## Highlights

**Network virtualization end to end -** Deploy a single technology across the entire enterprise - from Data Center to desktop. The Avaya VSP 4000, a fabric enabled multiservice edge platform optimized for small locations, enables you to extend the benefits of Avaya Fabric Connect to the edge of the network.

**Deploy multiple services without multiple protocols -** The VSP 4000 delivers a comprehensive array of network services including Layer 2 and Layer 3 virtualization with optimized routing and multicast. Phase out multiple complex legacy technologies and, instead, enable all services through a single, next-generation technology.

**Increase network agility -** With end point provisioning, deploying new services and activating moves, adds and changes has never been easier. Eliminate hop-by-hop manual provisioning to increase IT efficiency and to reduce the risk of an outage as a result of human error.

**Protect your investment with a standards-based technology -** The VSP 4000's Fabric Connect technology is based on open technology, IEEE 802.1 aq Shortest Path Bridging and IETF RFC 6329, that prevents vendor lock-in.

**Increase resiliency -** With sub second recoveries for all services, VSP 4000 makes network issues transparent to applications and users.

**Save money -** A fabric-based network can deliver tremendous OPEX savings - in the form of reduced complexity and simplified provisioning - especially when extended to small locations.

# Virtual Services Platform 4000

## Simplify your network end to end with the Avaya fabric-enabled multiservice edge device

Simplify your network with the Avaya Virtual Services Platform (VSP) 4000. Designed to extend the reach of Avaya VENA Fabric Connect technology to the network edge, the VSP 4000 delivers fully featured network virtualization capabilities in a low cost 1 Gig/10 Gig platform optimized for small locations. Offering full multiservice capabilities without deployment of multiple protocols, the VSP 4000 offers a simplified, streamlined way to build and manage networks.

For deployments in small offices where it is desirable to extend fabric technology across the wide area, the metro, or the campus edge or where you need separation of traffic for regulatory/security reasons or to support multiple entities, Avaya VSP 4000 delivers rich multiservice and multi-tenant functionality in a cost-effective platform for small locations.

## A new way of building networks

Reflecting the complexity of most networks, a recent Avaya survey of IT managers found that 41% of all respondents need one month or more to implement a simple network change. This is not surprising when even moves, adds and changes, for example, often require cumbersome network-wide configuration that makes them difficult to implement. Fixing one thing can mean breaking something else when rigid design rules and a myriad of protocols are involved. What's needed is more speed, agility, and flexibility in configuring networks – especially when incorporating megatrends such as video, mobility, Cloud Computing, Big Data and the rapid advancement of applications and end devices.

A completely new way to build networks, Avaya Fabric Connect delivers a simplified, agile and resilient infrastructure that makes network configuration and deployment of new services faster and easier. A standards-based fabric technology based on enhanced IEEE 802.1aq Shortest Path Bridging and IETF 6329, Avaya Fabric Connect combines decades of experience with Ethernet and

Intermediate System-to-Intermediate System (IS-IS) to deliver a next generation technology that combines the best of Ethernet with the best of IP. Avaya Fabric Connect creates a multipath Ethernet network that leverages IS-IS routing to build a topology between nodes dynamically. Traffic always takes the shortest path from source to destination, increasing performance and efficiency.

Avaya Fabric Connect takes the complexity out networking. Delivering a comprehensive array of network services, including Layer 2 and Layer 3 virtualization with optimized routing and IP multicast support, it allows customers to phase out multiple complex legacy technologies gradually and to enable all services through a single, next-generation technology.

Accelerating time to service and reducing errors, simple end point provisioning can extend any service anywhere in the infrastructure. Physical topology becomes irrelevant and complex design rules are eliminated, enabling network operators to build any logical topology wherever and whenever it's required.

*"Avaya Fabric Connect greatly simplifies the deployment of vital business applications, potentially reducing delivery times by days or even weeks and taking human error out of the equation,"* says Mike Kincaid, Manager of Network Services and Telecommunications at UC Health.

Compared to a traditional network, Avaya Fabric Connect offers a dynamic, agile network that is much easier to plan, build and run.

## VSP 4000: Extending Avaya Fabric Connect to the network edge

VSP 4000 is an industry leading fabric-enabled multiservice edge device that extends Avaya Fabric Connect to the Campus, MAN or WAN edge by providing a services-rich yet low cost platform for small sites. It plays a critical role in delivering enterprise-wide fabric architecture that spans from Data Center to desktop.

Leveraging the robust, field-proven, carrier-grade Linux operating system of the Avaya Data Center core switch, the VSP 9000, the VSP 4000 provides a consistent feature set and CLI. Its operating system contains many of the same features that contribute to the robustness of the VSP 9000 core platform including:

- Flight recorder-style logging to help with continuous real-time monitoring of internal control message flows

- Key Health Indicators that provide a view of system health at all levels (OS, system applications /protocols I/O modules, ports and the forwarding path)

## VSP 4000 Models:

The VSP 4000 comes in four model variants:

**VSP 4450GSX-PWR+** - 36 x 100/1000 Mbps SFP ports, 12-ports of 10/100/1000Base-T with PoE+, and 2-ports of 1/10 Gig SFP+ which have been enabled with MACSec encryption.

**VSP 4850GTS** - 48 ports of 10/100/1000 including two shared SFP and two SFP+ uplink ports with optional redundant power.

**VSP 4850GTS-PWR+** - 48 ports of 10/100/1000 with PoE+ including two shared SFP and two SFP+ uplink ports with optional redundant power.

**VSP 4850GTS-DC** - 48 ports of 10/100/1000 including two shared SFP and two SFP+ uplink ports with optional DC redundant power.

For the VSP 4850 series products, because the hardware is based on the ERS 4800 product line, customers can purchase a conversion kit that enables ERS 4850 models, rev 10 and higher, to be converted (by adding a software module and cover) to a VSP 4850 system. This option does not exist for the VSP 4450GSX-PWR+

## VSP 4000 Services Overview:

The VSP 4000 offers a wide range of network services that can be deployed simply and easily. The first release supports:

- Layer 2 Virtualized Services that extend VLANs across the Fabric (including across subnets and long distances)

- Layer 3 Virtualized Services that interconnect and extend VRFs across the Fabric

- Native routing between Layer 2 and Layer 3 Virtualized Services for access to shared services.

- IP Shortcut Routing that enables direct Layer 3 connectivity between individual end-points without requiring deployment of additional IGPs.

- IP Multicast Shortcuts for scalable, efficient and resilient multicast distribution without the deployment of PIM-based protocols

- IP Multicast Virtualization for the support of PIM-free multicast within a Layer 2 or Layer 3 Virtual Services Network

| Traditional Networks | Avaya Fabric Connect |
|---|---|
| Complex: <br> • Multiple protocols (STP, RIP, OSPF, BGP, PIM) <br> • Network design rules <br> • Cumbersome adds moves and changes <br> • Network wide configuration (STP groups, VLANs, hop by hop) | Simple: <br> • Single protocol (IS-IS) <br> • Design flexibility (Independent from physical topology, services can be added wherever needed) <br> • Quick adds, moves and changes <br> • Single-command end point provisioning for new services and changes to services |
| Inefficient use of resources (blocked ports) | Efficient use of resources (no blocked ports, optimized shortest latent path from source to destination) |
| Slow recovery (generally seconds) | Sub second recovery |

# VSP 4000 Deployment Scenarios:

Offering a multiplicity of services, VSP 4000 is well suited to a wide array of deployment scenarios including:

- Virtualized small / mid-sized enterprise
- Distributed enterprise

A deployment may require either or both of the following (which are discussed in detail further down in this document):

- End to end traffic separation for multi-tenancy or for security / regulatory compliance (i.e. PCI DSS)
- Integrated video surveillance, video distribution and digital signage support

The VSP 4850 series is optimized for copper-based deployments while the VSP 4450 is optimized for heavy fiber-based deployments.  An example is a riser of a building, where Gigabit connectivity is delivered to each of the floors.

## Virtualized Small / Midsized Enterprise

The Avaya Fabric Connect strategy includes delivering the value of fabric based technology to any size company. Providing a small-to-midsize enterprise solution that is both feature-rich and cost effective, the VSP 4000 can be deployed with VSP 8200 in the core to enable a simplified, agile, resilient network. Deployed together, this powerful combination of fabric enabled edge and small compact core options enables the main stream adoption of fabric technology by making it cost-effective for the smaller enterprise.
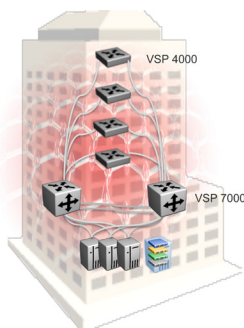


*Figure 1: Virtualized Small / Midsized Enterprise*

| Traffic Separation: Traditional Networks | Traffic Separation: Avaya Fabric Connect |
| --- | --- |
| **MPLS-based separation**<br>- Complex:<br>  – Multiple protocols (IGPs, BGP, MPLS)<br>  – Complex to configure (VRFs, IGP, iBGP, MPBGP, route targets, route distinguishers)<br>  – Complex to move, add and change tenants<br>- Slow recovery (generally in seconds)<br>**VLAN-based separation**<br>- No true traffic isolation<br>- Vulnerable to security breaches (VLAN jumping) | **Avaya Fabric Connect**<br>- Simple:<br>  – Single protocol (IS-IS)<br>  – Easy to configure (VRF to ISID)<br>  – Easy to move, add and change tenants<br>- Fast recovery (sub second)<br>- True traffic isolation; meet regulatory requirements<br>- Secure  (MAC in MAC encapsulation prevents VLAN jumping) |

## Distributed Enterprise

For Avaya Fabric Connect technology to truly transform the network end to end, it must extend to remote locations. Enabling a single technology that can be used throughout the network, the VSP 4000 provides connectivity to remote sites across Service Provider Layer 2 Services (E-Line and E-Tree). VSP 4000s can also be deployed over a physical ring based infrastructure extending the reach of the Fabric Connect network across the metro.
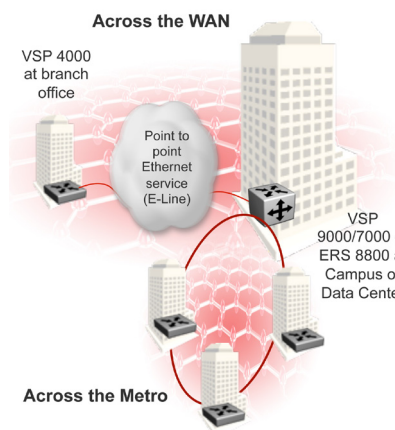


*Figure 2: Distributed Enterprise*

## End to End Traffic Separation to support Multi-tenancy

Within any type of enterprise environment, end-to-end traffic separation may be required to support multi-tenancy. Airports, universities, governments, healthcare and enterprises engaged in acquiring other entities, for example, sometimes want to segregate traffic while offering some shared services.

With its integrated VRF capabilities, Avaya Fabric Connect allows Layer 3 networks to be deployed easily across the fabric with simple end point provisioning. Acting as a low-cost multi-tenant demarcation service that supports and isolates traffic from multiple entities, the VSP 4000 makes a critical contribution to the environment.
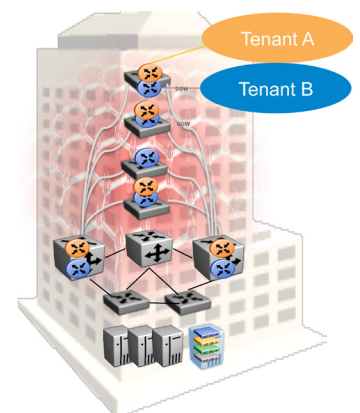


*Figure 3: End to End Traffic Separation to support Multi-tenancy*

## End to End Traffic Separation for Security or Regulatory Reasons

For security or regulatory reasons enterprises may need to separate traffic end to end. Examples include protecting credit card transactions, medical equipment or surveillance cameras from other network traffic or, in any vertical, separating VoIP and managing it independently.

We designed a L3 network over our Avaya fabric for credit card transactions and keep it totally isolated from the other student and staff traffic. This allows us to meet PCI DSS compliance for the banks very easily. Plus to implement, we didn't need to make changes all the way through the core in order to segment the traffic.

*- Phil Taylor, Communications Consultant from Leeds Metropolitan University*

With its integrated VRF capabilities, Avaya VENA Fabric Connect allows Layer 3 networks to be deployed easily across the fabric and kept isolated end to end. This, in addition to Mac-in-Mac encapsulation at the edge, can deliver the multiple networks required and offer additional security by preventing breaches like VLAN jumping.
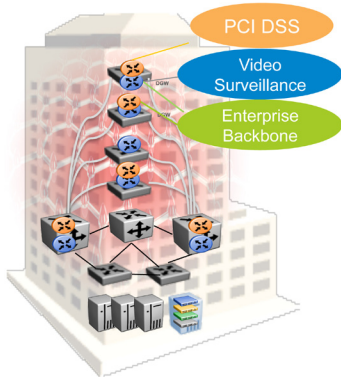


*Figure 4: End to end traffic separation for security or regulatory reasons*

| IP multicast: Traditional Networks | IP multicast: Avaya Fabric Connect |
|---|---|
| Complex:<br>• Multiple protocols (PIM over OSPF)<br>• Complex to operate and troubleshoot (proprietary tools)<br>• Network wide configuration (boot strap routers, rendezvous points) | Simple:<br>• Single protocol (IS-IS)<br>• Easy to operate and troubleshoot (IEEE 802.1 ag extensions)<br>• Single command end point configuration |
| Recovery from failures seconds even minutes | Fast recovery (sub second) |
| Limited scale (100's of streams) | Massive scaling (10's of thousands of streams) |

## Integrated Video Surveillance, Video Distribution and Digital Signage

Verticals such as transportation, government and hospitality often rely on video surveillance technology to protect people and products and, while it is evolving toward multicast, video surveillance still relies largely on unicast traffic. VSP 4000 supports both types of surveillance networks - without requiring additional IGPs or PIM protocols. In addition, VSP 4850GTS-PWR+ and VSP 4450GSX-PWR+ devices, which also support IEEE 802.3at PoE+, can power new point tilt and zoom cameras.

Avaya Fabric Connect technology is built from the ground up to handle Multicast trees efficiently since Broadcast and Multicast forwarding are inherent functions within Ethernet. Enabling the network to instantiate point-to-point, point-to-multi-point and any-to-any connectivity services on demand, Avaya Fabric Connect offers a highly efficient, scalable, more resilient way to distribute multicast to support IPTV, digital signage or multicast enabled video surveillance networks.

Compared to traditional IP multicast implementations, Avaya Fabric Connect offers the following benefits. (see table above)

## Management

The Avaya Virtual Services Platform 4000 can be managed by a variety of management tools, creating a flexible operational environment based on business requirements. These include: standardized Command Line Interface (CLI), Web-based Enterprise Device Manager (EDM), SNMP-based management (SNMP v1, v2 & v3), and the evolving Unified Management framework for comprehensive, centralized, and multi-facetted network management. Based on common services – authentication and access control, audit, etc. – plus a number of integrated AJAX-based plug-in applets that deliver seamless task-specific capabilities, all have a consistent look and feel: Configuration & Orchestration Management; Visualization, Performance and Fault Management; and IP Flow Manager.

Enabling a more streamlined, accurate, intelligent approach to delivering device-centric and network-wide management services, the entire Avaya Fabric Connect management framework is context based. Provision wizards, along with other labor-saving tools, provide faster service activation with a more consistent approach to configuration and, because wizard templates are pre-populated with best-practice recommendations and/or mandatory values, human-error is minimized.

## Lifetime warranty

Avaya includes comprehensive warranty services for its portfolio of stackable switches, including Fabric Connect edge devices. Complimentary next-business-day shipment of failed units is provided for the full life of the product in addition to next-business-day shipping to replace failed hardware worldwide. Avaya also offers complimentary basic technical support: Level 1 for the supported lifecycle of the product and up to Level 3 for the first 90 days after purchase including support for the shipped software version with an optional Software Release Service. Based on the industry norm for hardware, 'Lifetime' is defined as the production lifecycle phase plus 5 years post-discontinuation. And, for customers desiring protection over and above warranty provisions, Avaya offers a full suite of support services.

## Summary

Deployed in conjunction with other Avaya Fabric Connect solutions, the VSP 4000 can increase profitability and productivity, streamline business operations, lower costs and help your business gain a competitive edge. Offering a simple, more elegant approach to deployment of all L2/3 services, Avaya is a leader in fabric-enabled networking.

## Learn more

To learn more about the Virtual Services Switch 4000 series, please contact your Avaya Account Manager or Avaya Authorized Partner. Or, visit us online at **avaya.com**.

## VSP 4450GSX-PWR+

| Switch details | 12-ports of 10/100/1000Base-T with PoE+ support<br>36 ports of 100/1000 Mbps SFP ports<br>2 ports of 1/10 Gig SFP+<br>System CPU operates at 1.2GHz<br>Switch configured with 2GB of 800 DDR3 DRAM<br>RJ-45 Console port and a USB 2.0 port<br>Ships with 1 set of 44mm/19" rack mount brackets |
|---|---|
| Dimensions | 1U 4.4cm (H), 44cm [19" rack mount compatible] (W), 43.6cm (D) |
| Weight | 17.2lbs (7.80 kg) with 1 PSU installed.  A PSU weighs 3.1 lbs (1.40 kg) |
| Power and Thermal | Supplied with 1 x 1000W AC field replaceable power supply unit<br>Supports addition of second field replaceable AC power supply for redundancy<br>Power consumption without POE is 95W typical and 140W max so thermal is 324 BTU/hr typical and 477.70 BTU/hr max |

## VSP 4850GTS

| Switch details | 48 10/100/1000 Gigabit Ethernet ports<br>2 shared SFP ports<br>Plus 2 x 1/10 Gigabit SFP+ ports<br>System CPU operates at 533 MHz<br>Switch is configured with 1GB RAM<br>RJ-45 Console port provides industry standard serial port connectivity<br>Ships with 1 set of 44mm/19" rack mount brackets |
|---|---|
| Dimensions | 4.4cm – 1RU (H), 44.0cm (W), 43.68cm (D) |
| Weight | 11.48 Kg |
| Power and Thermal | Supplied with 1 x 300 watt Field Replaceable AC power supply<br>Supports addition of second Field Replaceable AC power supply for redundancy<br>Thermal Rating 323 BTU/hr |

# VSP 4850GTS-PWR+

| Switch details | 48 10/100/1000 Gigabit Ethernet ports<br>48 ports support IEEE 802.3at PoE+<br>2 shared SFP ports<br>Plus 2 x 1/10Gigabit SFP+ ports<br>System CPU operates at 533 MHz<br>Switch is configured with 1GB RAM<br>RJ-45 Console port provides industry standard serial port connectivity<br>Ships with 1 set of 44mm/19" rack mount brackets |
|---|---|
| Dimensions | 4.4cm – 1RU (H), 44.0cm (W), 43.68cm (D) |
| Weight | 11.98 Kg |
| Power and Thermal | Supplied with 1 x 1000 watt Field Replaceable AC power supply<br>Supports addition of second Field Replaceable AC power supply for redundancy or additional PoE<br>Thermal Rating 383 BTU/hr |
| Maximum PoE budget | 855 watts when operating on one 1000w power supply<br>1855 watts when operating on two 1000w power supply |

# VSP 4850GTS-DC

| Switch details | 48 10/100/1000 Gigabit Ethernet ports<br>2 shared SFP ports<br>Plus 2 x 1/10 Gigabit SFP+ ports<br>System CPU operates at 533 MHz<br>Switch is configured with 1GB RAM<br>RJ-45 Console port provides industry standard serial port connectivity<br>Ships with 1 set of 44mm/19" rack mount brackets |
|---|---|
| Dimensions | 4.4cm – 1RU (H), 44.0cm (W), 43.68cm (D) |
| Weight | 11.48 Kg |
| Power and Thermal | Supplied with 1 x 300 watt Field Replaceable DC power supply<br>Supports addition of second Field Replaceable DC power supply for redundancy<br>Thermal Rating 323 BTU/hr |

*"Avaya is fundamentally changing the way multicast is delivered. When testing their IP multicast over Fabric Connect functionality, all the resources I had in my lab couldn't stress their solution. Also, during failover testing, I was amazed that the network and the multicast service re-converged faster than I could record it. We look forward to working with Avaya to deliver scalable, and efficient video surveillance solutions for our customers."*

*- Darren Giacomini,*
*Lead Architect, Pelco*

# Technical Specifications

## General & Performance

- Frame length: 64 to 1518 Bytes (802.1Q Untagged), 64 to 1522 bytes (802.1Q Tagged)
- Jumbo Frame support: up to 9.6 KBytes
- Switching Fabric Capacity: 184 Gbps
- Packet Forwarding Throughput (64-byte packets): 102 Mpps
- Multi-Link/LAG: up to 128 Groups, with 8 Links per Group
- VRRP Backup Master
- VLANs: up to 4,084
- Multiple Spanning Tree Instances: up to 12
- MAC Address: up to 32k
- IP Interfaces: 256
- Dynamic ARP Entries: up to 6000
- Dynamic routing:  RIP, OSPF and BGP
- VRRP Interfaces: up to 64

- IP Forwarding Table: 16k
- IP static Routes: up to 1000
- Circuitless IP Instances: up to 64
- Latency (64-byte packets): 9 microseconds
- ECMP Routes: up to 512 NH Groups, up to 4 NH per group
- VRF instances (IPv4): up to 24
- SPB L2 VSN: up to 1000
- SPB L3 VSNS: up to 24
- SPB Inter-VSN Routing
- SPB IP Shortcut Routing
- SPB Multicast Shortcut Routing
- SPB Multicast Virtualization
- Policy-based Routing
- Ingress & Egress Port ACLs
- QoS priority queues: 8

- Ingress VLAN ACLs
- Enterprise Device Manager GUI, on-box & off-box
- Configuration & Orchestration Manager
- Virtualization Performance & Fault Manager
- Virtualization Provisioning Service
- System Logging
- Mirroring: 1:1 / 1:M / M:1 / M:M
- Key Health Indicators
- Flight Recorder
- Auto MDIX
- MACsec (VSP 4450GSX-PWR+ only)
- TACACS+
- SLAMon agent

## IEEE & IETF Standards Compatibility

### IEEE

- IEEE 802.1Q VLAN Tagging
- IEEE 802.1AX Link Aggregation Control Protocol (LACP)
- IEEE 802.1p Priority Queues
- IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
- IEEE 802.1v VLAN Classification by Protocol and Port
- IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
- 802.1ag Connectivity Fault Management
- 802.1aq Shortest Path Bridging (MAC-in-MAC)

- IEEE 802.1Qbb Priority-based Flow Control
- IEEE 802.3 10BASE-T Ethernet
- IEEE 802.3 CSMA/CD Ethernet (ISO/IEC 8802-3)
- IEEE 802.3i 10BASE-T Auto-Negotiation
- IEEE 802.3u 100BASE-FX
- IEEE 802.3u 100BASE-TX Fast Ethernet (ISO/IEC 8802-3, Clause 25)
- IEEE 802.3u Auto-Negotiation on Twisted Pair (ISO/IEC 8802-3, Clause 28)
- IEEE 802.3x Flow Control on the Gigabit Uplink port

- IEEE 802.3z Gigabit Ethernet
- IEEE 802.3ab 1000BASE-BX Ethernet
- IEEE 802.3ab 1000BASE-CWDM Ethernet
- IEEE 802.3ab 1000BASE-LX Ethernet
- IEEE 802.3ab 1000BASE-SX Ethernet
- IEEE 802.3ab 1000BASE-T Ethernet
- IEEE 802.3ab 1000BASE-XD Ethernet
- IEEE 802.3ab 1000BASE-ZX Ethernet
- IEEE 802.3ae 10GBASE-X

### IETF

- RFC 768 UDP Protocol
- RFC 783 TFTP Protocol
- RFC 791 IP Protocol
- RFC 792 ICMP Protocol
- RFC 793 TCP Protocol
- RFC 826 ARP Protocol
- RFC 854 Telnet Protocol
- RFC 894 A standard for the Transmission of IP Datagrams over Ethernet Networks
- RFC 896 Congestion control in IP/TCP internetworks
- RFC 903 Reverse ARP Protocol
- RFC 906 Bootstrap loading using TFTP
- RFC 950 Internet Standard Sub-Netting Procedure
- RFC 951 / RFC 2131 BootP / DHCP
- RFC 1058 RIPv1 Protocol
- RFC 1112 IGMPv1
- RFC 1122 Requirements for Internet Hosts
- RFC 1256 ICMP Router Discovery
- RFC 1305 Network Time Protocol v3 Specification, Implementation and Analysis
- RFC 1340 Assigned Numbers
- RFC 1519 Classless Inter-Domain Routing (CIDR): an Address Assignment and Aggregation Strategy

- RFC 1541 Dynamic Host Configuration Protocol1
- RFC 1542 Clarifications and Extensions for the Bootstrap Protocol
- RFC 1583 OSPFv2 RFC 1587 The OSPF NSSA Option
- RFC 1591 DNS Client
- RFC 1723 RIP v2 – Carrying Additional Information
- RFC 1771/1772 BGP-4
- RFC 1812 Router Requirements
- RFC 1866 HTMLv2 Protocol
- RFC 1997 – BGP-4 Community Attributes
- RFC 1998 – An Application of the BGP Community Attribute in Multi-home Routing
- RFC 2068 Hypertext Transfer Protocol
- RFC 2131 Dynamic Host Control Protocol (DHCP)
- RFC 2138 RADIUS Authentication
- RFC 2139 RADIUS Accounting
- RFC 2178 OSPF MD5 cryptographic authentication / OSPFv2
- RFC 2236 IGMPv2 for snooping
- RFC 2270 BGP-4 Dedicated AS for sites/ single provide

- RFC 2328 OSPFv2
- RFC 2384 BGP-4 MD5 Authentication
- RFC 2439 BGP-4 Route Flap Dampening
- RFC 2453 RIPv2 Protocol
- RFC 2474 / RFC 2475 DiffServ Support
- RFC 2475 An Architecture for Differentiated Service
- RFC 2597 Assured Forwarding PHB Group
- RFC 2598 Expedited Forwarding PHB
- RFC 2819 Remote Monitoring (RMON)
- RFC 2918 Route Refresh Capability for BGP-4
- RFC 2992 Analysis of an Equal-Cost Multi-Path Algorithm
- RFC 3046 DHCP Relay Agent Information Option 82
- RFC 3376 IGMPv3
- RFC 3768 Virtual Router Redundancy Protocol
- RFC 4893 BGP Support for 4-Octet AS Number Space
- RFC 6329 IS-IS Extensions supporting Shortest Path Bridging

## Technical Specifications

### Network Management

- RFC 959 File Transfer Protocol
- RFC 1155 SMI
- RFC 1157 SNMP
- RFC 1215 Convention for defining traps for use with the SNMP
- RFC 1271 Remote Network Monitoring Management Information Base
- RFC 1305 (NTP client / unicast mode only)
- RFC 1350 The TFTP Protocol (Revision 2)
- RFC 1354 IP Forwarding Table MIB
- RFC 1757 / RFC 2819 RMON
- RFC 1907 SNMPv2
- RFC 1908 Coexistence between v1 & v2 of the Internet-standard Network Management Framework

- RFC 1930 Guidelines for creation, selection, and registration of an Autonomous System (AS)
- RFC 2541 Secure Shell Protocol Architecture
- RFC 2571 An Architecture for Describing SNMP Management Frameworks
- RFC 2572 Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
- RFC 2573 SNMP Applications
- RFC 2574 User-based Security Model (USM) for v3 of the Simple Network Management Protocol (SNMPv3)
- RFC 2575 View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)
- RFC 2576 Coexistence between v1, v2, & v3 of the Internet standard Network Management FrameworkRFC 2616 Hypertext Transfer Protocol 1.1

- RFC 2819 Remote Network Monitoring Management Information Base
- RFC 4250 Secure Shell (SSH) Protocol Assigned Numbers
- RFC 4251 Secure Shell (SSH) Protocol Architecture
- RFC 4252 Secure Shell (SSH) Authentication Protocol
- RFC 4253 Secure Shell (SSH) Transport Layer Protocol
- RFC 4254 Secure Shell (SSH) Connection Protocol
- RFC 4255 DNS to Securely Publish SSH Key Fingerprints
- RFC 4256 Generic Message Exchange Authentication for SSH

### MIBs

- RFC1155 Structure of Management Information
- RFC 1156 MIB for network management of TCP/IP
- RFC1157 Simple Network Management Protocol (SNMP)
- RFC 1212 Concise MIB definitions
- RFC 1213 TCP/IP Management Information Base
- RFC1215 A convention for defining traps for use with SNMP
- RFC 1354 IP Forwarding Table MIB
- RFC 1398 Ethernet MIB
- RFC 1442 Structure of Management Information for version 2 of the Simple Network Management Protocol (SNMPv2)
- RFC 1450 Management Information Base for v2 of the Simple Network Management Protocol (SNMPv2)
- RFC1493 Definitions of Managed Objects for Bridges
- RFC 1573 Interface MIB
- RFC 1643 Definitions of Managed Objects for the Ethernet-like Interface Types
- RFC 1650 Definitions of Managed Objects for the Ethernet-like Interface Types
- BGP-4 MIB using SMIv2
- RFC1907 Management Information Base of the Simple Network Management Protocol version 2 (SNMPv2)

- RFC 2021 RMON MIB using SMIv2
- RFC2233 Interfaces Group MIB using SMIv2
- RFC 2096 IP Forwarding Table MIB
- RFC2571 An Architecture for Describing SNMP Management Frameworks
- RFC 2572 Message Processing and Dispatching for the SNMP
- RFC 2573 SNMP Applications
- RFC2574 User-based Security Model (USM) for version 3 of the SNMP
- RFC2575 - View-based Access Control Model (VACM) for the SNMP
- RFC2576 – Coexistence between Version 1, Version 2, and Version 3 of the Internet-standard Network
- Management Framework
- RFC 2578 Structure of Management Information v2 (SMIv2)
- RFC 2674 Bridges with Traffic MIB
- RFC 2787 Definitions of Managed Objects for the Virtual Router Redundancy Protocol
- RFC2819 Remote Network Monitoring (RMON)
- RFC2851 Definitions of Managed Objects for the Virtual Router Redundancy Protocol
- RFC 2863 Interface Group MIB

- RFC 2925 Remote Ping, Traceroute & Lookup Operations MIB
- RFC3411, RFC3412, RFC3413, RFC3414, RFC3415 SNMPv3
- RFC3416 v2 of the Protocol Operations for the Simple Network Management Protocol (SNMP)
- RFC3826 The Advanced Encryption Standard (AES) Cipher Algorithm in the SNMP User-based Security Model
- RFC4022 Management Information Base for the Transmission Control Protocol (TCP)
- RFC4113 Management Information Base for the User Datagram Protocol (UDP)
- RFC4133 Entity MIB
- IEEE 802.3ad Link Aggregation Control Protocol
- IEEE 802.1x Exensible Authentication Protocol Over Local Area Networks
- PROMIB1 - Rapid City MIB
- PROMIB 2 - SynOptics Root MIB
- PROMIB3 - Other SynOptics definitions
- PROMIB4 - Other SynOptics definitions
- PROMIB5 - Other SynOptics definitions
- PROMIB6 - Avaya RSTP/MSTP proprietary MIBs
- PROMIB11 - Avaya MIB definitions

# End to End Traffic Separation Before and After

Compared to traditional networks, which generally rely on complex MPLS based technologies for traffic separation, Avaya Fabric Connect offers a simplified network environment where adding, moving and changing tenants can be accomplished simply and easily with end point provisioning.

## Technical Specifications

### VSP 4000 Environmental Specifications

- Operating temperature: 0°C to 50°C (32°F to 122°F)
- Storage temperature: -40°C to 85°C (-13°F to 158°F)
- Operating humidity: 0 to 95% maximum relative humidity, non-condensing
- Storage humidity: 10 to 90% maximum relative humidity, non-condensing Operating altitude: 0 to 3,048m (0 to 10,000ft) maximum
- Storage altitude: 0 to 12,192m (0 to 40,000ft) maximum
- Acoustic Noise:
- less than 50dbA at 35°C
- less than 57dbA at 50°C

- VSP 4000 Safety Agency Approvals
- Global basis for certification: IEC 60950 current edition with all CB member deviations
- CB Scheme Certification with Member Deviations
- EN60950 Europe Safety (CE)
- UL60950 United States of America Safety
- CSA22.2, #60950 Canada Safety
- NOM Mexico Safety
- S-mark Argentine Safety
- Anatel Brazilian Safety
- Electromagnetic Emissions & Immunity
- CISPR22 International EMC Emissions
- CIRPR24 International EMC Immunity

- EN55022:2006 European EMC Emissions (CE)
- EN55024 European EMC Immunity (CE)
- EN61000
- Additional European EMC Specifications (CE)
- FCC Part 15 US EMC Emissions
- ICES-003 Canadian EMC Emissions
- VCCI Japan EMC Emissions
- AN/NZS 3548 Australia/New Zealand EMC Emissions
- CNS13438 Taiwan EMC Emissions
- MIC Korean EMC Certification
- Anatel Brazilian EMC Certification

### MTBF Values

- 214,542 to 311,104 hours (24.49 to 35.31 years)

### Warranty

- Lifetime Next Business Day advanced hardware replacement
- Lifetime Basic Technical Support

- 90-Day Advanced Technical Support
- Optional Software Release Service also available: GW5300ASG / GW6300ASG

### Country of Origin

- Peoples Republic of China

# Ordering information

| Part Number | Description |
|---|---|
| EC4400?05-E6 | Virtual Services Platform 4450GSX-PWR+ with 36 port 100/1000 Mbps SFP, 12 port 10/100/1000 802.3at PoE+ plus 2 1/10G SFP+ ports. Inc. Base Software License, 1 Field replaceable 1000W PSU. |
| EC4800?78-E6* | VSP 4850GTS with 48 10/100/1000 & 2 SFP ports plus 2 SFP+ ports. Inc. Base Software License, 1 Field replaceable 300W AC PSU. NO PC |
| EC4800?88-E6* | VSP 4850GTS-PWR+ with 48 10/100/1000 802.3at PoE+ & 2 SFP ports plus 2 SFP+ ports. Inc. Base Software License, 1 Field replaceable 1000W AC PSU. NO PC |
| EC4800078-E6 | VSP 4850GTS with 48 10/100/1000 & 2 SFP ports plus 2 SFP+ ports. Inc. Base Software License, 1 Field replaceable 300W DC PSU. NO PC. |
| EC4810003-3.0 | ERS4800 to VSP4000 Conversion kit. Includes VSP USB software module and cover. Licensed for a single system covers Base License features. SPB L2 support. |

# Redundant power supplies

| Part Number | Description |
|---|---|
| EC4005A02-E6 | VSP 4000 1000W AC Redundant Power Supply (Medium-Gray). For use in the VSP4450GSX |
| EC4011001-E6 | VSP 4000 Chassis Power Supply Filler Panel (Medium-Gray) |
| AL1905?08-E5* | 300W AC redundant power supply. For use in the ERS 4626GTS, 4850GTS, VSP 4850GTS and WL8180, WL8180-16L wireless controllers. [EUED RoHS 5/6 compliant]. |
| AL1905?21-E6* | STACKABLE 1000W AC POE+ POWER SUPPLY. FOR USE IN 4X00 PWR+, |
| AL1905005-E5 | Redundant 300W DC power supply. For use in the VSP 4850GTS-DC, ERS5698TFD, 5650TD, and 5632FD. (EUED RoHS 5/6 compliant). DC connector included |

*Note: The seventh character (?) of the switch order number must be replaced with the proper letter to indicate desired product nationalization. See table for details:

"A"  No power cord included

"B"  Includes European "Schuko" power cord common in Austria, Belgium, Finland, France, Germany, The Netherlands, Norway, and Sweden

"C"  Includes power cord commonly used in the United Kingdom and Ireland

"D"  Includes power cord commonly used in Japan

"E"  Includes North American power cord

"F"  Includes Australian power cord, also commonly

## Licenses

| Part Number | Description |
| --- | --- |
| EC4810010 | Advanced License for any VSP4000  - "Routing" (Qty 1) |
| | GRT IP Routing including IP-Shortcuts, Inter-ISID-Routing, VRRP, DHCP-Relay, RIP, OSPF, BGP, IPv6**, SMLT**, IP-Shortcuts with Multicast support |
| EC4810011 | Advanced License for any VSP4000  - "Routing" (Qty 10) |
| | GRT IP Routing including IP-Shortcuts, Inter-ISID-Routing, VRRP, DHCP-Relay, RIP, OSPF, BGP, IPv6**, SMLT**, IP-Shortcuts with Multicast support |
| EC4810012 | Advanced License for any VSP4000  - "Routing" (Qty 25) |
| | GRT IP Routing including IP-Shortcuts, Inter-ISID-Routing, VRRP, DHCP-Relay, RIP, OSPF, BGP, IPv6**, SMLT**, IP-Shortcuts with Multicast support |
| EC4810015 | Premier License for any VSP 4000 - "L3 Virtualization" (Qty 1) |
| | IP VRFs, L3 VSNs incl. RIP, OSPF, BGP, Virtualized SPB Multicast |
| EC4810016 | Premier License for any VSP 4000 - "L3 Virtualization" (Qty 10) |
| | IP VRFs, L3 VSNs incl. RIP, OSPF, BGP, Virtualized SPB Multicast |
| EC4810017 | Premier License for any VSP 4000 - "L3 Virtualization" (Qty 25) |
| | IP VRFs, L3 VSNs incl. RIP, OSPF, BGP, Virtualized SPB Multicast |

**Note: Feature support planned for a future release

## 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**.