	SNMP Applications
1867	HTML/2.0 Forms with file upload extensions	3414	User-based security model
1901	Community-based SNMPv2	3415	View-based control model
1907	SNMPv2 MIB	3416	SNMPv2
1908	Coexistence between SNMPv1/v2	3417	Transport Mappings
2011	IP MIB	3418	SNMP MIB
2012	TCP MIB	3577	RMON MIB
2013	UDP MIB	3580	802.1X with RADIUS
2068	HTTP/1.1	3737	Registry of RMON MIB
2096	IP Forwarding Table MIB	4086	Randomness Requirements
2233	Interfaces Group using SMIPv2	4113	UDP MIB
2246	TLS v1	4251	SSHv2 Protocol
2271	SNMP Framework MIB	4252	SSHv2 Authentication
2295	Transport Content Negotiation	4253	SSHv2 Transport
2296	Remote Variant Selection	4254	SSHv2 Connection Protocol
2346	AES Ciphersuites for TLS	4419	SSHv2 Transport Layer Protocol
2576	Coexistence between SNMPv1/v2/v3	4521	LDAP Extensions
2578	SMIPv2	4716	SECSH Public Key File Format
2579	Textual Conventions for SMIPv2	6101	SSL
2580	Conformance Statements for SMIPv2	6398	IP Router Alert
2613	RMON MIB	Dell	Enterprise MIB supporting routing features draft-ietf-hubmib-etherif-mib-v3-00.txt (Obsoletes
2618	RADIUS Authentication MIB		
2620	RADIUS Accounting MIB		
2665	Ethernet-like Interfaces MIB		
2666	Identification of Ethernet chipsets		

## 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; FDA 21 CFR 1040.10 and 1040.11  
 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 EMC 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 EMC representative.

### EU WEEE

EU Battery Directive

### REACH

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.

## 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.



#### Optimize

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.

Learn more at [Dell.com/LifecycleServices](http://Dell.com/LifecycleServices)

Learn more at [Dell.com/Networking](http://Dell.com/Networking)