

# Avaya VENA Distributed Top-of-Rack

Delivering game-changing productivity, agility, and dependability

Supporting mission-critical applications requires 24x365 always-on infrastructure, and the Avaya Virtual Services Platform 7000 delivers against this challenge. It is a highly strategic product that is fit-for-purpose for today's connectivity requirements and future-ready for the evolving and emerging application-driven needs of tomorrow.

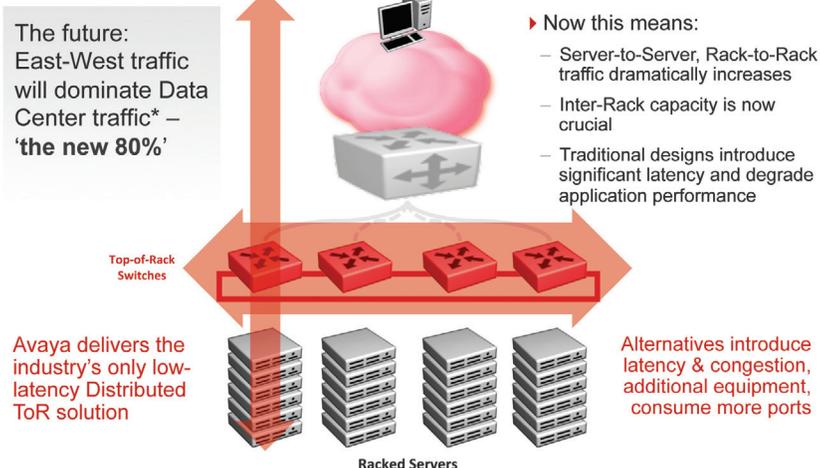
Helmuth von Moltke the Elder, the nineteenth century military strategist, theorized "no plan survives contact with the enemy"; as it is in battle so it is when operating a multi-faceted data center. Best-laid plans for application consolidation and centralization progressively dissipate, impacted by something known as the 'application fragmentation' phenomenon. The hurly-burly of day-to-day Virtual Machine operations – both planned and unplanned – means that the numerous components that combine to form modern composite application architectures inevitably become dispersed through the data center resource pool. The idealized notion of application traffic being contained within a single rack, and therefore being serviced by a single network device, is pure fantasy. The reality is that multiple east-west transitions are required to support a single north-south transaction.

Avaya's unique value is centered on our ability to deliver simplified network designs that uniquely deal with the real-world pain-points within the data center; most specifically, we satisfy the demand for a low-latency solution for east-west traffic. The Avaya Virtual Enterprise Network Architecture (VENA)

Fabric Connect solution, incorporating the Virtual Services Platform 7000 (VSP 7000) deployed as a 'Distributed ToR', delivers revolutionary network simplicity, because it is the only network fabric offering that creates network-wide services with a single control plane independent of the physical topology.

The VSP 7000 delivers a new take on the traditional Top-of-Rack Switch requirement. For modest scenarios, Switches can be horizontally interconnected, creating a single logical system spanning eight units/racks.

## Delivering the Cloud-grade difference



Time-to-service, in the context of the data center, is a simple function of provisioning, and it draws on all three areas of the classic 'plan, build, run' model. The ability to implement change, in real-time, and without risk is key to delivering business-centric time-to-service. Avaya delivers this with our Virtualization Provisioning Service (VPS) management application that acts as the glue that binds the lifecycle activity of VMware's vCenter with the edge-only, one-touch provisioning capability enabled by our Fabric Connect solution.

Alternatively, hundreds of VSP 7000s can be flexibly meshed for massive scale-out that uniquely delivers multi-hop, low-latency. Forming a single-tier, Avaya's Distributed ToR is a connectivity solution for the data center's primary requirement: high-performance, low-latency, Layer 2 east-west traffic. Utilizing the high-speed virtual backplane capacity, and invoking Ethernet's plug & play advantage, the VSP 7000 empowers simplified, one-touch, edge-only provisioning.

The VSP 7000 is an integral component of our Fabric Connect solution for end-to-end Fabric-enabled networking; and our unique Distributed ToR delivers the industry's best application performance solution. By keeping the data center's Layer 2 traffic within the ToR tier – leveraging the high-performance virtual backplane system that is created between multiple Switches – real-world multi-rack/multi-server latency is dramatically reduced.

Avaya's innovative Distributed ToR approach offers integrated Layer 3 interconnectivity, together with traditional Layer 2 functionality throughout data center environments. As and when needed, Layer 3 connectivity and additional scale is delivered by an Aggregation Switching layer, leveraging multiple 10 Gigabit or (future) 40/100 Gigabit connections.

The most striking example of the unique capabilities of VSP 7000 is when real-world, multi-hop – that is, rack-to-rack-to-rack – latency performance is compared to traditional two-tier offerings; the VSP 7000 injects an average of only 1 microsecond of latency per Switch hop. This is an astonishing level of performance, and is several orders of magnitude better than any other industry offering. While there are other examples of individual ToR Switches offering microsecond latency, we would all appreciate that no data center is ever networked by a single device, and transiting through an Aggregation Switch can add 20 microsecond, or more, per hop; a four-hop data mash-up could cost as much as 100 microseconds, as opposed to 4 microseconds with the VSP 7000 Distributed ToR solution.

Additionally, the VSP 7000 features a front-panel expansion slot, making field-upgradability as easy as hot-swapping in a new pluggable expansion adaptor; options include additional 10Gbps ports (SFP+ sockets or RJ45 10GBASE-T), and future 40Gbps, 100Gbps Ethernet, and Storage Convergence.

As Virtual Machines are prepared for deployment or migration by server administration, vCenter's API is leveraged by VPS to prepare the Distributed ToR network of VSP 7000s – automatically, dynamically, and proactively. The benefits are pronounced and significant. Compliant, role-based migrations are now enacted without any manual network administration, in real-time, and the human-error induced outages of the past are genuinely a thing of the past.

An innovative design helps ensure that the appropriate portion of the switching fabric's 1,280Gbps performance is dedicated to supporting MDA-based connections, while still providing full wire-speed throughput for all front panel ports and the flexible, high-speed Fabric Interconnects. The power of these to create the high-performance, low-latency Distributed ToR solution cannot be over-estimated. Although Avaya has architected the Distributed ToR solution to scale up to 480 Switches within a single instance, the typical build block is thirty-two VSP 7000 Switches across 16 server racks, delivering 1,024 ports meshed across almost 20Tbps of virtual backplane. This building block concept is itself extremely flexible; with virtually no hard-and-fast topology constraints, blocks can be as small or large as required, and easily interconnected with extended-reach copper or fibre cabling.

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Highlights of the VSP 7000 hardware are a hardened physical architecture of dual, hot-swappable, directional AC or DC power supplies and fan trays, making it ideally suited to deliver today's pressing need for flexible, high-speed Ethernet connectivity in the high-performance Top-of-Rack role. A full lifetime hardware and software warranty is simply the icing on the cake, including complimentary next-business-day shipment for the life of the product.

Avaya believes that the IEEE's 802.1aq Shortest Path Bridging (SPB) standard is the option that provides the most opportunity for advancement when it comes to Fabric-based networking. Forming the basis of our Fabric Connect solution, it is the only technology capable of creating network-wide services with a single control plane that is truly independent of the physical topology, thereby avoiding issues with layering and stitching of multiple protocols into a complicated mess and/or simply failing to scale beyond a single physical data center.

## About Avaya

Avaya is a global provider of business collaboration and communications solutions, providing unified communications, contact centers, networking and related services to companies of all sizes around the world. For more information please visit [www.avaya.com](http://www.avaya.com).

The VSP 7000 brings unique differentiation to the ToR role: with a flexible, non-blocking architecture, including wire-speed server access connections and Fabric Interconnects. The VSP 7000 is purpose-built to support today's dynamic data center operations and high-density, low-latency 10 Gigabit Ethernet Top-of-Rack deployments. It alleviates infrastructure complexity and reduces power consumption with a truly scalable and strategic architecture; it is designed to deliver a high-performance Distributed ToR solution into the next decade.