

## Avaya Ethernet Routing Switch 8600

**A resilient, flexible and scalable solution that delivers network virtualization, exceptional value per port and one of the industry's highest 10G densities per module/rack.**



Increasingly, companies are turning to technology to help boost their bottom line and increase employee productivity. Advances in technology, however, have led to some very real challenges, particularly how to efficiently and cost effectively connect a myriad of different devices, disparate systems and multiple locations. The answer to addressing these challenges lies in virtualization of the network.

Unified communications enables the collaborative technologies required to share resources within your entire organization, improve day-to-day operational processes and communicate more costeffectively 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 for your organization. Among other things, virtualization provides for network simplicity, flexibility and scalability, and enables faster time-to-market in the data center and core campus. It works by virtualizing servers, and centralizing services, management and security — without compromising the high availability, security and performance on which you've come to rely. As a result, virtualization delivers many benefits to your business, including simplified

management, accelerated decision making, decreased recurring costs and increased employee productivity through unified communications.

By offering advanced virtualization features and one of the industry's highest 10G densities per module/rack, the Avaya Ethernet Routing Switch 8600 can turn your network into a highly reliable, efficient and cost effective infrastructure that drives unified communications and critical business applications.

With the latest release 5.1 of Ethernet Routing Switch 8600, Avaya is the only vendor to offer multiple

viable options that enable IP Virtual Private Network solutions across the entire campus. Avaya's Layer 3 virtualization is simple, flexible and easy to deploy — and doesn't require adjustments to your existing core infrastructure, which means no additional capital equipment expenditures. And, since the solution is based on IP technologies, training is minimal compared to requirements for MPLS, resulting in operational cost savings.

## Resiliency, Intelligence and Security – without the design complexity

The Ethernet Routing Switch 8600 is a proven and tested resilient, secure and intelligent network solution that can deliver many

hundreds of gigabits per second (Gbps) and hundreds of millions of packets per second (Mpps) performance to the network core. This powerful and flexible switch combines resilient high performance with intelligence and security, while taking the complexity out of network design. Ideal for medium to large enterprise campuses and data centers, the Ethernet Routing Switch 8600 leverages technology from industry-leading products to create an integrated intelligence with the Web Switch Module, SSL Acceleration Module and the Service Delivery Module.

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 fibre modules

- A highly redundant solution with optional redundant, high-availability Switch Fabrics, N+1 Power Supplies and dual AC input 1500 Watt to enhance redundancy by connecting two separate AC inputs
- The flagship product for Avaya's "Switch Cluster" technology based on SMLT/RSMLT, delivering non-stop end-to-end application availability

The high-density and high-speed server connectivity in large deployments is matched by a suitably high-performance switching architecture that is based on NPU rather than ASIC technology. This RSP delivers fastpath flexibility and investment protection due to software- upgradeable data path technology — while still providing 10-Gbps line rate switching/routing capabilities.

### Ethernet Routing Switch 8600 highlights

- IP Flow Information eXport (IPFIX) IETF RFC 3917 — Benchmarks network traffic and identify anomalous day-zero behavior
- Offers high-density 10G, high-density Gigabit and 10/100/1000 Ethernet — per chassis/rack solution for the enterprise core at a competitive value/Mpps
- Offers increased value per slot by delivering a combo module with copper 10/100/1000, 100/1000 SFP and 10GE XFP interfaces
- Available with optional security and applications awareness modules for deep packet inspection to identify attacks that appear as normal traffic and to improve application availability
- IPv6 — Increases scalability for even the most demanding networks
- Split Multi-Link Trunking/Routed Split Multi-Link Trunking — Increases resiliency for the most demanding applications and networks as well as performance as all Layer 2 and Layer 3 links are forwarding traffic
- Enables IP VPN services across the campus metro for departments and users through existing IP infrastructure — without the need for additional equipment investment or complex setup and management
- Includes virtualized Layer 3 with device and network solutions (e.g., VRF-lite, MPLS and IP VPN-Lite\*)
- Provides cost-effective and simplified multicast virtualization (IGMP, PIM-SM/SSM) and unicast traffic combined with SMLT/RSMLT resiliency for multiple customers and user groups
- Delivers high performance to fastpath-enabled MPLS and IP VPN solutions on an R/RS module port
- Includes sophisticated mirroring capabilities (i.e., many-to-one, one-to-many, and many-to-many) to enable traffic analysis and IDS/TPS clustering
- Offers unique best-in-class resiliency with SMLT for VMware server virtualization in an iSCSI environment\*
- Supports large-scale convergence deployments; expands DWDM fiber capacity to 20 wavelengths on 10GE XFP optics

\*For additional details, visit [www.Avaya.com/datacenter](http://www.Avaya.com/datacenter).

The Ethernet Routing Switch 8600 meets enterprises' increasing demands for scalability, simplification, maximized application uptime, value and security. The platform takes the complexity out of network design by simplifying the network architecture and increasing value per port per slot with advanced features on high-density modules.

This results in a balanced solution without the constraints or bottlenecks imposed by inferior designs. In addition to establishing a solid foundation for unified communications, Ethernet Routing Switch 8600 provides enterprises with the basic network building blocks to grow their business operations and evolve their network as future applications and technologies emerge.

## Resiliency to Ensure Business Continues

Network resiliency is the most basic requirement when implementing a converged network. The Ethernet Routing Switch 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, organizations can use the same hardware platform to create multiple Layer 3 routing domains to support multiple

customers. Avaya VPN-Lite makes it possible for these same organizations to also deploy VPN over the existing IP infrastructure (campus or metro) without incurring additional capital or operational expense.

The Ethernet Routing Switch 8600 addresses resiliency at multiple levels for maximum coverage. At the hardware level, the switch provides hot swappable modules including fan trays and N+1 power supplies, and dual AC input power supplies. The Ethernet Routing Switch 8600 software ensures resiliency for the network core with industry-leading features, including VLACP (Virtual Link Aggregation Control Protocol) for Layer 1-2 link failure detection, BFD (Bidirectionally Forwarding Detection) for Layer 3 link failure detection, Split Multi-Link Trunking (SMLT), VRRP Active/Active and Switch Clustering (Routed Split Multi-Link Trunking, R-SMLT).

Additionally, organizations can effectively dual-connect to servers, desktops and switch clustering with minimum investment, maximum flexibility and sub-second failover.

## Intelligence for a Smarter Way to do Business

Network devices need to be keenly aware of traffic types and be able to handle specific types of traffic differently.

This sense or awareness of differing traffic types, combined with the ability to process each type differently, is what sets intelligent networks apart from typical LANs. The Ethernet Routing Switch 8600 combines intelligence and performance to create a next generation intelligent network solution.

## Security to Keep Information Safe

All devices on the network need to ensure network element security as well as data integrity. The Ethernet Routing Switch 8600 employs several layers of built-in security for both switch access and network data. Avaya Secure Network Access v1.5 offers seamless secure access for internal end users (i.e., wired or wireless LAN 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



ERS 8006



RS modules



ERS 8010

and its data stay secure. Also, ERS8600 supports 8 users to login simultaneously with TACACS+ to centralize validation of users attempting to gain access to a device.

## Innovation Module Options to Meet Any Requirements

### Simple, Scalable and Stackable

The Ethernet Routing Switch 8600 takes the complexity out of network design by simplifying the network architecture and increasing value per port with advanced features on high density modules for modular products and high-density ports for

stacking. High-density ports, combined with the rich capabilities and applications and the leading reliability technologies offered by the Ethernet Routing Switch 8600, result in exceptionally high value for enterprises. The Avaya RSP, which is based on NPU technology, offers an investment protection path for future software upgrades.

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

### One Module; Many Flavors

The Ethernet Routing Switch 8600 also offers an innovative new hybrid combination module that supports 10G Ethernet, 1000BASE-X and 10/100/1000BASE-TX ports. Economical, flexible and an industry first, this 'combo' module includes copper 10/100/1000, SFP and XFP interfaces to meet the demand of smaller aggregation sites. It is an affordable solution that provides all the functionality many organizations need — all in one convenient and affordably priced module.

## Key features

**The latest release of Ethernet Routing Switch 8600 includes advanced software features and new hardware that address network virtualization, reduce complexity, and enhance scalability and security.**

- SMLT/RSMLT — sub second fail over
- IP Flow Information Export IPFIX RFC 3917 Software
- Virtual Routing and Forwarding (VRF-Lite)\*†
- IP VPN (RFC 2547/4364) with MP-iBGP\*†
- IP VPN-Lite w/MP-iBGP (without MPLS) (IP-in-IP VPN)\*†
- Port Mirror enhancements (one-to-many, many-to-one, many-to-many)†
- MPLS LER, LSR, LDP, RSVP\*†
- Avaya Secure Network Access v1.5†
- Avaya Networks Command Line Interface
- Multicast scaling enhancements (4,000 S,G)†
- VLAN scaling enhancements (4k VLANs)†
- High Availability (HA) Enhancements (HA-CPU configuration w/ VRF-Lite in hot standby and with L3 IP Multicast and BGP; and MPLS in warm standby)
- Routed SMLT Edge/Access support
- Customized Auto-Negotiation Advertisements†
- Software licensing framework

### Hardware

- 8612XLRS 12-port 10GBASE-X XFP Ethernet Interface Module
- 8634XGRS "Combo" Ethernet Interface Module: 2 ports for 10GBASE-X XFP; 24 ports for 1000 BASE-X SFP; 8 ports for 10/100/1000BASE-TX
- 8648GBRS 48-port 1000BASE-X SFP Ethernet Interface Module
- 8648GTRS 48-port 10/100/1000BASE-TX Ethernet Interface Module
- Several lower density module options with various interfaces for added flexibility as well as WAN connectivity

- Dual AC Input 1500W Power Supply Unit
- 10GBASE-LRM XFP Pluggable; 1000BASE-X 120km SFP Pluggable; DDI SFPs
- High-speed fan trays

### New for the v5.1 feature release:

The following software features have been added to the ERS 8600's capabilities with the release of v5.1 Operating System:

- TACACS+ support
- BFD (Bidirectional Forwarding Detection)\*†
- Multicast virtualization (IGMP & PIM-SM/SSM)\*†
- MSDP support\*†
- IGMPv3 backward compatibility
- DWDM XFP
- Multicast Stats
- Static Mroute
- DDI SW Support
- NNCLI and SNMP support for multicast virtualization, MSDP Log Enhancement for SMP (System Messaging Platform)
- Log Reference Book Enhancements
- Multicast Standards MIB
- Minlink (Minimum- Links)
- Avaya Automatic QoS

\* 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

## Applications: New Capabilities and More Choices to Optimize Communications

By offering advanced capabilities such as IP VPN-Lite, VRF-lite and IP VPN MPLS based all on one platform, the Ethernet Routing Switch 8600 enables virtual services across campus and metro environments to address new and additional business requirements and applications. For example, a university seeking a solution to connect several of its campuses can choose industry-standard MPLS or Avaya's IP VPN-Lite technology.

### Virtual Private Networking Through IP VPN-Lite

Avaya IP VPN-Lite is an innovative IP-in-IP capability that leverages Avaya's flexible forwarding network processor unit (RSP) — making it easier to implement, deploy and manage VPN services across campuses. With IP VPN-Lite, enterprises can build any-to-any private connections between local or geographically dispersed sites using any IP infrastructure (i.e., private or through a public IP service provider).

IP VPNs are typically used for inter-office connectivity and also to create trusted connections to partner organizations; they leverage IP as the common carriage, and remove a dependency on specific wide area technologies (e.g., frame relay or ATM) or service providers. Avaya's IP VPN-Lite solution has the additional benefit of being inherently less complex and therefore more cost-effective than using MPLS. Managing IP VPN-Lite versus MPLS is much simpler and doesn't require costly MPLS IT training or special resources. IP VPN-Lite's set-up

is based on the flexible RFC4364/2547 configuration model, and requires no MPLS core infrastructure. As a result, the solution can scale as high as an MPLS-based IP VPN. Additionally, both MPLS and IP VPN-Lite can coexist and operate in parallel.

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

Through VRF-lite on Ethernet Routing Switch 8600, enterprises can use the same hardware platform to create multiple Layer 3 routing domains to support multiple customers and keep traffic separated for both unicast and multicast (IGMP, PIM-SM/SSM).

The VRF-lite capability virtualizes routing within the switch, enabling enterprises to facilitate business and networking challenges such as mergers and acquisitions, Data Center consolidation and sharing, departmental or business unit segmentation, and general audit and compliant requirements. By allowing the switch to have two or more routing instances, more sophisticated connections are made possible, in addition to supporting overlapping IP Address spaces. Complete traffic separation on Layers 2 and 3 is usually a key requirement. However, if necessary, the system can be configured to provide inter-VRF forwarding capabilities to allow access to common resources.

### Multi-Protocol Label Switching (MPLS)

When delivered on a LAN Switch such as the Ethernet Routing Switch 8600, MPLS complements the majority of today's wide area networking solutions. MPLS provides sophisticated connectivity and traffic engineering techniques, and is often used as the basis for VPNs. Through this capability,

A set of hardware provides the necessary flexibility as enterprises proceed with the transition to 10G Ethernet in the Core and the Riser, and with server consolidation in the Data Center.

users can create MPLS environments based on the Ethernet Routing Switch 8600, and increase the overall level of transparency and interoperability.

## Software Enhancements

### Multicast Virtualization

Multicast virtualization of IGMP and PIM-SM/SSM along with unicast virtualization is supported on the same platform through VRF-Lite, extending the benefit of simplifying network design, hardware investment and lowering operational expense — all combined with best in-class resiliency SMLT/RSMLT.

### Avaya Automatic QoS

With Avaya Automatic QoS enabled, an ERS 8300 supporting a Avaya 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 Avaya Automatic QoS support on the ERS 8300 will see the Core functionality

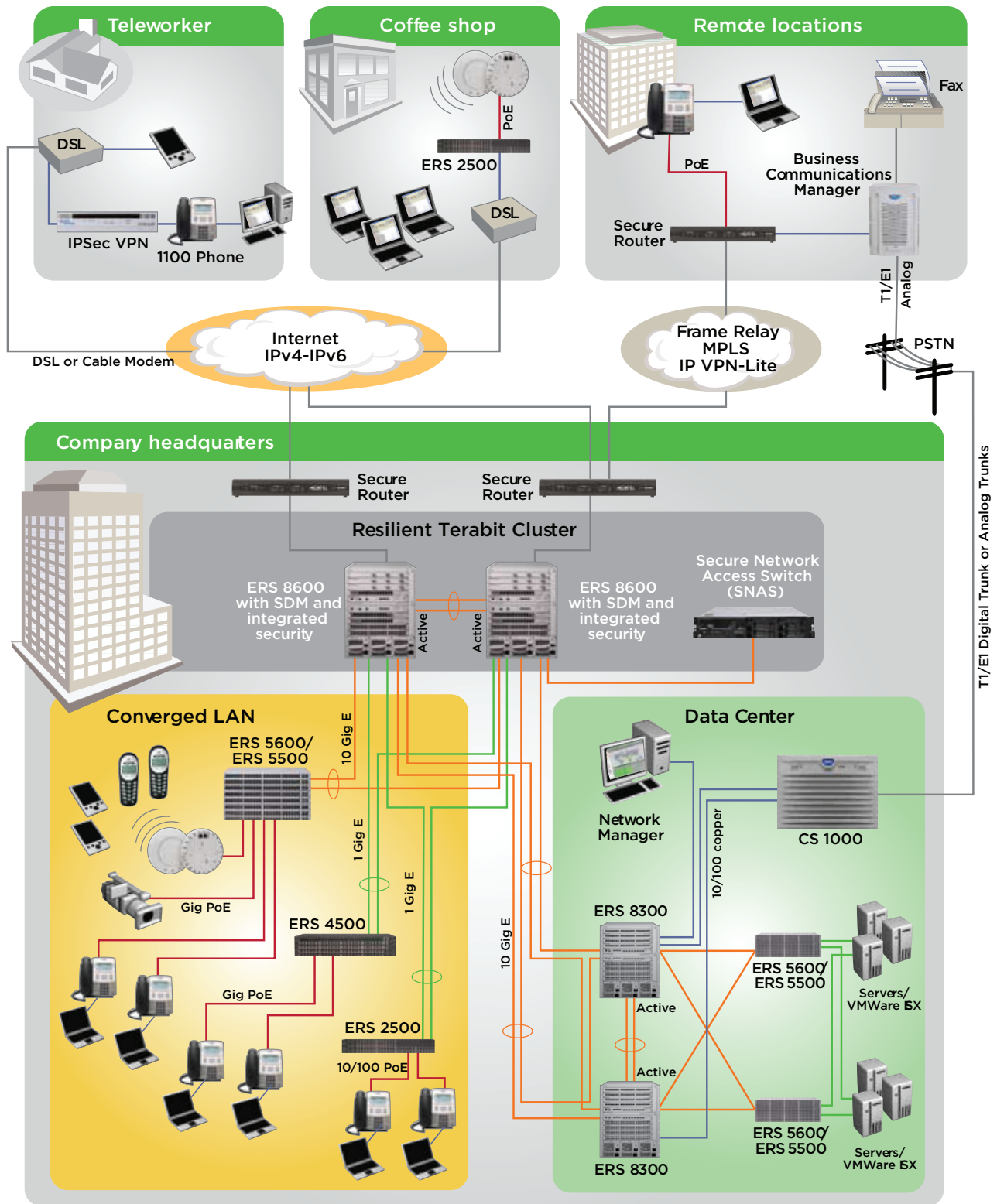


Figure 2. Avaya Ethernet Routing Switch 8600 Network diagram

delivered first, followed by Access functionality in a subsequent release.

### Multi-port Mirroring

The Ethernet Routing Switch 8600 includes RS line cards for enhanced mirroring capabilities, including enabling one-to-many, many-to-one and many-to-many mirroring for traffic analysis and IDS/TPS clustering.

### Avaya Secure Network Access

Through Avaya Secure Network Access (NSNA) v1.5, the Ethernet Routing Switch 8600 offers ubiquitous and seamless secure access for internal end users (i.e., wired or wireless LAN networks) or outside users (i.e., remote access, including SSL/IPsec/WAN networks).

### Service and Management (DfO)

Log references and messages, standard MIBs, command support via NNCLI and SNMP, data collection of pluggable optics in real-time, etc. are a few examples to minimize operational cost and enhance service and management of the switch.

## Why Choose Avaya?

Avaya is the only vendor in the industry to offer multiple viable options that enable IP VPN solutions across the campus. These options include standard solutions of MPLS IP-VPN and Avaya's IP VPN-Lite, which offers the added benefit by running over existing IP infrastructure without the need for additional capital investment or operational expense.

Avaya is also the only vendor that delivers increased value per slot by introducing a

## A REAL-WORLD SCENARIO: VIRTUAL ROUTING AND FORWARDING

An international airport, which handles a large amount of traffic from multiple national and global airlines and other local on-campus businesses, is looking for a networking solution that will maximize application uptime, safeguard information, while providing excellent business value. By employing Ethernet Routing Switch 8600 and VRF-lite capabilities, the airport can keep airlines and their respective traffic separate — all from one economical, simple-to-implement and easy-to-manage hardware platform.

combo module with copper 10/100/1000, SFP and XFP interfaces to meet the demand of smaller aggregation sites. Finally, Avaya has the distinction of offering one of the industry's highest 10G densities per module/rack, and the only solution vendor to offer best-in-class resiliency with SMLT for VMware server virtualization in an iSCSI environment.<sup>1</sup>

### Summary

The Ethernet Routing Switch 8600 is a resilient, intelligent, secure solution that allows corporate networks to provide a truly unified communications network and business continuity for critical applications. Enabling a Resilient Terabit Switch Cluster solution, the Ethernet Routing Switch 8600 allows you to scale converged and web applications network-wide. Resiliency helps ensure that network resources are always available. Intelligence delivers bandwidth and performance for those applications that need it the most when they need it. Security helps ensure that the information traveling across your network

remains secure and unaltered. Resiliency, intelligence and security are the basic network building blocks that allow an enterprise to use their network to grow their business and provide a solid foundation for their future network growth.

The Ethernet Routing Switch 8600 offers a high-performance architecture that combines with rich, advanced services for convergence applications to enhance, protect and simplify network service and operations. Customers 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 provider of end-to-end solutions that span voice, data, applications and network management, Avaya has the necessary expertise to increase your opportunities for profitability, streamline your business operations, increase productivity and help you gain competitive advantage.

<sup>1</sup> Note that, 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.

## Performance specifications

- System architecture bandwidth: 720 Gbps
- Sub100ms failover (requires 8692SF with SuperMezz)
- Frame length: 64 to 1,518 bytes (IEEE 802.1Q Untagged), 64 to 1,522 bytes (IEEE 802.1Q Tagged)
- Jumbo frame support: Up to 9.6k bytes (IEEE 802.1Q Tagged)
- Multi-Link Trunks: Up to 128 trunks with 8 links per group with 8692SF + R/RS-Modules/Mode
- VLANs: Up to 4,000 port-or protocol-based; per VLAN Tagging option
- IP Multicast: Up to 4,000 S,G
- Multiple spanning tree groups: Up to 64 (STGs)
- SMLT and RSMILT (Routed Split Multi-Link Trunking)
- Single Port Split Multi-Link Trunking

## Network protocol and standards compatibility

### IEEE

- IEEE 802.1D Spanning Tree Protocol
- IEEE 802.1p Priority Queues
- IEEE 802.1Q VLAN Tagging
- IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
- IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
- IEEE 802.1v VLAN Classification by Protocol and Port
- IEEE 802.1x Ethernet Authentication Protocol
- IEEE 802.3 CSMA/CD Ethernet (ISO/IEC 8802-3)
- IEEE 802.3ab 1000BASE-T Ethernet
- IEEE 802.3ab 1000BASE-LX Ethernet
- IEEE 802.3ab 1000BASE-ZX Ethernet
- IEEE 802.3ab 1000BASE-CWDM Ethernet
- IEEE 802.3ab 1000BASE-SX Ethernet
- IEEE 802.3ab 1000BASE-XD Ethernet
- IEEE 802.3ab 1000BASE-BX Ethernet
- IEEE 802.3ad Link Aggregation Control Protocol (LACP)
- IEEE 802.3ae 10GBASE-X XFP
- IEEE 802.3i 10BASE-T – Autonegotiation
- IEEE 802.3 10BASE-T Ethernet
- IEEE 802.3u 100BASE-TX Fast Ethernet (ISO/IEC 8802-3, Clause 25)
- IEEE 802.3u 100BASE-FX
- IEEE 802.3u Auto-negotiation on Twisted Pair (ISO/IEC 8802-3, Clause 28)
- IEEE 802.3x Flow Control on the Gigabit Uplink port
- IEEE 802.3z Gigabit Ethernet 1000BASE-SX and LX

### IETF RFCs

#### Layer 2 features ATM / POS

- RFC 1332 IPCP (POS module)
- RFC 1471 LCP (POS module)
- RFC 1473 NCP (POS module)
- RFC 1474 Bridge NCP (POS module)
- RFC 1552 IPXCP (POS module)
- RFC 1638 BCP (POS module)
- RFC 1661 PPP (POS module)
- RFC 1989 PPP Link Quality Monitoring (POS module)
- RFC 2558 Sonet / SDH (POS module)
- RFC 2615 PPP over Sonet / SDH (POS module)

#### IPv4 Layer 3 / Layer 4 Intelligence

- RFC 768 UDP Protocol
- RFC 783 TFTP Protocol
- RFC 791 IP Protocol
- RFC 792 ICMP Protocol
- RFC 793 TCP Protocol
- RFC 826 ARP Protocol
- RFC 854 Telnet Protocol
- RFC 894 A standard for the Transmission of IP Datagrams over Ethernet Networks
- RFC 896 Congestion control in IP/TCP internetworks
- RFC 903 Reverse ARP Protocol
- RFC 906 Bootstrap loading using TFTP
- RFC 950 Internet Standard Subnetting Procedure
- RFC 951 / RFC 2131 BootP / DHCP
- RFC 1027 Using ARP to implement transparent subnet gateways/
- RFC 1305 Network Time Protocol v3 Specification, Implementation and Analysis3
- RFC 1332 The PPP Internet Protocol Control Protocol (IPCP)
- RFC 1340 Assigned Numbers
- RFC 1541 Dynamic Host Configuration Protocol1
- RFC 1542 Clarifications and Extensions for the Bootstrap Protocol
- RFC 1583 OSPFv2
- RFC 1587 The OSPF NSSA Option
- RFC 1591 DNS Client
- RFC 1631 NAT (Network Address Translation) — only with WSM
- RFC 1695 Definitions of Managed Objects for ATM Management v8.0 using SMLv2
- RFC 1723 RIP v2 – Carrying Additional Information
- RFC 1745 BGP / OSPF Interaction
- RFC 1771 / RFC 1772 BGP-4
- RFC 1812 Router Requirements
- RFC 1866 HTMLv2 Protocol
- RFC 1965 BGP-4 Confederations
- RFC 1966 BGP-4 Route Reflectors
- RFC 1998 An Application of the BGP Community Attribute in Multi-home Routing
- RFC 1997 BGP-4 Community Attributes
- RFC 2068 Hypertext Transfer Protocol
- RFC 2131 Dynamic Host Control Protocol (DHCP)
- RFC 2138 RADIUS Authentication
- RFC 2139 RADIUS Accounting
- RFC 2178 OSPF MD5 cryptographic authentication / OSPFv2
- RFC 2205 Resource ReSerVation Protocol (RSVP) — v1 Functional Specification
- RFC 2210 The Use of RSVP with IETF Integrated Services
- RFC 2211 Specification of the Controlled-Load Network Element Service
- RFC 2236 IGMPv2 for snooping
- RFC 2270 BGP-4 Dedicated AS for sites/single provide
- RFC 2283 Multiprotocol Extensions for BGP-4
- RFC 2328 OSPFv2
- RFC 2338 VRRP: Virtual Redundancy Router Protocol
- RFC 2362 PIM-SM
- RFC 2385 BGP-4 MD5 authentication
- RFC 2439 BGP-4 Route Flap Dampening
- RFC 2453 RIPv2 Protocol
- RFC 2475 An Architecture for Differentiated Service
- RFC 2597 Assured Forwarding PHB Group
- RFC 2598 An Expedited Forwarding PHB
- RFC 2702 Requirements for Traffic Engineering Over MPLS
- RFC 2765 Stateless IP/ICMP Translation Algorithm (SIIT)
- RFC 2796 BGP Route Reflection — An Alternative to Full Mesh IBGP
- RFC 2819 Remote Monitoring (RMON)
- RFC 2858 Multiprotocol Extensions for BGP-4
- RFC 2918 Route Refresh Capability for BGP-4
- RFC 2961 RSVP Refresh Overhead Reduction Extensions
- RFC 2992 Analysis of an Equal-Cost Multi-Path Algorithm
- RFC 3031 Multiprotocol Label Switching Architecture
- RFC 3032 MPLS Label Stack Encoding
- RFC 3036 LDP Specification
- RFC 3037 LDP Applicability
- RFC 3065 Autonomous System Confederations for BGP
- RFC 3210 Applicability Statement for Extensions to RSVP for
- RFC 3215 LDP State Machine
- RFC 3270 Multi-Protocol Label Switching (MPLS) Support of Differentiated Services
- RFC 3376 Internet Group Management Protocol, v3
- RFC 3392 Capabilities Advertisement with BGP-4 LSP-Tunnels
- RFC 3443 Time To Live (TTL) Processing in Multi-Protocol Label Switching (MPLS) Networks
- RFC 3569 An overview of Source-Specific Multicast (SSM)
- RFC 3917 Requirements for IP Flow Information Export (IPFIX)
- RFC 4364 BGP/MPLS IP Virtual Private Networks (VPNs)
- RFC 4379 Detecting Multi-Protocol Label Switched (MPLS) Data Plane Failures
- BFD: IETF Bidirectional Forwarding Detection draft for IPv4 and IPv6 (Single Hop)

#### IPv4 Multicast

- RFC 1075 DVMRP Protocol
- RFC 1112 IGMP v1 for routing / snooping
- RFC 1519 Classless Inter-Domain Routing (CIDR): an Address Assignment and Aggregation Strategy

- RFC 2236 IGMP v2 for routing / snooping
- RFC 2362 + some PIM-SM v2 extensions (PIM-SM)
- RFC 2385 Protection of BGP Sessions via the TCP MD5 Signature Option
- RFC 2547 BGP/MPLS VPNs
- RFC 3446: Anycast Rendezvous Point (RP) mechanism using Protocol Independent Multicast (PIM) and Multicast Source Discovery Protocol (MSDP)
- RFC 3618 Multicast Source Discovery Protocol (MSDP)
- RFC 3768 Virtual Router Redundancy Protocol (VRRP)

#### IPv6

- IPv6 requires 8692SF and SuperMezz Daughter card and R/RS-Modules
- RFC 1881 IPv6 Address Allocation Management
- RFC 1886 DNS Extensions to support IP version 6
- RFC 1887 An Architecture for IPv6 Unicast Address Allocation
- RFC 1981 Path MTU Discovery for IP v6
- RFC 2030 Simple Network Time Protocol (SNTP) v4 for IPv4, IPv6 & OSI
- RFC 2373 IPv6 Addressing Architecture
- RFC 2375 IPv6 Multicast Address Assignments
- RFC 2460 Internet Protocol, v6 (IPv6) Specification
- RFC 24614 Neighbor Discovery
- RFC 2462 IPv6 Stateless Address Autoconfiguration
- RFC 2463 Internet Control Message Protocol (ICMPv6) for the Internet Protocol v6 (IPv6) Specification RFC 2464 Transmission of IPv6 Packets over Ethernet Networks RFC 2474 Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers
- RFC 2526 Reserved IPv6 Subnet Anycast Addresses
- RFC 2710 Multicast Listener Discovery (MLD) for IPv6
- RFC 2740 OSPF for IPv6
- RFC 2893 Configured Tunnels and Dual Stack Routing per port
- RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers
- RFC 3056 Connection of IPv6 Domains via IPv4 Clouds
- RFC 3363 Representing Internet Protocol Version 6 Addresses in DNS3
- RFC 3484 Default Address Selection for IPv6
- RFC 3513 Internet Protocol Version 6 (IPv6) Addressing Architecture
- RFC 3587 IPv6 Global Unicast Address Format
- RFC 3596 DNS Extensions to Support IP v6
- RFC 3587 IPv6 Global Unicast Address Format
- RFC 3590 Source Address Selection for the Multicast Listener Discovery (MLD) Protocol
- RFC 3596 DNS Extensions to support IP version 6
- RFC 3810 IPv6 Multicast capabilities
- SSH/SCP, Telnet, Ping, CLI, JDM support for IPv6

#### Platform

- RFC 1305 (NTP client / unicast mode only)
- RFC 1340 Assigned Numbers
- RFC 1350 The TFTP Protocol (Revision 2)

## Quality of Service (QoS)

- RFC 2474 / RFC 2475 DiffServ Support
- RFC 2597 / RFC 2598 DiffServ per Hop Behavior
- Automatic QoS

## Network management

- RFC 1155 SMI
- RFC 1157 SNMP
- RFC 1215 Convention for defining traps for use with the SNMP
- RFC 1269 Definitions of Managed Objects for the Border Gateway Protocol: v3
- RFC 1271 Remote Network Monitoring Management Information Base
- RFC 1304 Definitions of Managed Objects for the SIP Interface Type
- RFC 1354 IP Forwarding Table MIB
- RFC 1389 RIP v2 MIB Extensions
- RFC 1565 Network Services Monitoring MIB
- RFC 1757 / RFC 2819 RMON
- RFC 1907 SNMPv2
- RFC 1908 Coexistence between v1 & v2 of the Internet-standard Network Management Framework
- RFC 1930 Guidelines for creation, selection, and registration of an Autonomous System (AS)
- RFC 2571 An Architecture for Describing SNMP Management Frameworks
- RFC 2572 Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
- RFC2573 SNMP Applications
- RFC 2574 User-based Security Model (USM) for v3 of the Simple Network Management Protocol (SNMPv3)
- RFC 2575 View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)
- RFC 2576 Coexistence between v1, v2, & v3 of the Internet-standard Network Management Framework

## MIBs

- RFC 1212 Concise MIB definitions
- RFC 1213 TCP/IP Management Information Base
- RFC 1213 MIB II
- RFC 1354 IP Forwarding Table MIB
- RFC 1389 / RFC 1724 RIPv2 MIB extensions
- RFC 1398 Definitions of Managed Objects for the Ethernet-Like Interface Types
- RFC 1406 Definitions of Managed Objects for the DS1 and E1 Interface Types
- RFC 1414 Identification MIB

- RFC 1442 Structure of Management Information for version 2 of the Simple Network Management Protocol (SNMPv2)
- RFC 1447 Party MIB for v2 of the Simple Network Management Protocol bytes)
- RFC 1450 Management Information Base for v2 of the Simple Network Management Protocol (SNMPv2)
- RFC 1472 The Definitions of Managed Objects for the Security Protocols of the Point-to-Point Protocol
- RFC 1483 Multiprotocol Encapsulation over ATM Adaptation Layer 5
- RFC 1493 Bridge MIB
- RFC 1525 Definitions of Managed Objects for Source Routing Bridges
- RFC 1565 Network Services Monitoring MIB
- RFC 1573 Interface MIB
- RFC 1643 Ethernet MIB
- RFC 1650 Definitions of Managed Objects for the Ethernet-like Interface Types using SMIv2
- RFC 1657 BGP-4 MIB using SMIv2
- RFC 1658 Definitions of Managed Objects for Character Stream Devices using SMIv2.)
- RFC 1695 Definitions of Managed Objects for ATM Management v8.0 using SMIv2
- RFC 1696 Modem Management Information Base (MIB) using SMIv2
- RFC 1724 RIP v2 MIB Extension
- RFC 1850 OSPF MIB
- RFC 2021 RMON MIB using SMIv2
- RFC 2037 Entity MIB using SMIv2
- RFC 2096 IP Forwarding Table MIB
- RFC 2233 Interfaces Group MIB using SMIv2
- RFC 2452 IPv6 MIB: TCP MIB
- RFC 2454 IPv6 MIB: UDP MIB
- RFC 2465 IPv6 MIB: IPv6 General group and textual conventions
- RFC 2466 IPv6 MIB: ICMPv6 Group
- RFC 2578 Structure of Management Information v2 (SMIv2)
- RFC 2613 Remote Network Monitoring MIB Extensions for Switched Networks v1.0
- RFC 2665 Definitions of Managed Objects for the Ethernet-like Interface Types
- RFC 2668 Definitions of Managed Objects for IEEE 802.3 Medium Attachment Units (MAUs)
- RFC 2674 Bridges with Traffic MIB
- RFC 2787 Definitions of Managed Objects for the Virtual Router Redundancy Protocol
- RFC 2863 Interface Group MIB

- RFC 2925 Remote Ping, Traceroute & Lookup Operations MIB
- RFC 2932 IPv4 Multicast Routing MIB
- RFC 2933 IGMP MIB
- RFC 2934 PIM MIB
- RFC 3019 IPv6 MIB: MLD Protocol
- RFC 3411 An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks
- RFC 3412 Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
- RFC 3416 v2 of the Protocol Operations for the Simple Network Management Protocol (SNMP)
- RFC 3635 Definitions of Managed Objects for the Ethernet-like Interface Types
- RFC 3636 Definitions of Managed Objects for IEEE 802.3 Medium Attachment Units (MAUs)
- RFC 3810 Multicast Listener Discovery v2 (MLDv2) for IPv6
- RFC 3811 Definitions of Textual Conventions (TCs) for Multiprotocol Label Switching (MPLS) Management
- RFC 3812 Multiprotocol Label Switching (MPLS) Traffic Engineering (TE) Management Information Base (MIB)
- RFC 3813 Multiprotocol Label Switching (MPLS) Label Switching Router (LSR) Management Information Base (MIB)
- RFC 3815 Definitions of Managed Objects for the Multiprotocol Label Switching (MPLS), Label Distribution Protocol (LDP)
- RFC 4022 Management Information Base for the Transmission Control Protocol (TCP)
- 4087 IP Tunnel MIB
- RFC 4113 Management Information Base for the User Datagram Protocol (UDP)
- RFC 4624 Multicast Source Discovery Protocol (MSDP) MIB

## Physical specifications

### Ethernet Routing Switch 8006

- 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)
- Cooling system:
  - Fan trays: 1 per chassis
  - Fans: 20 per fan tray
  - Thermal sensors: 1 per fan tray

### Ethernet Routing Switch 8010

- 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: 15 per fan tray
  - Thermal sensors: 1 per fan tray

### 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)

### Environmental specifications

- Operating temperature: 0°C to 40°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: 3024 m (10,000 ft) maximum
- Storage altitude: 3024 m (10,000 ft) maximum
- Free fall/drop: ISO 4180-s, NISTA 1A
- Vibration: IEC 68-2-6/34
- Shock/bump: IEC 68-2-27-29

### Electromagnetic emissions summary

#### Meets the following standards:

- US: CFR47, Part 15 Subpart B, Class A
- Australia/New Zealand: NZS 3548:1995, Class A
- Canada: ICES-003, Issue 2, Class A
- Japan: V-3/97.04:1997, Class A
- Taiwan: CNS 13438, Class A
- EN 55022:1995, Class A
- EN 61000-3-2:1995
- EN 61000-3-3:1994
- Electromagnetic immunity: Meets the EN 50082-1:1997 standard

<sup>1</sup> Limited to DHCP Relay only

<sup>2</sup> Limited to DNS Client Support only

<sup>3</sup> NTP client, unicast mode only

<sup>4</sup> Router support only. Host will be supported with infinity 2.0

<sup>5</sup> Partially implemented

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## 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).



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