DELL EMC NETWORKING 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 twelve 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. The N2000 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 EMC 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. 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

N2000 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 600 1GbE ports in a 12-unit stack for high-density, high-availability in IDF, MDF, 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.

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 a 12-unit stack for high-density, high-availability in IDF, MDF, and wiring closets.

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

*Contact your Dell EMC 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.
### Product Description

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>N2000 series</strong></td>
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<tr>
<td>N2024:</td>
<td>24x RJ-45 10/100/1000Mb auto-sensing ports, 2x SFP+ ports, 2x stacking ports, 1 integrated 100W PSU</td>
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<tr>
<td>N2024P:</td>
<td>24x RJ-45 10/100/1000Mb PoE+ (up to 30.8W) autosensing ports, 2x SFP+ ports, 2x stacking ports, 1 integrated 1000W PSU (requires C15 plug)</td>
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<tr>
<td>N2048:</td>
<td>48x RJ-45 10/100/1000Mb auto-sensing ports, 2x SFP+ ports, 2x stacking ports, 1 integrated 100W PSU</td>
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<tr>
<td>N2048P:</td>
<td>48x RJ-45 10/100/1000Mb PoE+ (up to 30.8W) autosensing ports, 2x SFP+ ports, 2x stacking ports, 1 integrated 1000W PSU (requires C15 plug)</td>
</tr>
<tr>
<td>N2128PX-ON:</td>
<td>24x RJ-45 10/100/1000Mb PoE+ (up to 30.8W) auto-sensing ports, 4x RJ-45 10/100/1000/2500Mb PoE 60W auto-sensing ports, 2x SFP+ ports, 2x stacking ports, 1 integrated 1000W PSU (requires C15 plug)</td>
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<tr>
<th><strong>Power cords</strong></th>
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<tbody>
<tr>
<td>C13 to NEMA 5-15, 3M</td>
<td></td>
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<tr>
<td>C13 to C14, 2M</td>
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<tr>
<td>C15 to NEMA 5-15, 2M (C15 for POE N-Series only)</td>
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<tr>
<th><strong>Power supplies (optional)</strong></th>
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<tr>
<td>RPS720 external power supply for N2000 non-POE (720 watts): N2024 and N2048 (sold separately)</td>
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<tr>
<td>MPS1000 external power supply for N2000 PoE+ switches (1000 watts): N2024P, N2048P, N2128PX-ON (sold separately)</td>
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<tr>
<th><strong>Optics (optional)</strong></th>
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<tr>
<td>Transceiver, SFP, 1000BASE-T</td>
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<tr>
<td>Transceiver, SFP, 1000BASE-SX, 850nm wavelength, up to 550m reach</td>
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<tr>
<td>Transceiver, SFP, 1000BASE-LX, 1310nm wavelength, up to 10km reach</td>
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<tr>
<td>Transceiver, SFP+, 10GbE, LR, 1510nm wavelength, up to 40km reach</td>
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<th><strong>Cables (optional)</strong></th>
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<tr>
<td>Stacking cable 0.5m, 1m and 3m</td>
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<tr>
<td>Dell Networking cable, SFP+ to SFP+, 10GbE, copper twinax direct attach cable, 0.5m, 1m, 3m, 5m and 7m</td>
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### Technical 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
- Air flow: I/O to power supply
- Integrated power supply: 100W AC (N2024, N2048), 1,000W AC (N2024P, N2048P, N2128PX-ON)
- RJ-45 console port with RS232 signaling (RJ-45 to female D9-9 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 15.2 in (43.5 mm x 440.0 mm x 387.0 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: 8.3551lbs/3.69kg (N2024), 14.0435lbs/6.37kg (N2024P), 8.8927lbs/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); 220Gbps (N2128PX-ON)
- Forwarding rate: 128Mpps (N2024 and N2024P); 164Mpps (N2048 and N2048P); 256Mpps (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 N2128PX-ON)

#### 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)
Network management and security
1155 SMIPv1  1573 Evolution of Interfaces
1157 SNMPv1  1612 DNS Resolver
1212 Concise MIB  1613 MIB-2i
1213 MIB-2i  1643 Ethernet-like MIB
1215 SNMP Traps  1757 RMON MIB
1286 Bridge MIB  1867 HTML/2.0 Forms with File Upload Extensions
1442 SMIPv2  1901 Community-based SNMPv2
1451 Manager-to-Manager MIB  1907 SNMPv2 MIB
1492 TACACS+  
1493 Managed Objects for Bridges MIB

Layer 3 functionality
1058 RIPv1  2082 RIPv-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 srtCM
2587 Assured Fwd PHB Dell L4 Trusted Mode
Dell Port Based QoS(TCP/UDP) Services Mode Dell UDL
Dell Flow Based QoS Services Mode (IPv4/IPv6)
RFC compliance and additional features
General Internet protocols
General IPv4 protocols
General IPv6 protocols

Regulatory, environment and other compliance
Safety and emissions
Australia/New Zealand: ACMA RCM Class A
Canada: CCa 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

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.

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