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THE ENTERPRISE FUTURE-PROOFS THE HIGH-DENSITY, HIGH-PERFORMANCE WIRING CLOSET

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Product Brief

Nortel Ethernet Routing Switch 8300

Nortel Ethernet Routing Switch 8300 benefits

- › Power to IP phones, wireless access points and Web cameras
- › Power over Ethernet, Gigabit Ethernet to the desktop, high-density Ethernet and Fast Ethernet
- › Enhanced network security to support true network convergence with Nortel Secure Network Access (NSNA)
- › Maximize investment with integrated uplinks on switch fabric module
- › Cost-effective modular wiring closet switch

Business advantage

Leading enterprises are taking a different approach to networking — one that involves increased availability, performance, security and intelligence. The most effective way of delivering against this strategy is to have an Edge Switch that provides the essential elements seamlessly in one modular platform; enter the Ethernet Routing Switch 8300 from Nortel.

The multimedia-rich applications that form the lifeblood of today's modern business require a network that delivers service without compromise; flexible bandwidth

with standards-based Power over Ethernet, high-speed performance with integrated Quality of Service, embedded security capabilities with optional enhanced integrity checking of PCs, backed-up by a roadmap that truly future-proofs those critical wiring closet investments.

- › The Ethernet Routing Switch 8300 provides customers with unmatched network resiliency for the enterprise where the network is critical to user productivity. Nortel's switching portfolio implements maximum device level reliability with the highly resilient feature — Split Multi-Link Trunking (SMLT) — designed to deliver 99.999 percent reliability to the network.
- › For enterprises challenged with managing the deployment of converged communication such as IP Telephony, Power over Ethernet, Gig to the desktop, wireless LANs and multimedia applications such as distance learning and video surveillance, the Ethernet Routing Switch 8300 is the common sense approach.



➤ As emerging applications introduce new traffic patterns and wireless access makes securing the edge increasingly important, the Ethernet Routing Switch 8300 helps ensure security is not compromised by implementing industry-standard access control (802.1X). Nortel's advanced Secure Network Access solution is also supported, ensuring host integrity without the need for additional client-based software.

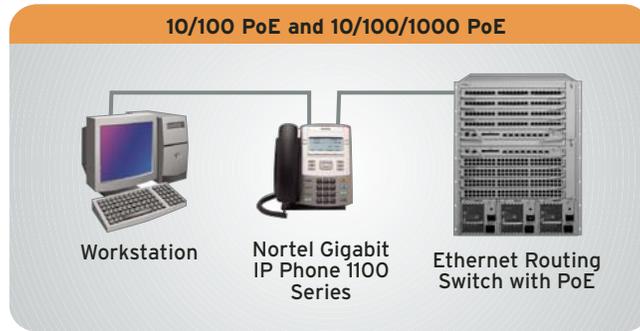
As the network evolves, unraveling exciting new applications, performance, reliability and resiliency become paramount. The Ethernet Routing Switch 8300 is the wiring closet switch that delivers on these promises and ensures an easier transition and simplified management of the network today, and into the future.

Converged communications

One of the fundamental shifts in networking is that of the desktop PC now being connected to the network via an IP Telephone handset — typically connected to the Wiring Closet Switch via a Gigabit Ethernet port supporting Power over Ethernet (PoE), as shown in Figure 1.

Imagine a knowledge worker downloading project worksheets over the super-fast Gigabit link, while at the same time dialing into a conference bridge using his VoIP handset. At the same time, his neighbor watches a Webcast published by the Training Department and completes an online certification examination. This is the reality of today's network: all traffic is not made equal, but must be supported at all times. The Ethernet Routing Switch

Figure 1. Workstation/phone to Ethernet Routing Switch 8300



8300 accelerates the deployment of today's converged applications by implementing key enabling technologies while minimizing both capital and operational costs.

IEEE-compliant 802.3af Power over Ethernet (PoE)

Gigabit PoE is moving into the mainstream and is becoming a viable alternative for VoIP deployments. The recently introduced 10/100/1000 PoE and 10/100 PoE modules facilitate this migration cycle. A typical enterprise solution with the Ethernet Routing Switch 8300 and IP-powered devices is detailed in Figure 2.

Gigabit to the Desktop

Today's bandwidth-hungry applications like desktop videoconferencing and multimedia require high-speed links to the desktop. By providing ten times the bandwidth over Fast Ethernet, Gigabit Ethernet mitigates congestion, accelerates voice and video traffic and affords investment protection for existing networks. The Ethernet Routing Switch 8300 makes the transition from Fast Ethernet to Gigabit Ethernet much easier with the release of the 48-port 10/100/1000 module.

Auto discovery feature

The Ethernet Routing Switch 8300 automatically recognizes the connection of a device and immediately sends power to it. This automatic capability ensures fast connectivity without manual intervention.

Dynamic power management

Each port on the Ethernet Routing Switch 8348TX-PWR and the 8348GTX-PWR can be configured to limit the power delivered to a device. Each port can also be configured for power priority level — Low, High and Critical. On the switch, total available power is monitored. In the case where all available power is fully utilized, the switch may turn off lower priority ports and turn on higher priority ports.

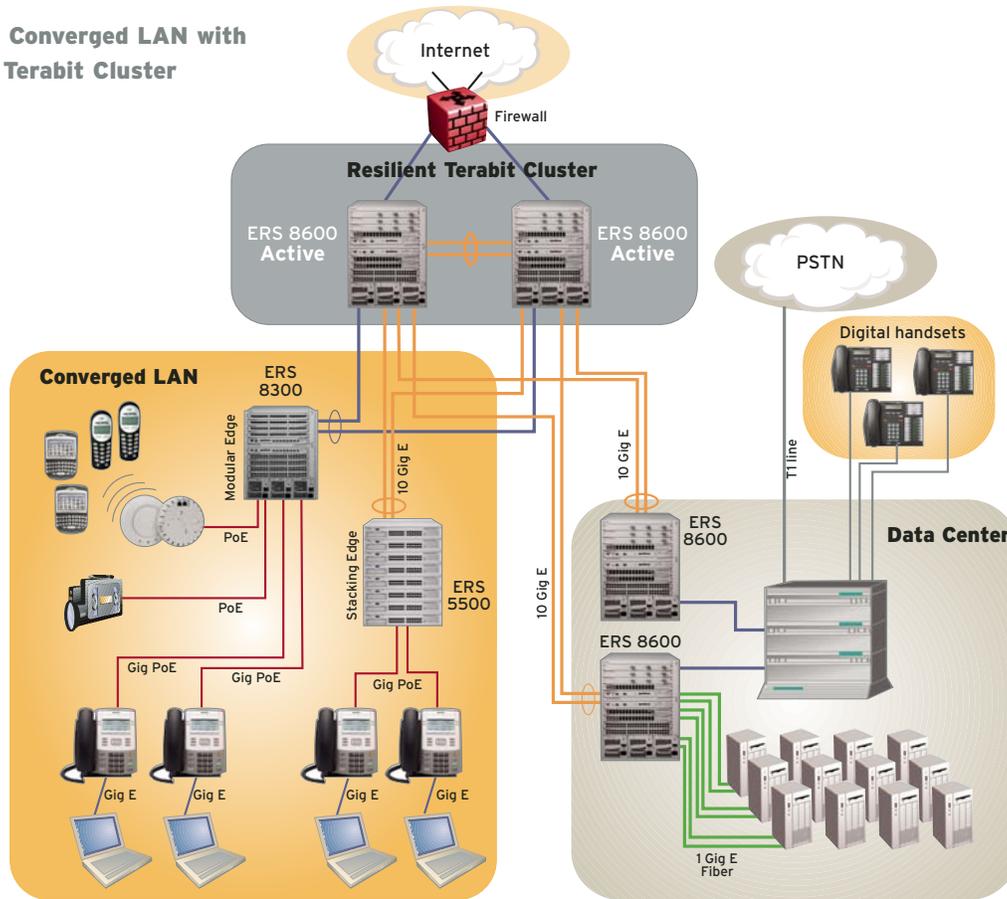
Integrated Access Control security

Security consistently appears as one of the key concerns for technical staff and management. At the Board level of the enterprise, lapses or failures in securing the network can have catastrophic impact on the profitability of a company. Nortel

Table 1. Maximum PoE port densities for the Ethernet Routing Switch

Module and interface type	PoE ports/module	Ethernet Routing Switch 8306	Ethernet Routing Switch 8310
		6-slot chassis	10-slot chassis
8348GTX-PWR 48-port 10/100/1000 Power over Ethernet module	48 10/100/1000 PoE	192 10/100/1000 PoE	384 10/100/1000 PoE
8348TX-PWR 48-port 10/100 Power over Ethernet module	48 10/100 PoE	192 10/100 PoE	384 10/100 PoE

Figure 2. Converged LAN with Resilient Terabit Cluster



has developed a multi-layered strategy for enhanced defense against threats from external and internal sources. The Ethernet Routing Switch 8300 plays a key role in this strategy by supporting comprehensive security services for access control at the Edge.

802.1X/Extensible Authentication Protocol

Nortel's commitment to open standards extends to the Ethernet Switching portfolio with support for the IEEE 802.1X/Extensible Authentication Protocol (EAP) across the entire range of Edge Switches. The Ethernet Routing Switch 8300 has comprehensive 802.1X/EAP support with enhancements such as Multiple Hosts Multiple Authentications (MHMA), Guest VLAN for Single Host Single Authentication (SHSA) and centralized MAC-based authentication.

Nortel's Secure Network Access Solution

Supplementing the standards-based approach is support for the next generation of network access control: Nortel Secure Network Access. This is a Nortel initiative that leverages all of the advantages of third-party authentication and host integrity checking solutions, but delivers this with the added advantages of being clientless, and being fully integrated with policy and authorization systems.

Advanced resiliency

Resiliency, intelligence and security have become terms you cannot ignore. Nortel delivers on these promises by introducing the next evolution in networking with the Resilient Terabit Cluster. Tolly Group verified, this solution helps you provide an infrastructure that is built to handle today's applications as well as hedging your bets for what is coming tomorrow. The Ethernet Routing Switch 8300 is

an integral part of the Resilient Terabit Cluster design, bringing 10/100/1000 PoE to the edge.

Split Multi-Link Trunking (SMLT)

Nortel's advanced technology for resiliency, SMLT, provides for sub-second failover and sub-second recovery with full load balancing by eliminating the network node as a point of failure. SMLT enhances the benefits of 802.3ad link aggregation by eliminating the link as a point of failure and by allowing trunk members to terminate at different physical switches. The Ethernet Routing Switch 8300 deployed in the wiring closet is compatible with SMLT when implemented in the network with an Ethernet Routing Switch 8600 switch in the core. SMLT capabilities will be integrated in Ethernet Routing Switch 8300 in a future release for installation of the Ethernet Routing Switch 8300 as a medium or branch office core switch.

Advanced IP services

Quality of Service (QoS)

The Ethernet Routing Switch 8300's QoS features allow you to not just utilize bandwidth more efficiently, optimizing existing network resources and capabilities, but also provide packet classification and marking at the edge of the network, simplifying the QoS deployment at the aggregation and core of the network. By classifying, prioritizing, policing and marking (DiffServ Code Point) LAN traffic, networks can offer reliable connectivity and required bandwidth for mission-critical applications like IP Telephony and mission-critical data applications to specific groups and users, and to individual devices. The Ethernet Routing Switch 8300 provides eight hardware queues.

For each of these applications, advanced QoS features support Internet Engineering Task Force (IETF) standard DiffServ QoS architecture — a packet classification based on the content of IP packet header fields (voice, video, data) traffic policing and remote sniffing.

Traffic shaping

Traffic shaping offers the ability to limit traffic on each port. While traffic policing is needed to provide different levels of service to data streams on the ingress ports, traffic shaping is needed to smooth the traffic from the egress ports. Ethernet Routing Switch 8300 supports port-based traffic shaping. Enterprises working with service providers or carriers utilize this feature when they are deploying Ethernet in place of the traditional Frame Relay, ISDN or ATM WAN access solutions.

IP filtering

IP filters can be used to manage traffic and to provide security. Filters are defined with match conditions and the actions to be performed when the condition is satisfied. Only data that matches the pattern is allowed to pass through the filter. Filters can be used to set traffic priority, drop or allow IP packets, as well as define conditions for mirroring of traffic.

Traffic policing

Traffic policing enables provisioning of different service levels by limiting traffic throughput at the ingress (incoming) port of the Ethernet Routing Switch 8300.

Traffic policing enables provisioning of different levels of service by limiting traffic throughput at the ingress (incoming) port of the switch. Traffic policing will be supported on the Ethernet Routing Switch 8300 in a future software release.

Enhanced usability and flexibility

The network needs to be closely aligned with the business by having flexibility and the capability to adapt without impacting availability. Flexibility is about being in control, being able to adapt to the challenges that the business will create from time to time, without costing more in terms of manpower or additional equipment. The Ethernet Routing Switch 8300 includes a comprehensive set of value-adding features that facilitate the most cost-effective solution for the wiring closet.

Network management

The Ethernet Routing Switch 8300 can be managed by a variety of management tools to adapt to the specific operating environment. These include: dual Command Line interface (CLI), Java™-based Device Manager, Web-based management, SNMP management software (SNMPv1, v2 and v3) and Nortel Enterprise Switch Manager software*, Enterprise Network Management System (ENMS) and Enterprise Policy Services (EPS)*. The Ethernet Routing Switch 8300 supports four groups of Remote Monitoring (RMON) on all ports. The four groups of RMON are alarms, events, history and statistics.

Common software platform

The Ethernet Routing Switch 8000 family, which includes the 8300 and 8600, now use a common Operating System base. The tangible business benefit for the customer is that features operate in a consistent manner, and configuration and operational costs are minimized.

Integrated Time Domain Reflectometer (TDR)

The Ethernet Routing Switch 8300 provides an integrated TDR to simplify troubleshooting of the physical cable plant, enabling Operations to quickly identify faults, isolating the source of problems, and helping ensure maximum uptime of the network. This provides for remote and non-invasive diagnosis of cabling issues such as cable opens, cable shorts or impedance mismatch reporting — to within one meter — the distance to the fault. The Ethernet Routing Switch 8300 can detect and report these issues without unplugging cables and the need for expensive cable testers and additional personnel.

Active circuit protection

The Ethernet Routing Switch 8300 can automatically disable a port if there is a short, while all the other ports remain active, forwarding traffic and unaffected by the disabled port.

Pay as you grow software capable

With the introduction of Base and Advanced licenses, Nortel enables customers to pay only for the functionality that meets their business needs. Future software releases are planned to include advanced routing protocols OSPF, ECMP, VRRP, DVMP, PIM-SM and PIM-SSM.

Summary

The Ethernet Routing Switch 8300 high-performance hardware technology, combined with the rich advanced services to enhance, protect and simplify network operations, is the solution for customers making an investment in their campus LAN infrastructure that will grow with the business for years to come. As a provider of end-to-end solutions that span voice, data, applications and network management, Nortel can help you increase your opportunities for profitability, streamline your business operations, increase productivity and help you gain a competitive business edge.

** Planned future release*

Technical specifications

Table 2. Ethernet Routing Switch 8300

Interfaces
• 48-port 10/100/1000 BASE-T auto-speed sensing with 802.3af Power over Ethernet
• 48-port 10/100 BASE-T auto-speed sensing with 802.3af Power over Ethernet
• 48-port 10/100/1000 BASE-T auto-speed sensing
• 48-port 10/100 BASE-T auto-speed sensing
• 24-port 100BASE FX Ethernet
• 8 x 1000BASE-x SFP ports included on Switch Fabric module
Performance specifications
• Switch fabric bandwidth: 320 Gbps
• Frame length: 64 to 1518 bytes (IEEE 802.1Q Untagged), 64 to 1522 bytes (IEEE 802.1Q Tagged)
• Jumbo frame support: Up to 9000 bytes (IEEE 802.1Q Tagged)
• Multi-Link Trunks: Up to 32 trunks with 4 links per group
• VLANs: Up to 2,000 port- or protocol-based; per VLAN Tagging option
• Multiple spanning tree groups: Up to 64 (STGs)
Network protocol and standards compatibility
• IEEE 802.3 10BASE-T (ISO/IEC 8802 3, Clause 14)
• IEEE 802.3u 100BASE-TX (ISO/IEC 8802-3, Clause 25)
• IEEE 802.3u Autonegotiation on Twisted Pair (ISO/IEC 8802-3, Clause 28)
• IEEE 802.3x (Flow Control on the Gigabit Uplink port)
• IEEE 802.3z 1000BASE-SX and 1000BASE-LX
• IEEE 802.3ab 1000BASE-T
• IEEE 802.1D MAC Bridges (ISO/IEC 10038)
• IEEE 802.1P (Prioritizing)
• IEEE 802.1Q (VLAN Tagging)
• IEEE 802.1D Spanning Tree Protocol
• IEEE 802.1X Extended Authentication Protocol (EAP)
• IEEE 802.1AB Link Level Discovery Protocol
RFC support
RFC 1213 (MIB-II); RFC 1493 (Bridge MIB); RFC 2863 (Interfaces Group MIB); RFC 2665 (Ethernet MIB); RFC 2737 (Entity MIBv2); RFC 2819 (RMON MIB); RFC 1757 (RMON); RFC 1271 (RMON); RFC 1157 (SNMP); RFC 2570 (SNMPv3); RFC 2571 (SNMP Frameworks); RFC 2573 (SNMPv3 Applications); RFC 2574 (SNMPv3 USM); RFC 2575 (SNMPv3 VACM); RFC 2576; RFC 2572 (SNMP Message Processing); RFC 1332/1661 (Point to Point Protocol); RFC791/1812 (Internet Protocol); RFC 1388/2453 (RIP1/RIP2); RFC 2328(OSPF)†
Physical specifications
Ethernet Routing Switch 8306
• Height: 15.8 in. (40.1 cm)
• Width: 17.5 in. (44.5 cm)
• Depth: 19.9 in. (50.5 cm)
• Weight (empty): 49 lb (22 kg)
• Weight (fully loaded): 140 lb (63 kg)
• NOM approved

Physical specifications — <i>continued</i>
Ethernet Routing Switch 8310
• Height: 22.9 in. (58.2 cm)
• Width: 17.5 in. (44.5 cm)
• Depth: 19.9 in. (50.5 cm)
• Weight (empty): 85 lb (39 kg)
• Weight (fully loaded): 225 lb (102 kg)
• Cooling system:
– Fan trays: 2 per chassis
– Fans: 8 per fan tray
– Thermal sensors: 1 per fan tray
• Operating altitude: 3,024 m (10,000 ft)
Environmental specification
• Operating temperature: 0°C to 50°C (32°F to 104°F)
• Storage temperature: -25°C to 70°C (-13°F to 158°F)
• Operating humidity: 85% maximum relative humidity, noncondensing
• Storage humidity: 95% maximum relative humidity, noncondensing
• Operating altitude: 3048 m (10,000 ft) maximum
• Storage altitude: 3048 m (10,000 ft) maximum
• Free fall/drop: ISO 4180-s, NSTA 1A
• Vibration: IEC 68-2-6/34
• Shock/bump: IEC 68-2-27-29
Safety agency approvals
• UL Listed (UL1950)
• IEC 950/EN60950
• C22.2 No. 950 (CUL) with all national deviations
• UL-94-V1 Flammability requirements for PC board
• NOM (NOM-019)
Electromagnetic emissions summary
Meets the following standards:
• US,CFR47, Part 15 Subpart B, Class A
• Canada, ICES-003, Issue 2, Class A
• Australia/New Zealand, NZS 3548:1995,Class A
• Japan, V-3/97.04:1997, Class A
• Taiwan, CNS 13438, Class A
• EN55022:1995, Class A
• EN 61000-3-2:1995
• EN 61000-3-3:1994
• Electromagnetic immunity: Meets the EN 50082-1:1997 standard

Ordering Information

Table 3. Ordering information for the Ethernet Routing Switch 8300

Order number	Description
Chassis	
DS1402007	Ethernet Routing Switch 8310 10-Slot Chassis
DS1402008	Ethernet Routing Switch 8306 6-slot Chassis
DS1405?14	Ethernet Routing Switch 8301 AC Power Supply
DS1405?16	Ethernet Routing Switch 8302 AC Power Supply (Low Wattage)
Modules	
DS1404076	Ethernet Routing Switch 8393SF Switch Fabric Module with 8 SFP Gigabit Ethernet Ports
DS1404094	Ethernet Routing Switch 8348GTX-PWR 48-port 10/100/1000 PoE Module
DS1404078	Ethernet Routing Switch 8348TX-PWR 48-port 10/100 PoE Module
DS1404093	Ethernet Routing Switch 8348GTX 48-port 10/100/1000 Module
DS1404077	Ethernet Routing Switch 8348TX 48-port 10/100 Module
DS1404079	Ethernet Routing Switch 8324GT 24-port 10/100/1000 Module
DS1404098	Ethernet Routing Switch 8324FX. 24 Port 100Base-FX Ethernet Interface Module
Software	
DS1421002-2.0	Ethernet Routing Switch 8300 Base Software license
Pluggable Ethernet Transceivers	
AA1419013	1-port 1000BASE-SX Small Form Factor GBIC (LC connector)
AA1419014	1-port 1000BASE-SX Small Form Factor GBIC (MT-RJ connector)
AA1419015	1-port 1000BASE-LX Small Form Factor GBIC (LC connector)
AA1419025	1-port 1000BASE-CWDM SFP GBIC-1470nm Wavelength (40km), LC connector
AA1419026	1-port 1000BASE-CWDM SFP GBIC-1490nm Wavelength (40km), LC connector
AA1419027	1-port 1000BASE-CWDM SFP GBIC-1510nm Wavelength (40km), LC connector
AA1419028	1-port 1000BASE-CWDM SFP GBIC-1530nm Wavelength (40km), LC connector
AA1419029	1-port 1000BASE-CWDM SFP GBIC-1550nm Wavelength (40km), LC connector
AA1419030	1-port 1000BASE-CWDM SFP GBIC-1570nm Wavelength (40km), LC connector
AA1419031	1-port 1000BASE-CWDM SFP GBIC-1590nm Wavelength (40km), LC connector
AA1419032	1-port 1000BASE-CWDM SFP GBIC-1610nm Wavelength (40km), LC connector
AA1419033	1-port 1000BASE-CWDM SFP GBIC-1470nm Wavelength (70km), LC connector
AA1419034	1-port 1000BASE-CWDM SFP GBIC-1490nm Wavelength (70km), LC connector
AA1419035	1-port 1000BASE-CWDM SFP GBIC-1510nm Wavelength (70km), LC connector
AA1419036	1-port 1000BASE-CWDM SFP GBIC-1530nm Wavelength (70km), LC connector
AA1419037	1-port 1000BASE-CWDM SFP GBIC-1550nm Wavelength (70km), LC connector
AA1419038	1-port 1000BASE-CWDM SFP GBIC-1570nm Wavelength (70km), LC connector
AA1419039	1-port 1000BASE-CWDM SFP GBIC-1590nm Wavelength (70km), LC connector
AA1419040	1-port 1000BASE-CWDM SFP GBIC-1610nm Wavelength (70km), LC connector
AA1419043	1-port 1000BASE-T SFP, 8-pin modular connector (RJ-45) DY4311046 Power splitters for i200X phones-bag of 12

* The seventh character (?) of the power supply order number must be replaced with the proper code to indicate desired product nationalization "A" No power cord included, must be ordered separately.

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For more information, contact your Nortel representative, or call 1-800-4 NORTEL or 1-800-466-7835 from anywhere in North America.

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In the United States:

Nortel
35 Davis Drive
Research Triangle Park, NC 27709 USA

In Canada:

Nortel
8200 Dixie Road, Suite 100
Brampton, Ontario L6T 5P6 Canada

In Caribbean and Latin America:

Nortel
1500 Concorde Terrace
Sunrise, FL 33323 USA

In Europe:

Nortel
Maidenhead Office Park, Westacott Way Maidenhead
Berkshire SL6 3QH UK
Phone: 00800 8008 9009 or
+44 (0) 870-907-9009

In Asia Pacific:

Nortel
Nortel Networks Centre, 1 Innovation Drive
Macquarie University Research Park Macquarie
Park, NSW 2109 Australia
Tel +61 2 8870 5000

In Greater China:

Nortel
Sun Dong An Plaza, 138 Wang Fu Jing Street
Beijing 100006 China
Phone: (86) 10 6510 8000