

SwitchBlade® x908 Generation 2

High Capacity Stackable Layer 3+ Modular Switch

The Allied Telesis SBx908 GEN2 is the ideal solution for the modern enterprise network core. This stackable modular switch also has the capacity to support Smart City and IoT networks.

The SBx908 GEN2 delivers a future-proof network with superior flexibility, coupled with the ability to stack multiple units.

The high-capacity 2.6 Terabit fabric eliminates bottlenecks, effortlessly streams video and ensures all traffic in large networks is delivered reliably. Flexible hot-swappable expansion modules (XEMs) support 10 Gigabit, 40 Gigabit—and 100 Gigabit in the future—to easily expand the SBx908 GEN2 to meet network traffic demands, both now and well into the future.

Smart City and IoT networks

The SBx908 GEN2 has large switching and routing tables to support Smart City networks and the Internet of Things (IoT). It meets the increasing demand for the convergence of multiple services, like video surveillance, public Wi-Fi, information kiosks, environmental information and more.

Powerful network management

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

Vista Manager™ EX is an intuitive visualization tool that complements the power of AMF. It allows a user to monitor the network and quickly identify issues before they become major problems.

Secure

The SBx908 GEN2 is packed with advanced security features to protect the network—from the edge to the core.

This includes powerful control over network traffic types and protection against attacks.

AMF ensures secure network management without the overhead of additional complexity.

Resilient

The convergence of network services in the enterprise 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 SBx908 GEN2 can form a VCStack of up to four units for enhanced resiliency and simplified device management. 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 in the future, G.8032 ERPS—ensure that distributed network segments have high-speed, resilient access to online resources and applications.

Reliable

Designed with reliability in mind, the SBx908 GEN2 guarantees the continual delivery of essential services. Hot-swappable components such as XEMs, fans, and load-sharing Power Supply Units (PSUs) pair with near-hitless online stack reconfiguration, to ensure that maintenance doesn't affect network uptime.

Environmentally friendly

The SBx908 GEN2 supports Energy Efficient Ethernet (EEE), automatically reducing the power consumed by the switch whenever there is no traffic on a port, reducing operating costs.



AlliedWare Plus™
OPERATING SYSTEM

Key Features

- ▶ 2.6 Terabit fabric
- ▶ 40G fiber XEMs
- ▶ 10G fiber and copper XEMs
- ▶ Allied Telesis Autonomous Management Framework™ (AMF)
- ▶ Active Fiber Monitoring
- ▶ Scalable and flexible
- ▶ SDN-ready
- ▶ Large switching and routing tables
- ▶ VCStack two units using 40G ports
- ▶ VCStack over long distance

Coming Soon

- ▶ VCStack stacking for up to four units
- ▶ Support for 100G fiber expansion module (XEM2-1CQ)
- ▶ Stacking over 100G ports (XEM2-1CQ)
- ▶ OpenFlow v1.3
- ▶ G.8032 ERPS for resilient rings
- ▶ Energy Efficient Ethernet (EEE)

VCStack™

AMF™

EPSRing™

ACTIVE
Fiber Monitoring™

Key Features

VCStack™

- ▶ Create a VCStack of up to four units using the XEM2-4QS, for up to 320Gbps stacking bandwidth on each unit. Stacking links are connected in a ring so each device has dual connections to further improve resiliency. VCStack provides a highly available system where network resources are spread out across stacked units, reducing the impact if one of the units 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.

AMF™

- ▶ AMF 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 SBx908 GEN2 can operate as the AMF network master, storing firmware and configuration backups for all other network nodes. The AMF master enables auto-provisioning and auto-upgrade by providing appropriate files to new network members.
- ▶ AMF Guestnode allows Allied Telesis wireless access points and further switching products, as well as third party devices such as IP phones and security cameras, to be part of an AMF network.

Large network tables

- ▶ High-capacity 2.6 Terabit fabric and 1,905Mpps 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.

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.

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.
- ▶ 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.

sFlow

- ▶ sFlow is an industry standard technology for monitoring high speed switched networks. It provides complete visibility into network use, enabling performance optimization, usage accounting/billing, and defence against security threats. Sampled packets sent to a collector ensure it always has a real-time view of network traffic.

Quality of Service (QoS)

- ▶ Comprehensive low-latency wire-speed QoS provides flow-based traffic management with full classification, prioritization, traffic shaping and min/max bandwidth profiles. Enjoy boosted network performance and guaranteed delivery of business-critical Ethernet services and applications. Time-critical services like voice and video applications take precedence over non-essential services like file downloads, maintaining responsiveness of Enterprise applications.

Premium Software License

- ▶ By default, the SBx908 GEN2 offers a comprehensive Layer 2 and standard Layer 3 feature set that includes static routing and IPv6 management features. The feature set can easily be elevated to full Layer 3 by applying the premium software license. This adds dynamic routing protocols and Layer 3 multicasting capabilities.

Optical DDM

- ▶ Most modern optical SFP/SFP+/QSFP+ transceivers support Digital Diagnostics Monitoring (DDM) functions according to the specification SFF-8472. This enables real time monitoring of the various parameters of the transceiver, such as optical output power, temperature, laser bias current and transceiver supply voltage. Easy access to this information simplifies diagnosing problems with optical modules and fiber connections.

Active Fiber Monitoring

- ▶ Active Fiber Monitoring prevents eavesdropping on fiber communications by monitoring received optical power. If an intrusion is detected, the link can be automatically shut down, or an operator alert can be sent.

VLAN ACLs

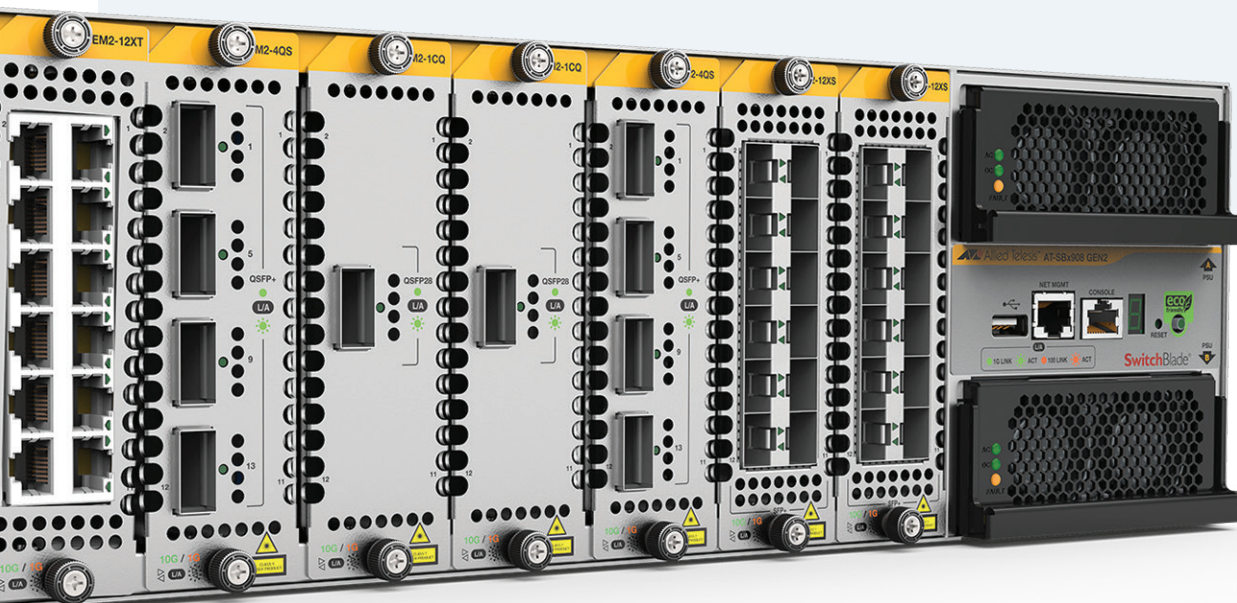
- ▶ Simplify access and traffic control across entire segments of the network. Access Control Lists (ACLs) can be applied to a Virtual LAN (VLAN) as well as a specific port.

TACACS+ Command Authorization

- ▶ Centralize control of which commands may be issued by a specific user of an AlliedWare Plus device. TACACS+ command authorization complements authentication and accounting services for a complete AAA solution.

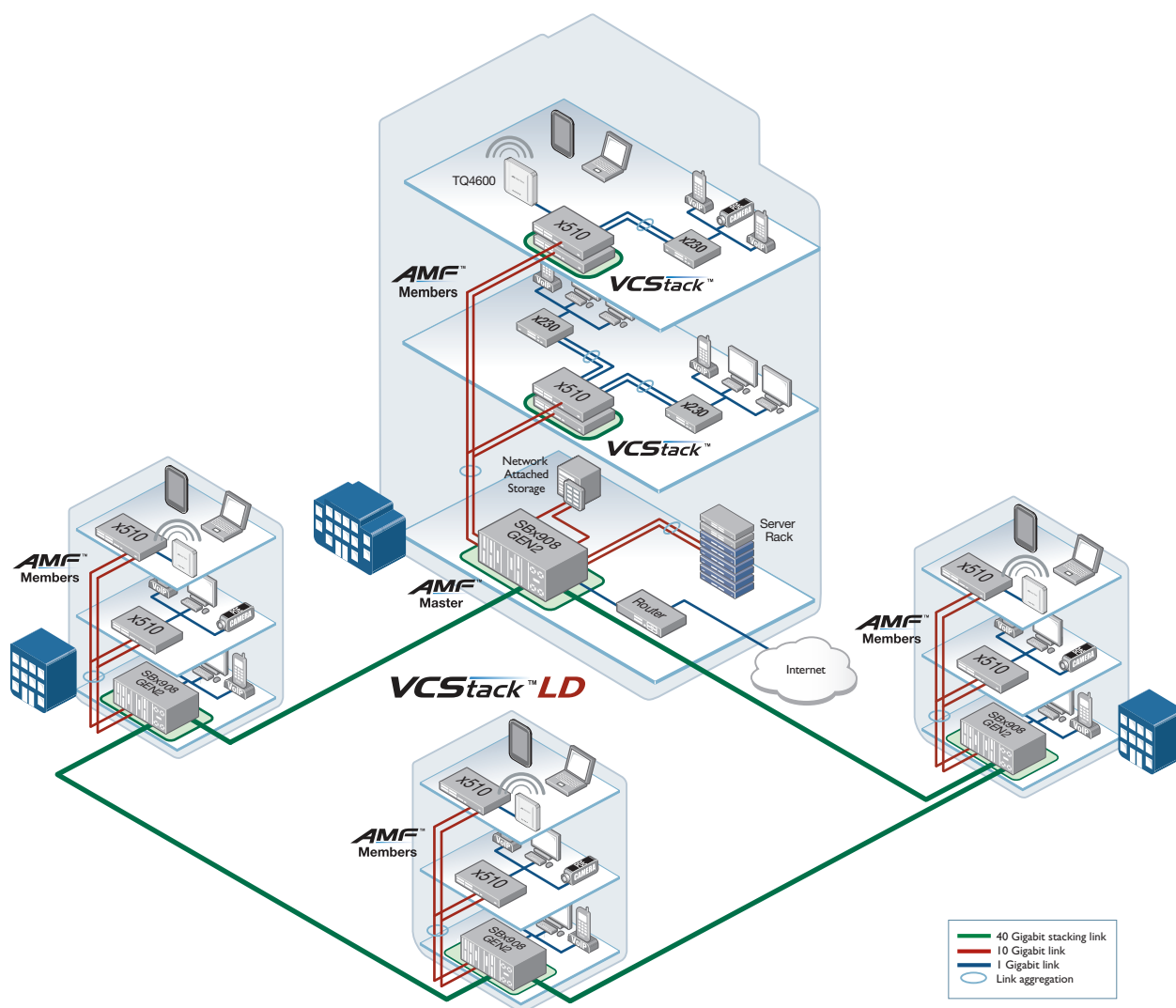
UniDirectional Link Detection

- ▶ UniDirectional Link Detection (UDLD) is useful for monitoring fiber-optic links between two switches that use two single-direction fibers to transmit and receive packets. UDLD prevents traffic from being sent across a bad link by blocking the ports at both ends of the link in the event that either the individual transmitter or receiver for that connection fails.



Key Solutions

Distributed network core



Today's large enterprises demand ready access to online resources and applications, and require a high-performing network that can seamlessly carry multiple converged services. This campus solution uses the SwitchBlade x908 GEN2 and long-distance Virtual Chassis Stacking (VCSstack LD)—ideal for a distributed network core that provides high availability, increased capacity and ease of management.

Using VCSstack 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, ensuring always-available online services. Seamless wireless access, and the convergence

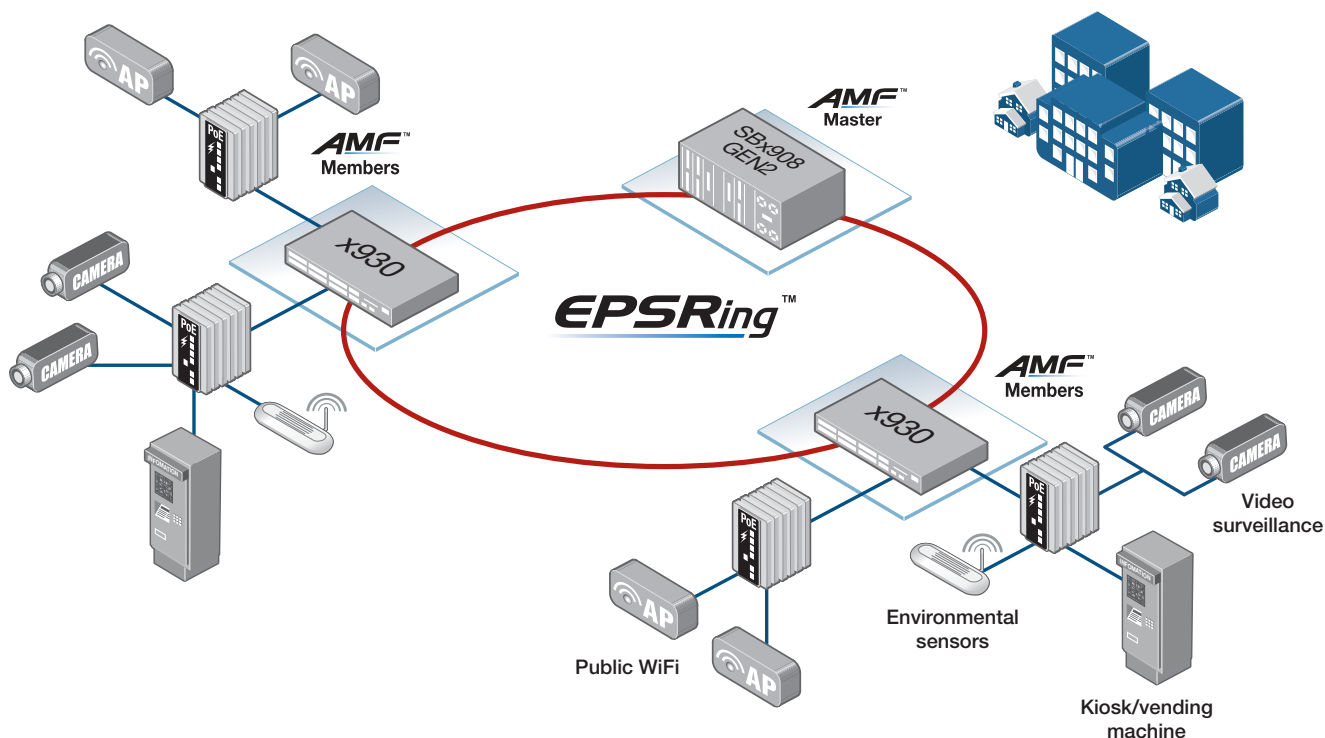
of business data, voice, and video surveillance traffic on the network, are easily supported with this powerful solution.

AMF allows the entire network to be unified for ease of management. The SwitchBlade x908 GEN2 acts as the AMF Master, automatically backing up the entire network, and enabling plug-and-play networking with zero-touch expansion and recovery.

The SwitchBlade x908 GEN2 delivers a protocol-less and Active/Active campus backbone solution, with high performance and flexible scalability.

Key Solutions

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.

The SwitchBlade x908 GEN2 is the ideal network 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 and many more.

Allied Telesis EPSR creates a high-speed resilient ring that can utilize 10G, 40G or 100G, and provides 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 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 SwitchBlade x908 GEN2 and Allied Telesis advanced features support network managers in delivering leading Smart City services.

Specifications

Performance

- ▶ 2.6 Terabit Switching Fabric
- ▶ 1,905Mpps forwarding rate
- ▶ Extensive wirespeed traffic classification for ACLs and QoS
- ▶ Supports 10KB Jumbo frame size for data center and server aggregation applications
- ▶ Wirespeed multicasting
- ▶ 96K MAC address entries
- ▶ Up to 96K host entries
- ▶ Up to 4K multicast entries
- ▶ 4K VLANs
- ▶ 4GB DDR SDRAM
- ▶ Separate packet buffer memory
- ▶ 4GB Flash Memory

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 modules (XEMs)
- ▶ 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

- ▶ Eight high speed expansion bays supporting a choice of modules for port flexibility and application versatility
- ▶ Versatile licensing options for additional features

Power Characteristics

- ▶ AC Voltage: 100 to 240V (+/-10% auto ranging)
- ▶ Frequency: 47 to 63Hz
- ▶ DC Voltage: 36 to 72V

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 mirroring
- ▶ 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 64 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

Management

- ▶ 7-segment LED provides at-a-glance status and fault information
- ▶ Allied Telesis Management Framework (AMF) enables powerful centralized management and zero-touch device installation and recovery
- ▶ Try AMF for free with the built-in Starter license
- ▶ Console management port on the front panel for ease of access
- ▶ Eco-friendly mode allows ports and LEDs to be disabled to save power
- ▶ 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
- ▶ USB interface allows software release files, configurations and other files to be stored for backup and distribution to other devices

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

- ▶ 40G Ethernet ports can be configured as stacking ports
- ▶ 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

- ▶ Long-Distance VSTACK over fiber with 40G QSFP+ modules (VSTACK LD)
- ▶ Loop protection: loop detection and thrash limiting
- ▶ PVST+ compatibility mode
- ▶ STP root guard
- ▶ VSTACK fast failover minimizes network disruption

Security

- ▶ Access Control Lists (ACLs) based on layer 3 and 4 headers
- ▶ Configurable ACLs for management traffic
- ▶ 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
- ▶ Network Access and Control (NAC) features manage endpoint security
- ▶ Port-based learn limits (intrusion detection)
- ▶ 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

Environmental Specifications

- ▶ Operating temperature range:
0°C to 50°C (32°F to 122°F)
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

Restrictions on Hazardous Substances (RoHS) Compliance

- ▶ EU RoHS compliant
- ▶ China RoHS compliant

Country of Origin

- ▶ Singapore

Physical Specifications

PRODUCT	WIDTH	DEPTH	HEIGHT	MOUNTING	WEIGHT	
					UNPACKAGED	PACKAGED
SwitchBlade x908 GEN2	440 mm (17.32 in)	480 mm (18.89 in)	132 mm (5.19 in)	Rack-mount 3RU	14.32 kg (31.57 lb)	16.7 kg (36.81 lb)
SBxPWRSYS2	84 mm (3.30 in)	170 mm (6.69 in)	40 mm (1.57 in)	N/A	1.32 kg (2.91 lb)	1.9 kg (4.18 lb)
XEM2-12XS	109 mm (4.29 in)	170 mm (6.69 in)	40 mm (1.57 in)	N/A	0.82 kg (1.80 lb)	1.4 kg (3.08 lb)
XEM2-12XT	109 mm (4.29 in)	170 mm (6.69 in)	40 mm (1.57 in)	N/A	0.82 kg (1.80 lb)	1.4 kg (3.08 lb)
XEM2-4QS	109 mm (4.29 in)	170 mm (6.69 in)	40 mm (1.57 in)	N/A	0.82 kg (1.80 lb)	1.4 kg (3.08 lb)
XEM2-1CQ	109 mm (4.29 in)	170 mm (6.69 in)	40 mm (1.57 in)	N/A	0.82 kg (1.80 lb)	1.4 kg (3.08 lb)

Latency (microseconds)

PRODUCT	
XEM2-12XT (1G/10G)	2.4 μs
XEM2-12XS (1G/10G)	1.9 μs
XEM2-4QS (40G)	0.7 μs

Standards and Protocols

AlliedWare Plus Operating System

Version 5.4.7-2

Authentication

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

Border Gateway Protocol (BGP)

- BGP dynamic capability
- BGP outbound route filtering
- RFC 1772Application of the Border Gateway Protocol (BGP) in the Internet
- RFC 1997BGP communities attribute
- RFC 2385Protection of BGP sessions via the TCP MD5 signature option
- RFC 2439BGP route flap damping
- RFC 2545Use of BGP-4 multiprotocol extensions for IPv6 inter-domain routing
- RFC 2858Multiprotocol extensions for BGP-4
- RFC 2918Route refresh capability for BGP-4
- RFC 3392Capabilities advertisement with BGP-4
- RFC 3882Configuring BGP to block Denial-of-Service (DoS) attacks
- RFC 4271Border Gateway Protocol 4 (BGP-4)
- RFC 4360BGP extended communities
- RFC 4456BGP route reflection - an alternative to full mesh iBGP
- RFC 4724BGP graceful restart
- RFC 4893BGP support for four-octet AS number space
- RFC 5065Autonomous 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
- Digital Signatures & Asymmetric Key Generation:
- ▶ DSA
- ▶ ECDSA
- ▶ RSA
- Secure Hashing:
- ▶ SHA-1
- ▶ SHA-2 (SHA-224, SHA-256, SHA-384, SHA-512)

- Message Authentication:
- ▶ HMAC (SHA-1, SHA-2(224, 256, 384, 512)
- Random Number Generation:
- ▶ DRBG (Hash, HMAC and Counter)

Non FIPS Approved Algorithms

- RNG (AES128/192/256)
- DES
- MD5

Ethernet Standards

- IEEE 802.2Logical Link Control (LLC)
- IEEE 802.3Ethernet
- IEEE 802.3ab1000BASE-T
- IEEE 802.3ae10 Gigabit Ethernet
- IEEE 802.3an10GBASE-T
- IEEE 802.3azEnergy Efficient Ethernet (EEE)
- IEEE 802.3ba40GBASE-X
- IEEE 802.3xFlow control - full-duplex operation
- IEEE 802.3z1000BASE-X

IPv4 Features

- RFC 768User Datagram Protocol (UDP)
- RFC 791Internet Protocol (IP)
- RFC 792Internet Control Message Protocol (ICMP)
- RFC 793Transmission Control Protocol (TCP)
- RFC 826Address Resolution Protocol (ARP)
- RFC 894Standard for the transmission of IP datagrams over Ethernet networks
- RFC 919Broadcasting Internet datagrams
- RFC 922Broadcasting Internet datagrams in the presence of subnets
- RFC 932Subnetwork addressing scheme
- RFC 950Internet standard subnetting procedure
- RFC 951Bootstrap Protocol (BootP)
- RFC 1027Proxy ARP
- RFC 1035DNS client
- RFC 1042Standard for the transmission of IP datagrams over IEEE 802 networks
- RFC 1071Computing the Internet checksum
- RFC 1122Internet host requirements
- RFC 1191Path MTU discovery
- RFC 1256ICMP router discovery messages
- RFC 1518An architecture for IP address allocation with CIDR
- RFC 1519Classless Inter-Domain Routing (CIDR)
- RFC 1542Clarifications and extensions for BootP
- RFC 1591Domain Name System (DNS)
- RFC 1812Requirements for IPv4 routers
- RFC 1918IP addressing
- RFC 2581TCP congestion control

IPv6 Features

- RFC 1981Path MTU discovery for IPv6
- RFC 2460IPv6 specification
- RFC 2464Transmission of IPv6 packets over Ethernet networks
- RFC 3484Default address selection for IPv6
- RFC 3587IPv6 global unicast address format
- RFC 3596DNS extensions to support IPv6
- RFC 4007IPv6 scoped address architecture
- RFC 4193Unique local IPv6 unicast addresses
- RFC 4213Transition mechanisms for IPv6 hosts and routers

- RFC 4291IPv6 addressing architecture
- RFC 4443Internet Control Message Protocol (ICMPv6)
- RFC 4861Neighbor discovery for IPv6
- RFC 4862IPv6 Stateless Address Auto-Configuration (SLAAC)
- RFC 5014IPv6 socket API for source address selection
- RFC 5095Deprecation of type 0 routing headers in IPv6
- RFC 5175IPv6 Router Advertisement (RA) flags option
- RFC 6105IPv6 Router Advertisement (RA) guard

Management

- AMF MIB and SNMP traps
- AT Enterprise MIB
- Optical DDM MIB
- SNMPv1, v2c and v3
- IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
- RFC 1155Structure and identification of management information for TCP/IP-based Internets
- RFC 1157Simple Network Management Protocol (SNMP)
- RFC 1212Concise MIB definitions
- RFC 1213MIB for network management of TCP/IP-based Internets: MIB-II
- RFC 1215Convention for defining traps for use with the SNMP
- RFC 1227SNMP MUX protocol and MIB
- RFC 1239Standard MIB
- RFC 1724RIPv2 MIB extension
- RFC 2578Structure of Management Information v2 (SMIv2)
- RFC 2579Textual conventions for SMIv2
- RFC 2580Conformance statements for SMIv2
- RFC 2674Definitions of managed objects for bridges with traffic classes, multicast filtering and VLAN extensions
- RFC 2741Agent extensibility (AgentX) protocol
- RFC 2787Definitions of managed objects for VRRP
- RFC 2819RMON MIB (groups 1,2,3 and 9)
- RFC 2863Interfaces group MIB
- RFC 3164Syslog protocol
- RFC 3176sFlow: a method for monitoring traffic in switched and routed networks
- RFC 3411An architecture for describing SNMP management frameworks
- RFC 3412Message processing and dispatching for the SNMP
- RFC 3413SNMP applications
- RFC 3414User-based Security Model (USM) for SNMPv3
- RFC 3415View-based Access Control Model (VACM) for SNMP
- RFC 3416Version 2 of the protocol operations for the SNMP
- RFC 3417Transport mappings for the SNMP
- RFC 3418MIB for SNMP
- RFC 3621Power over Ethernet (PoE) MIB
- RFC 3635Definitions of managed objects for the Ethernet-like interface types
- RFC 3636IEEE 802.3 MAU MIB
- RFC 4022MIB for the Transmission Control Protocol (TCP)
- RFC 4113MIB for the User Datagram Protocol (UDP)
- RFC 4188Definitions of managed objects for bridges
- RFC 4292IP forwarding table MIB
- RFC 4293MIB for the Internet Protocol (IP)
- RFC 4318Definitions of managed objects for bridges with RSTP

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- RFC 4560

Definitions of managed objects for remote ping, traceroute and lookup operations
- RFC 6527

Definitions of managed objects for VRRPv3

Multicast Support

- Bootstrap Router (BSR) mechanism for PIM-SM

IGMP query solicitation

IGMP snooping (IGMPv1, v2 and v3)

IGMP snooping fast-leave

IGMP/MLD multicast forwarding (IGMP/MLD proxy)

MLD snooping (MLDv1 and v2)

PIM for IPv6

PIM SSM for IPv6

RFC 1112

Host extensions for IP multicasting (IGMPv1)

RFC 2236

Internet Group Management Protocol v2 (IGMPv2)

RFC 2710

Multicast Listener Discovery (MLD) for IPv6

RFC 2715

Interoperability rules for multicast routing protocols

RFC 3306

Unicast-prefix-based IPv6 multicast addresses

RFC 3376

IGMPv3

RFC 3810

Multicast Listener Discovery v2 (MLDv2) for IPv6

RFC 3956

Embedding the Rendezvous Point (RP) address in an IPv6 multicast address

RFC 3973

PIM Dense Mode (DM)

RFC 4541

IGMP and MLD snooping switches

RFC 4601

Protocol Independent Multicast - Sparse Mode (PIM-SM): protocol specification (revised)

RFC 4604

Using IGMPv3 and MLDv2 for source-specific multicast

RFC 4607

Source-specific multicast for IP
- Open Shortest Path First (OSPF)
- OSPF link-local signaling

OSPF MD5 authentication

Out-of-band LSDB resync

RFC 1245

OSPF protocol analysis

RFC 1246

Experience with the OSPF protocol

RFC 1370

Applicability statement for OSPF

RFC 1765

OSPF database overflow

RFC 2328

OSPFv2

RFC 2370

OSPF opaque LSA option

RFC 2740

OSPFv3 for IPv6

RFC 3101

OSPF Not-So-Stubby Area (NSSA) option

RFC 3509

Alternative implementations of OSPF area border routers

RFC 3623

Graceful OSPF restart

RFC 3630

Traffic engineering extensions to OSPF

RFC 4552

Authentication/confidentiality for OSPFv3

RFC 5329

Traffic engineering extensions to OSPFv3

RFC 5340

OSPFv3 for IPv6 (partial support)

Quality of Service (QoS)

IEEE 802.1p

Priority tagging

RFC 2211

Specification of the controlled-load network element service

RFC 2474

DiffServ precedence for eight queues/port

RFC 2475

DiffServ architecture

RFC 2597

DiffServ Assured Forwarding (AF)

RFC 2697

A single-rate three-color marker

RFC 2698

A two-rate three-color marker

RFC 3246

DiffServ Expedited Forwarding (EF)

Resiliency Features

IEEE 802.1AX

Link aggregation (static and LACP)

IEEE 802.1D

MAC bridges

IEEE 802.1s

Multiple Spanning Tree Protocol (MSTP)

IEEE 802.1w

Rapid Spanning Tree Protocol (RSTP)

IEEE 802.3ad

Static and dynamic link aggregation

RFC 5798

Virtual Router Redundancy Protocol version 3 (VRRPv3) for IPv4 and IPv6

Routing Information Protocol (RIP)

RFC 1058

Routing Information Protocol (RIP)

RFC 2080

RIPng for IPv6

RFC 2081

RIPng protocol applicability statement

RFC 2082

RIP-2 MD5 authentication

RFC 2453

RIPv2

Security Features

SSH remote login

SSLv2 and SSLv3

TACACS+ accounting and authentication

IEEE 802.1X authentication protocols (TLS, TTLS, PEAP and MD5)

IEEE 802.1X multi-supplicant authentication

IEEE 802.1X port-based network access control

RFC 2818

HTTP over TLS ("HTTPS")

RFC 2865

RADIUS authentication

RFC 2866

RADIUS accounting

RFC 2868

RADIUS attributes for tunnel protocol support

RFC 3280

Internet X.509 PKI Certificate and Certificate Revocation List (CRL) profile

RFC 3546

Transport Layer Security (TLS) extensions

RFC 3579

RADIUS support for Extensible Authentication Protocol (EAP)

RFC 3580

IEEE 802.1x RADIUS usage guidelines

RFC 3748

PPP Extensible Authentication Protocol (EAP)

RFC 4251

Secure Shell (SSHv2) protocol architecture

RFC 4252

Secure Shell (SSHv2) authentication protocol

RFC 4253

Secure Shell (SSHv2) transport layer protocol

RFC 4254

Secure Shell (SSHv2) connection protocol

RFC 5246

TLS v1.2

Services

RFC 854

Telnet protocol specification

RFC 855

Telnet option specifications

RFC 857

Telnet echo option

RFC 858

Telnet suppress go ahead option

RFC 1091

Telnet terminal-type option

RFC 1350

Trivial File Transfer Protocol (TFTP)

RFC 1985

SMTP service extension

RFC 2049

MIME

RFC 2131

DHCPv4 (server, relay and client)

RFC 2132

DHCP options and BootP vendor extensions

RFC 2616

Hypertext Transfer Protocol - HTTP/1.1

RFC 2821

Simple Mail Transfer Protocol (SMTP)

RFC 2822

Internet message format

RFC 3046

DHCP relay agent information option (DHCP option 82)

RFC 3315

DHCPv6 (server, relay and client)

RFC 3633

IPv6 prefix options for DHCPv6

RFC 3646

DNS configuration options for DHCPv6

RFC 3993

Subscriber-ID suboption for DHCP relay agent option

RFC 4330

Simple Network Time Protocol (SNTP) version 4

RFC 5905

Network Time Protocol (NTP) version 4

VLAN Support

Generic VLAN Registration Protocol (GVRP)

IEEE 802.1ad Provider bridges (VLAN stacking, Q-in-Q)

IEEE 802.1Q Virtual LAN (VLAN) bridges

IEEE 802.1v VLAN classification by protocol and port

IEEE 802.3ac VLAN tagging

Voice over IP (VoIP)

LLDP-MED

ANSI/TIA-1057

Voice VLAN

Feature Licenses

NAME	DESCRIPTION	INCLUDES	STACK LICENSING
AT-FL-GEN2-01	SwitchBlade x908 GEN2 Advanced Layer 3 license	▶ OSPF¹ (16,000 routes) ▶ BGP4¹ (5,000 routes) ▶ PIMv4-SM, DM and SSM (2,000 entries) ▶ VLAN double tagging (Q-in-Q) ▶ RIPng (5,000 routes) ▶ OSPFv3 (8,000 routes) ▶ BGP4+ (5,000 routes) ▶ MLDv1 and v2 ▶ PIMv6-SM and SSM (1,000 entries) ▶ VRF lite (64 domains) ▶ RADIUS Full ▶ UDLD	▶ One license per stack member
AT-FL-GEN2-AM40-1YR	AMF Master license	▶ AMF Master 40 nodes for 1 year	▶ One license per stack
AT-FL-GEN2-AM40-5YR	AMF Master license	▶ AMF Master 40 nodes for 5 years	▶ One license per stack
AT-FL-GEN2-AM80-1YR	AMF Master license	▶ AMF Master 80 nodes for 1 year	▶ One license per stack
AT-FL-GEN2-AM80-5YR	AMF Master license	▶ AMF Master 80 nodes for 5 years	▶ One license per stack
AT-FL-GEN2-AM120-1YR	AMF Master license	▶ AMF Master 120 nodes for 1 year	▶ One license per stack
AT-FL-GEN2-AM120-5YR	AMF Master license	▶ AMF Master 120 nodes for 5 years	▶ One license per stack
AT-FL-GEN2-AM300-1YR	AMF Master license	▶ AMF Master 300 nodes for 1 year	▶ One license per stack
AT-FL-GEN2-AM300-5YR	AMF Master license	▶ AMF Master 300 nodes for 5 years	▶ One license per stack
AT-FL-GEN2-AC10-1YR ²	AMF Controller 10	▶ AMF Controller for 10 areas for 1 year	▶ One license per stack
AT-FL-GEN2-AC10-5YR ²	AMF Controller 10	▶ AMF Controller for 10 areas for 5 years	▶ One license per stack
AT-FL-GEN2-AC30-1YR ²	AMF Controller 30	▶ AMF Controller for 30 areas for 1 year	▶ One license per stack
AT-FL-GEN2-AC30-5YR ²	AMF Controller 30	▶ AMF Controller for 30 areas for 5 years	▶ One license per stack
AT-FL-GEN2-AC60-1YR ²	AMF Controller 60	▶ AMF Controller for 60 areas for 1 year	▶ One license per stack
AT-FL-GEN2-AC60-5YR ²	AMF Controller 60	▶ AMF Controller for 60 areas for 5 years	▶ One license per stack

¹ 64 OSPF and BGP routes included in base license
² Only a single license is required per chassis. This is automatically synchronized to the second control card

NETWORK SMARTER

SwitchBlade x908 GEN2 | 7

SwitchBlade x908 GEN2 | High Capacity Stackable Layer 3+ Modular Switch

Ordering Information

AT-SBx908 GEN2

High capacity Layer 3+ modular switch chassis with 8 x high speed expansion bays, fans included

AT-SBxPWRSYS2-xx³

Hot-swappable load-sharing power supply⁴

AT-SBxPWRSYS1-80

1200W DC system power supply

AT-FAN08

Spare hot-swappable fan module

AT-XEM2-12XS

12 x 1G/10G SFP+ ports

AT-XEM2-12XT

12 x 1G/10G RJ45 ports

AT-XEM2-4QS

4 x 40G QSFP+ ports

AT-XEM2-1CQ⁵

1 x 100G QSFP28 port

³Where xx = 10 for AC power supply with US power cord
20 for AC power supply with no power cord
30 for AC power supply with UK power cord
40 for AC power supply with AU power cord
50 for AC power supply with EU power cord

⁴Note that fans are included but NO power supplies ship with the base chassis, they must be ordered separately.

⁵Available 2018

⁶Using Cat 6a/7 cabling

Accessories

SFP Modules

AT-SPSX

1000SX GbE multi-mode 850 nm fiber up to 550 m

AT-SPSX/I

1000SX GbE multi-mode 850 nm fiber up to 550 m industrial temperature

AT-SPEX

1000X GbE multi-mode 1310nm fiber up to 2 km

AT-SPLX10

1000LX GbE single-mode 1310 nm fiber up to 10 km

AT-SPLX10/I

1000LX GbE single-mode 1310 nm fiber up to 10 km industrial temperature

AT-SPBD10-13

1000LX GbE Bi-Di (1310 nm Tx, 1490 nm Rx) fiber up to 10 km

AT-SPBD10-14

1000LX GbE Bi-Di (1490 nm Tx, 1310 nm Rx) fiber up to 10 km

AT-SPLX40

1000LX GbE single-mode 1310 nm fiber up to 40 km

AT-SPZX80

1000ZX GbE single-mode 1550 nm fiber up to 80 km

10GbE SFP+ Modules

AT-SP10SR

10GSR 850 nm short-haul, 300 m with MMF

AT-SP10SR/I

10GSR 850 nm short-haul, 300 m with MMF industrial temperature

AT-SP10LRM

10GLRM 1310 nm short-haul, 220 m with MMF

AT-SP10LR

10GLR 1310 nm medium-haul, 10 km with SMF

AT-SP10LR/I

10GLR 1310 nm medium-haul, 10 km with SMF industrial temperature

AT-SP10LR20/I

10GER 1310nm long-haul, 20 km with SMF industrial temperature

AT-SP10ER40/I

10GER 1310nm long-haul, 40 km with SMF industrial temperature

AT-SP10ZR80/I

10GER 1550nm long-haul, 80 km with SMF industrial temperature

AT-SP10T

10GBase-T 20 m copper⁶

10GbE SFP+ Cables

AT-SP10TW1

1 meter SFP+ direct attach cable

AT-SP10TW3

3 meter SFP+ direct attach cable

AT-SP10TW7

7 meter SFP+ direct attach cable

40G QSFP+ Modules

AT-QSFP1CU

1 meter QSFP+ direct attach stacking cable

AT-QSFP3CU

3 meter QSFP+ direct attach stacking cable

AT-QSFPLR4

40GLR4 1310 nm medium-haul, 10 km with SMF

AT-QSFPSR

40GSR 850nm short-haul up to 150 m with MMF

AT-MTP12-1

1 meter MTP optical cable for AT-QSFPSR

AT-MTP12-5

5 meter MTP optical cable for AT-QSFPSR



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