

Product Assessment

# Avaya Ethernet Routing Switch 5000 Series

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Market: Enterprise Networking

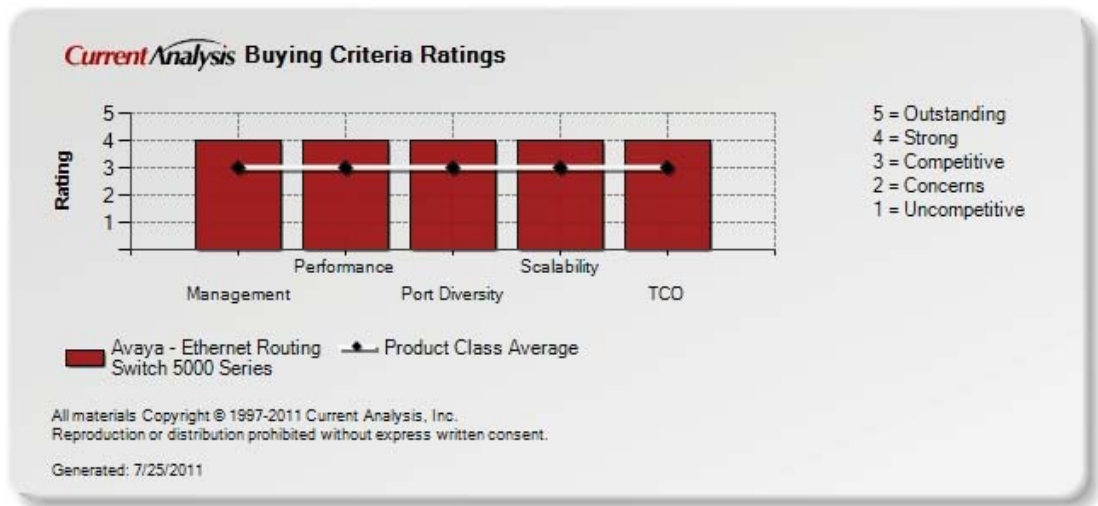
Class: Fixed Switching



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## Summary

### Buying Criteria Ratings



### Current Perspective: **Threatening**

Avaya's Ethernet Routing Switch 5000 series is a threatening fixed product family with a mix of models and additional software features that compete aggressively in the marketplace. Though this report focuses primarily on the usage of the ERS 5000 series in the campus environment, the ERS5600 is a good candidate for data center deployments as well. With the addition of the ERS 5600 models to the product line, the series has strong port diversity and a new, higher speed stacking technology further differentiating the switch from others in the industry. Avaya also has several other advantages such as its Multi-Link Trunking (MLT) Split Multi-Link Trunking (SMLT), and Distributed Multi-Link Trunking (DMLT) features. While these protocols are proprietary to Avaya, they offer the customer rapid route fail-over features as well as multi-path redundancy. One of the main values of their solution in comparison to other resiliency solutions is that these features interoperate with 802.3ad – therefore resiliency is extended to attached servers and other devices that support this protocol – rather than just being limited to the switching equipment. Additionally, Avaya is unique in supporting SMLT on this class of product. Most competitive solutions

**Product:****Avaya Ethernet  
Routing Switch 5000  
Series**

Enterprise Networking

only support rapid failover and multipath redundancy only their expensive core switches. Avaya is also using Horizontal Stacking technology via the actual stack ports of up to 15 feet to create horizontal groups in campus aggregation or top-of-rack situations for increased resiliency.

The ERS 5600 series offers Avaya's FAST (Flexible Advanced Stacking Technology) with a stacking speed of 144Gbps per unit and 1.152 Terabits for a full stack. The ERS 5500 offers 80Gbps per unit stacking speed and 640 Gbps for a full stack. The ERS 5000 Series has good port diversity including all-fiber models as well as strong support for 10 Gigabit Ethernet uplinks, especially in the ERS 5600 models.

In the last 18 months, Avaya has made strides to distance itself from the business cloud that had shadowed it and has once again established itself as a technology driver. Given time, Avaya data solutions is on track to do well – though the competitors in the market are equally aggressive and Avaya will have to execute well to outpace the rest of the field.

**Strengths and Weaknesses****Strengths**

- With new ownership by Avaya, the data switching division has experienced a revitalization that can be felt in its marketing, products, and plans. Avaya has put behind it any of the former Nortel's issues and revived an employee community that is evident in engagements and the market. This palpable excitement is apparent to customers and makes for compelling discussions.
- The 5500 family was one of the first stacking solutions in the industry, at the time exceeding that of the market leader (5510) and today, the ERS5600 raises the bar for stacking capabilities in a fixed switch form factor by providing a stack capability that exceeds 1 terabit resulting in a fixed stackable solution superior to the performance of many modular chassis designs.
- The Ethernet Routing Switch 5000 series supports 803.2ad Multi-Link Trunking, Split Multi-Link Trunking and Distributed Multi-Link Trunking features. MLT, SMLT, and DMLT allow for redundant data path failover with very rapid re-convergence times and multi-path data redundancy, which both contribute to a much higher level of availability for complex network applications such as VoIP. In addition, 802.3ad can be employed by server adapters for resilient active links to multiple switches resulting in a more fault tolerant compute domain.
- The Ethernet Routing Switch 5000 series features automatic stack configuration that simplifies additions, moves, and changes in the stack and provides for faster recovery times in the event that a failed unit needs to be replaced. The switch can be stacked eight units high resulting in 400 ports within a single switching domain.
- The Avaya Ethernet Routing Switch 5000 series can be deployed in a policy-managed environment, and it is supported by Enterprise Policy Manager. This enables enterprise-wide configuration of quality of service and switch configuration parameters from a central location, lowering the amount of operational overhead associated with managing and maintaining the network.
- The PoE features of the latest models in the ERS 5000 series, the ERS 5600 offer much improved power supply schemes. The ERS 5600 offers user-replaceable power supplies and in much larger wattages, allowing for the products to provide a full 15.4 watts per port and still retain power supply redundancy.

**Weaknesses**

- Competitors continue to spread FUD regarding Avaya's commitment to the data switching line, citing the intense competition in the Ethernet switching market as well as Avaya's past apathy

**Product:**

**Avaya Ethernet Routing Switch 5000 Series**

Enterprise Networking

towards creating its own data switching. This is all in spite of Avaya’s very public declarations and demonstrations of its commitment to the data switching market. Time will cure this ill, but for now it remains a competitive factor that Avaya must continue to deal with.

- The Ethernet Routing Switch 5000 series can classify, prioritize, and redirect IPv6 traffic, but it cannot natively route IPv6 packets, though it does possess static IPv6 route capabilities. This limiting factor puts Avaya at a competitive disadvantage in specific geographic and vertical markets when competing against fully IPv6-enabled hardware. The 5000 family does possess the means to implement it though should Avaya see customer demand strong enough.
- The ERS 5000 Series does not support PoE+, the 30 watt standard for enhanced power over Ethernet today. This isn’t a crippling issue at this point, but importance may grow as customers embrace more PoE+ dependent technologies.

**Point and Counterpoint**

**Point:** Avaya isn’t committed to the data switching business and remains focused on their telephony solutions, leaving data and Avaya Data customers to their own means.

**Counterpoint:** Avaya has made very public and demonstrative commitments to the Ethernet switching market, and over the last year has launched many products including a new end to end architecture, Virtual Enterprise Network Architecture (VENA). Avaya Data Solutions has momentum, energy, and the backing of a multi-billion dollar multi-national technology leader committed to the success of the data business. At no time in recent history has Avaya Data had a brighter future than today and customers should feel confident that solutions from Avaya will stand the test of time.

**Point:** Competitors can use Avaya’s performance reporting on the stacking bandwidth of their switches against the company in competitive selling situations.

**Counterpoint:** Avaya should respond by saying that its stacking bandwidth numbers are calculated in the same manner that most vendors use and has become the accepted practice and then show customers exactly how they arrive at those figures to dispel the impression of exaggeration. In the end though, the true measure of performance is packets per second processed (pps) and Avaya’s numbers stand up to scrutiny there exceptionally well.

**Point:** Competitors should call out Avaya’s dependency on its proprietary SMLT technology to deliver higher resilience in the network, claiming that it locks customers into a proprietary solution.

**CounterPoint:** Avaya should respond that SMLT is a published draft standard, that it can fully co-exist with any Ethernet switch, and that it delivers a higher degree of fault tolerance and faster re- convergence times than standards-based technology. Avaya can further respond that SMLT interoperates with 802.3 ad compatible device; therefore, which provides greater interoperability than some alternatives.

**Buying/Selecting Criteria**

**Management/Ease of Use: Strong**

- The Avaya Ethernet Routing Switch 5000 series presents a single management entity for the entire stack, giving the administrator a single point of control over an entire wiring closet full of ports. This eases deployment tasks, configuration changes, and day-to-day maintenance tasks.
- A failed device in a stack of Ethernet Routing Switch 5000 series switches does not influence con-

**Product:****Avaya Ethernet  
Routing Switch 5000  
Series**

Enterprise Networking

nectivity with other switches in the stack or to the upstream switch, if the Ethernet Routing Switch 5000 series switch is properly deployed with multiple uplinks spanning multiple switch members in the stack. Replacing a failed unit or adding a new member to the stack is non-disruptive and the new unit will re-learn its configuration and receive any necessary software downloads from other members in the stack –without the need for an engineer to configure or manage the process.

- Avaya's Split Multi-Link Trunking or "Switch Clustering" features provide greater network reliability and faster convergence in the event of a device or cabling failure. Although the technology is unique to Avaya, it is fully interoperable with any device that supports 802.3 ad Link Aggregation Control Protocol. This gives Avaya the unique ability to be able to offer a resilient end to end solution that extends to attached servers and other devices that support 802.3 ad. Avaya is also unique in supporting these features in this class of product, as they are typically only offered on expensive core solutions. This allows enterprises of all sizes to build cost-effective resilient solutions.
- Avaya provides Web, command line, and standalone Java management interfaces, and it can deliver integrated policy management features via Enterprise Policy Manager, further reducing the complexity of network administration and provisioning in the enterprise. For provisioning Avaya offers the Configuration and Orchestration Manager which offer provisioning wizards to dramatically simplify complex provisioning tasks.
- Avaya ERS 5000 series offer plug and play provisioning of IP phones and offers automatic QoS provisioning of the switch as well as attached phones and call servers.
- Avaya ERS 5000 offers integration with Avaya's Identity Engines portfolio to simplify network access. This enables the auto assignment of VLAN, Port, and QoS of attached end points at the time of access based on the user and the device credentials. This type of solution dramatically simplifies adds, moves and changes since IT no longer has to pre-assign each switch port to specific VLANs, filters, etc., and then, when devices move, manually re-configure each port.

**Performance: Strong**

- The latest models of the ERS 5000 series, the ERS 5600 uses two 36Gbps stacking ports for a total stacking bandwidth of 72Gbps between both ports. Like most other vendors, Avaya counts both ingoing and outgoing traffic for 72Gbps per stacking port to get to 144Gbps total. These numbers are much higher than the older ERS 5500 models and many competing products.
- The ERS 5600 can be stacked alone or with the ERS 5500. When stacked with the ERS 5500 - the adjacent 5600's will run at the speed of the 5500, however, giving customers the flexibility to add newer switches to older stacks provides some measure of investment protection at the cost of performance.
- The Ethernet Routing Switch 5000 series performs local packet switching when possible. This means packets bound for a local interface on a given switch do not cross the stacking interface, leaving more bandwidth for cross-stack traffic, and generally resulting in higher throughput.
- Through a combination of non-blocking internal Switch Fabrics with high-speed stacking architecture – Avaya's stackable chassis technology is not bound by the limitations and constraints facing solutions employing simple merchant silicon stacking (token sharing/ passing systems, or basic cascading) and can scale proportionally as a new member joins the stack. It utilizes a unique physical/logical ring topology that allows traffic to flow either "upstream" or "downstream" simultaneously from every switch in the stack – providing the shortest path for each data flow.
- The Ethernet Routing Switch 5000 series supports a unique horizontal stacking capability which can be deployed in a Data Center Top of Rack scenario to significantly reduce latency (from milliseconds to microseconds) for server to server communications by keeping traffic local to the stack. It's important to note that in this type of environment where performance and throughput really

**Product:****Avaya Ethernet  
Routing Switch 5000  
Series**

Enterprise Networking

matter, the ERS5650 can be entirely non-blocking for all traffic ingressing front panel ports and egressing across the stack.

**Port Diversity: Strong**

- The Avaya ERS 5000 Series offers 24-port, 48-port and 96-port copper interfaces as well as the essential PoE options for converged network situations in those port counts.
- Every model of the ERS 5600 offers 10 Gigabit Ethernet uplink, most of them in addition to Gigabit copper uplinks.
- The 5530-24TFD model offers 12 ports of fiber connectivity for customers that have made an investment in a fiber infrastructure. The 5530-24TFD is also unique in that it also offers 24 (12 shared) ports of Gigabit copper, for the ultimate in flexibility in a single switch.
- The ERS 5600 provides up to 96 ports in a single model (5696) with fully redundant power at 15.4W /port, making it unique in the industry for a fixed switch product.
- The ERS 5632 offers 24x100/1000BASE-SFP plus 8 x 10GBASE-XFP for greater 10 gig density than other campus fixed switch solutions.

**Scalability: Strong**

- The Avaya Ethernet Routing Switch supports up to eight units in a single stack. When additional capacity is required, a new unit can be cabled in and the stack configuration is automatically updated. ERS 5000 ensures bandwidth can scale proportionally as a new member joins the stack. In addition, each Ethernet Routing Switch is only one RU tall with the exception of the 96 port models of the ERS 5600, which are two RU. The stack is also limited to a total number of 400 ports, regardless of the number of switches in the stack. This isn't generally regarded as an issue, since very few single stacks in the wiring closet need that density.
- Each Ethernet Routing Switch 5000 series switch has at least two SFP-pluggable Gigabit uplinks, some have four and some models offer optional 10GbE, which provide aggregated bandwidth back to the core of the enterprise LAN.
- The Ethernet Routing Switch 5000 series supports full Layer 2-4 quality of service and advanced queuing capabilities with eight hardware queues. The solution can be managed via Avaya's Enterprise Policy Manager, reducing operational overhead associated with configuring and maintaining the LAN.
- Avaya's wrap-around stack provides 72 Gbps of bandwidth (144Gbps full duplex) between each member switch in a stack being the first stackable solution to exceed terabit capacity, and it provides fault-tolerance in the event of a switch failure. Avaya supports hot-switch replacement with full reconfiguration, reducing the chance for human error when replacing a failed device.
- The ERS 5698 models are unique in that they offer 96 ports of switching capacity in addition to having stacking capabilities.

**Total Cost of Ownership: Strong**

- The Ethernet Routing Switch 5000 series is competitively priced in the market for advanced enterprise stackables, and it has an enterprise-class feature set to back the product up.
- The ERS 5500 and ERS 5600 products will stack together and this gives customers only good flexibility to add to existing stacks, but provides investment protection to customers who started with the ERS 5500 and are now moving to the ERS 5600.
- The ERS 5000 Series support the Avaya Energy Saver Solution which dims consumption of Avaya

**Product:**

**Avaya Ethernet  
Routing Switch 5000  
Series**

Enterprise Networking

Switches and attached IP phones during off-peak periods and even turning off low-priority devices not needed after-hours this can reduce ongoing power consumption costs for the enterprise.

- Avaya is requiring an Advanced Routing License to enable a number of the Layer 3 routing protocols, specifically SMLT, OSPF, VRRP, and ECMP. Such a pricing maneuver puts Avaya at greater price parity with competitors, but also gives it feature parity. This pay as you grow approach is advantageous for customers who do not have to buy functionality they do not need.

**Product Metrics**

**Product: Avaya Ethernet Routing Switch 5000 Series**

Physical Characteristics	
Device Class	Layer 2 - 3
Primary Target Market	Wiring Closet, small core, data center top of rack
QoS Features	
Total Number of Transmit Queues Per Port	8
Total Number of Receive Queues Per Port	8
Rate Limiting Granularity	1 Mbps
Protocol Support	
IP Routing	Yes
IP Routing Protocols	RIPv1/v2, OSPF, VRRP, PIM-SM
Interface Support	
10/100/1000Base-T	24-port, 48-port, 96-port
10/100/1000Base-T with 802.3af	24-port, 48-port, 96-port
10/100/1000Base-T with 802.3at (PoE+)	None
1000Base-X (GBIC or SFP)	2 or 4 SFP ports, 8 SFP on 5530, 24 SFP on 5632
10G - XENPAC	2-port XFP, 8-port XFP
10G - 10GBASE-T Copper	None
Other (Specify Type and Port Count)	None
Special Modules (Non-line Cards)	None
PoE Power Budget	24-96 depending on model
802.3 at PoE+ Power Budget	None
High Availability	
Redundant Power Supplies	External RPS for 5500, dual/triple internal for 5600
Non-Stop Code Upgrade	Yes
Performance	
Aggregate Switch Throughput	80 – 384 Gbps
Forwarding Rate	35.7 – 172.7 Mpps
Non-blocking Wire Speed	Yes
Switch Forwarding Latency	< 10 us
Pricing	
Switch Price	\$5,495 - \$9,995
Expansion Module Pricing	NA
Support	
Standard Warranty	Lifetime
Enterprise Maintenance Contract	SBD, NBD, 4 Hours (7x24)