

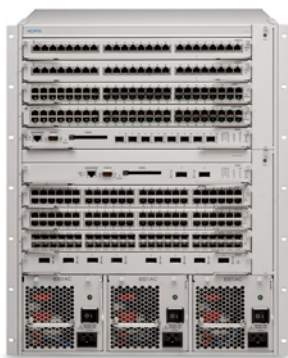


## Product Brief

### Nortel Ethernet Routing Switch 8300 Series

*Resilient, high-performance switching for the Core or the Wiring Closet*

The Nortel Ethernet Routing Switch 8300 continues to evolve into the Core Switch of choice for the mid-sized enterprise campus, delivering simplified yet superior networking, creating one network using less but more intelligent equipment — increasing availability and performance while minimizing costs. In addition, the Ethernet Routing Switch 8300 remains a premier Wiring Closet Switch for large networks, meeting and exceeding the requirements of enterprises embarking on convergence as part of their strategic plan for success.



**Ethernet Routing Switch 8300**

#### Flexible deployment options

The highly versatile Ethernet Routing Switch 8300 (ERS 8300) offers a wide range of capabilities that integrate easily into many network designs.

With its performance and network resiliency features, the ERS 8300 provides an excellent option for the core of the medium-sized enterprise network — offering high-density 1GbE and 10GbE interface options, individual device redundancy, and delivering overall network and application resiliency.

Established and newly-enhanced Access Switch features ensure that the ERS 8300 remains the platform of choice for large-scale, enterprise-class deployments that value performance, density, security and convergence-friendly capabilities. The introduction of BGP-Lite and availability of VRF-Lite for virtualized IP Routing provide a sophisticated set

#### Ethernet Routing Switch 8300 highlights

- Virtualized and advanced IP Routing for network design flexibility
- Enables large-scale convergence deployments of IP Telephony, unified communications and Wireless LAN mobility
- Simplified, automated optimization of application performance
- Supports Nortel's "Switch Cluster" technology for delivering 99.999 percent end-to-end resilient application availability
- 6- and 10-slot chassis, with 1GbE and 10GbE pluggable, and 10/100 and 10/100/1000 copper modules; class-leading 10GbE port density
- Optional redundant N-1 Switch Fabric and N+1 power supplies
- "Pay-as-you-grow" options for both hardware and software capabilities
- Standards-based Power-over-Ethernet with Dynamic Power Management
- Enhanced network security with access control and host integrity checking via Nortel's Secure Network Access (SNA)

**Table 1. Nortel Ethernet Routing Switch 8300 Series**

Model	Port densities of up to:
8306	Up to 36 ports of 10GbE, or 208 ports of 1GbE (SFP Pluggable), or 192 ports of 10/100/1000 (Copper) with or without PoE, or 96 ports of 100FX
8310	Up to 68 ports of 10GbE, or 400 ports of 1GbE (SFP Pluggable), or 384 ports of 10/100/1000 (Copper) with or without PoE, or 192 ports of 100FX

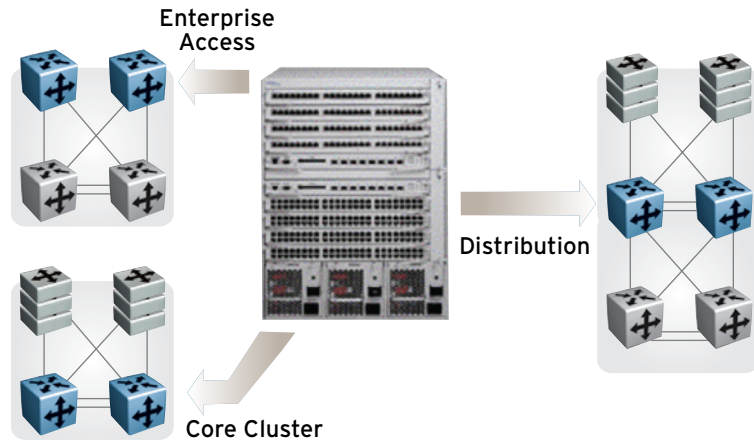
of capabilities — accommodating, for example, operations within airport authorities, city and state government, and post merger and acquisition in large enterprises.

For network designs that require a third “Distribution” tier, the Ethernet Routing Switch 8300 is an ideal option with high density interface options and high performance delivered on a relatively small footprint.

The ERS 8300 Series provides:

- High-density 1GbE and 10GbE pluggable interfaces for core, distribution and access tier connectivity requirements
- High performance and low latency to ensure optimized application performance
- Switch Clustering to extend sub-second fail-over and full session load-sharing across the network infrastructure — from user to application

## Versatile deployment alternatives for the Nortel Ethernet Routing Switch 8300



### End-to-end application performance and availability

In a converged world reliability goes beyond individual nodes and is measured at the application level, end-to-end across the network; providing trusted and dependable fail-over that is consistently less than one second, regardless of the failure scenario. Through simplified, resilient solutions, Nortel is uniquely positioned to address these needs.

### Switch Clustering

Nortel’s advanced resilient technology, Split Multi-Link Trunking (SMLT) and now Routed SMLT, provides complete protection against any individual component, link or node failure. This solution provides for sub-second recovery combined with user session-based load-balancing — all leveraging standards-based dynamic link aggregation at the network edge (user or server). Deploying the ERS 8300 in the core is the ideal solution for delivering highly-available services.

Routed SMLT provides rapid failover for networks that are using dynamic Layer 3 routing protocols. Routed SMLT is not dependent on the routing protocol used, and IP Gateway redundancy is achieved by synchronizing forwarding information between Switch CPUs.

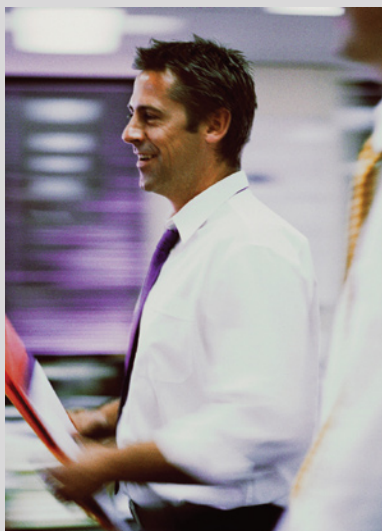
### Redundant and resilient chassis-based solution

As a stand-alone device, ERS 8300 provides an extremely robust platform for resilient networking. The system supports dual redundant Switch Fabric/ CPU modules, N+1 AC or Dual-Input DC power supplies, and hot-swappable modules and fan trays.

## New for the v4.2 feature release

The following features and hardware have been added to the ERS 8300’s capabilities with the release of v4.2 Operating System software:

- Border Gateway Protocol (BGP-Lite)
- Nortel Automatic QoS (Core)
- IP Flow Information Export
- IGMPv3 Snooping
- DHCP Snooping
- IP Source Guard
- Dynamic ARP Inspection
- VLAN IP Spoofing Prevention
- BPDU Filtering
- VLACP Global Configuration



## Precision performance

Real-time applications are sensitive to variable performance and are relatively bandwidth-intensive. Performance is closely linked to reliability with many of the design options for today's networks being a trade-off between performance needs and reliability requirements. Nortel's ERS 8300 eliminates the need to choose one over the other by delivering high-speed, low-latency performance with superior reliability.

## Performance architecture

At the heart of the ERS 8300, there is a passive backplane design and a distributed forwarding architecture that leverages the advantages of dual N-1, active-active Switch Fabrics. The 720Gbps Crossbar and the 8394SF Switch Fabric module deliver up to 464Gbps of genuine data throughput and 345Mpps of frame-forwarding performance per Switch. Putting these figures into a business context, an ERS 8300 Core Switch Cluster can transport more than 60,000 average-sized Office files per second, and still not be subject to contention.

## Advanced Quality-of-Service (QoS)

The Ethernet Routing Switch 8300's QoS features not only allow more efficient use of bandwidth to optimize existing network resources and capabilities, but also provide packet classification and marking at the edge of the network to simplify the QoS solution at the core. By classifying, prioritizing, policing and marking LAN traffic, networks can deliver the right service levels for mission-critical and quality-sensitive applications. The Ethernet Routing Switch 8300 provides eight hardware queues per port. Advanced QoS features support the standard Internet Engineering Task Force (IETF) Differentiated Services (DiffServ) QoS architecture — packet classification based on the contents of the IP Packet Header fields (e.g., voice, video and data).

## Nortel Automatic QoS

With Nortel Automatic QoS is enabled, an ERS 8300 supporting a Nortel Unified Communications solution automatically recognizes the special, private Differentiated Service Code Point (DSCP) values used by these applications, and optimizes the management Egress Queues. Without this automated functionality, operators would need to have detailed knowledge of how QoS works, and also the private DSCP values, to enable manual configuration for optimized Queue usage. With this feature, the process is automated and optimized, and protects against misconfiguration.

The introduction of Nortel Automatic QoS support on the ERS 8300 will see the Core functionality delivered first, followed by Access functionality in a subsequent release.

## Traffic Policing and Shaping

Traffic Policing enables the provisioning of different service levels by limiting traffic throughput at the ingress (inbound) port of the Ethernet Routing Switch 8300. This feature ensures that limits can be placed upon the amount of bandwidth that particular users or

applications can push into the network. An associated capability, Custom Auto-Negotiation Advertisements (CANAs), allows for only specified connection rates to be advertised by auto-negotiation, and therefore limits low-priority devices to the appropriate connection speed.

Traffic Shaping offers the ability to limit traffic on egress (outbound) from the Ethernet Routing Switch 8300, typically to comply with some form of service tariff. Enterprises working with service providers or carriers can use this feature when they deploy Ethernet as an alternative to traditional Frame Relay or ATM WAN access solutions.

## IP Filtering and Deep Packet Pattern Matching

IP Filters can be used to manage traffic and provide security, by ensuring that specific actions are performed when defined criteria are matched. Only data that matches the pattern is allowed to pass through the filter, and these filters can be used to set traffic priority, drop or allow IP packets, as well as define the conditions for mirroring traffic (e.g., IP telephony in a Contact Center environment). Deep Packet Pattern Matching is

## The 'Nortel Edge'

Through embedding functionality within its converged networking solutions, Nortel is creating a new operational paradigm built around synergistic, communications-enabled networking and simplicity of design. The 'Nortel Edge' focuses on ensuring that the network is easy to deploy and one that is equipped with intelligence that reduces the burden of ongoing manageability, delivering additional benefits to businesses.

Real-time application environments require network intelligence and Quality-of-Service (QoS), which allows the network to understand what to do with high-priority traffic in times of network congestion. However, the configuration of QoS across the network can be time-consuming and if incorrectly executed, leads to a sub-standard solution for high-priority traffic. Nortel data, voice and application products can be enabled for optimized QoS across the network through the Nortel Automatic QoS feature.

Enabling the Automatic QoS functionality seamlessly configures QoS on Nortel IP Phones, Call Servers and Applications, and Ethernet Switches. This allows network managers to easily configure QoS across a Nortel converged infrastructure through a few simple commands or a single click of the mouse, delivering a consistent and optimized QoS configuration. Simple and effective delivery of optimized end-to-end application performance; a tangible manifestation of genuine business benefits of Nortel.

The ERS 8300 implements key enabling technologies while minimizing capital and operational costs.



an advanced implementation of filtering that allows operators to match fields deep within the packet by specifying both an offset and a value to match.

### Convergence and unified communications

The reality of today's networks is that different applications must be given the quality of service appropriate to their differing needs and requirements. The ERS 8300 facilitates enterprises' transition to convergence-based applications by implementing key enabling technologies while minimizing capital and operational costs.

#### Desktop Gigabit

Many enterprises are looking to transition from Fast Ethernet to Gigabit Ethernet as the default for desktop connectivity. Gigabit Ethernet offers an alternative that is more strategic; as PCs gain more performance and efficiency, there is opportunity to exploit that zone between 100Mbps and 1Gbps. The ERS 8300 enables a seamless transition to Gigabit Ethernet by offering equivalent high-density 10/100 and 10/100/1000 modules that can readily co-exist in the same system.

#### Standards-based Power-over-Ethernet (PoE)

PoE is increasingly becoming the default solution for connectivity for the converged desktop, often in combination with Gigabit Ethernet. The ERS 8300 supports the deployment of IP Telephony, Wireless LAN, and

any third-party line-powered device by offering standards-based PoE support on both 10/100 and 10/100/1000 interface modules.

#### Dynamic Power Management

To increase flexibility and ensure that the highest priority users and devices always have service when they need it, ERS 8300 PoE modules support an option to configure the priority level for power delivery. In the event that total available power is less than that generally required by the sum of all the devices, power will be dynamically — not statically — served on the basis of the configured priority level.

#### Device Auto Discovery

The Ethernet Routing Switch 8300 automatically recognizes the connection of a convergence device and immediately provides power to it. The Switch supports two schemes — Nortel's Auto-Discovery and Auto Configuration (ADAC) and standards-based 802.1AB. This capability eases the roll-out of convergence applications and devices, saving time and money.

#### Integrated Access Control Security

Lapses or failures in network security can have a costly impact on the profitability of companies. Nortel has developed a multi-layered strategy for enhanced defense against threats from external and internal sources. The ERS 8300, a key element of this strategy, supports comprehensive security services for access control at the access layer.

#### 802.1X/Extensible Authentication Protocol

Nortel's commitment to open standards is proven with the Ethernet Switching portfolio's support for IEEE 802.1X/Extensible Authentication Protocol (EAP) across the entire range of Access Switches. The ERS 8300 has comprehensive 802.1X/EAP support with additional enhancements such as:

- Multiple Hosts Multiple Authentications (MHMA)
- Multiple Hosts Single Authentication (MHSA)
- Guest VLAN
- Mixed EAP/Non-EAP
- Centralized MAC-based Authentication

These enhancements ensure a readily deployable solution that's compatible with all standards-compliant third-party 802.1X/EAP products — providing enterprises with a means of effectively authenticating access to the network.

#### Secure Network Access

Secure Network Access (SNA) — Nortel's endpoint security and policy compliance solution — inspects and assesses, ensuring compliance to policy and enabling remediation at the network endpoint source, prior to full network access.

With Secure Network Access, the enterprise is able to define acceptable criteria for the security software installed on PCs, test these criteria and confirm user credentials — all before the User is

given any access to corporate servers and information. Any failures or inconsistencies during the check process can be resolved from the safety of a quarantined remediation VLAN, and Guest Users can be given access to an isolated VLAN (for example, Internet-only access). Assuming successful logon and checking, the user's port is automatically assigned to the appropriate production VLAN, with the correct quality settings.

### Enhanced usability and flexibility

With the network now needing to be closely aligned with the business — often subject to seasonal variations, or changes through merger and acquisition activity, the network needs to have great flexibility and the capability to adapt without impacting availability. The highly-versatile ERS 8300 includes a comprehensive set of features that ensure the most cost-effective solution for enterprises.

#### Border Gateway Protocol (BGP-Lite)

Large private IP networks can often have a requirement for sophisticated IP connectivity. This could be the need to support multiple connections to Internet Service Providers, or to satisfy a requirement to join a number of large internal routing domains and apply access policy.

The implementation of BGP-Lite on the ERS 8300 is intended to provide a sub-set of the full BGP capability, initially being a reduced scale implementation of iBGP. The feature will support up to four BGP Peers connections, and up to 8,000 BGP Routes. The BGP-Lite feature is classified as being part of the Advanced License feature set.

#### Equal Cost Multi-Path (ECMP)

The ERS 8300 now supports load-sharing of Layer 3 traffic by configuring ECMP routing on up to four individual links. ECMP supports Static, and RIP and OSPF routing protocols.

#### Multicast VLAN Registration (MVR)

Multicast VLAN Registration (MVR) is a feature that enables better support for wide-scale deployment of multicast applications — clients remain in their separate VLANs while sharing access to common multicast streams.

#### Integrated Time Domain Reflectometer (TDR)

The ERS 8300 provides an integrated TDR to simplify troubleshooting of the physical copper 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. The ERS 8300 can detect and report these issues without the need to unplug cables or use expensive cable testers and additional personnel.

#### Pay-as-you-grow

With the introduction of the tiered Software License framework, Nortel enables customers to pay only for the functionality that meets their business needs. This avoids over-investing in

unnecessary and unused software feature functionality, yet provides a seamless enhancement path and investment protection.

#### Network management

The ERS 8300 can be managed by a variety of management tools, offering a very flexible operational environment according to individual business requirements. These include: dual Command Line Interface (CLI), a Java-based Device Manager, Web-based management, SNMP-based management (SNMPv1, v2 and v3), Enterprise Switch Manager (ESM), Enterprise Network Management System (ENMS) and Enterprise Policy Services (EPS).

### Summary

The Ethernet Routing Switch 8300 uniquely combines high performance with rich, advanced services for convergence applications to enhance, protect and simplify network service and operations. Enterprises seeking to make strategic investments in their campus LAN infrastructure can now create solutions that will support business growth for years to come. As a leading provider of end-to-end solutions that span voice, data, applications and network management, Nortel has the expertise to help enterprises increase profitability, streamline business operations and enhance productivity.

Base	Advanced	Premier
All features, except those defined as <b>Advanced</b> or <b>Premier</b>	All <b>Base</b> features, plus: <ul style="list-style-type: none"> <li>• BGP-Lite*</li> <li>• Deep Packet Pattern Matching</li> <li>• ECMP</li> <li>• OSPF</li> <li>• PIM-SM</li> <li>• SLPP</li> <li>• SMLT</li> <li>• Routed SMLT</li> <li>• VRRP</li> </ul>	All <b>Base</b> and <b>Advanced</b> features, plus: <ul style="list-style-type: none"> <li>• VRF-Lite</li> </ul>

\* New features for v4.2

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