

Preliminary Data Sheet

Avaya Ethernet Routing Switch 3500 Series

A cost effective, feature rich solution, the Avaya Ethernet Routing Switch (ERS) 3500 series is a family of standalone or stackable 10/100BASE-TX and 10/100/1000BASE-T Ethernet switching products perfectly suited to small remote branch offices of enterprises.

Ideal for enterprises moving to a converged network now or in the future, the Ethernet Routing Switch 3500 offers the resiliency, performance and simplified operational features you need, while helping keep on-going total cost of ownership low.

Highlights:

- **Cost effective Fast Ethernet and Gigabit Ethernet connectivity** for small offices and SMEs
- **8-port and 24-port fanless options** for quiet operation in retail, classrooms, boardrooms, hotels etc.
- **Best in class Stackable Chassis** enabling true pay as you grow scaling, in-service maintenance and restoration and centralized management.
- **Convergence friendly features** including plug and play capabilities for IP phones, automatic QoS provisioning and industry standard Power over Ethernet and Power over Ethernet+ capabilities.
- **Lower Total Cost of Ownership** through simple stacking operations, an energy efficient design and lifetime warranty capabilities.
- **Cost-effective, standards-based, unified access control** - through integration with Avaya Identity Engines.

The Avaya Ethernet Routing Switch 3500 Series offers 6 different switching model variants to suit a wide range of deployment scenarios. Available in both 8 port and 24 port form factors, the 8-port models offer cost-effective Gigabit Ethernet connectivity. The 24-port models provide cost effective Fast Ethernet and Gigabit Ethernet connectivity, and will support Avaya's best-in-class Stackable Chassis solution¹. Both the 8-port and the 24-port model variants come in powered (PoE/PoE+) and unpowered versions. Fanless options are also available to support quiet operation in retail shops, classrooms, boardrooms and hotels.

All ERS 3500 models support Layer 2 switching, Layer 3 static routing, advanced convergence features and a wide range of security features. This enables the ERS 3500 series to deliver the scalability and resiliency required by today's application-driven enterprise networks while reducing total operational costs.

Convergence-ready for Unified Communications and more

For businesses looking to consolidate all forms of communication – voice, video and data – on a single infrastructure, the Avaya ERS 3500 Series delivers

¹ Stacking support will be delivered in the v5.1 release for the ERS3526T/3526T-PWR+ and ERS3524GT/3524GT-PWR+ models.

functionality that simplifies convergence of these technologies.

Choice of PoE or PoE+ to power your devices

Through support for both the IEEE 802.3af PoE and 802.3at PoE+ standards, ERS 3500 products are able to power IP phones, wireless access points, networked high-definition CCTV cameras and other devices. This eliminates the need for separate power supplies for each unit, enabling reduced cabling and management costs for adds, moves, or changes.

Customers have the flexibility of choosing a PoE capable device or a PoE/PoE+ capable device. Having PoE+ support gives customers investment protection even though the driver for higher power usage is not present in many of the end devices typically being used.

Plug and play for IP phones

One of the main benefits offered by the ERS 3500 Series is plug and play support for IP phones enabled through a combination of IEEE 802.1AB Link Layer Discovery Protocol (LLDP) and Avaya's Auto Discovery and Auto Configuration (ADAC) capability.

With these features enabled the ERS 3500 can automatically provision end devices such as IP Phones for simplified deployments and moves. The ERS 3500 dynamically applies the correct VLAN and QoS to both the IP phone and the attached edge port. When the phone is moved to another location, the configuration is automatically updated. In addition, QoS is automatically provisioned on the ERS 3500 uplink so that voice is given top priority from the wiring closet to the network core. These features save network operators time and can dramatically reduce the likelihood of a provisioning error during a large IP phone deployment.

The ERS 3500 also learns the identification, configuration, and capabilities of neighboring devices and provides these details to the network management system. This enables the system to have the most up-to-date physical view of the network so that communication configuration mismatches are detected and corrected quickly.

Sophisticated QoS capabilities

The ERS 3500 Series delivers unsurpassed control for networks supporting a wide range of different application types. The ERS 3500 classifies, prioritizes and marks LAN IP traffic using up to four hardware queues (1 strict priority and 3 weighted round robin) on every port – including our Stackable Chassis ports.

Classification can be done based on MAC address, IP ToS/DSCP marking, IP source /destination address or subnets, TCP/UDP source/destination port/port range, IEEE 802.1p user priority bits, ingress source port, IP Protocol ID (e.g., TCP, UDP, IGMP), EtherType (e.g., IP, IPX) or the IEEE 802.1Q VLAN ID. Comprehensive traffic policing and traffic shaping are also supported.

Intelligent stacking solution delivering scalability, flexibility, resilience and performance²

No one knows stacking like Avaya. We introduced our first Stackable Chassis product in 1998 and have been perfecting the technology ever since. We were the first and only vendor to break the Terabit boundary with our ERS 5600 Series products and we've differentiated ourselves in the industry by ensuring that our Stackable Chassis perform like a traditional modular chassis implementation. We offer genuine chassis-like features including true pay-as-you-grow scaling and in service maintenance and restoration. From a management perspective, our Stackable Chassis looks like a single network entity – utilizing only a single IP address to dramatically simplify software upgrades.

A stack of up to eight Avaya ERS 3500 units can be created, enabling the Ethernet Routing Switch 3500 series to deliver up to 80 Gbps stacking throughput by scaling up to 384 x 10/100 ports and 16 x 10/100/1000/ SFP combo ports, or 384 x 10/100/1000 ports.

High performance architecture with true pay-as-you grow scaling

Our Stackable Chassis products combine non-blocking internal switching fabrics with a high-speed virtual backplane architecture to deliver a high performance solution that scales proportionally as new switches are added. Adding a new unit to the Stack is as easy as cabling in a new member then extending the appropriate configuration. The necessary software images and the configuration file are automatically downloaded to the new unit and then brought on-line without any user intervention.

To ensure wire-speed performance, our Stackable Chassis architecture is based on a shortest-path algorithm for optimal data flow across the stack. Unlike competitive solutions that use unwieldy logical ring or token technology, Avaya allows traffic to flow upstream and downstream simultaneously from every switch connected to the virtual backplane, optimizing performance, resiliency, and resource utilization. Avaya has an additional advantage in that we honor Quality-of-Service settings as traffic passes over the stacking connections – providing applications with optimal performance, and a positive end user experience.

All ERS 3500 models come with two in-built Stackable Chassis interfaces for simple, cost-effective and efficient connectivity. Unlike comparative offerings which daisy chain low-speed interfaces, this design frees uplink ports for dedicated connectivity to the backbone. In addition to the stacking cables, a return cable is also used to protect against any port, unit or cable failures.

In-service maintenance and restoration

Virtual hot swap capabilities ensure that a failure in any unit of the Stackable Chassis is quickly and easily rectified. Pioneered in modular switches, virtual hot swap is available in Avaya's Stackable Chassis solutions enabling immediate like-for-like unit replacement without any impact to the existing traffic or any units. If a failure occurs, neighboring switches automatically wrap their fabric connections to help ensure that other switches within the Stackable Chassis are not impacted. The failed unit is

² Stacking support will be delivered in the v5.1 release for the ERS3526T/3526T-PWR+ and ERS3524GT/3524GT-PWR+ models.

simply disconnected from the virtual backplane and, without pre-staging of software or configuration, a like-for-like unit is inserted, cabled, and powered-up. The Automatic Unit Replacement (AUR) process self-manages software and configuration downloads to the new switch then brings it online, without the need for an engineer to configure or manage the process.

Further complementing the Stackable Chassis architecture, the Avaya ERS 3500 Series supports standards-based 802.3ad Link Aggregation as well as its own Multi-Link Trunking technology that allows grouping of ports to form high-speed trunks/aggregations. These bundles or groups of ports can be distributed across different units in the same Stackable Chassis, delivering higher levels of resilience in case of link or Switch failure to help ensure that traffic gets to its destination.

Distributed real-time monitoring of the Stackable Chassis provides an at-a-glance view of operational status and health which further enhances operational and management simplicity.

Centralized management

From a management perspective, our Stackable Chassis appears as a single networking entity – utilizing only a single IP Address. This can significantly reduce the number of switches to be managed within the network as a stack of up to 8 switches can be managed just as easily as a single switch. All Ethernet Routing Switch 3500 models use the same software image, irrespective of model type. The image needs to be loaded only to the base unit of the Stackable Chassis which automatically loads it to other switches.

Securing access at the edge

The Ethernet Routing Switch 3500 offers the highest level of security with authenticated network access that leverages IEEE 802.1X (Extensible Authentication Protocol (EAP) with extensions or devices MAC Address. Integration into Avaya's Identity Engines portfolio for centralized, policy-based access control is included along with secure management enabled through features such as Secure Shell (SSHv2), Secure Sockets Layer (SSL), Simple Network Management Protocol (SNMPv3), IP Manager List, Remote Authentication Dial-In User Service (RADIUS), and TACACS+ authentication. The ERS 3500 Series also offers numerous features that help prevent direct Denial of Service Attacks.

Authenticated Network Access

The ERS 3500 offers a wide range of flexible security options to help ensure that only authorized personnel can access the LAN. Through IEEE 802.1X-based EAP client or device MAC Address, network administrators control authentication and authorization for access to network resources. Ethernet Routing Switch 3500 can support authentication of multiple devices/users on a single port. For example, if a user's PC connects into the network via an IP phone, the PC and the IP phone can be independently authenticated on the same port. And, if your company has visiting users, guest VLAN support allows non-authenticated users to use the network with access to predefined guest resources only, such as Internet access. ERS 3500 Series also allows configuration of different servers to handle different RADIUS/ 802.1X functions.

When advanced, policy-based and centralized user/device authentication is required, the Avaya ERS 3500 can be used in conjunction with the innovative Avaya Identity Engines portfolio solution. This easy-to-deploy, policy-based solution assigns network access rights and permissions based on user role, where the user connects (local or remote) and now the user connects (wired or wireless). In this way, each connected device and user are known and are governed by device-specific security policies. For example, based on her network credentials, an employee using a corporate owned device will be granted full corporate access however, while using a non-corporate-owned device; he or she will be granted limited access.

As the number of employee-owned devices increases, Identity Engines can help network operators retain control and, by running device health checks and verifying user and device credentials, Identity Engines helps ensure that network access permission levels are enforced and adhered to without undue effort on the part of the IT staff.

Secure Management

The ERS 3500 Series supports Secure Shell (SSHv2) for strong authentication and encrypted communication and SSL, which is supported on our web-based Enterprise Device Manager. SNMPv3 provides user authentication and data encryption for secure configuration and monitoring while IP Manager List limits access to ERS 3500 management features via a list of IPv4 and IPv6 addresses, ranges or subnets, providing greater security and manageability.

Preventing Directed Attacks

Through advanced security services, the ERS 3500 Series actively protects against malicious network attacks including protection from snooping of DHCP services, verification and filtering of ARP traffic via in-hardware processing (Dynamic ARP inspection), restriction of IP traffic to registered end devices (IP Source Guard), and control of Spanning Tree BPDU flow within the network (BPDU Filtering). Also supported, MAC Security and Static MAC address assignment have the ability to disable MAC learning if required.

The ERS 3500 supports advanced packet classification and deep packet filtering of up to 128 bytes, helping block unwanted network traffic while forwarding mission-critical traffic efficiently.

Secure and simplified network management

Creating a flexible operational environment, the ERS 3500 Series can be managed by a variety of management tools:

- Intuitive industry-aligned Command Line Interface (CLI) that eases the transition from one vendor to another.
- GUI and Web-based, Enterprise Device Manager (EDM) is an element management tool that enables quick, easy configuration changes to a single device through a pictorial view of that device using either HTTP or HTTPS (Secure Web).

- SNMP-based management (SNMP v1, 2 and 3) that provides an alternative standards based management approach and an interface for Configuration and Orchestration Manager.
- Avaya configuration tools that can be chosen based on the tasks the customer wishes to perform and the size of their environment.

These platforms include:

- Configuration and Orchestration Manager (COM) - Simplifies multi-element configuration via wizards and templates and provides network discovery, device backup, audits configuration changes, and bulk configuration management.
- Enterprise Device Manager – Simple on-switch web GUI based interface enabling simple device based provisioning.

Lifetime warranty

Avaya includes industry-leading warranty services for our portfolio of stackable switches, including Avaya ERS 3500 Series products. The warranty includes complimentary next-business-day shipment of failed units for the life of the product, next-business-day shipping worldwide on replacement of failed hardware, and basic technical support as follows: Level 1 for the supported lifecycle of the product and up to Level 3 for the first 90 days after purchase. This includes support for the shipped software version, with an optional Software Release Service available to provide access to new feature releases.

For customer with more complex implementations, a suite of support services are available to supplement the Lifetime Warranty offer.

Summary

Avaya is positioned to provide an end-to-end solution for converged networks. The Ethernet Routing Switch 3500 series, along with other Avaya products, can increase profitability and productivity, streamline business operations, lower costs and help your business gain a competitive edge.

Avaya Ethernet Routing Switch 3500 Series	
ERS 3526T	24 x 10/100 ports, plus 2 10/100/1000/SFP combo ports, plus 2 rear SFP ports or 2.5G stack ports, fanless.
ERS 3526T-PWR+	24 x 10/100 IEEE 802.3af/at PoE+ ports, plus 2 10/100/1000/SFP combo ports, plus 2 rear SFP ports or 2.5G stack ports. PoE budget 370W.
ERS 3510GT	8 x 10/100/1000 ports, plus 2 x SFP ports. Standalone, fanless.
ERS 3510GT-PWR+	8 x 10/100/1000 IEEE 802.3af/at PoE+ ports, plus 2 SFP ports, standalone. Fanless low power mode (60W PoE budget), Fan operation in high power mode (170W PoE Budget)
ERS 3524GT	24 x 10/100/1000 ports, 4 shared SFP ports, plus 2 rear SFP ports or 2.5G stack ports.
ERS 3524GT-PWR+	24 x 10/100/1000 IEEE 802.3af/at PoE+ ports, 4 shared SFP ports, plus 2 rear SFP ports or 2.5G stack ports. PoE budget 370W.

Avaya Ethernet Routing Switch 3500 Standards compliance

- IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
- IEEE 802.1Q VLANs
- IEEE 802.1p Priority Queues
- IEEE 802.1D Spanning Tree
- IEEE 802.1w Rapid Spanning Tree
- IEEE 802.1s Multiple Spanning Tree Groups
- IEEE 802.1X Ethernet Authentication Protocol (EAP)
- IEEE 802.3 10BASE-T Ethernet
- IEEE 802.3u 100BASE-TX Fast Ethernet
- IEEE 802.3z Gigabit Ethernet
- IEEE 802.3 (ANSI) Auto-negotiation
- IEEE 802.3x Flow Control
- IEEE 802.3ad Link Aggregation
- IEEE 802.3af Power over Ethernet (15.4W max)
- IEEE 802.3at Power over Ethernet Plus (30W max)
- RFC 783 Trivial File Transfer Protocol (TFTP)
- RFC 791/950 Internet Protocol (IP)
- RFC 792 Internet Control Message Protocol (ICMP)
- RFC 826 Address Resolution Protocol (ARP)
- RFC 854 Telnet Server and Client
- RFC 951 / 1542 BOOTP
- RFC 1112 Internet Group Management Protocol v1
- RFC 1215 SNMP Traps Definition
- RFC 1271 / 1757 / 2819 RMON
- RFC 1361 / 1769 Simple Network Time Protocol (SNTP)
- RFC 1493 Bridge MIB
- RFC 1573 / 2863 Interface MIB
- RFC 1643 / 2665 Ethernet MIB
- RFC 1905 / 3416 SNMP
- RFC 1906 / 3417 SNMP Transport Mappings
- RFC 1907 / 3418 SNMP MIB
- RFC 1945 HTTP v1.0
- RFC 1981 Path MTU Discovery for IPv6
- RFC 2011 SNMP v2 MIB for IP
- RFC 2012 SNMP v2 MIB for TCP
- RFC 2013 SNMP v2 MIB for UDP
- RFC 2138 RADIUS
- RFC 2236 Internet Group Management Protocol v2
- RFC 2460 Internet Protocol v6 (IPv6) Specification
- RFC 2461 Neighbor Discovery for IPv6
- RFC 2462 IPv6 Auto-configuration of link local addresses
- RFC 2474 Differentiated Services Support
- RFC 2570 / 3410 SNMPv3
- RFC 2571 / 3411 SNMP Frameworks
- RFC 2572 / 3412 SNMP Message Processing
- RFC 2573 / 3413 SNMPv3 Applications
- RFC 2574 / 3414 SNMPv3 USM
- RFC 2575 / 3415 SNMPv3 VACM
- RFC 2576 / 3584 Co-existence of SNMP v1/v2/v3
- RFC 2660 HTTPS (Secure Web Server)
- RFC 2665 Ethernet MIB
- RFC 2863 Interfaces Group MIB
- RFC 2674 Q-Bridge MIB
- RFC 2737 Entity MIBv2
- RFC 2819 RMON MIB
- RFC 2866 RADIUS Accounting
- RFC 2869 RADIUS Extensions (interim updates)
- RFC 3046 (& 5010) DHCP option 82, Relay Agent Information Option
- RFC 3058 RADIUS Authentication.
- RFC 3576 RADIUS Change of Authorization
- RFC 4007 Scoped Address Architecture
- RFC 4193 Unique Local IPv6 Unicast Addresses
- RFC 4291 IPv6 Addressing Architecture
- RFC 4301 Security Architecture for the Internet Protocol
- RFC 4443 Internet Control Message Protocol (ICMPv6). Update to RFC2463.
- RFC 4675 RADIUS Attributes for VLAN and Priority Support