

## Avaya Ethernet Routing Switch 8600

A resilient, flexible, scalable solution delivering network virtualization, exceptional value per port, and one of the Industry's highest 10G Ethernet densities per module and rack.



Companies turn to technology to help boost the bottom line and to increase productivity. Technology advances in one area often lead to real challenges in others. Virtualization is a case in point, particularly when it comes to efficiently connecting a myriad of disparate applications and systems – many now virtualized – across multiple locations.

Unified Communications enables collaborative business processes that are required for resource sharing across an organization, improves day-to-day operational practice, and deliver cost-effective communication with customers, partners and suppliers.

Virtualization can transform your IT infrastructure and your business by providing a clear path to advanced applications that create a Unified Communications environment. Virtualization delivers flexibility and scalability, and enables faster activation of new services in data centers and the campus core. Without compromising high-availability and high-performance, virtualizing servers and consolidating services, management and security delivers benefits such as simplified management, accelerated decision making, decreased recurring costs, and increased productivity. Providing one of the Industry's highest 10G Ethernet densities per module and rack, the Avaya Ethernet Routing Switch 8600 (ERS 8600) can turn infrastructure

into a highly reliable network that drives Unified Communications and other business-critical applications.

Recently updated, the Avaya ERS 8600 offers multiple options that enable IP Virtual Private Networking solutions across the entire enterprise. Avaya Layer 3 virtualization is simple, flexible, and easy to deploy – and doesn't require adjustments to your existing core infrastructure, adding no additional capital equipment expenditures. Because the solution is standards-based and uses well-understood IP techniques, less training time is required. This can reduce operational costs when compared to training required for service provider-centric, Multi-Protocol Label Switching (MPLS) solutions.

## Resiliency, intelligence & scalability without design complexity

The ERS 8600 is a proven, tested, resilient intelligent network solution that scales, delivering hundreds of Gigabits per second (Gbps) and hundreds of millions of packets per second (Mpps) of performance to the core. This flexible switch reduces the complexity of network design, making it ideal for midsize-to-large enterprise campuses and data centers.

Its switching architecture is based on Network Processing Units (NPU) rather than generic ASIC technology. NPUs are large-scale CPU arrays specifically designed for network-related functions such as

efficient examination and manipulation of packet headers. Avaya's specialized high-performance NPU is known as the Route Switch Processor (RSP). It delivers fast-path flexibility and investment protection based on its ability to support in-life firmware upgrades and provides 10Gbps line rate switching and routing capabilities regardless of standards evolution.

The ERS 8600 is a balanced solution, unconstrained by bottlenecks imposed by inferior designs. In addition to establishing a solid foundation for Unified Communications, the ERS 8600 delivers a flexible networking infrastructure that fosters growth by enabling businesses to leverage new, emerging applications and technologies.

### The Ethernet Routing Switch 8600

- Is available in a 3-, 6- and 10-slot Chassis, supporting dedicated 1G and 10G pluggable modules, and 10/100 and 10/100/1000 copper and fiber modules
- Delivers high resiliency with optional redundant, high-availability Switch Fabrics, N+1 Power Supplies, and optional dual AC Power Supplies that enhance redundancy by providing separate mains inputs
- Delivers non-stop, end-to-end application availability as the flagship SMLT/RSMLT-based product for Avaya's "switch cluster" technology

### Ethernet Routing Switch 8600 highlights

- Increases resiliency through switching clustering (Split Multi-Link Trunking/Routed Split Multi-Link Trunking) for the most demanding applications and networks and boosts performance because all links forward traffic at Layer 2 & 3
- Includes virtualized Layer 3 with device and network solutions (e.g., VRF-Lite, IP VPN-Lite, & MPLS)
- Provides cost-effective, simplified multicast virtualization (IGMP, PIM-SM/SSM) and unicast traffic combined with switch clustering resiliency for multiple customers and communities
- Enables IP VPN services across campus or metro through existing IP infrastructure with no additional equipment or complex setup and management required
- Streamlines IP VPN and MPLS solutions through high-performance R/RS modules
- Offers high-density 10G, high-density Gigabit and 10/100/1000 Ethernet for enterprise core and aggregation applications, delivering competitive high value
- Delivers best-in-class resiliency with switch clustering support for VMware server virtualization in an iSCSI environment
- Provides increased value, flexibility, and slot conservation through a new combo module with copper 10/100/1000, 100/1000 SFP and 10GbE XFP interfaces
- Benchmarks network traffic and identifies anomalous behavior using IP Flow Information eXport (IPFIX) IETF RFC 3917
- Supports high-performance IPv6 – a key scalability tool for demanding and expanding networks
- Identifies attack patterns through optional application-aware service modules for deep packet inspection
- Enables traffic analysis and IDS/TPS clustering through sophisticated mirroring capabilities (i.e., many-to-one, one-to-many, and many-to-many)
- Supports large-scale convergence deployments, expanding DWDM Fiber capacity to 20 wavelengths using 10GbE XFP optics

The Ethernet Routing Switch 8600 meets demanding enterprise-class requirements for scalability, simplification, maximized application uptime, value, and security. It reduces network design complexity by simplifying network architecture and increasing per port value with advanced features on high-density modules.

## Business Continuity

Network resiliency is the most basic requirement when implementing a converged network. The ERS 8600 supports redundant connectivity for virtualized solutions such as VRF-Lite, VPN-Lite for Edge/Core, and MPLS LER IP-VPN for Edge networks. With Avaya's VRF-Lite, businesses can use the same hardware platform to create multiple Layer 3 routing domains supporting numerous customer environments. Avaya's innovative IP VPN-Lite solution facilitates deployment of resilient, fault-tolerant IP VPNs over an existing IP infrastructure (campus or metro).

To provide maximum protection, the ERS 8600 addresses resiliency at multiple levels. At the hardware level, the switch provides hot-swappable modules and fan

trays along with N+1 and dual input power supplies. Its software delivers resiliency for the core with industry-leading features that include VLACP (Virtual Link Aggregation Control Protocol) for Layer 1-2 link failure detection, BFD (Bi-directionally Forwarding Detection) for Layer 3 link failure detection, and switching clustering that leverages our pioneering Split Multi-Link Trunking (SMLT), Routed Split Multi-Link Trunking (R-SMLT), and VRRP Active/Active technologies.

Additionally, organizations are encouraged to dual-connect servers and, with minimum additional investment, the sub-second failover advantage is automatically extended beyond the boundary of the networking equipment, all the way to the application host. Competitive solutions, basing their failure recovery model on variations of the Spanning Tree Protocol, do not compare

## Intelligence for a smarter way to do business

Network devices must be able to distinguish different traffic types and to handle different traffic requirements. This sense of traffic class awareness, combined with the ability to process each type differently, sets intelligent networks apart from commonplace LANs. The ERS 8600 combines intelligence and performance to create a next-generation intelligent network solution.

## Keeping information secure

All devices on the network must ensure network element security as well as data integrity. The ERS 8600 employs several layers of embedded security for access to the switch and for network data. Avaya, through the Identity Engines product line, offers seamless secure access for internal end users (wired and wireless networks) or external users. Firewalls, passwords, access policies, secure protocols, address and port filtering, routing policies and DoS prevention mechanisms help ensure that the network and its data stay secure. The ERS 8600 supports up to eight unique user sessions for simultaneous login, and leverages TACACS+ to centralize and manage user validation.



ERS 8006



RS Modules



ERS 8010

## Innovative & versatile module options

### Flexible & scalable

The ERS 8600 reduces complexity and risk in network design by simplifying the network architecture and increasing value with advanced features on high-density modules. High port density, combined with rich capabilities and leading reliability technologies, deliver exceptionally high value to enterprises. Avaya's RSP technology, based on a flexible NPU architecture, offers investment protection through in-field firmware upgrade capability.

Recent additions to the classic range of high-performance I/O module options offer a

number of practical benefits. These include a high-density 10G Ethernet (12 ports per module and up to 96 ports per chassis) and higher-density 1000BASEX 48-port module that complements the existing 30-port model.

### One Module with many uses

The ERS 8600 supports an innovative hybrid combination module that concurrently supports 10G Ethernet, 1000BASE-X, and 1000BASE-T ports. Economical, flexible and a class-first, this 'combo' module includes 10/100/1000 Copper, SFP, and XFP interfaces to meet the demands of smaller aggregation sites. It is an affordable solution providing all the functionality many enterprises need in one convenient module.

## Applications: new capabilities & choices optimize communications

Through advanced capabilities including VRF-Lite, IP VPN-Lite, and MPLS-based IP VPN on a single platform, the ERS 8600 enables virtual services across campus and metro environments to address new business requirements and applications. For example, a university seeking to connect several campuses can choose traditional MPLS technology or can leverage Avaya's innovative IP VPN-Lite solution.

### Virtual Routing and Forwarding (VRF-Lite)

Through VRF-Lite on ERS 8600, enterprises

## New for the v5.1 release:

### The following features have been added to ERS 8600 capabilities with the release of v5.1 operating system:

- Multicast Virtualization for VRF-Lite (IGMP, PIM-SM, and PIM-SSM) \*†
- Multicast Source Discovery Protocol (MSDP) \*†
- IGMPv3 backward compatibility
- Multicast Static IP Route (mroute)
- Automatic QoS
- Bi-directional Forwarding Detection (BFD) \*†
- Link Aggregation Control Protocol (LACP) Minimum Link
- Standards-based MIBs for multicast
- Multicast Routing process statistics
- IPv6 support for FTP, TFTP, and rlogin
- TACACS+
- DDI software support

- Time zone offset enhancement
- Source IP enhancement for ping and traceroute
- Switch Cluster operational improvements
- IPFIX enhancement
- New operation for corrupt configuration loading
- Core dumps

\* Indicates features that are categorized as non-base and therefore require additional licensing: Advanced or Premier

† Indicates features that require use of the R or RS-Series Interface Modules

New hardware includes:

- Qualified DWDM XFPs
- Support for 100BASE-FX SFP

can use the same hardware platform to create multiple Layer 3 routing domains to support multiple customers and to keep traffic separated for both unicast and multicast (IGMP, PIM-SM/SSM).

The VRF-Lite capability virtualizes routing within the switch, addressing business and networking challenges driven by activities such as mergers and acquisitions, data center consolidation, departmental or business unit segmentation, and evolving audit and compliance requirements. By enabling the switch to have two or more routing instances, more sophisticated connections can be enabled in addition to support for overlapping IP addresses. Complete and total traffic separation at Layers 2 and 3 is the usual practice, however the system can be configured to provide inter-VRF forwarding capabilities, allowing shared access to common resources.

### **Virtual Private Networking through IP VPN-Lite**

The Avaya IP VPN-Lite capability is an innovative IP-in-IP technology that leverages the RSP flexible forwarding engine – delivering VPN services that are easier to implement, deploy, and manage. With IP VPN-Lite, enterprises can build any-to-any private connections between local or geographically dispersed sites using any IP infrastructure (private networks or via a public IP service provider).

IP VPNs are typically used for cross-location connectivity and to create trusted connections to external partner organizations, leveraging IP as the common carriage and removing dependency on

specific wide area technologies (such as Frame Relay or ATM) or exclusivity to a single service provider. Avaya's IP VPN-Lite solution is inherently less complex and therefore much more cost-effective than using the MPLS alternative. Managing IP VPN-Lite versus MPLS is simpler and does not require specialized carrier-class IT skills or resources. The foundation of IP VPN-Lite is simply an IP network, using the flexible RFC 2547/4364 connectivity model and it does not require an MPLS-enabled core infrastructure. This simplified solution can scale per carrier-class MPLS with the cost-effective simplicity of a solution designed specifically for the enterprise. Delivering total flexibility, the ERS 8600 supports classic MPLS in addition to IP VPN-Lite and VRF-Lite and all VPN technologies can be concurrently leveraged to deliver individually tailored solutions.

### **Multi-Protocol Label Switching (MPLS)**

MPLS forms the basis for most service provider IP VPNs and is used in most WAN solutions because it delivers sophisticated connectivity and traffic engineering techniques. By implementing this same functionality the ERS 8600 can interoperate directly with 3rd party MPLS networks and participate in their IP VPNs, extending them into the enterprise campus network as required. Enterprise architects can leverage this interoperability to create ERS 8600-based MPLS environments that increase the overall level of transparency.

## **Software enhancements**

### **Multicast Virtualization**

Multicast virtualization of IGMP and PIM-

SM/SSM, along with Unicast virtualization, is supported on the same system by leveraging VRF-Lite. This extends the benefit of simplified network design, less investment in hardware, lower operational expense all of which are supported by best-in-class switch clustering resiliency.

### **Avaya Automatic QoS**

With Avaya Automatic QoS, an ERS 8600 supporting an Avaya Unified Communications solution automatically recognizes the special, private Differentiated Service Code Point (DSCP) values used by specific Avaya VoIP applications and optimizes the management egress queues. Without this functionality, operators would require detailed knowledge of how QoS works and private DSCP values in order to manually configure optimized queue usage. With this feature, the process is automated, optimized, and protects against mis-configuration. The introduction of Avaya Automatic QoS support on the ERS 8600 delivers core functionality first, to be followed by access functionality in a subsequent release.

### **Multi-port Mirroring**

RS Interface Modules enable the ERS 8600 to deliver enhanced mirroring capabilities, including enabling one-to-many, many-to-one and many-to-many mirroring for sophisticated traffic analysis and IDS/TPS clustering.

### **Service & Management**

The ERS 8600 can be managed by a variety of management tools, creating a flexible operational environment based on business requirements. These include: dual

Command Line Interface (CLI), the web-based Enterprise Device Manager (EDM), SNMP-based management (SNMPv1, v2 & v3), Enterprise Switch Manager (ESM), Enterprise Policy Services (EPS), and the evolving Unified Communication Management solution. The ERS 8600 also supports a core dump feature providing enhanced troubleshooting information should the CPU need to recover automatically.

## Why choose Avaya?

Avaya offers multiple, flexible options that enable versatile IP VPN solutions across the campus including Avaya's innovative IP VPN-Lite. IP VPN Lite leverages existing IP infrastructure without requiring additional capital investment or the overhead operational expense of carrier-class MPLS.

The unique architecture of the next-generation R/RS modules sets Avaya apart based on deliver of optimal functionality and value at the port level. Introduction of the combo module (supporting Copper 10/100/1000, SFP and XFP interfaces) meets the requirements of smaller sites. Avaya offers one of the industry's highest 10G Ethernet port densities per module, switch, or rack and is the only solution vendor to offer best-in-class resiliency for VMware server virtualization in an iSCSI environment.<sup>1</sup>

## Real World Scenario: Virtual Routing and Forwarding

An airport handling a large amount of traffic from multiple national and international airlines and local on-site businesses, seeks a networking solution that maximizes application uptime, safeguards information, and delivers excellent business value. By choosing the Ethernet Routing Switch 8600 with its versatile IP VPN capabilities, the airport supports all of these communities and keeps traffic segregated using a single, cost-effective hardware platform that is easy to implement and manage.

## Summary

The Ethernet Routing Switch 8600 is a resilient, efficient, scalable solution that enables enterprises to build truly unified communications networks and to provide business continuity for critical applications. Enterprises can scale converged and web applications network-wide with switching clustering delivering always-on resiliency. The ERS 8600 offers a high-performance architecture combining rich, advanced services for convergence applications that enhance, protect and simplify network service and operations. Customers wanting to make strategic investments in a campus LAN infrastructure can use the ERS 8600

to create solutions that can evolve as their business evolves. A provider of end-to-end solutions spanning voice, data, applications and network management, Avaya has the expertise required to help businesses enhance revenue potential, streamline business operations, increase productivity and gain competitive advantage.

## Learn More

To learn more about the Avaya Ethernet Routing Switch 8600, contact your Avaya Account Manager, Avaya Authorized Partner or visit us at: [www.avaya.com](http://www.avaya.com).

<sup>1</sup> Where multiple iSCSI targets are used, VMware recommends using ESX NIC teams in "IP Hashing" mode to balance traffic across NIC teams and take advantage of multiple Switch redundancy.

## About Avaya

Avaya is a global leader in enterprise communications systems. The company provides unified communications, contact centers, and related services directly and through its channel partners to leading businesses and organizations around the world. Enterprises of all sizes depend on Avaya for state-of-the-art communications that improve efficiency, collaboration, customer service and competitiveness. For more information please visit [www.avaya.com](http://www.avaya.com).

The Avaya logo consists of the word "AVAYA" in a bold, red, sans-serif font. The letters are closely spaced, and the 'A's and 'Y's have a distinctive shape.

INTELLIGENT COMMUNICATIONS

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03/10 • DN5102

A red rectangular button with the text "avaya.com" in white, lowercase, sans-serif font.