



DELL EMC POWERSWITCH N2000 SERIES SWITCHES

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

The N2000 switch series offers a power-efficient Gigabit Ethernet (GbE) network-access switching solution with integrated 10GbE uplinks. With high-performance capabilities and wire-speed performance, utilizing a non-blocking architecture to easily handle unexpected traffic loads, the switches offer simple management and scalability via an 84Gbps (full-duplex) high availability stacking architecture that allows management of up to eight* switches from a single IP address. An integrated 80PLUS-certified power supply and features such as Energy-Efficient Ethernet and short cable detection provide energy efficiency to help decrease power and cooling costs.

Modernize campus network architectures

Modernize campus network architectures with a power-efficient and resilient 1/10GbE switching solution with Power over Ethernet Plus (PoE+). Select N2000 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, N2000 switches offer the latest open-standard protocols and include technology to interface with Cisco protocol RPVST+ and devices using CDP.

Leverage familiar tools and practices

All N-Series switches include Dell EMC Networking OS6, 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. 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

N2200-ON series switches help create performance assurance with a data rate up to 220Gbps (full duplex) and a forwarding rate up to 256Mpps. Scale easily with built-in rear stacking ports. Switch stacks of up to 400* 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.**

* Up to 12 units running firmware pre-6.6.x.x. 6.6.x.x firmware reduces the maximum stack size of N2000 and N2128PX Series to 8 units.

**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. For details, visit <https://www.dell.com/en-us/work/shop/networkingwarranty/cp/networkingwarranty>.

Hardware, performance and efficiency

- Up to 48 line-rate GbE RJ-45 ports and two integrated 10GbE SFP+ ports.
- Support for 24 ports of PoE+ in 1RU or up to 48 ports of PoE+ with an optional external power supply.
- N2128PX-ON supports PoE 60W over its 4 2.5GbE ports, delivering up to 60W per port and bandwidth for Wave 2 wireless.
- Up to 600 1GbE ports in an 8-unit* stack for high-density, high-availability in IDFs, MDFs and wiring closets.
- Non-stop forwarding and fast failover in stack configurations.
- 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 113°F (45°C) helps reduce cooling costs in temperature constrained deployments.

Deploying, configuring and managing

- USB auto-configuration rapidly deploys the switch without complex TFTP configurations or sending technical staff to remote offices.
- 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.
- Layer 3 Standard IPv4 and IPv6 functionality including static routing, RIP, and OSPFv2 support.

Product	Description
N2000 Series	<p>N2024: 24x RJ45 10/100/1000Mb auto-sensing ports, 2x SFP+ ports, 2x stacking ports, 1 integrated 100W PSU</p> <p>N2024P: 24x RJ45 10/100/1000Mb PoE+ (up to 30.8W) autosensing ports, 2x SFP+ ports, 2x stacking ports, 1 integrated 1000W PSU (requires C15 plug)</p> <p>N2048: 48x RJ45 10/100/1000Mb auto-sensing ports, 2x SFP+ ports, 2x stacking ports, 1 integrated 100W PSU</p> <p>N2048P: 48x RJ45 10/100/1000Mb PoE+ (up to 30.8W) autosensing ports, 2x SFP+ ports, 2x stacking ports, 1 integrated 1000W PSU (requires C15 plug)</p> <p>N2128PX-ON: 24x RJ45 10/100/1000Mb PoE+ (up to 30.8W) auto-sensing ports, 4x RJ45 10/100/1000/2500Mb PoE 60W auto-sensing ports, 2x SFP+ ports, 2x stacking ports, 1 integrated 1000W PSU (requires C15 plug)</p>
Power cords	<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>
Power supplies (optional)	<p>RPS720 external power supply for N2000 non-POE (720 watts): N2024 and N2048 (sold separately)</p> <p>MPS1000 external power supply for N2000 PoE+ switches (1000 watts): N2024P, N2048P, N2128PX-ON (sold separately)</p>
Optics (optional)	<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</p> <p>Transceiver, SFP+, 10GbE, LR, 1310nm wavelength, up to 10km reach</p> <p>Transceiver, SFP+, 10GbE, ER, 1550nm wavelength, up to 40km reach</p>
Cables (optional)	<p>Stacking cable 0.5m, 1m and 3m</p> <p>Dell Technologies Networking cable, SFP+ to SFP+, 10GbE, copper twinax direct attach cable, 0.5m, 1m, 3m, 5m and 7m</p>

Technical specifications

Hardware specifications

Physical

2 rear stacking ports (21Gbps) supporting up to 84Gbps (full duplex)

2 integrated front 10GbE SFP+ dedicated ports

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

Integrated power supply:

100W AC (N2024, N2048),

1,000W AC (N2024P, N2048P, N2128PX-ON)

RJ45 console 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):

N2024 and N2048: 1.7 in x 17.3 in x 10.1 in

(43.5 mm x 440.0 mm x 257.0 mm)

N2024P, N2048P, N2128PX-ON:

1.7 in x 17.3 in x 15.2 in

(43.5 mm x 440.0 mm x 387.0 mm)

Approximate weight:

8.135lbs/3.69kg (N2024),

14.0435lbs/6.37kg (N2024P),

8.9287lbs/4.05kg (N2048),

14.9914lbs/6.8kg (N2048P),

15.05lbs/6.8kg (N2128PX-ON)

Rack mounting kit with 2 mounting brackets, bolts and cage nuts

Environmental

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

Max. thermal output (BTU/hr):

117.44 (N2024), 3,113.33 (N2024P), 167.7 (N2048),

6069.80 (N2048P)

Power consumption max (watts):

42.9 (N2024), 913 (N2024P), 53.9 (N2048),

1738 (N2048P), 1039.8 (N2128PX-ON)

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

Operating humidity: 95%

Storage temperature:

-40° to 149°F (-40° to 65°C)

Storage relative humidity: 85%

Performance

MAC addresses: 32K

Static routes: 256 (IPv4)/128 (IPv6)

Dynamic routes: 256 (IPv4)

Switch fabric capacity:

172Gbps (N2024 and N2024P) (full duplex);

192Gbps (N2128PXON); 220Gbps (N2048 and N2048P)

Forwarding rate:

128 Mpps (86 Gbps) - N2024 and N2024P

164 Mpps (110 Gbps) - N2048 and N2048P

256 Mpps (172 Gbps) - N2128PX-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 N2128PX-ON)

Packet buffer memory: 4MB (5MB for N2128PXON)

CPU memory: 1GB (2GB for N2128PX-ON)

RIP routing interfaces: 256

VLAN routing interfaces: 256

VLANs supported: 4,094

Protocol-based VLANs: Supported

ARP entries: 4,096

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: 2,048

Max rules per ACL: 1,023

Max ACL rules per interface (IPv4):

1,024 (ingress), 512 (egress)

Max ACL rules per interface (IPv6):

512 (ingress), 256 (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+ (N2024P and N2048P)

802.3AX LAG Load Balancing

Dell Multi-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)

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 Technologies representative.

General IPv4 protocols

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

General IPv6 protocols

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

Layer 3 functionality

1058 RIPV1

2082 RIP-2 MD5 Auth

1724 RIPV2 MIB Extension

2453 RIPV2

Multicast

2365 Admin scoped IP Mcast

4541 IGMP v1/v2/v3

2932 IPv4 MIB Snooping and Querier

IEEE 802.1ag draft 8.1 – Connectivity Fault Management

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(TCP/UDP) Services Mode

Dell UDLD

Dell Flow Based QoS Services Mode (IPv4/IPv6)

Network management and security

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 Ethernet-like MIB

1757 RMON MIB

1867 HTML/2.0 Forms with File Upload Extensions

1901 Community-based SNMPv2

1907 SNMPv2 MIB

1908 Coexistence Between SNMPv1/v2

2011 IP MIB

2012 TCP MIB

2013 UDP MIB

2068 HTTP/1.1

2096 IP Forwarding Table MIB

2233 Interfaces Group using SMIv2

2246 TLS v1

2271 SNMP Framework MIB

2295 Transport Content Negotiation

2296 Remote Variant Selection

2576 Coexistence Between SNMPv1/v2/v3

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

2818 HTTP over TLS

2819 RMON MIB (groups 1, 2, 3, 9)

2856 Text Conv. For High Capacity Data Types

2863 Interfaces MIB

2865 RADIUS

2866 RADIUS Accounting

2868 RADIUS Attributes for Tunnel Prot.

2869 RADIUS Extensions
3268 AES Ciphersuites for TLS
3410 Internet Standard Mgmt. Framework
3411 SNMP Management Framework
3412 Message Processing and Dispatching
3413 SNMP Applications
3414 User-based security model
3415 View-based control model
3416 SNMPv2
3417 Transport Mappings
3418 SNMP MIB
3577 RMON MIB
3580 802.1X with RADIUS
3737 Registry of RMOM MIB
4086 Randomness Requirements
4113 UDP MIB
4251 SSHv2 Protocol
4252 SSHv2 Authentication
4253 SSHv2 Transport
4254 SSHv2 Connection Protocol
4419 SSHv2 Transport Layer Protocol
4521 LDAP Extensions
4716 SECSH Public Key File Format
6101 SSL
6398 IP Router Alert
Dell Enterprise MIB supporting routing features
draft-ietfhubmib-etherifmib-v3-00.txt
(Obsoletes RFC 2665)
Dell LAG MIB Support for 802.3ad Functionality
Dell sflow version 1.3 draft 5
Dell 802.1x Monitor Mode
Dell Custom Login Banners
Dell Dynamic ARP Inspection
Dell IP Address Filtering
Dell Tiered Authentication
Dell RSPAN
Dell Change of Authorization
Dell OpenFlow 1.3
Dell Python Scripting
Dell Support Assist
HiveManager NG

Regulatory, environment and other compliance

Safety and emissions

Australia/New Zealand: ACMA RCM 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 Dell Technologies 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 Technologies 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 Technologies 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.



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

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