AVAYA

Engage **The Power of We**™

Avaya Virtual Services Platform 8404

Flexible, Compact Form-Factor Ethernet Switch designed to deliver sophisticated functionality in versatile deployment scenarios for businesses that range from mid-market up to mid-sized enterprises

Avaya progresses the Compact Form-Factor Ethernet Switch concept with the introduction of a flexible, semi-modular option. This expansion to the VSP 8000 Series enables businesses to satisfy many typical deployments scenarios with a consistent hardware platform.

Mid-sized businesses are increasingly dependent upon application access and IT systems – much like their larger siblings – however they typically do not have the same levels of IT or funding resources available to build-out reliable networks using conventional techniques and products. They too seek advanced networking capabilities, but need these to be delivered in a streamlined, simplified, and cost-effective package.
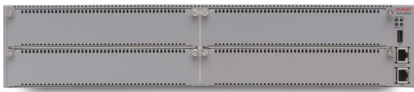
The VSP 8000 Series features tight integration between the Industry's leading hardware and Avaya's proven VSP Operating System and this delivers a compelling package of enhanced levels of functionality and robustness. Leveraging Avaya's unique virtualization technologies, businesses can benefit from real-time service agility, avoiding the delays associated with conventional design, and the outages introduced in trying to maintain them. The Compact

Form-Factor (CFF) design revolutionizes the cost/benefit proposition for the mid-market/mid-sized Core Switch role; delivering higher port density, better price/port, lower entry price-point, enhanced power efficiency, reduced maintenance, smaller physical footprint, and easy scalability. Essentially, the CFF gives business what they need, and at the same time helps them avoid the 'Chassis Tax'.

The VSP 8000 Series debuted the Compact Form-Factor design concept, ushering in a unique approach to product and solution design. The original VSP 8284XSQ has come to define simplification, and the new VSP 8404 now adds flexibility to the equation. Leveraging the ability to support a diverse mix of Ethernet interfaces – from 100Mbps to 40Gbps, Copper- and Fiber-based – businesses
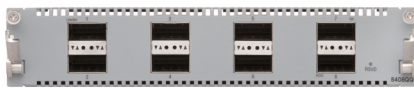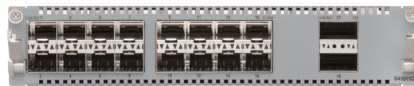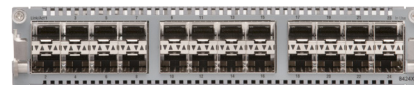
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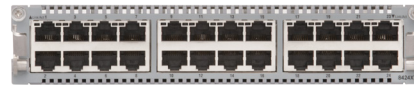

Front View

Rear View

8408QQ Ethernet Switch Module

8418XSQ Ethernet Switch Module

8424XS Ethernet Switch Module

8424XT Ethernet Switch Module

The VSP 8000 Series features tight integration between the Industry's leading hardware and Avaya's proven VSP Operating System and this delivers a compelling package of enhanced level of functionality and robustness.

can use the VSP 8404 to address a range of networking applications. The VSP 8404 is equally at home in the Core of a mid-sized Campus network, or as the Spine Switch in a Data Center Spine/Leaf Top-of-deployment. The VSP 8404 can also be deployed as a Campus Distribution Switch, providing and aggregation point between the Core and Access tiers. Supporting Avaya's innovative Fabric Connect and Switch Cluster technologies, in addition to conventional IPv4 and IPv6 Routing, the VSP 8404 is an agile and versatile player in a number of distinct scenarios.

The VSP 8404 deploys and operationalizes quickly, minimizes ongoing operational burden, and Avaya's unique network virtualization technologies enable real-time service deployment. As a product line, the VSP 800 Series enables businesses to redirect their finite IT resources to important value-adding projects.

The new VSP 8404 shares the same next-generation hardware and software technology basis as the existing VSP 8284XSQ. This positions the product line to support both today's requirements and tomorrow's emerging needs. The VSP 8000 Series provides business with a future-ready solution that leverages the Industry's most software-definable network virtualization technology.

Product Overview

The VSP 8404 Ethernet Switch provides four front-panel slots that support the flexible deployment of high-density VSP 8400 Series

Ethernet Switch Modules. By default, the VSP 8404 is a "zero port" system, with a Chassis that integrates the switching fabric and all associated control and management electronics. Ethernet interfaces are delivered by the addition of one or more field-replaceable and hot-swappable Ethernet Switch Modules (ESMs).

The ESMs made available in the initial release include support for 10 Gigabit Ethernet (SFP+ and Copper), and 40 Gigabit Ethernet. The VSP 8404 can scale from as little as 16 ports of 10 Gigabit and 2 ports of 40 Gigabit, up to 96 ports or 32 ports respectively. In this manner, the VSP 8404 provides a low-cost, pay-as-you-grow solution for mid-sized businesses that wish to retain a high degree of flexibility as they develop solutions for their networking requirements.

The VSP 8400 Series Ethernet Switch Modules delivered at launch are as follows:

• 8408QQ 8-port 40 Gigabit Ethernet QSFP+ ESM

• 8418XSQ 16-port 10 Gigabit Ethernet SFP+ and 2-port 40 Gigabit Ethernet QSFP+ Combo ESM

• 8424XS 24-port 10 Gigabit Ethernet SFP+ ESM

• 8424XT 24-port 10 Gigabit Ethernet RJ45 ESM

It should also be noted:

• 40 Gigabit Ethernet QSFP+ ports support Channelization and can therefore be individual sub-divided into four 10 Gigabit Ethernet channels.

- 10 Gigabit Ethernet SFP+ ports also support a wide range of 1 Gigabit Ethernet SFP Transceivers.

- 10 Gigabit Ethernet RJ45 ports also support 100/1000Mbps connectivity

Please refer to the product technical documentation for further details.

The innovative design leverages the most advanced chipset from the Industry's leading supplier, featuring 2.56Tbps of switching and 1,428Mpps of frame forwarding performance. The chipset is designed to deliver Terabit-scale, wire-speed capabilities, with a fully integrated 10/40/100 Gigabit ASIC architecture that facilitates multiple design opportunities. Latency has been optimized, with a 40% advance over current best examples. New intelligent buffer technology self-tunes thresholds for excellent burst absorption, offering a 5x efficiency gain over existing static designs. A flexible, Unified Forwarding Table allows for future in-field optimization, with up to four mission profiles supported. This chipset also includes embedded support for a range of enabling technologies such as DCB, SPB, VXLAN, PIM, FCoE, and NAT/PAT.

Benefits

The VSP 8404 adds significant flexibility to the Avaya Networking portfolio, and is compatible with, and complementary to, existing products and technologies. A new product, introducing the Compact Form-

Factor concept, the VSP 8404, when deployed with other Avaya or third party Ethernet Switches devices, provides very high-capacity, high-performance connectivity solution for mid-sized Campus networks.

Building the Core using the cost-effective VSP 8404 and the Avaya Switch Cluster technology enhances the resiliency posture normally available to mid-sized business. In addition to the various high-availability factors offered by expensive Chassis-based products (i.e. CPU, Switch Fabric, Power, Cooling, and of course Link), the combination of Switch Cluster and distributed hardware delivers total physical independent, including the ability to have the 'Core' split and deployed in different physical locations, independent and isolated control planes (meaning genuine process separation, isolation, and protection), and in-service software upgrades and be easily enacted. The VSP 8404 brings to the mid-sized Core the advantages that deploying Switch Cluster on Avaya's Chassis-based products has delivered for many years to larger networks, but now offering it at a price-point more compatible with mid-sized business.

The VSP 8404 also natively supports the Avaya Fabric Connect technology. Some of the key advantages that Fabric Connect delivers include:

- Making the need to configure network-wide VLANs obsolete

- Replacing multiple sequential legacy protocols with this one single unified technology

- Totally removing the risk of network loops

- Delivering the Edge-only provisioning model which seamlessly integrates with orchestration and automation

- Fully optimizing all links and all devices enabling businesses to get the most out of infrastructure investments

Traditionally, provisioning new services or to changing existing ones, requires engineers to touch every device in the service path, configuring each device to enable both the active and redundant links. The bigger the network the more complex and risky this becomes. Leveraging Fabric Connect to virtualize the network delivers fundamental change. Rather than the network appearing as a mass of individual devices it becomes an opaque cloud, where we only need to touch the single unique device that is providing service directly to the end-point. Fabric Connects automatically and instantly propagates all of service attributes to every other node within the cloud.

Fabric Connect has the added advantage of separating and segmenting traffic to unique service constructs. This has advantages in delivering 'stealth networking' solutions that help with compliance for business processes such as PCI and HIPAA.

Creating an autonomic network delivers crucial advantages. It means that businesses no longer need to configure the Core of the network for

every service change; service change is only configured at the Edge of the network, and this has dramatic impacts for the entire change paradigm. Network segmentation means that each service is uniquely encapsulated and carried independent of every other service. Leveraging a single unified protocol, with integrated IP Multicast, enables Fabric Connect to deliver the Industry's premium solution for simplified, scalable, and resilient IP Multicast-based applications. The Edge-only provisioning model delivers significant advances in how the network interacts with VM mobility. Layer 2 VLANs can be easily and seamlessly extended throughout the Data Center whether that is a single site or multi-site, and traffic flows are automatically load-balanced across all available links.

System Compatibility

From a software perspective, the VSP 8404 is introduced with the release of the VOSS 4.2 software version; this will therefore be the minimum level of software available to operate the Switch. The VOSS 4.2 release delivers the following major enhancements:

• 40 Gigabit Channelization

• IP Security (IPsec) data encryption for Control Plane traffic

• Various security enhancements

Features & Capabilities

• Flexible support for up to 96 ports of 10 Gigabit Ethernet or up to 24 ports of 40 Gigabit Ethernet

• Hot-swappable Ethernet Switch Modules

• Non-blocking, wire-speed switching architecture

• Integrated design that is optimized for low latency

• Flexible table architecture delivers MAC, ARP, and IP Routing scalability

• Feature-rich support for conventional VLAN, Link Aggregation, Spanning Tree technologies

• Routed IPv4 & IPv6 includes support for Static, RIP, OSPF, ECMP, VRRP, PIM-SM, and VRF

• IPv6-optimized Hardware

• Avaya Switch Cluster technology supports Triangle & Square configurations, with both Layer 2 and Layer 3 functionality

• Avaya Fabric Connect technology supports Layer 2 Virtual Service Networks, Layer 3 Virtual Service Networks, Inter-VSN Routing, and IP Shortcut Routing

• MACsec and Enhanced Security Mode options

High Availability Power & Cooling

• Up to 2 field-replaceable, hot-swappable AC or DC internal Power Supplies

• 4 field-replaceable Fan Modules

Warranty

• 12-month hardware

• A complete range of support options are also available, either directly from Avaya or indirectly from our Authorized Business Partner network

Software Licensing

• Base Software License, included with hardware purchase, enables most features with the exception of those specifically noted an enabled by the Premier Software License.

• Premier Software License, an optional accessory, enables the following features: Layer 3 Virtual Service Networks and - where local regulations permit - MACsec.

Country of Origin

• China (PRC)

VSP 8284XSQ Specifications

General

- Physical Connectivity:
  - Up to 96 x 10GBASE-SFP+ Ports
  - Up to 96 x 10GBASE-T Ports
  - Up to 24 x 40GBASE-QSFP+ Ports
- Channelization of 40 Gigabit ports
- Switch Fabric Architecture: 2.56Tbps Full-Duplex
- Frame forwarding rate: 1,428Mpps per Switch
- Nominal Latency: <480nsec
- Jumbo Frame support: up to 9,600 Bytes (802.1Q Tagged)
- MACsec support for 10 Gigabit and Channelized 40 Gigabit ports

Layer 2

- MAC Address: 224,000
- Port-based VLANs: 4,059
- Private VLANs/E-Tree: 4,059
- MSTP Instances: 12
- MLT/LACP Groups: up to 96
- MLT Links per Group: 8
- LACP Links per Group: 8 Active & 8 Standby
- Avaya VLACP Instances: up to 96
- Avaya SLPP Instances: 128

Layer 3 IPv4 Routing Services

- ARP Entries: 32,000
- Static ARP Entries: 2000 per VRF, 10,000 System-wide
- IP Interfaces: 506
- CLIP Interfaces: 256
- IP Routes: 16,000
- IP Static Routes: 1,000 per VRF, 5000 System-wide
- RIP Interfaces: 200
- RIP Routes: 16,000
- OSPF Interfaces: 500
- OSPF Routes: 16,000
- OSPF Areas: 12 per VRF, 80 System-wide
- BGP Peers: 12
- BGP Routes: 16,000
- ECMP Groups: 1,000
- ECMP Paths per Group: 8
- ECMP Routes: 16,000
- NLB Interfaces: 256
- VRRP Interfaces: 252
- RSMLT Interfaces: 252
- IP Route Policies: 500 per VRF, 5,000 System-wide
- VRF Instances: 24

Layer 3 IPv6 Routing Services

- Neighbors: 8,000
- Static Neighbors: 256
- IP Interfaces: 506
- CLIP Interfaces: 1
- IP Configured Tunnels: 506
- IP Routes: up to 8,000
- IP Static Routes: 1,000
- OSPFv3 Interfaces: 500
- OSPFv3 Routes: up to 8,000
- OSPFv3 Areas: 12 per VRF, 80 System-wide
- ECMP Groups: 1,000
- ECMP Paths per Group: 8
- ECMP Routes: 16,000
- VRRP Interfaces: 252
- RSMLT Interfaces: 252

Multicast

- IGMP Interfaces: 4,059
- PIM Active Interfaces: 128
- PIM Passive Interface: 256
- PIM-SSM Static Channels: 4,000
- IP Multicast Streams: 6,000

Fabric Connect

- 802.1aq/RFC 6329 Shortest Path Bridging with Avaya extensions
- MAC Address: 112,000
- IS-IS Adjacencies: up to 96
- BCB/BEB Nodes per Region: 2,000
- BEB Nodes per VSN: 512
- L2 Virtual Service Networks: 4,059
- L3 Virtual Service Networks: 24
- IP Shortcut Routes: IPv4 16,000, and IPv6 8,000
- L2 Multicast Virtual Service Networks: 2,000
- L3 Multicast Virtual Service Networks: 24

QoS & Filtering

- ACL: 256 Ingress and 126 Egress
- IPv4 ACE: 766 Ingress and 252 Egress
- IPv4 ACE: 252 Ingress and 252 Egress
- L2-L4 Ingress Port Rate Limiters: up to 96
- Egress Port Shaper Granularity: 1Mbps to 40Gbps per Port

Operations & Management

- Mirrored Ports: up to 95

Support Transceivers

40 Gigabit Ethernet

- 40GBASE-SR4/4x10GBASE-SR QSFP+ up to 150m over MMF (MPO connector)
- 40GBASE-LR4 QSFP+, up to 10km over SMF (Duplex LC)
- 40GBASE-QSFP+ Direct Attach Cable, 1m
- 40GBASE-QSFP+ Direct Attach Cable, 3m
- 40GBASE-QSFP+ Direct Attach Cable, 5m
- 40GBASE-QSFP+/4x10GBASE-SFP+ Break-Out Cable, 1m
- 40GBASE-QSFP+/4x10GBASE-SFP+ Break-Out Cable, 3m
- 40GBASE-QSFP+/4x10GBASE-SFP+ Break-Out Cable, 5m

10 Gigabit Ethernet

- 10GBASE-SR, up to 300m reach over MMF (Duplex LC)
- 10GBASE-LRM, up to 220m over FDDI-grade MMF (Duplex LC)
- 10GBASE-LR/LW, up to 10km reach over SMF (Duplex LC)
- 10GBASE-ER/EW, up to 40km reach over SMF (Duplex LC)
- 10GBASE-CDWM, up to 40 km reach on SMF (Duplex LC)
- 10GBASE-CDWM, up to 70 km reach on SMF (Duplex LC)
- 10GBASE-ZR/ZW, up to 80km reach on SMF (Duplex LC)
- 10GBASE-SFP+ Direct Attach Cable, 3m
- 10GBASE-SFP+ Direct Attach Cable, 5m
- 10GBASE-SFP+ Direct Attach Cable, 10m

Note: SFP+ sockets are also capable of supporting a wide range of 1 Gigabit Ethernet Transceivers; please refer to the product documentation for complete details. Additionally, 10 Gigabit Ethernet RJ45 ports also support 100/1000Mbps connectivity.

For a complete listing of all specifications and compliance please refer to the product documentation.

Ordering Information

Ordering Information	
Part Code	**Description**
EC8400*01-E6	Virtual Services Platform 8404 4-slot Ethernet Switch, supporting up to 4 VSP 8000 Series Ethernet Switch Modules. Includes single 800W 100-240V AC Power Supply (no Power Cord), four Fan Modules, and Base Software License. Slide Rack Mount Kit sold separately.
EC8400001-E6	Virtual Services Platform 8404 4-slot Ethernet Switch, supporting up to 4 VSP 8000 Series Ethernet Switch Modules. Includes single 800W DC Power Supply (no Power Cord), four Fan Modules, and Base Software License. Slide Rack Mount Kit sold separately.
EC8404003-E6	8408QQ 8-port 40GBASE-QSFP+ Ethernet Switch Module for VSP 8400 (Note: Ports 7 & 8 are disabled when used in VSP 8404).
EC8404005-E6	8418XSQ 16-port 10GBASE-SFP+ & 2-port 40GBASE-QSFP+ Combo Ethernet Switch Module for VSP 8400 Series.
EC8404001-E6	8424XS 24-port 10GBASE-SFP+ Ethernet Switch Module for VSP 8400.
EC8404002-E6	8424XT 24-port 10GBASE-T Ethernet Switch Module for VSP 8400.
EC8005*01-E6	800W 100-240V AC Power Supply, for use with the VSP 7200/8000 Series.
EC8005001-E6	800W DC Power Supply, for use with the VSP 7200/8000 Series.
380176	VSP 8000 Series Premier Software License: enables L3 VSN.
380177	VSP 8000 Series Premier Software License: enables L3 VSN and MACsec.
EC8011002-E6	VSP 8000 Slide Rack Mount Kit (300-900mm).
EC8011003-E6	VSP 8000 Chassis Power Supply Filler Panel.
EC8011004-E6	VSP 8000 Chassis Spare Fan Module.
AL2011020-E6	Avaya DB-9 Female to RJ-45 Console Connector (RED).
AL2011021-E6	Avaya DB-9 Male to RJ-45 Console Connector (BLUE).
AL2011022-E6	Avaya RJ-45/DB-9 Integrate Console Cable.
Where applicable the seventh character (*) of the Product Code is replaced to indicate the required product nationalization:	
A	No Power Cord option.
B	Includes European "Schuko" Power Cord option, common in Austria, Belgium, Finland, France, Germany, Netherlands, Nor- way and Sweden.
C	Includes Power Cord used in UK and Ireland.
D	Includes Power Cord used in Japan.
E	Includes Power Cord used in North America.
F	Includes Power Cord used in Australia, New Zealand and People's Republic of China.

Notes of product ordering and hardware installation considerations:

• Customers should choose the model number that corresponds with their regional power cord requirements.

• Avaya recommends that Customers purchase a second power supply unit, in order to provide highly available power.

• Avaya recommends that Customers order a Slide Rack Mount Kit with every unit; the 300-900mm kit is designed to fit within most 4-post rack mount systems. Rack mounting with just two post ears would likely cause warping of the rack due to the weight of the unit and is therefore not recommended. Customers are advised to use mounting ears only in conjunction with a supporting shelf.

• A Console Cable is not shipped with the unit and, if required, must be ordered separately.

Additional Information

For further information about the Avaya Virtual Services Platform 8000 Series please visit **www.avaya.com/products**, and for the complete Avaya Networking portfolio, **www.avaya.com/networking**.

About Avaya

Avaya is a leading, global provider of customer and team engagement solutions and services available in a variety of flexible on-premise and cloud deployment options. Avaya's fabric-based networking solutions help simplify and accelerate the deployment of business critical applications and services. For more information, please visit **www.avaya.com**.

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