Allied Telesis

SwitchBlade® x8100 Series

NEXT GENERATION INTELLIGENT LAYER 3+ CHASSIS SWITCHES

The Allied Telesis SwitchBlade x8100 Series of advanced Layer 3+ chassis switches are available in 6 and 12 slot models. Designed to deliver high availability, wirespeed performance, and a high port count, their advanced features make them the ideal solution for the modern enterprise network where resiliency, reliability and high performance are the key requirements.

SwitchBlade x8100 Series switches provide a high performing scalable solution, with an extensive range of connectivity options. Dual control cards provide resiliency. Gigabit and 10 Gigabit line card options ensure a system capable of meeting the requirements of today's networks, and the flexibility to expand when required.

High performing

SwitchBlade x8100 Series switches feature 80Gbps non-blocking throughput to each line card slot, providing maximum performance and wirespeed delivery of critical IPv4 and IPv6 traffic.

Maximum availability of premium services and applications is effortless, with industry-leading Quality of Service (QoS) features managing network responsiveness.

Powerful network management

Meeting the increased management requirements of modern converged networks, Allied Telesis Management Framework (AMF) automates many everyday tasks including configuration management. AMF has powerful centralized management features that allow you to manage your complete network as a single virtual device. You can easily grow the network with plug-and-play simplicity, and network node recovery is fully zero-touch.

Resilient

The SwitchBlade x8100 Series switches operate with one AC or DC system PSU. Installing a second load-sharing PSU provides ultimate redundancy. You can also install two Power over Ethernet (PoE)

PSUs, to maximize power available to connected devices.

Dual redundant control cards interconnect through redundant paths to the line cards over a passive backplane. Control cards, line cards, power supplies and fan tray are all hot-swappable, to minimize downtime when performing maintenance or upgrading the system.

To provide a high-speed solution where recovery occurs within as little as 50ms, SwitchBlade x8100 Series switches can be deployed in a ring-based topology, with the protected ring running at up to 10Gbps. This high performing resilient design for distributed networks is made possible with Allied Telesis EPSRing™ (Ethernet Protection Switched Ring) technology.

Scalable

The choice between either the x8112 12-slot chassis, or the x8106 6-slot chassis, provides a powerful solution for any size network. While you can alter port density to suit, both SwitchBlade x8100 Series switches share the same fully featured AlliedWare Plus™ Operating System.

There are currently three 24-port Gigabit line cards available: copper, PoE+ and fiber (SFP). The 6-port 10 Gigabit (SFP+) line card provides the SwitchBlade x8100 Series with high-speed backbone connectivity.

The new 40-port Gigabit copper line card maximizes port density, providing up to 400 Gigabit copper ports in a single 7RU

SwitchBlade x8112 chassis, or 200 Gigabit copper ports in a single 4RU SwitchBlade x8106 chassis[†].

Power over Ethernet Plus (PoE+)

SwitchBlade x8100 Series switches support IEEE 802.3at PoE+ (30W) to enable you to future-proof your network. The greater power supplied by PoE+ supports applications such as pan, tilt and zoom IP surveillance cameras, IP video phones, point-of-sale units, and wireless access points.

Environmentally friendly

In keeping with our commitment to environmentally friendly processes and products, the SwitchBlade x8100 Series are designed to reduce power consumption and minimize hazardous waste. Features include the use of high efficiency power supplies and low power chip sets. The switches also feature an ECO-Switch button on the front panel, which allows additional power conservation by turning off all diagnostic LED indicators when they are not required.

[†]200 ports in a SwitchBlade x8106 available with AlliedWare Plus 5.4.4

New Features

- » Allied Telesis Management Framework (AMF)
- » AMF master license for SwitchBlade x8100 Series
- » SBx81GT40 line card
- » SwitchBlade x8106 6 slot chassis
- » BGP4+ for IPv6

the **solution** : the **network**

Key Features

Allied Telesis Management Framework (AMF)

» Allied Telesis Management Framework (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 you can achieve the every-day running of a network 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 SwitchBlade x8100 Series switches 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.

EPSRing™ (Ethernet Protection Switched Ring)

» EPSRing and 10 Gigabit Ethernet allow several switches to form a high-speed protected ring capable of recovery within as little as 50ms. This feature is perfect for high performance and high availability 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.

Access Control Lists (ACLs)

» AlliedWare Plus™ delivers industry-standard access control functionality through ACLs. ACLs filter network traffic to control whether routed packets are forwarded or blocked at the port interface. This provides a powerful network security mechanism to select the types of traffic to be analyzed, forwarded, or influenced in some way.

Industry-leading Quality of Service (QoS)

» Comprehensive low-latency wirespeed 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 such as voice and video take precedence over non-essential services such as file downloads, maintaining responsiveness of enterprise applications.

Power over Ethernet Plus (PoE+)

» With PoE, a separate power connection to media end points such as IP phones and wireless access points is not necessary. PoE+ provides even greater flexibility, providing the capability to connect devices requiring more power (up to 30 Watts)—for example, tilt and zoom security cameras.

Ease of Management

» The AlliedWare Plus operating system incorporates an industry standard CLI, facilitating intuitive manage-ability.

» Configuration tasks can be automated, as commands may be used in scripts. Triggers can also be utilized, providing a powerful mechanism for automatic and timed management by automating the execution of commands in response to specific events.

» With three distinct modes, the CLI is very secure, and the use of encrypted remote login sessions ensures CLI access is not compromised.

AlliedWare Plus Licensing Unlocks New Features

» With AlliedWare Plus, a single license password is all that is necessary to unlock additional feature bundles that ship with the switch. The feature bundles provide a very simple upgrade path.

Dynamic Host Configuration Protocol (DHCPv6)

» DHCPv6 is used to dynamically assign IPv6 addresses to hosts from a central location. Acting as DHCPv6 client enables the switch to receive an IPv6 address, and acting as server enables the switch to dynamically allocate IPv6 addresses to hosts. The DHCPv6 server and client both support the Prefix Delegation feature which allocates a whole IPv6 subnet to a DHCP client. The client, in turn, can allocate addresses from this subnet to the hosts that are connected to it.

Virtual Router Redundancy Protocol (VRRPv3)

» VRRPv3 is a protocol for providing device redundancy, by connecting redundant WAN gateway routers or server access switches in an IPv6 network. It allows

a backup router or switch to automatically take over if the primary (master) router or switch fails.

sFlow

» sFlow is an industry standard technology for monitoring high-speed switched networks. It gives complete visibility into network use, enabling perfor-mance 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.

Network Access Control (NAC)

» NAC allows for unprecedented control over user access to the network in order to mitigate threats to network infrastructure. Allied Telesis SwitchBlade x8100 Series switches use IEEE 802.1x port-based authentication in partnership with standards-compliant dynamic VLAN assignment, to assess a user's adherence to network security policies and either grant access or offer remediation.

» If multiple users share a port, then multi-authentica-tion can be used. Different users on the same port can be assigned into different VLANs, and so given different levels of network access. Additionally, a Guest VLAN can be configured to provide a catch-all for users who aren't authenticated.

Tri-authentication

» Authentication options on the SwitchBlade x8100 Series also include alternatives to IEEE 802.1x port-based authentication, such as Web authentication to enable guest access, and MAC authentication for end points that do not have an IEEE 802.1x supplicant. All three authentication methods—IEEE 802.1x, MAC-based and Web-based—can be enabled simultaneously on the same port. This is called tri-authentication.

Link Aggregation

» Link aggregation allows a number of individual switch ports to be combined, forming a single logical connection of higher bandwidth. This provides a higher performance link, and also provides redun-dancy creating a more reliable and robust network. The SwitchBlade x8100 Series allow link aggregation groups to be created across line cards to maximize link resiliency.
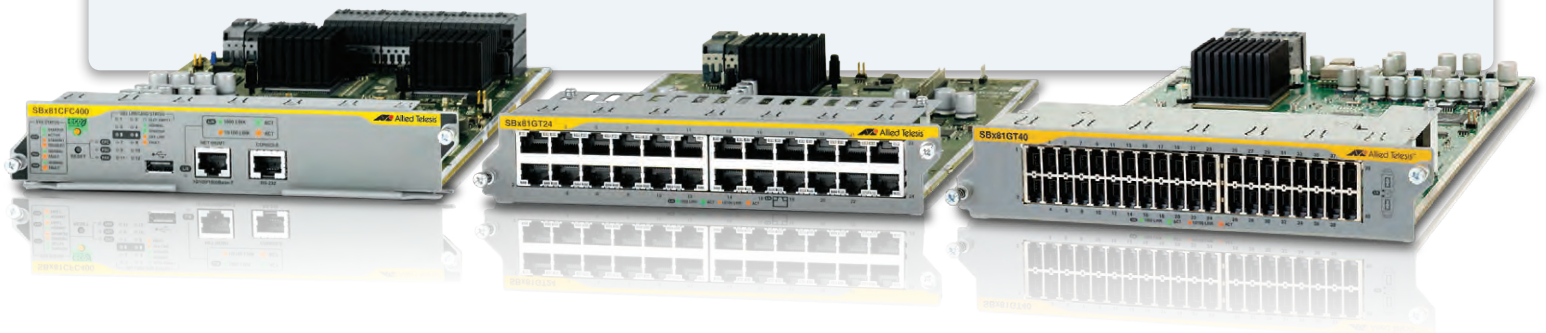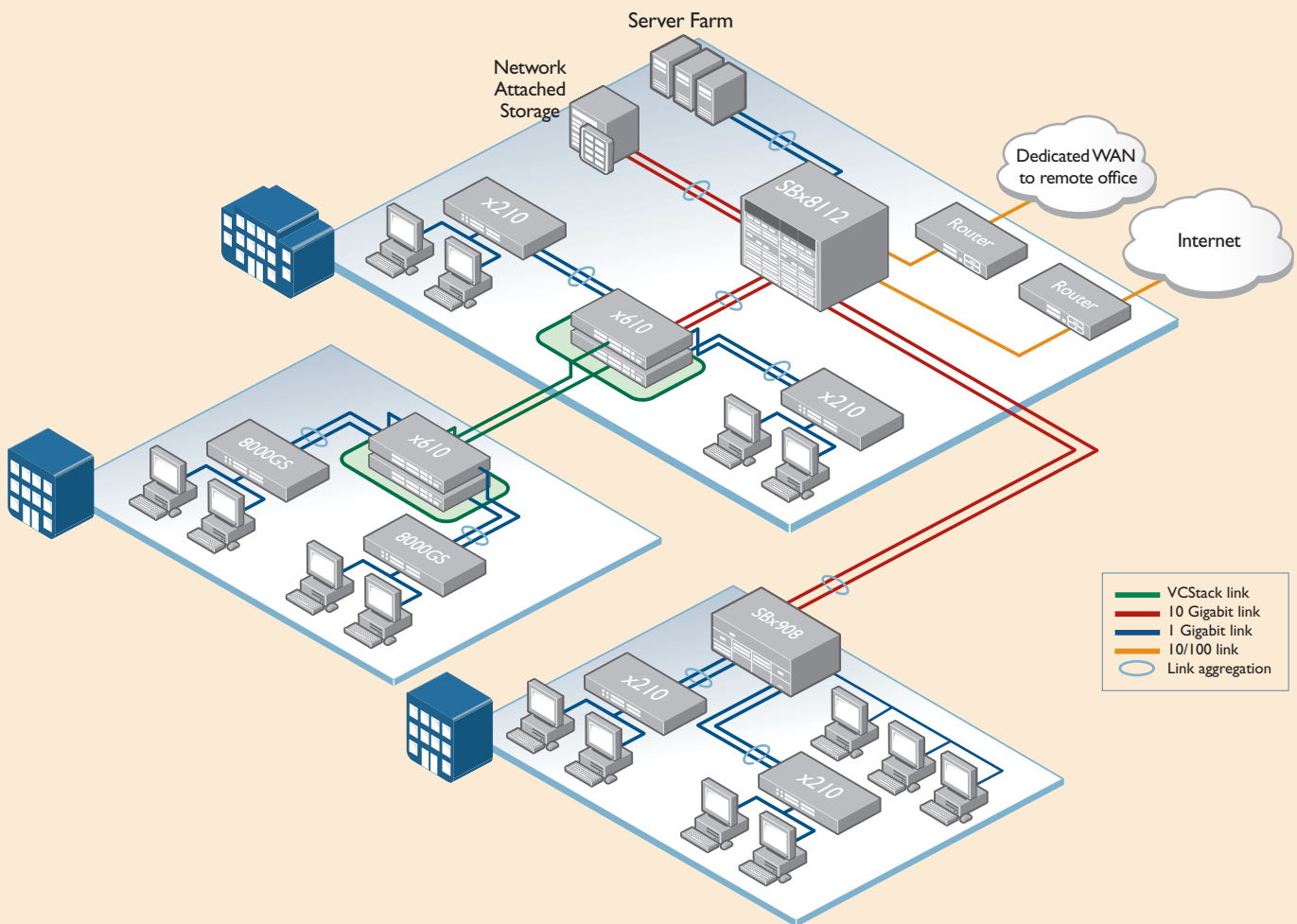
Key Solutions

Network core resiliency

The convergence of network services in the enterprise has led to increasing demand for high performing networks with minimal downtime. In this solution, a SwitchBlade x8112 provides a powerful network core solution with extremely high reliability. PSU redundancy ensures maximum uptime, while hot-swappable PSUs, fan tray, control and line cards allow for system maintenance or re-configuration with no network interruption.

Real-time applications like VoIP and streaming video are assured premium service on the network, as near hitless failover between the dual control cards on the SwitchBlade x8112 means there is no perceptible disruption in the case of a problem.

Link aggregation across line-cards to servers, network storage, and distribution switches leaves no single point of failure in this high performing network core.

Server Farm

Network Attached Storage

Dedicated WAN to remote office

Internet

SBx8112

Router

Router

x210

x610

x610

8000GS

8000GS

x210

SBx908

x210

x210

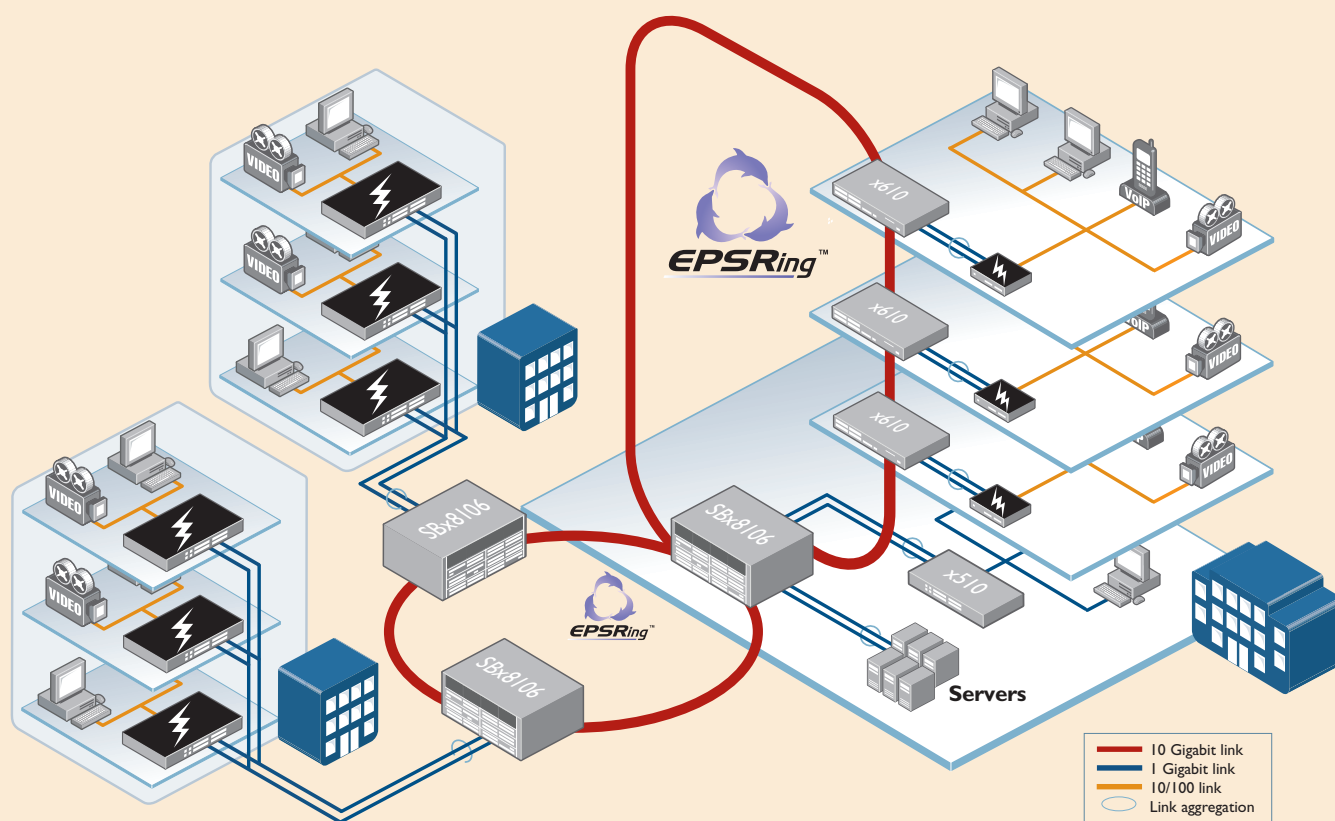|	
——	VCStack link
——	10 Gigabit link
——	1 Gigabit link
——	10/100 link
◯	Link aggregation

Key Solutions

Distributed network with EPSR

Where a distributed network design is required, Allied Telesis EPSRing (Ethernet Protection Switched Ring) with the SwitchBlade x8106 is ideal, providing high-speed 10GbE connectivity. Failover in a little as 50ms prevents a node or link failure from affecting customer experience, even with demanding applications such as IP telephony and video monitoring.

This is an ideal solution for ensuring continual access to online resources and applications in a multi-building campus. Now that technology has made high-availability and high-bandwidth so accessible, corporate business, education providers and other enterprise network users can enjoy the many benefits that EPSRing provides. This advanced self-healing network technology meets the constant demand for information.

▬▬	10 Gigabit link
▬▬	1 Gigabit link
▬▬	10/100 link
◯	Link aggregation

SwitchBlade x8100 Series | Next Generation Intelligent Layer 3+ Chassis Switches

Product Specifications

AT-SBx81CFC400 (Controller Fabric Card)
» 512MB SDRAM
» 512KB NVRAM
» 128MB flash memory
» Up to 32K MAC addresses*
» Up to 16K IP routes maximum*
» 24Mbit packet buffer memory
» Supports 10KB jumbo packets
» 4K VLANs

AT-SBx81GP24 (24 x 10/100/1000T PoE+ line card)
» 12Mbit packet buffer memory

AT-SBx81GT24 (24 x 10/100/1000T line card)
» 12Mbit packet buffer memory

AT-SBx81GT40 (40 x 10/100/1000T RJ.5 line card)
» 32Mbit packet buffer memory

AT-SBx81GS24a (24 x 100/1000 SFP line card)
» 24Mbit packet buffer memory

AT-SBx81XS6 (6 x 10Gbps SFP+ line card)
» 24Mbit packet buffer memory

Performance
» Non-blocking for all packet sizes, with 2 CFCs installed
» Wirespeed multicasting
» Forwarding rate: SBx8112 = 595Mpps
　　　　　　　　 SBx8106 = 238Mpps
» Switch fabric:　SBx8112 = 800Gbps
　　　　　　　　 SBx8106 = 320Gbps

Reliability
» Modular AlliedWare Plus operating system
» Redundant controller fabric cards
» Redundant 1200W AC or DC system power supplies
» Load-sharing 1200W PoE+ power supplies
» Full environmental monitoring of PSUs, fans, temperature and internal voltages. SNMP traps alert network managers in case of failure

Expandability
» High-speed line slots support any mix of hot-swappable cards for port flexibility and application versatility
» Premium license option for additional features
» AMF Master license option

Flexibility and compatibility
» Gigabit SFP ports will support any combination of 1000T, 100FX, 100BX, 1000SX, 1000LX, 1000ZX or 1000ZX CWDM SFPs
» 10G SFP+ ports will support any combination of 10GSR, 10GLR or 10GER SFP+ modules and SFP+ direct attach cables

Diagnostic Tools
» Optical Digital Diagnostic Monitoring (DDM)

» Ping polling for IPv4 and IPv6
» Port mirroring
» TraceRoute for IPv4 and IPv6

IPv4 Features
» Black hole routing
» Directed broadcast forwarding
» DNS relay
» Equal Cost Multi Path (ECMP) routing
» Route maps
» Route redistribution (OSPF, BGP, RIP)
» UDP broadcast helper (IP helper)

IPv6 Features
» DHCPv6 relay
» DNSv6
» Device management over IPv6 networks with SNMPv6, Telnetv6 and SSHv6
» NTPv6

Management
» Allied Telesis Management Framework (AMF) enables powerful centralized management and zero-touch device installation and recovery
» 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
» USB interface allows software release files, configurations and other files to be stored for backup and distribution to other devices

Quality of Service
» 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
» Policy-based QoS based on VLAN, Port, MAC and general packet classifiers
» Policy-based storm protection
» Taildrop for queue congestion control
» Strict priority, weighted round robin or mixed scheduling

Resiliency Features
» Control Plane Prioritization (CPP) ensures the CPU always has sufficient bandwidth to process network control traffic
» Dynamic link failover (host attach)
» EPSRing (Ethernet Protection Switched Rings) with SuperLoop Protection (SLP)

» EPSR enhanced recovery for extra resiliency
» Loop protection: loop detection and thrash limiting
» PVST+ compatibility mode
» STP root guard

Security Features
» Access Control Lists (ACLs)
» Configurable auth-fail and guest VLANs
» Authentication, Authorisation and Accounting (AAA)
» BPDU protection
» DHCP snooping, IP source guard and Dynamic ARP Inspection (DAI)
» 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)
» Strong password security and encryption
» Tri-authentication: MAC-based, web-based and IEEE 802.1x

Environmental Specifications
» Operating temperature range:
　0°C to 40°C (32°F to 104°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:
　3,048 meters maximum (10,000 ft)

Electrical Approvals and Compliances
» EMC: EN55022 class A, FCC class A, VCCI class A
» Immunity: EN55024, EN61000-3-levels 2 (Harmonics), and 3 (Flicker) – AC models only

Safety
» Standards: UL60950-1, CAN/CSA-C22.2 No. 60950-1-03, EN60950-1, EN60825-1, AS/NZS 60950.1
» Certification: UL, cUL, TUV

Restrictions on Hazardous Substances (RoHS) Compliance
» EU RoHS compliant
» China RoHS compilant

Country of Origin
» Singapore

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* Depending on selected configuration

SwitchBlade x8100 Series | Next Generation Intelligent Layer 3+ Chassis Switches

Standards and Protocols

AlliedWare Plus Operating System
Version 5.4.3 - 3.7

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 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

Encryption
FIPS 180-1   Secure Hash standard (SHA-1)
FIPS 186   Digital signature standard (RSA)
FIPS 46-3   Data Encryption Standard (DES and 3DES)

Ethernet
IEEE 802.1AX Link aggregation (static and LACP)
IEEE 802.2   Logical Link Control (LLC)
IEEE 802.3   Ethernet
IEEE 802.3ab 1000BASE-T
IEEE 802.3ad Static and dynamic link aggregation
IEEE 802.3ae 10 Gigabit Ethernet
IEEE 802.3af Power over Ethernet (PoE)
IEEE 802.3at Power over Ethernet plus (PoE+)
IEEE 802.3az Energy Efficient Ethernet (EEE)
IEEE 802.3u 100BASE-X
IEEE 802.3x Flow control - full-duplex operation
IEEE 802.3z 1000BASE-X

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

RFC 1918   IP addressing
RFC 2581   TCP congestion control

IPv6 Features
RFC 1981   Path MTU discovery for IPv6
RFC 2460   IPv6 specification
RFC 2464   Transmission of IPv6 packets over Ethernet networks
RFC 3056   Connection of IPv6 domains via IPv4 clouds
RFC 3484   Default address selection for IPv6
RFC 3596   DNS extensions to support IPv6
RFC 4007   IPv6 scoped address architecture
RFC 4193   Unique local IPv6 unicast addresses
RFC 4291   IPv6 addressing architecture
RFC 4443   Internet Control Message Protocol (ICMPv6)
RFC 4861   Neighbor discovery for IPv6
RFC 4862   IPv6 Stateless Address Auto-Configuration (SLAAC)
RFC 5014   IPv6 socket API for source address selection
RFC 5095   Deprecation of type 0 routing headers in IPv6
RFC 5175   IPv6 Router Advertisement (RA) flags option
RFC 6105   IPv6 Router Advertisement (RA) guard

Management
AT Enterprise MIB
SNMPv1, v2c and v3
IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
RFC 1155   Structure and identification of management information for TCP/IP-based Internets
RFC 1157   Simple Network Management Protocol (SNMP)
RFC 1212   Concise MIB definitions
RFC 1213   MIB for network management of TCP/IP-based Internets: MIB-II
RFC 1215   Convention for defining traps for use with the SNMP
RFC 1227   SNMP MUX protocol and MIB
RFC 1239   Standard MIB
RFC 1724   RIPv2 MIB extension
RFC 2011   SNMPv2 MIB for IP using SMIv2
RFC 2012   SNMPv2 MIB for TCP using SMIv2
RFC 2013   SNMPv2 MIB for UDP using SMIv2
RFC 2096   IP forwarding table MIB
RFC 2578   Structure of Management Information v2 (SMIv2)
RFC 2579   Textual conventions for SMIv2
RFC 2580   Conformance statements for SMIv2
RFC 2674   Definitions of managed objects for bridges with traffic classes, multicast filtering and VLAN extensions
RFC 2741   Agent extensibility (AgentX) protocol
RFC 2787   Definitions of managed objects for VRRP
RFC 2819   RMON MIB (groups 1,2,3 and 9)
RFC 2863   Interfaces group MIB
RFC 3164   Syslog protocol
RFC 3176   sFlow: a method for monitoring traffic in switched and routed networks
RFC 3411   An architecture for describing SNMP management frameworks
RFC 3412   Message processing and dispatching for the SNMP
RFC 3413   SNMP applications
RFC 3414   User-based Security Model (USM) for SNMPv3
RFC 3415   View-based Access Control Model (VACM) for SNMP
RFC 3416   Version 2 of the protocol operations for the SNMP
RFC 3417   Transport mappings for the SNMP
RFC 3418   MIB for SNMP
RFC 3621   Power over Ethernet (PoE) MIB
RFC 3635   Definitions of managed objects for the Ethernet-like interface types
RFC 3636   IEEE 802.3 MAU MIB
RFC 4188   Definitions of managed objects for bridges
RFC 4318   Definitions of managed objects for bridges with RSTP

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
IGMP/MLD multicast forwarding (IGMP/MLD proxy)
MLD snooping (v1 and v2)
PIM 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 3376   IGMPv3
RFC 3810   Multicast Listener Discovery v2 (MLDv2) for IPv6
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)

Open Shortest Path First (OSPF)
OSPF link-local signaling
OSPF MD5 authentication
OSPF restart signaling
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

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 3246   DiffServ Expedited Forwarding (EF)

Resiliency Features
IEEE 802.1D MAC bridges
IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
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

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RFC 2246	TLS protocol v1.0	
RFC 2865	RADIUS	
RFC 2866	RADIUS accounting	
RFC 2868	RADIUS attributes for tunnel protocol support	
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	

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 2554	SMTP service extension for authentication
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

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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

Physical Specifications

Product	Dimensions (WxDxH)	Weight (kg/lbs)
AT-SBx8112 chassis	48.0 x 38.8 x 31.0 cm	17.8 kg (39.1 lb)
AT-SBx8106 chassis	48.0 x 38.8 x 17.6 cm	14.4 kg (31.8 lb)
AT-SBx81CFC400 controller fabric card	20.7 x 31.3 x 4.1 cm	1.1 kg (2.4 lb)
AT-SBx81GP24 PoE+ line card	20.7 x 31.3 x 4.1 cm	1.1 kg (2.3 lb)
AT-SBx81GT24 line card	20.7 x 31.3 x 4.1 cm	1.1 kg (2.3 lb)
AT-SBx81GT40 RJ point five line card	20.7 x 31.3 x 4.1 cm	1.1 kg (2.3 lb)
AT-SBx81GS24a SFP line card	20.7 x 31.3 x 4.1 cm	1.1 kg (2.3 lb)
AT-SBx81XS6 SFP+ line card	20.7 x 31.3 x 4.1 cm	0.8 kg (1.8 lb)
AT-SBxPWRSYS1 AC sys power supply	10.2 x 32.2 x 4.3 cm	2.8 kg (6.1 lb)
AT-SBxPWRSYS1-80 DC sys power supply	10.2 x 32.2 x 4.3 cm	2.8 kg (6.1 lb)
AT-SBxPWRPOE1 PoE power supply	10.2 x 32.2 x 4.3 cm	2.7 kg (6.0 lb)
AT-SBxFAN12 fan tray	2.7 x 33.4 x 26.0 cm	1.8 kg (4.0 lb)
AT-SBxFAN06 fan tray	2.6 x 29.8 x 10.3 cm	0.86 kg (1.9 lb)
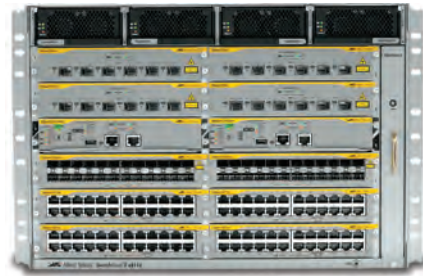
PoE Power Provisioning

Maximum number of ports that can be powered (with 2 x AT-SBxPWRPOE1 installed)

	PoE Power	Class 3 (15.4W)	Class 4 (30W)
PSUs in redundant mode	1200W	77	40
PSUs in boost mode	2400W	155	80

Power Consumption

	Maximum	Heat dissipation
AT-SBx81CFC400	48.3W	164.8 BTU/hr
AT-SBx81GP24	34.4W	117.4 BTU/hr
AT-SBx81GT24	34.4W	117.4 BTU/hr
AT-SBx81GT40	53.9W	183.7 BTU/hr
AT-SBx81GS24a	56.3W	192.1 BTU/hr
AT-SBx81XS6	48.3W	164.8 BTU/hr

Power Efficiency

Maximum power supply efficiency (based on 100V input voltage)

AT-SBxPWRSYS1	78.4% (100% load) 81.8% (50% load)
AT-SBxPWRPOE1	81.3% (100% load) 83.6% (50% load)

Latency

Measured in microseconds (μs) at 64byte framesize

	10Mbit	100Mbit	1000Mbit
AT-SBx81GP24	36.0 μs	5.6 μs	2.6 μs
AT-SBx81GT24	36.0 μs	5.6 μs	2.6 μs
AT-SBx81GT40	165.0 μs	20.0 μs	6.0 μs
AT-SBx81GS24a	38.5 μs	7.0 μs	2.8 μs
AT-SBx81XS6	3.1 μs (10Gbit)		

Power Characteristics

Voltage: 100-240V AC (10% auto-ranging)
Frequency: 50/60 Hz
Maximum current: 16A @ 100V

Ordering Information

AT-SBx8112-96POE+
96-port PoE+ starter bundle
1 x AT-SBx8112 chassis
1 x AT-SBx81CFC400 controller fabric card
4 x AT-SBx81GP24 PoE+ line card
1 x AT-SBxPWRSYS1 system power supply
1 x AT-SBxPWRPOE1 PoE power supply

AT-SBx8112-12XR
12-port 10G resiliency starter bundle
1 x AT-SBx8112 chassis
2 x AT-SBx81CFC400 controller fabric card
2 x AT-SBx81XS6 SFP+ Ethernet line card
2 x AT-SBxPWRSYS1 system power supply

AT-SBx8112
Rack mount 12-slot chassis with fan tray

AT-SBx8106
Rack mount 6-slot chassis with fan tray

AT-SBxFAN12
Contains four fans, temperature sensors and
controller board

AT-SBxFAN06
Contains two fans, temperature sensors and
controller board

AT-SBx81CFC400
400Gbps Controller fabric card

AT-SBx81GP24
24-port 10/100/1000T PoE+ Ethernet line card

AT-SBx81GT24
24-port 10/100/1000T Ethernet line card

AT-SBx81GT40
40-port 10/100/1000T RJ.5 Ethernet line card

AT-SBx81GS24a
24-port 100/1000X SFP Ethernet line card

AT-SBx81XS6
6-port 10GbE SFP+ Ethernet line card

AT-SBxPWRSYS1-xx
1200W AC system power supply

AT-SBxPWRSYS1-80
1200W DC system power supply

AT-SBxPWRPOE1-xx
1200W AC PoE power supply

10GbE SFP+ Modules

AT-SP10SR
10GSR 850 nm short-haul, 300 m with MMF

AT-SP10LR
10GLR 1310 nm medium-haul, 10 km with SMF

AT-SP10ER40/I
10GER 1550 nm long-haul, 40 km with SMF

10GbE 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

SFP Modules

AT-SPFX/2
100FX multi-mode 1310 nm fiber up to 2 km

AT-SPFX/I5
100FX single-mode 1310 nm fiber up to 15 km

AT-SPFXBD-LC-13
100BX Bi-Di (1310 nm Tx, 1550 nm Rx) fiber up to
10 km

AT-SPFXBD-LC-I5
100BX Bi-Di (1550 nm Tx, 1310nm Rx) fiber up to
10 km

AT-SPTX
1000T 100 m copper
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

Where xx =
10 for US power cord
20 for no power cord
30 for UK power cord
40 for Australian power cord
50 for European power cord

Power cords are only shipped with AT-SBxPWRSYS1 or
AT-SBxPWRPOE1 power supplies.
Note: Power entry connector is IEC 60320 C19 (High capacity)

AT-SPEX
1000X GbE multi-mode 1310 nm 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

RJ.5 to RJ45 Cables
For use with SBx81GT40

AT-UTP/RJ.5-100-A-008
RJ.5 to RJ45 1m Ethernet cables (pack of 8)

AT-UTP/RJ.5-300-A-008
RJ.5 to RJ45 3m Ethernet cables (pack of 8)

Feature Licenses

NAME	DESCRIPTION	INCLUDES
AT-FL-SBx81-01†	AT-SBx8100 Premium License	» OSPF* » BGP4 » PIMv4-SM, DM, SSM » EPSR Master » VLAN double tagging (Q-in-Q) » RIPng » OSPFv3 » BGP4+ for IPv6 » MLDv1 & v2 » PIMv6-SM » RADIUS-Full
AT-FL-CF4-AM40†	AMF Master License for up to 40 nodes	» AMF Master role

* 64 OSPF routes included in base license
† Only a single license is required per chassis. This is
   automatically synchronized to the second control card

Allied Telesis

the **solution** : the **network**

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