x950 Series

Expandable 10G/40G/100G Stackable Layer 3+ Switches

Allied Telesis x950 Series switches are ideal for the modern enterprise network core, where stacking creates a resilient local or distributed solution. These powerful switches support 100 Gigabit connectivity, and provide the capacity that today's Smart City and IoT networks need.

x950 Series switches feature a high-performing 1.92 Terabit fabric, to eliminate bottlenecks and effortlessly forward all traffic.

x950 switches feature 24 or 48 x 1/10 Gigabit SFP+ ports, or 24 or 48 x 1/2.5/5/10 Gigabit copper ports to enable flexible deployment, while 4 x built-in 40G/100G ports provide high-speed backbone connectivity. 24-port models also feature an expansion (XEM) bay to easily add more capacity. Stack multiple units for a future-proof network.

Smart City and IoT networks

Large switching and routing tables support Smart City networks and the Internet of Things (IoT). The x950 Series meets the increasing demand for the convergence of multiple services.

Network automation

Allied Telesis Autonomous Management Framework™ Plus (AMF Plus) meets the increasing management requirements of modern converged networks, by automating many everyday tasks. AMF Plus has powerful features that allow an entire network to be easily managed as a single virtual device.

Vista Manager™ EX is an intuitive graphical tool for monitoring and managing AMF Plus wired and Autonomous Wave Control (AWC) wireless devices. Full visibility and powerful features enable proactive management of large networks.

Device, network, and security management

The Device GUI on the x950 Series enables graphical monitoring of key switch features to support easy management.

Integrated into the Device GUI, Vista Manager mini supports visibility and management of AMF Plus wired and AWC wireless network devices, making it ideal as a one-stop solution for small to medium-sized networks. AWC is an intelligent, easy to use Wireless LAN controller that automatically maintains optimal wireless coverage. Vista Manager mini includes AWC floor and heat maps showing wireless coverage. It also supports AWC Channel Blanket hybrid operation, providing maximum performance and seamless roaming, as well as AWC Smart Connect for simplified deployment, and a resilient Wi-Fi network solution using wireless uplink connectivity.

The AMF-Security mini controller, with management integrated into the Device GUI, ensures protection against internal LAN malware threats, automatically stopping the spread of infection.

Resilient

The convergence of network services has led to increasing demand for highly-available networks with minimal downtime. Virtual Chassis Stacking (VCStack™), in conjunction with link aggregation, provides a network with no single point of failure, and a resilient solution for high-availability applications. The x950 Series can form a VCStack of up to eight units, at any port speed, for enhanced resiliency and simplified management. With VCStack over Long Distance (VCStack LD), stacks can also be created over long distance fiber links, making it the perfect choice for distributed environments too.

Allied Telesis Ethernet Protection Switched Ring (EPSRing™) and the standards-based G.8032 Ethernet Ring Protection, ensure that distributed network segments have high-speed, resilient access to online resources and applications.

Reliable

Designed with reliability in mind, the x950 Series guarantees the continual delivery of essential services. Hot-swappable components, such as XEMs, fans and load-sharing power supplies, pair with near-hitless online stack reconfiguration to ensure that maintenance doesn't affect network uptime.

Key Features

- High capacity, with 4 x QSFP+/QSFP28 slots supporting 40G or 100G connectivity
- Multi-gig, 10G, 40G, 100G XEMs (28-port models only)
- AC or DC PSU options
- Reverse airflow option for flexible deployment
- Autonomous Management Framework Plus (AMF Plus)
- Large switching and routing tables support Smart City and IoT networks
- VCStack™ up to 8 units, locally or over distance
- EPSRing™ and G.8032 ERPS for resilient rings
- EPSR Master
- Active Fiber Monitoring (AFM) for fiber data and stacking links
- Media Access Control Security (MACSec)
- Modbus support
- Multicast Source Discovery Protocol (MSDP)
- Link Monitoring
- Bidirectional Forwarding Detection (BFD)
- Upstream Forwarding Only (UFO)
- VXLAN static tunnels
- AMF-Security mini
- AT-Vista Manager mini enables:
  - Wired and wireless network visibility
  - AWC wireless network management
  - AWC-Channel Blanket hybrid wireless
  - AWC-Smart Connect wireless uplinks
- FIPS 140-2 certified
- Precision Time Protocol (PTP) Transparent Mode
- NETCONF/RESTCONF with YANG data modelling

Environmentally friendly

Energy Efficient Ethernet (EEE) automatically reduces power consumption whenever there is no traffic on a port, reducing operating costs.

Key Features

Vista Manager mini

- Integrated into the Device GUI, Vista Manager mini provides full network visibility of AMF Plus wired and AWC wireless devices. Manage and simplify wireless deployment with AWC-Smart Connect, and support optimal wireless performance from AWC hybrid operation with maximum throughput and a seamless Wi-Fi user experience.

Autonomous Management Framework Plus (AMF Plus)

- AMF Plus is a sophisticated suite of management tools that provide a simplified approach to network management. Common tasks are automated or made so simple that the everyday running of a network can be achieved without the need for highly-trained, and expensive, network engineers. Powerful features like centralized management, auto-backup, auto-upgrade, auto-provisioning and auto-recovery enable plug-and-play networking and zero-touch management.
- The x950 Series can operate as the AMF Plus network master, storing firmware and configuration backups for all other network nodes. The AMF Plus master enables auto-provisioning and auto-upgrade by providing appropriate files to new network members.
- An AMF Plus license (from AW+ version 5.5.2-2 onwards) provides all standard AMF network management and automation features, and also enables the AMF Plus intent-based networking features menu in Vista Manager EX (from version 3.10.1 onwards)

AWC Wireless Management

- Optimize wireless network performance with the Autonomous Wave Controller (AWC), built-in to the x950 Series. AWC analyzes wireless traffic patterns and automatically reconfigures access points to meet demand.
- Wireless network operation in multi-channel, single-channel (Channel Blanket), and hybrid (multi-channel and Channel Blanket) modes, supports maximum data throughput and seamless roaming for the most flexible wireless solution available.
- AWC-Smart Connect (AWC-SC) enables plug-and-play wireless network growth, as new APs only need a power connection, and will then automatically create resilient wireless uplink connections to other APs.

Large Network Tables

- High-capacity 1.92 Terabit fabric and 1,190Mpps packet forwarding provide powerful data transfer capability, supporting large campus networks as well as Smart City and IoT solutions. Large MAC and IP host tables are ready for the increasing number of connected devices found in modern enterprise and city-wide networks.

Multi-Speed Ports

- Copper ports on the x950-28XTQm, XEM2-12XTm and XEM2-8XSTm expansion modules support 2.5 and 5 Gigabit connectivity to enable high-speed wireless, or maximum downlink speed using legacy Cat5E/6 cabling.

VCStack™

- Create a VCStack of up to eight units at any port speed. VCStack provides a highly available system where network resources are spread out across stacked units, reducing the impact if a unit fails. Aggregating switch ports on different units across the stack provides excellent network resiliency.

VCStack LD

- Long-distance stacking allows a VCStack to be created over fiber links to span longer distances, perfect for a distributed network environment.

EPSRing™

- EPSRing allows several switches to form protected rings with 50ms failover—perfect for high performance at the core of Enterprise or Provider Access networks. x950 Series switches can act as the EPSR Master.
- SuperLoop Protection enables a link between two EPSR nodes to be in separate EPSR domains, improving redundancy and network fault resiliency.

G.8032 Ethernet Ring Protection

- G.8032 provides standards-based high-speed ring protection, that can be deployed stand-alone, or interoperate with Allied Telesis EPSR.
- Ethernet Connectivity Fault Monitoring (CFM) proactively monitors links and VLANs, and provides alerts when a fault is detected.

NETCONF/RESTCONF

- NETCONF/RESTCONF with YANG data modeling provides a standardized way to represent data and securely configure devices.

Active Fiber Monitoring (AFM)

- AFM prevents eavesdropping on fiber data or stacking links by monitoring received optical power. If an intrusion is detected, the link can be automatically shut down, or an alert sent.

sFlow

- sFlow monitors switched networks, and provides visibility to enable performance optimization, usage accounting/billing, and defense against security threats. Sampled packets sent to a collector provide a real-time view of network traffic.

Media Access Control Security (MACSec)

- 802.1AE MACSec secures all traffic on point-to-point Ethernet links between directly connected nodes, ensuring protection against security threats such as denial of service, intrusion, man-in-the-middle, passive wiretapping, and playback attacks.

AMF Application Proxy

- Allied Telesis SES (Secure Enterprise SDN) solution enables internal LAN threat detection and automatic end-point isolation to protect the network. The AMF Plus Application Proxy enables the SES controller to communicate with the AMF Plus master when a threat is detected, so the AMF Plus master can take action to block the threat at source by quarantining the infected end-point.

Virtual Routing and Forwarding (VRF Lite)

- VRF Lite provides Layer 3 network virtualization by dividing a single switch into multiple independent virtual routing domains. With independent routing domains, IP addresses can overlap without causing conflict, allowing multiple customers to have their own secure virtual network within the same physical infrastructure. VRF Lite supports IPv4 (unicast and multicast) and IPv6 (unicast) traffic.
- The built-in DHCP Server on the x950 Series is VRF aware, enabling the supply of IP addresses to clients across multiple isolated networks.

VLAN Translation

- Service Providers can provide customer traffic with a unique VLAN-ID for use within the SP's network.
- Enterprises can merge two networks together, without reconfiguring VLAN numbering.

Modbus

- Modbus enables communication with Supervisory Control and Data Acquisition (SCADA) systems for industrial automation.

Software-Defined Networking (SDN)

- OpenFlow is a key technology that enables the use of SDN to build smart applications that unlock value and reduce cost.

Bi-directional Forwarding Detection (BFD)

- BFD enables fast detection of link failures, so recovery time is minimized. BFD works with static routes, and also alongside BGP and OSPF dynamic routing protocols supporting faster shutdown of neighbor connections if a peer session goes down. When using VRF-Lite, BFD is supported globally or within a domain.

Upstream Forwarding Only (UFO)

- UFO lets you manage which ports in a VLAN can communicate with each other, and which only have upstream access to services, for secure multi-user deployment.

Multicast Source Discovery Protocol (MSDP)

- MSDP enables two or more PIM-SM (Sparse Mode) domains to share information on active multicast sources, for more efficient forwarding of multicast traffic.

Link Monitoring (Linkmon)

- Linkmon enables network health monitoring by regularly sending probes over key links to gather metrics comprising latency, jitter, and probe loss. This supports pro-active network management, and can also be used with triggers to automate a change to device or network configuration in response to the declining health of a monitored link.

AMF-Security mini

- The AMF-Sec mini security controller (integrated into the Device GUI) works with your security appliance to enable automatic protection from internal malware threats. It stops the spread of infection and protects the LAN by quarantining any suspect devices.

Flexible deployment

- The x950 Series supports both AC and DC PSU options for flexible deployment. Reverse airflow PSUs and fans are also available to support high-speed server connectivity from the top-of-rack in an Enterprise datacenter.

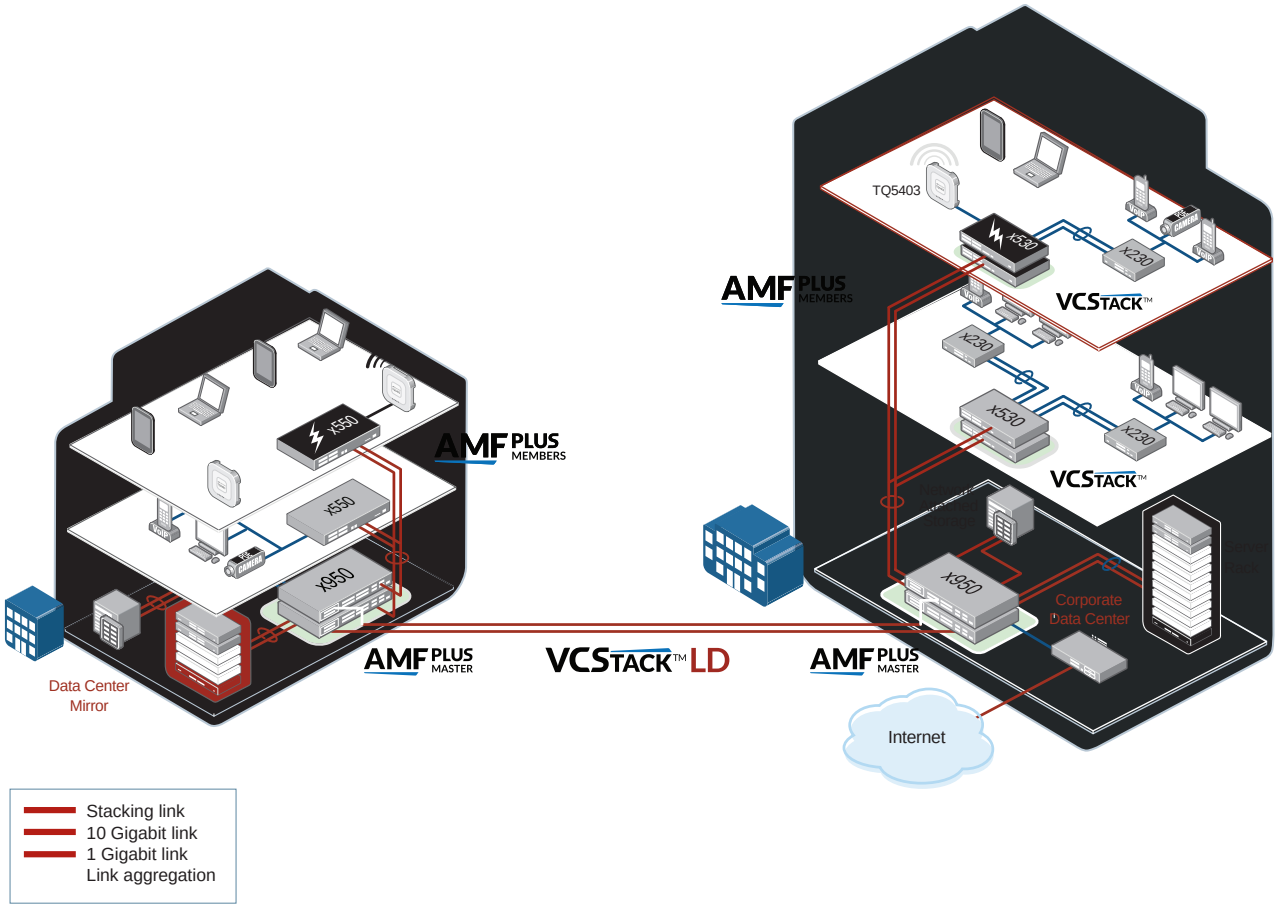
Virtual Extensible LAN (VXLAN) tunnels

- VXLAN tunnels let you join two or more L2 networks over an L3 IP network to form a single L2 broadcast domain. VXLAN adds scalability to cloud computing environments. The x950 Series supports static VXLAN tunnels.

Precision Time Protocol (PTP)

- PTP (IEEE 1588v2) synchronizes clocks throughout the network with micro-second accuracy, supporting industrial automation and control systems. PTP operates on standalone or stacked switches.

Distributed network core



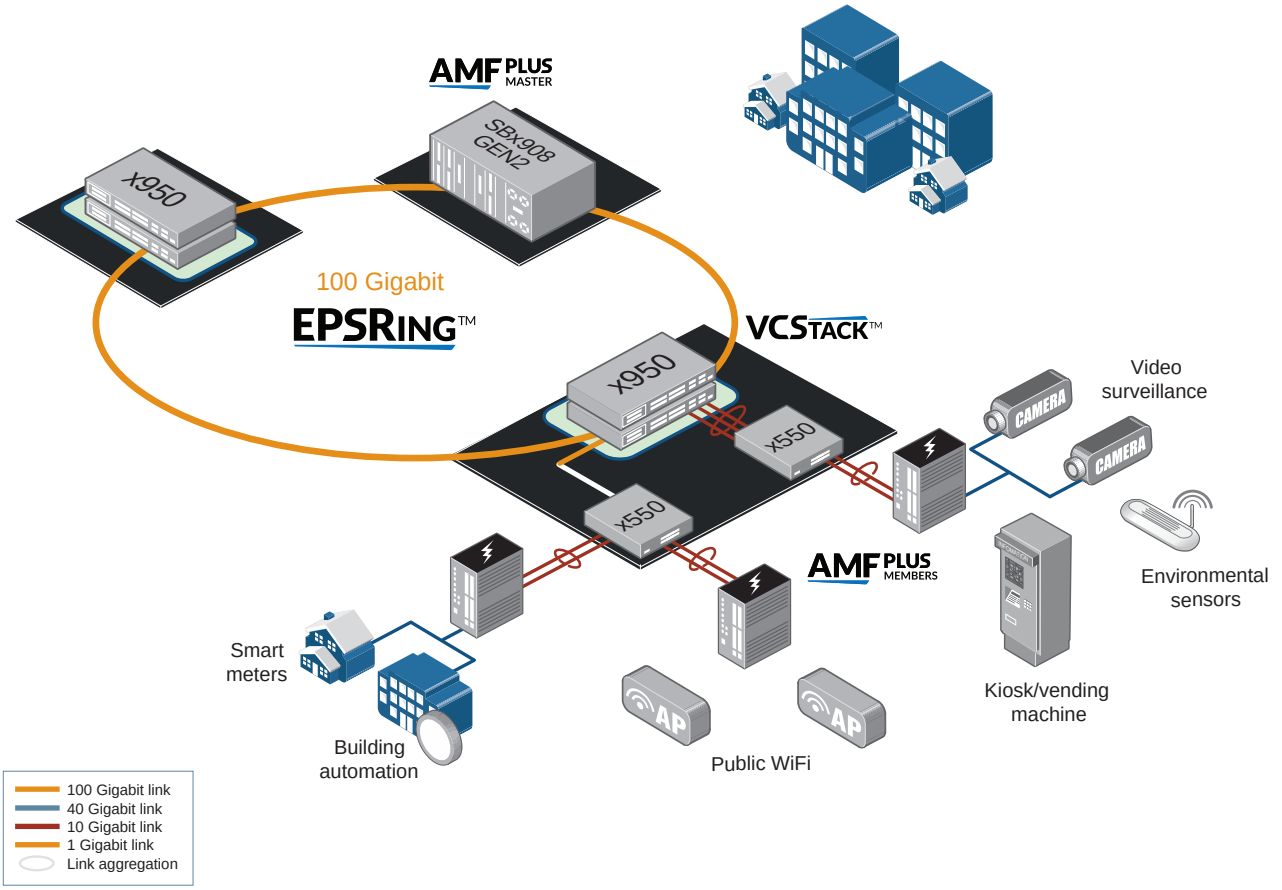
Today's corporate network users demand a high-performing enterprise network that can seamlessly carry multiple converged services, and provide instant access to online resources and applications. This key solution uses the x950 Series and VCStack LD—ideal for a distributed business network core that provides high availability, increased capacity and ease of management.

Using VCStack at the core of the network allows multiple switches to appear as a single virtual chassis, simplifying management. In normal operation, the full bandwidth of the network is used, and with two x950 switches in each location, there is both device and path resiliency. The x950 series stacks up to eight units at any port speed for flexible deployment—supporting up to four locations with complete resiliency, or up to eight locations with a single switch each.

This powerful solution easily supports all online services, while mirroring of the corporate data center enables automated disaster recovery, to ensure always-available access to digital resources.

AMF Plus allows the entire network to be unified for ease of management. The x950 VCStack acts as the AMF Plus Master, automatically backing up the entire network, and enabling plug-and-play networking with zero-touch expansion and recovery.

Smart city network



All over the world, Smart Cities are looking to increase information availability, security and transport efficiency, whilst reducing pollution and waste. Access to real-time data from a variety of sources gives cities the ability to enhance the quality of their urban services, and increase citizen safety.

In this key solution, x950 Series switches, together with the Allied Telesis SwitchBlade x908 GEN2, create the ideal distributed core solution for Smart City and IoT networks. Large switching and routing tables support the many devices that make up modern metropolitan networks, including video surveillance cameras, environmental sensors, information kiosks, public Wi-Fi, building automation and many more.

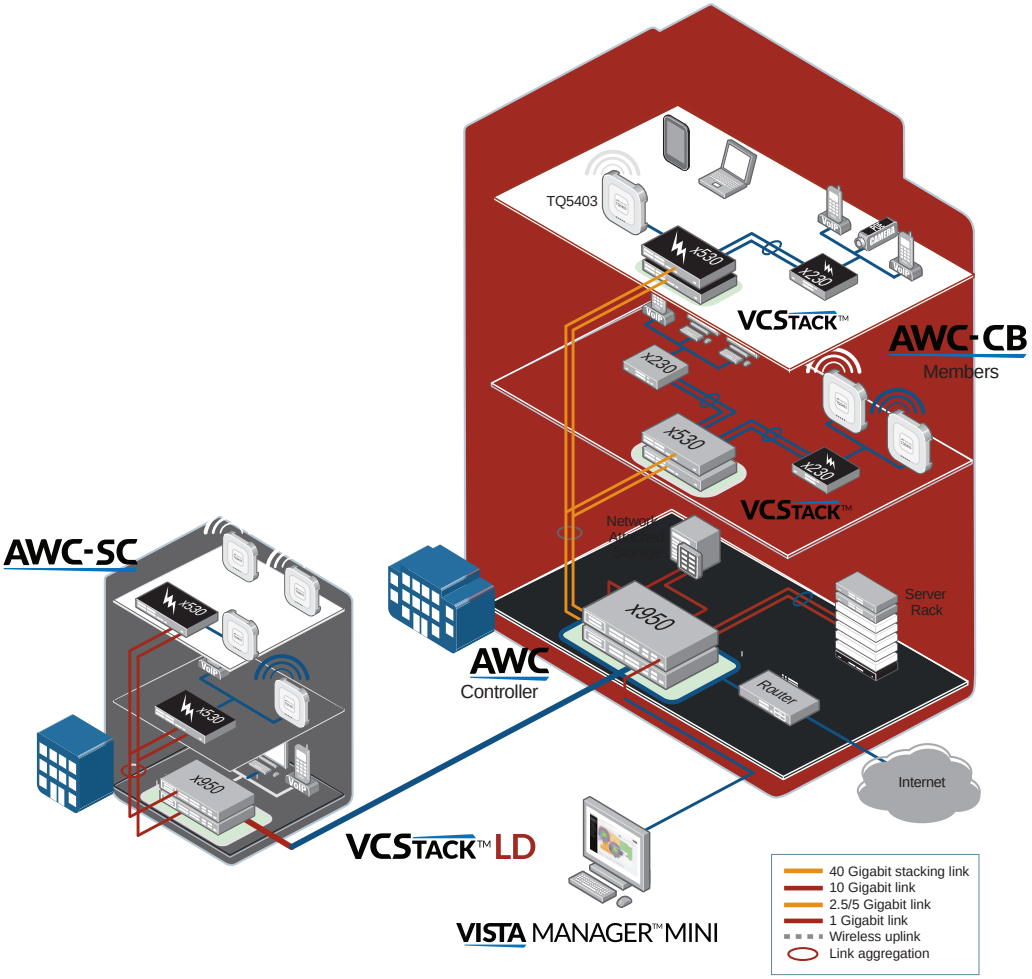
In this Smart City solution, the flexible x950 Series provides 10G, 40G and 100G connectivity. Allied Telesis EPSR creates a high-speed resilient metro ring running at 100Gbps for maximum performance, and extremely fast failover between nodes. EPSR enables rings to recover within as little as 50ms, preventing a node or link failure from impacting the delivery of converged data and video traffic.

AMF Plus automates many day-to-day tasks, backs up the entire network, and provides the ability to configure many or all devices city-wide—with a single command.

The x950 Series and Allied Telesis advanced features enable network managers to deliver leading Smart City services.

Key Solutions

Integrated wireless LAN management



Allied Telesis Autonomous Wave Controller (AWC) offers solutions for two of the most common problems with Wireless LANs: initial setup complexity and on-going performance degradation. Initial WLAN set-up usually requires a site survey to achieve the best coverage; and performance of WLANs can often change over time as external sources of radio interference reduce coverage and bandwidth. These issues can be time-consuming to identify and resolve.

AWC features an intelligent process that automatically re-calibrates the signal strength and radio channel of each Access Point (AP) for optimal WLAN performance.

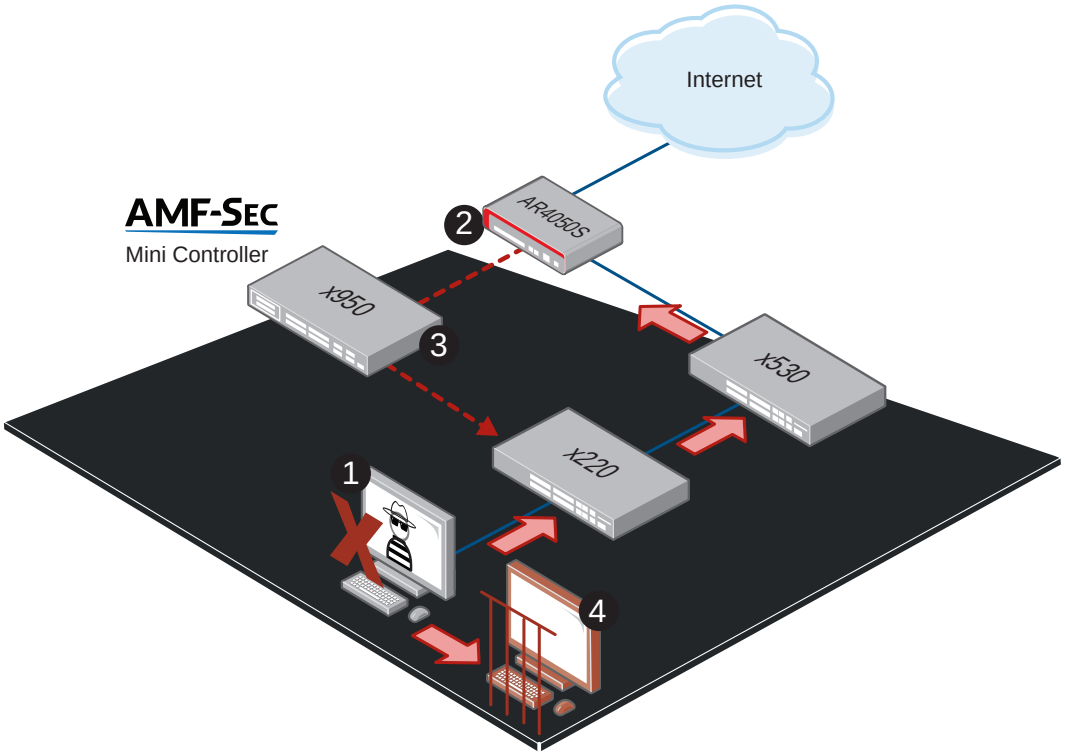
AWC Smart Connect (AWC-SC) uses wireless uplink connections between APs, so deployment is as easy as plugging in and powering on the new APs, which automatically extend the Wi-Fi network, creating a resilient solution.

Vista Manager mini is integrated into the Device Gui of the x950 Series and provides an ideal solution for modern enterprise networks, enabling management of both the wired (with AMF Plus) and wireless (with AWC) networks to be automated. This reduces both the time and cost of network administration, as well as maximizing network performance for a superior user experience.

Up to 5 TQ Series wireless APs can be managed for free, and up to a further 180 APs (max 185) with feature licenses, available separately.

On some AP models, hybrid channel blanket enables multi-channel and single-channel WiFi operation simultaneously. This supports seamless roaming and maximum throughput. Channel Blanket licenses are available for up to 180 APs. For plug-and-play wireless deployment AWC-SC licenses are available for up to 180 APs.

Automated Internal LAN Security



1. Targeted attack inside the network! Malware threat information is seen upline
2. The security appliance passes threat information to the AMF-Sec mini controller integrated into the x950 Series switch
3. AMF-Sec mini security controller instructs the x220 Series switch to block the threat source
4. Infected device is sent to quarantine to automatically stop the spread of infection

AMF Security mini

Most threat protection solutions are only capable of blocking suspicious external traffic arriving at the firewall from the Internet, so only those external threats can be detected and blocked—this is the traditional “secure border” model.

However, the AMF-Sec mini security controller integrated with the x950 Series switch can isolate traffic anywhere in the network, automatically blocking threats such as targeted attacks, or malware introduced inadvertently by staff with USB flash drives, BYOD and so on.

AMF-Sec mini enables automatic protection from internal threats, to protect the LAN from malware by quarantining any suspect devices. Get easy and immediate edge security, so you can relax and enjoy your self-defending network.

The AMF-Sec mini contoller can be managed from the Device GUI of the x950 for easy administration. AMF-Sec mini licenses for 1 year or 5 years are available (see the license table in this datasheet).

Specifications

PRODUCT	1/2.5/5/10G (RJ-45) COPPER PORTS	1/10 GIGABIT SFP+ PORTS	40G/100G QSFP+/ QSFP28 PORTS	XEM BAY	SWITCHING FABRIC	FORWARDIN RATE
x950-28XSQ		24	4*	1	1.92Tbps	1190Mpps
x950-28XTQm	24		4*	1	1.92Tbps	1190Mpps
x950-52XSQ		48	4*		1.92Tbps	1309Mpps
x950-52XTQm	48		4*		1.92Tbps	1309Mpps

*Can also support up to 16 10G ports (using 4 x 10G breakout cables)

Performance

- Extensive wirespeed traffic classification for ACLs and QoS
- 9KB L2/L3 Jumbo frames
- Wirespeed multicasting
- 96K MAC address entries
- Up to 96K host entries
- Up to 8K multicast entries
- Up to 128 Link Aggregation Groups (LAGS) - any combination of static and dynamic (LACP)
- 4K VLANs (VCStack of up to 4 units)
- 2K VLANs (VCStack of 5-8 units)
- 4GB DDR SDRAM
- 16MB packet buffer memory
- 4GB Flash Memory
- Multicore CPU with 4 dual-threaded cores for high-performance, and enabling Vista Manager mini and AWC wireless network management

Reliability

- Modular AlliedWare Plus operating system
- Dual hot swappable PSUs with 1 + 1 redundancy
- Dual feed support: a separate power circuit can feed each power supply providing extra reliability
- Hot-swappable expansion module (XEM)
- Hot-swappable fan modules
- Full environmental monitoring of PSUs, fans, temperature and internal voltages, with SNMP traps to alert network managers in case of any failure

Expandability

- Support for 4 x 40G or 100G connections built in, and an expansion bay to add further switching capacity
- Versatile licensing options for additional features

Power Characteristics

- AC Voltage: 100 to 240V (+/-10% auto ranging)
- Frequency: 47 to 63Hz

Diagnostic Tools

- Active Fiber Monitoring detects tampering on optical links
- Built-In Self Test (BIST)
- Cable fault locator (TDR)
- Find-me device locator
- Hardware health monitoring
- Automatic link flap detection and port shutdown
- Optical Digital Diagnostic Monitoring (DDM)
- Ping polling for IPv4 and IPv6
- Port and VLAN mirroring (RSPAN)
- Link Monitoring
- TraceRoute for IPv4 and IPv6
- Uni-Directional Link Detection (UDLD)

IPv4 Features

- Black hole routing
- Directed broadcast forwarding
- DNS relay
- Equal Cost Multi Path (ECMP) routing
- Policy-based routing
- Route maps
- Route redistribution (OSPF, BGP, RIP)
- Static unicast and multicast routing for IPv4
- UDP broadcast helper (IP helper)
- Up to 600 Virtual Routing and Forwarding (VRF lite) domains (with license)

IPv6 Features

- DHCPv6 client and relay
- DNSv6 client and relay
- IPv4 and IPv6 dual stack
- IPv6 hardware ACLs
- Device management over IPv6 networks with SNMPv6, Telnetv6 and SSHv6
- NTPv6 client and server
- Static unicast and multicast routing for IPv6
- Log to IPv6 hosts with Syslog v6
- IPv6 Ready certified

Management

- 7-segment LED provides at-a-glance status and fault information
- Allied Telesis Management Framework Plus (AMF Plus) enables powerful centralized management and zero-touch device installation and recover
- Try AMF Plus for free with the built-in Starter license
- NETCONF/RESTCONF northbound interface with YANG data modelling
- Console management port on the front panel for ease of access
- Eco-friendly mode allows ports and LEDs to be disabled to save power
- Web-based Graphical User Interface (GUI)
- Industry-standard CLI with context-sensitive help
- Out-of-band 10/100/1000T Ethernet management port
- Powerful CLI scripting engine
- Comprehensive SNMP MIB support for standards-based device management
- Built-in text editor
- Event-based triggers allow user-defined scripts to be executed upon selected system events
- OpenFlow v1.3 for software-defined network orchestration
- USB interface allows software release files, configurations and other files to be stored for backup and distribution to other devices
- AWC Lite Wi-Fi Controller
- Vista Mini for easy network-wide management

Quality of Service

- 8 priority queues with a hierarchy of high priority queues for real time traffic, and mixed scheduling, for each switch port
- Bandwidth limiting (virtual bandwidth) Limit bandwidth per port or per traffic class down to 64kbps
- Wirespeed traffic classification with low latency essential for VoIP and real-time streaming media applications
- IPv6 QoS support and IPv6-aware storm protection
- Policy-based QoS based on VLAN, port, MAC and general packet classifiers
- Policy-based storm protection
- Extensive remarking capabilities and taildrop for queue congestion control
- Queue scheduling options for strict priority, weighted round robin or mixed scheduling
- IP precedence and DiffServ marking based on layer 2, 3 and 4 headers

Resiliency Features

- Control Plane Prioritization (CPP) ensures the CPU always has sufficient bandwidth to process network control traffic
- Dynamic link failover (host attach)
- Ethernet Protection Switched Rings (EPSR) with SuperLoop Protection (SLP) and EPSR enhanced recovery for extra resiliency
- Bidirectional Forwarding Detection (BFD)
- Flexi-stacking allows the use of any port speed to stack
- VCStack up to 8 units
- G.8032 Ethernet Ring Protection Switching (ERPS)
- Long-distance VCStack over fiber (VCStack LD)
- Loop protection: loop detection and thrash limiting
- PVST+ compatibility mode
- STP root guard
- VCStack fast failover minimizes network disruption

Security

- Federal Information Processing Standard Publication 140-2 (FIPS 140-2) certified
- Access Control Lists (ACLs) based on layer 3 and 4 headers
- Configurable ACLs for management traffic
- Dynamic ACLs assigned via port authentication
- ACL Groups enable multiple hosts/ports to be included in a single ACL, reducing configuration
- Auth fail and guest VLANs
- Authentication, Authorisation and Accounting (AAA)
- Bootloader can be password protected for device security
- BPDU protection
- DHCP snooping, IP source guard and Dynamic ARP Inspection (DAI)
- DoS attack blocking and virus throttling
- Dynamic VLAN assignment
- MAC address filtering and MAC address lock-down
- Media Access Control Security (MACSec)
- Network Access Control (NAC) features manage endpoint security
- Learn limits (intrusion detection) for single ports or LAGs
- Private VLANs provide security and port isolation for multiple customers using the same VLAN
- Secure Copy (SCP)
- Secure File Transfer Protocol (SFTP) client
- Strong password security and encryption
- TACACS+ command authorisation

- Tri-authentication: MAC-based, web-based and IEEE 802.1x
- Web-based authentication
- RADIUS group selection per VLAN or port
- RADIUS Proxy

Environmental Specifications

- Operating temperature range:
  0°C to 50°C (32°F to 122°F)
  0°C to 45°C (32°F to 113°F) if using 100G QSFP28 modules
  Derated by 1°C per 305 meters (1,000 ft)
- Storage temperature range:
  -25°C to 70°C (-13°F to 158°F)
- Operating relative humidity range:
  5% to 90% non-condensing
- Storage relative humidity range:
  5% to 95% non-condensing
- Operating altitude:
  3,050 meters maximum (10,000 ft)

Electrical Approvals and Compliances

- EMC: EN55032 class A, FCC class A, VCCI class A
- Immunity: EN55024, EN61000-3-levels 2 (Harmonics), and 3 (Flicker)

Safety

- Standards: UL60950-1, CAN/CSA-C22.2 No. 60950-1-03, EN60950-1, EN60825-1, AS/NZS 60950
- Certification: UL, cUL, TUV, FIPS 140-2

Restrictions on Hazardous Substances (RoHS) Compliance

- EU RoHS compliant
- China RoHS compliant

Physical Specifications

PRODUCT	WIDTH X DEPTH X HEIGHT	MOUNTING	WEIGHT	
			UNPACKAGED	PACKAGE
x950-28XSQ	440 x 445 x 44 mm (17.32 x 17.52 x 1.73 in)	Rack-mount 1 RU	7.26 kg (16.01 lb)	10.76 kg (23.72 lb)
x950-28XTQm	440 x 445 x 44 mm (17.32 x 17.52 x 1.73 in)	Rack-mount 1 RU	7.26 kg (16.01 lb)	10.94 kg (24.12 lb)
x950-52XSQ	441 x 449 x 44 mm (17.36 x 17.68 x 1.73 in)	Rack-mount 1 RU	7.5 kg (16.5 lb)	12.0 kg (26.5 lb)
x950-52XTQm	441 x 449 x 44 mm (17.36 x 17.68 x 1.73 in)	Rack-mount 1 RU	7.7 kg (16.98 lb)	11.26kg (24.83lb)
PWR600-AC	51 x 245 x 40 mm (2.0 x 9.6 x 1.6 in)	N/A	0.84 kg (1.85 lb)	2.04 kg (4.50 lb)
PWR600-DC	51 x 245 x 40 mm (2.0 x 9.6 x 1.6 in)	N/A	0.84 kg (1.85 lb)	1.84 kg (4.06 lb)
FAN05	153 x 100 x 43 mm (6.02 x 3.94 x 1.69 in)	N/A	0.35 kg (0.77 lb)	1.06 kg (2.34 lb)
PWR600R-AC	51 x 255 x 41 mm (2.0 x 10.04 x 1.62 in)	N/A	0.84kg (1.85 lb)	2.04 kg (4.50 lb)
PWR600R-DC	51 x 255 x 41 mm (2.0 x 10.04 x 1.62 in)	N/A	0.84kg (1.85 lb)	2.04 kg (4.50 lb)
FAN05R	153 x 80 x 43 mm (5.99 x 3.15 x 1.69 in)	N/A	0.36kg (0.79 lb)	1.03 kg (2.27 lb)
XEM2-8XSTm	130 x 166 x 40 mm (5.11 x 6.53 x 1.57 in)	N/A	0.70 kg (1.54 lb)	1.7 kg (3.75 lb)
XEM2-12XTm	130 x 166 x 40 mm (5.11 x 6.53 x 1.57 in)	N/A	0.75 kg (1.65 lb)	1.8 kg (3.97 lb)
XEM2-12XT	130 x 166 x 40 mm (5.11 x 6.53 x 1.57 in)	N/A	0.75 kg (1.65 lb)	1.8 kg (3.97 lb)
XEM2-12XS v2	130 x 166 x 40 mm (5.11 x 6.53 x 1.57 in)	N/A	0.75 kg (1.65 lb)	1.8 kg (3.97 lb)
XEM2-4QS	130 x 166 x 40 mm (5.11 x 6.53 x 1.57 in)	N/A	0.66 kg (1.45 lb)	1.7 kg (3.75 lb)
XEM2-1CQ	130 x 166 x 40 mm (5.11 x 6.53 x 1.57 in)	N/A	0.62 kg (1.37 lb)	1.6 kg (3.53 lb)

Power, Heat, Noise (with two PSUs installed)

PRODUCT	MAX POWER CONSUMPTION	MAX HEAT DISSIPATION	NOISE
x950-28XSQ	231.2W	789.0 BTU/h	63.4 dBA
x950-28XSQ + XEM2-8XSTm	250.3W	854.0 BTU/h	63.4 dBA
x950-28XSQ + XEM2-12XTm	261.6W	892.8 BTU/h	63.4 dBA
x950-28XSQ + XEM2-12XT	271.9W	927.7 BTU/h	63.4 dBA
x950-28XSQ + XEM2-12XS v2	262.3W	895.1 BTU/h	63.4 dBA
x950-28XSQ + XEM2-4QS	248.0W	846.4 BTU/h	63.4 dBA
x950-28XSQ + XEM2-1CQ	238.1W	812.8 BTU/h	63.4 dBA
x950-28XTQm	255.3W	871.1 BTU/h	61.9 dBA
x950-28XTQm + XEM2-8XSTm	273.9W	934.7 BTU/h	61.9 dBA
x950-28XTQm + XEM2-12XTm	284.6W	971.3 BTU/h	61.9 dBA
x950-28XTQm + XEM2-12XT	295.8W	1009.5 BTU/h	61.9 dBA
x950-28XTQm + XEM2-12XS v2	286.2W	976.6 BTU/h	61.9 dBA
x950-28XTQm + XEM2-4QS	271.7W	927.1 BTU/h	61.9 dBA
x950-28XTQm + XEM2-1CQ	261.7W	893.2 BTU/h	61.9 dBA
x950-52XSQ	266.1W	908.1 BTU/h	65.7 dBA
x950-52XTQm	300W	1,089 BTU/h	63.5 dBA

Latency (microseconds)

PRODUCT	LATENCY
x950-28XSQ	0.8µs
x950-28XTQm	2.3µs
x950-52XSQ	0.98 µs (100Gbps, FEC)
x950-52XTQm	2.3µs
XEM2-8XSTm	2.2µs
XEM2-12XTm	2.4µs
XEM2-12XT	2.4µs
XEM2-12XS v2	1.9µs
XEM2-4QS	0.7µs
XEM2-1CQ	0.7µs

Standards and Protocols

AlliedWare Plus Operating System

Version 5.5.4

Authentication

RFC 1321 MD5 Message-Digest algorithm
RFC 1828 IP authentication using keyed MD5

Border Gateway Protocol (BGP)

BGP dynamic capability
BGP outbound route filtering
RFC 1772 Application of the Border Gateway Protocol (BGP) in the Internet
RFC 1997 BGP communities attribute
RFC 2385 Protection of BGP sessions via the TCP MD5 signature option
RFC 2439 BGP route flap damping
RFC 2545 Use of BGP-4 multiprotocol extensions for IPv6 inter-domain routing
RFC 2858 Multiprotocol extensions for BGP-4
RFC 2918 Route refresh capability for BGP-4
RFC 3392 Capabilities advertisement with BGP-4
RFC 3882 Configuring BGP to block Denial-of-Service (DoS) attacks
RFC 4271 Border Gateway Protocol 4 (BGP-4)
RFC 4360 BGP extended communities
RFC 4456 BGP route reflection - an alternative to full mesh iBGP
RFC 4724 BGP graceful restart
RFC 4893 BGP support for four-octet AS number space
RFC 5065 Autonomous system confederations for BGP

Cryptographic Algorithms

FIPS Approved Algorithms

Encryption (Block Ciphers):

- AES (ECB, CBC, CFB and OFB Modes)
- 3DES (ECB, CBC, CFB and OFB Modes)

Block Cipher Modes:

- CCM
- CMAC
- GCM
- XTS