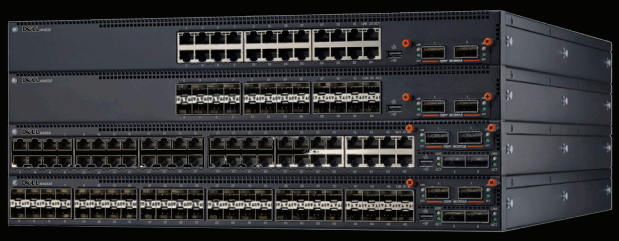

DELL EMC NETWORKING N4000 SERIES SWITCHES

Energy-efficient, cost-effective 10GbE switches for modernizing and scaling network infrastructure

The N4000 switch series offers a power-efficient and resilient 10 Gigabit Ethernet (10GbE) switching solution with support for 40GbE uplinks for advanced Layer 3 distribution for offices and campus networks. The N4000 switch series has high-performance capabilities and wire-speed performance utilizing a non-blocking architecture to easily handle unexpected traffic loads. The N4000 series includes dual internal hot-swappable 80PLUS-certified power supplies for high availability and power efficiency. The switches offer simple management and scalability via flexible user port stacking at 10Gbps or 40Gbps. The high-availability stacking architecture 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 10/40GbE switching solution for environments requiring high throughput and availability at the aggregation or core. For greater interoperability in multivendor networks, N4000 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). N4000 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. These high density 24-port or 48-port 10GbE switches are ready for converged fabric requirements for SAN and LAN networks with loss-less operation for iSCSI environments with Data Center Bridging (DCB). N4000 supports VRF-lite, allowing it to be partitioned into multiple virtual routers with isolated control and data planes on the same physical switch. The N4000 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 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.

*Available starting with Dell Networking OS 6.1 release
**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.

Deploy with confidence at any scale

N4000 series switches help create performance assurance with a data rate up to 1.28Tbps (full duplex) and a forwarding rate up to 952Mpps. Scale easily with 10/40Gbps user port stacking supporting distances up to 100 meters. Switch stacks of up to 672 10GbE 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 as well as optics and cables purchased with the switch. Details at Dell.com/LifetimeWarranty.***

Hardware, performance and efficiency

- Up to 32 10GbE ports (N4032 and N4032F) and up to 64 10GbE ports (N4064 and N4064F) using breakout cables.
- Converged network support for DCB with Priority Flow Control (802.1Qbb), ETS (802.1Qaz), DCBx, iSCSI TLV Support.
- Up to 672 10GbE 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 QSFP+ (8x 10GbE), quad-port 10GBaseT and quad-port SFP+.
- Dual 80PLUS-certified efficient hot swappable power supplies and redundant variable speed fan operation help 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 113°F (45°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 switches without 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.

Product	Description
N4000 series	N4032: 24x 10GbE RJ45 auto-sensing (10Gb/1Gb/100Mb) fixed ports, 1x hot swap expansion module bay, 2x redundant 460W PSU included N4032F: 24x 10GbE SFP+ auto-sensing (10Gb/1Gb) fixed ports, 1x hot swap expansion module bay, 2x redundant 460W PSU included N4064: 48x 10GbE RJ45 auto-sensing (10Gb/1Gb/100Mb) fixed ports, 2x 40GbE QSFP+ fixed ports, 1x hot swap expansion module bay, 2x redundant 460W PSU included N4064F: 48x 10GbE SFP+ auto-sensing (10Gb/1Gb) fixed ports, 2x 40GbE QSFP+ fixed ports, 1x hot swap expansion module bay, 2x redundant 460W 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)	4-port 10 Gigabit SFP+ hot swappable module 4-port 10 Gigabit Base-T RJ-45 hot swappable module 2-port 40 Gigabit QSFP+ hot swappable module
Optics (optional)	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+, 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, QSFP+, 40GbE, SR4, 850nm wavelength, up to 150m reach Transceiver, QSFP+, 40GbE, ESR, 850nm wavelength, up to 300m reach Transceiver, QSFP+, 40GbE, LR4, 1310nm wavelength, up to 10km reach Transceiver, QSFP+, 40GbE, PSM4 with 1m, 5m or 15m pigtail to MPO
Cables (optional)	Dell Networking cable, SFP+ to SFP+, 10GbE, copper twinax direct attach cable, 0.5m, 1m, 3m, 5m, 7m Dell Networking cable, QSFP+ to 4x SFP+, 40GbE to 4x10GbE, passive copper breakout cable, 0.5m, 1m, 3m, 5m, 7m Dell Networking cable, QSFP+ to QSFP+, 40GbE, passive copper direct attach cable, 0.5m, 1m, 3m, 5m, 7m OM3 MTP fiber cable, QSFP+ to QSFP+, 40GbE, requires QSFP+ optics, 1m, 3m, 5m, 7m, 10m, 25m, 50m, 75m, 100m Fiber breakout cable, QSFP+ to 4x SFP+, 40GbE MTP to 4x 10GbE LC, requires 1x QSFP+ and 4x SFP+ optics, 1m, 3m, 5m, 7m

Technical specifications

Physical

User port stacking up to 100m using 10Gb or 40Gb supporting up to 160Gbps on N4032 and 320Gbps on N4064 (full duplex)
Rear 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
Dual redundant hot swappable power supplies included: 460W
RJ45 console/management port with RS232 signaling (RJ-45 to female DB-9 connector cable included)
Dual firmware images on-board

Chassis

Size (1RU, H x W x D): 1.71 in x 17.08 in x 18.11 in (43.43 mm x 433.83 mm x 459.99 mm)
(Power supply handle adds 1.13 in or 28.7 mm)
Approximate weight: 21.67lbs/9.83kg (N4032), 21.14lbs/9.59kg (N4032F), 24.07lbs/10.92kg (N4064), 23.28lbs/10.56kg (N4064F)
ReadyRails rack mounting system, no tools required

Environmental

Power supply efficiency: 80% or better in all operating modes
Max. thermal output (BTU/hr): 823.44 (N4032), 603.86 (N4032F), 1353.53 (N4064), 754.82 (N4064F)
Power consumption max (watts): 240 (N4032), 176 (N4032F), 395 (N4064), 220 (N4064F)
Operating temperature: 32° to 113°F (0° to 45°C)
Operating relative humidity: 90%
Storage temperature: –4° to 158°F (–20° to 70°C)
Storage relative humidity: 95%

Performance

MAC addresses: 131,072
Static routes: 1,024 (IPv4)/1,024 (IPv6)
Dynamic routes: 8,160 (IPv4)/4,096 (IPv6)
Switch fabric capacity: 640Gbps (N4032 and N4032F) (full duplex)
1.28Tbps (N4064 and N4064F)
Forwarding rate: 476Mpps (N4032 and N4032F) 952Mpps (N4064 and N4064F)
Link aggregation: 128 LAG groups, 144 dynamic ports per stack, 8 member ports per LAG
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: 9MB
CPU memory: 2GB
OSPF routing interfaces: 8,160
RIP routing interfaces: 512
ECMP next hops per route: 4
ECMP groups: 1,024
VLAN routing interfaces: 128
VLANs supported: 4,094
Protocol-based VLANs: Supported
Multicast forwarding entries: 512 (IPv4), 256 (IPv6)
ARP entries: 6,144
NDP entries: 1024
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: 3,072
Max rules per ACL: 1,023
Max ACL rules per interface (IPv4): 2,047 (ingress), 1,023 (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
802.1Qaz DCBx, Enhanced Transmission Selection (ETS)
802.1Qbb Priority-based Flow Control (PFC)
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 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
1724 RIPv2 MIB Extension
1765 OSPF DB overflow
1850 OSPF MIB
2082 RIP-2 MD5 Auth
2328 OSPFv2
2338 VRRP
2370 Opaque LSA Option
Dell Policy Based Routing
2453 RIPv2
2740 OSPFv3
2787 VRRP MIB
3101 NSSA
3137 OSPF Stub Router Advert
3623 Graceful Restart
3768 VRRP
4271 BGP
5187 OSPFv3 Graceful Restart

Multicast

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

Quality of service

2474 DiffServ Field
2475 DiffServ Architecture
2597 Assured Fwd PHB
Dell L4 Trusted Mode
Dell Port Based QoS Services (TCP/UDP)
Mode Dell Red/WRED
Dell Flow Based QoS Services
2697 srTCM
4115 trTCM
Dell Audio Video

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
2346 AES Ciphersuites for TLS
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
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 RMON 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-ietf-hubmib-etherif-mib-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 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 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.

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

Learn more at Dell.com/Networking

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