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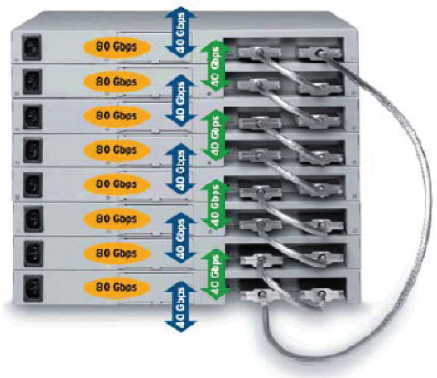
Avaya Stackable Chassis

Avaya stacking architecture delivers up to 20X better performance than the leading rival

Stackable Ethernet switches have become increasingly popular, and are often selected in preference to chassis-based alternatives. Price is an obvious influence on these decisions, but not all 'stackable' switches are created equal.

Indeed, not all 'stackable' switches provide a genuine alternative to the traditional modular chassis, as not all can deliver the necessary combination of performance, resiliency, and ease of operations crucial in the Enterprise environment. Some options are not even truly stackable, and are basic combinations that present a simplified management view.

Avaya's innovative intelligent wiring closet solutions – based on our Flexible Advanced Stacking Technology (FAST) – enable customers to progressively and effectively scale their network without increasing management complexity. The highly scalable stacking architecture delivers resilience, outstanding performance levels, intelligence and flexibility. Our solutions are genuine chassis alternatives, confirming our innovation of a new market segment, the 'Stackable Chassis'. Business networks of all sizes can reap the benefits that Avaya offers as we provide Stackable Chassis options for entry-level, mainstream, and high-end deployment scenarios with the Ethernet Routing Switch 2500, 4500 and 5000 Series product lines, respectively.



The Chassis-alternative challenge: compare rivals to what Avaya offers

A unique combination of capabilities allows the resilient Stackable Chassis solutions delivered by Avaya – and only Avaya – to be considered as genuine alternatives to a conventional chassis for the wiring closet requirements. These are typically characterized as being:

- **High-performance and low-latency.** With a chassis solution it has been a given that performance comes as a natural function of design and price. The Avaya Stackable Chassis combines non-blocking internal switching fabrics with high-speed stacking architectures to deliver a true high-performance alternative. Avaya FAST is not bound by the limitations and constraints facing other vendors (using token sharing/passing systems, or basic cascading), and has been specifically designed to scale proportionally as new members are added to the stack, as more ports are added and bandwidth requirements grow.
- **Ease of expansion.** With a chassis solution it is simply a case of adding a new module, adding configuration, and connecting devices. With the Avaya Stackable Chassis it is much the same: simply cable-in a new stack member, and because the stack is managed as a single network entity, the appropriate configuration is easily extended.
- **No single point-of-failure.** With a chassis solution this has meant N+1 power supplies and even redundant switching fabrics. The Avaya Stackable Chassis provides an elegant equivalent: each member has an independent switching fabric, and adding the redundant power supply option means that there is no one single point-of-failure; any individual element failure is equivalent to the failure of a single module within a chassis.

By introducing an architecture that combines all of the mandatory and many of the desirable aspects of the traditional modular chassis, but delivering these with pay-as-you-grow fixed-format stackable switches, Avaya has created a new dynamic for the unified communications network. Avaya's technology simulates a conventional chassis, with a virtual backplane for the exchange of data and control plane traffic that is implemented via an intelligent, scalable, and resilient stacking mechanism. This creates a marriage of the cost-effectiveness of the stackable model and the performance and scalability of a chassis.

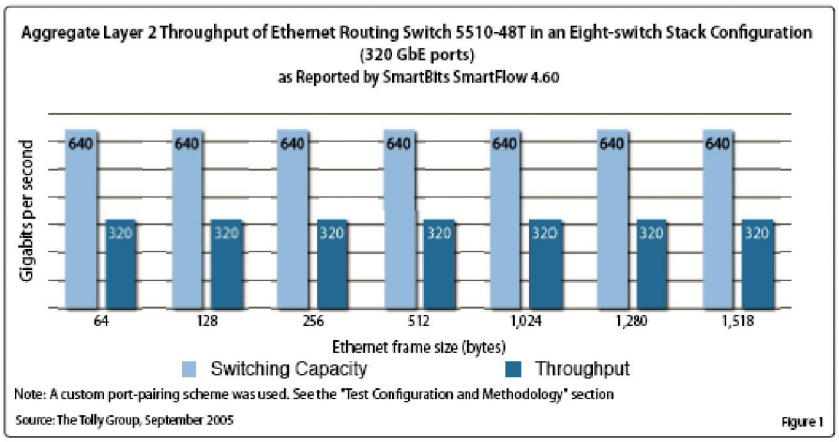
Avaya's Flexible Advanced Stacking Technology (FAST) delivers the highly-sophisticated architecture needed to guarantee flexible performance and reliability:

- **Bi-directional shortest-path traffic forwarding** – This capability is at the heart of our resilient stackable chassis architecture, ensuring that the shortest, most optimal forwarding path is selectively chosen for each unique data flow. There is none of the unwieldy logical ring or token technology that rivals use, but a star-based distributed forwarding topology that allows traffic to flow either 'upstream' or 'downstream' simultaneously from every switch in the stack, optimizing both performance and resiliency.

- **Auto-unit replacement** – This crucial service and operations feature ensures that any unit failure can be quickly and easily rectified; a hot-swap capability. Enabling immediate like-for-like unit replacement without impacting the remaining stack functionality and traffic, and without complex engineering intervention empowers Operators to deploy our Stackable Chassis solutions just like they would a conventional chassis. The AUR process can automatically deliver the agent image software, the configuration file, and the diagnostic Image software to the replacement switch.
- **Scalable stacking performance** – The stacking fundamentals are consistent across the portfolio, and variations come in terms of individual switch products and therefore overall stacking bandwidth. The stacking connection bandwidths scale linearly with the addition of each new unit into the stack and are proportionally designed to match the market positioning of the individual products.

Avaya implements FAST across the stackable product lines, delivering solutions with virtual backplanes that scale for any deployment scenario. These capacities are:

- **Our premium high-end switches** – Ethernet Routing Switch 5600 models scale up to 1,152Gbps (that's over 1Tbps) and the Ethernet Routing Switch 5500 models scale up to 640Gbps
- **Ethernet Routing Switch 4500 Series** – our mainstream wiring closet switches – scale up to 320Gbps
- **Branch Office and entry-level wiring closet switches** – Ethernet Routing Switch 2500 Series – scale up to 32Gbps



In this example we demonstrate the inter-switch and whole-of-stack capacity for the ERS 5500 models – a mechanism that is identical for all products and it's simply a case of the different connection capacities that correspond to their different typical usage.

The ability to deliver chassis-like performance is crucial, as units within a stack must be able to effectively communicate between each other and back to the network infrastructure with minimal congestion and latency, especially as real-time communications applications roll out. The Avaya stacking architecture delivers exactly what is needed: high-performance, low-latency, and effective scalability.

Independent testing[1] proves two things. Firstly that Avaya's architecture delivers the performance levels that we claim, and secondly that our performance is up to 20 times higher than that of similarly-positioned rival products. The stacking capacity of Cisco's Catalyst 3750 products range from 32 to 64Gbps (shared across a stack of nine switches), whereas Avaya's ERS 5000 Series scales linearly up 1,152Gbps for a stack of eight. And this isn't a purely esoteric or theoretical comparison; with roughly 400Gbps of front-panel capacity available there is the very real potential for a heavily congested situation that will impact application performance, particularly for real-time multi-media applications. Avaya has an additional advantage in that we honor Quality-of-Service settings as traffic passes over the stacking connections – the virtual backplane – and this, combined with the high capacity, provides applications with the best possible chance of optimal performance, and correspondingly the user experience.

Only Avaya's comprehensive portfolio of FAST-enabled stackable chassis switches are genuinely Enterprise-class, offering the performance, resiliency, and ease of serviceability crucial when looking to replicate many of the positive attributes of a chassis solution but at a lower price point. Avaya enables operators to truly think outside the box; no longer having to compromise on capability or performance when seeking to leverage the pay-as-you-grow cost model of a fixed-format product.

[1] Tolly Group Test Report #210118 Avaya Ethernet Routing Switch 5000 Series Competitive Performance Evaluation

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.

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