SwitchBlade® x8100 Series

WITH CFC400 CONTROLLER

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. The CFC400 based system delivers high availability, wirespeed performance, and a high port count. Advanced features provide 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 CFC400 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

Dual CFC400 control cards provide 80Gbps non-blocking throughput to each line card slot, providing maximum performance and wirespeed delivery of critical IPv4 and IPv6 traffic.

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

Powerful network management

The Allied Telesis Management Framework (AMF) meets the increased management requirements of modern converged networks, automating many everyday tasks including configuration management. AMF has powerful centralized management features that manage a complete network as a single virtual device. The network can be expanded with plug-and-play simplicity, and network node recovery is fully zero-touch.

Resilient

SwitchBlade x8100 Series switches operate with one AC or DC system PSU. Installing a second load-sharing PSU provides ultimate redundancy. Installing two Power over Ethernet (PoE) PSUs maximizes power available to connected devices.

The active/active 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 of 6 and 12-slot chassis versions provides a powerful solution for networks of all sizes, and both versions share the same fully featured AlliedWare Plus™ Operating System.

To expand the SwitchBlade x8100 system to encompass large networks, including stacking two chassis with VCStack Plus™, the CFC400 control cards can be replaced with CFC960 control cards.

There are currently three 24-port Gigabit line cards available: copper, PoE+ and fiber (SFP).

AMF™ EPSRing™

CFC400 AlliedWare Plus™ OPERATING SYSTEM

The 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.

The 6-port 10 Gigabit (SFP+) line card provides the SwitchBlade x8100 Series with high-speed backbone connectivity.

Power over Ethernet Plus (PoE+)

SwitchBlade x8100 Series switches support IEEE 802.3at PoE+ (30W) allowing 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, and wireless access points.

PoE plus™

Environmentally friendly

SwitchBlade x8100 Series switches are designed to reduce power consumption and minimize hazardous waste. Features include high efficiency power supplies and low power chip sets. An ECO-Switch button on the front panel allows additional power conservation, by turning off all diagnostic LED indicators when they are not required.

eco friendly

New features

- Allied Telesis Management Framework (AMF) enhancements for networks up to 80 nodes
- BGP4+ for IPv6

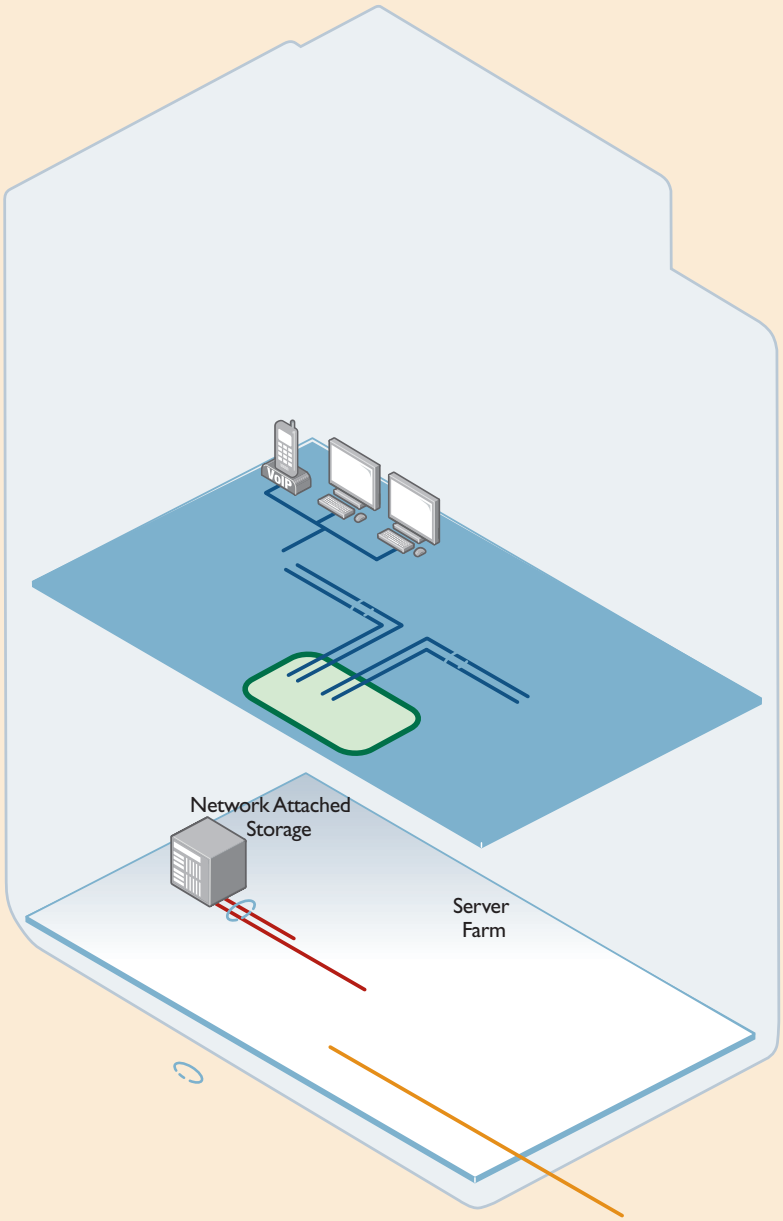
Key Solutions

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 with dual CFC400 control cards provides a powerful network core with extremely high reliability. PSU redundancy ensures maximum uptime, while hot-swappable PSUs, fan tray, control and line cards allow for system maintenance or reconfiguration with no network interruption.

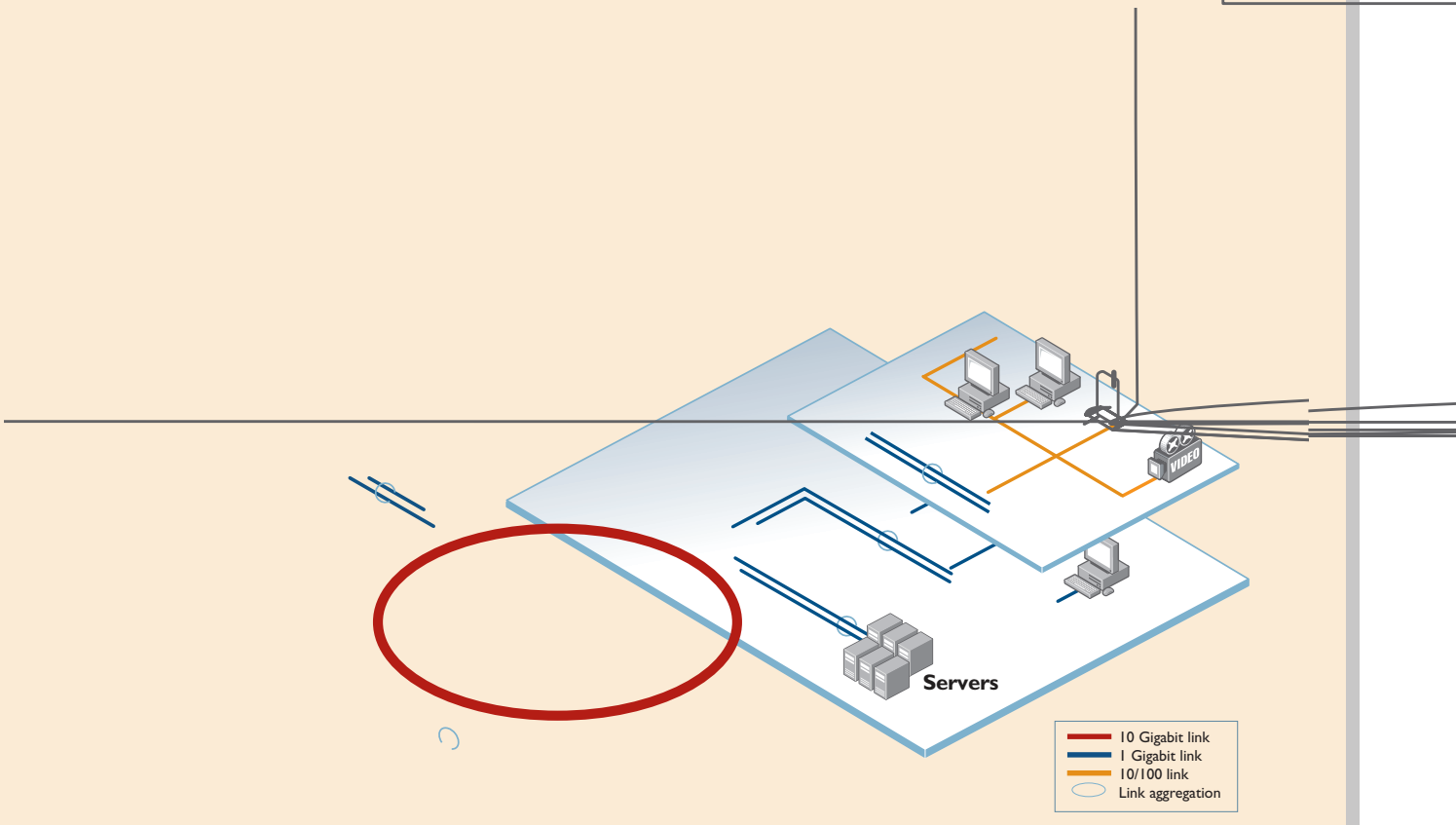
Real-time applications like VoIP and streaming video are assured premium service on the network, as near hitless failover between the dual control cards on the SwitchBlade x8112 means there is no perceptible disruption in the case of a problem.

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



Distributed network with EPSRing

Wherever a distributed network design is required, Allied Telesis Ethernet Protection Switched Ring (EPSRing) 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 when using demanding applications such as IP telephony and video monitoring.



Standards and Protocols

AlliedWare Plus Operating System
Version 5.4.4

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

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
AMF MIB and SNMP traps
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 (v1, v2 and v3)
IGMP snooping fast-leave
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)
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
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
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
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)

Power characteristics

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

Chassis switching fabric

	2 x CFC400
SBx8112	800Gbps
SBx8106	320Gbps

Control and Line Card switching capacity and forwarding rates

	Switching capacity	Forwarding rate
SBx81XS6	120Gbps	89Mpps
SBx81GT24	48Gbps	36Mpps
SBx81GP24	48Gbps	36Mpps
SBx81GS24a	48Gbps	36Mpps
SBx81GT40	80Gbps	60Mpps

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)		

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

AT-SP10ZR80/I
10GER 1550 nm long-haul, 80 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/15
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-15
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

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

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-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 point five to RJ-45 cables
For use with AT-SBx81GT40

AT-UTP/RJ point five-100-A-008
RJ point five to RJ-45 1 m Ethernet cables (pack of 8)

AT-UTP/RJ point five-300-A-008
RJ point five to RJ-45 3 m Ethernet cables (pack of 8)

Feature licenses

NAME	DESCRIPTION	INCLUDES
AT-FL-CFC400-01†	AT-SBx8100 Premium License	» OSPF* » BGP4 » PIMv4-SM, DM, SSM » VLAN double tagging (Q-in-Q) » RIPng » OSPFv3 » BGP4+ for IPv6 » MLDv1 & v2 » PIMv6-SM » RADIUS-Full
AT-FL-CF4-AM40†	AMF Master License up to 40 nodes	» AMF Master 40
AT-FL-CF4-AM80†	AMF Master License up to 80 nodes	» AMF Master 80
AT-FL-CF4-AMALL†	Allows all nodes to join AMF network	» AMF All Clients

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

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