SwitchBlade™ x3112

ACCESS EDGE CHASSIS SWITCH

The SwitchBlade x3112 is a 12 Slot Access Edge Chassis Switch primarily targeted for service provider fiber access networks, and equally at home at the enterprise network edge and the data center. The switch was designed to deliver high availability, maximum performance with wire speed non-blocking backplane performance, and high port count.

FTTx Service Provider Applications

The AT-SBx3112 is a versatile carrier-class FTTx platform for delivering Gigabit services to residential, Multi-Dwelling Unit (MDU) and business customers in the last mile. It features redundant power supplies, controllers and WAN ports to ensure reliability standards in carrier networks are met, along with powerful sub-50 millisecond failover protection using EPSR ring for link level protection. The AT-SBx3112 is available with either AC or DC power options.

As a FTTx platform, the AT-SBx3112 can support a maximum of 240 ports per chassis using 24-port 100/1000Mbps SFP-based line cards (AT-SBx31GS24). It can also support redundant 10G uplinks using 4-port XFP based line cards with EPSR (AT-SBx31XZ4). The x3112 can act as an aggregation hub for last mile FTTx applications using 10G line cards. It features 40 Gigabit non-blocking throughput to each slot, thus providing a maximum level of performance for FTTx services, both 1G and 10G. Coupled with ultra-fast 200G switch controllers, FTTx services can operate at wire speed connectivity.

An evolution of our tried and tested iMAP (integrated Multi-service Access Platform) carrier-grade platform, the AT-SBX3112 delivers true IP Triple Play services such as IPTV, VoIP. Tiered High Speed Internet Access (HSIA) and other cloud based services such as Over-the-Top Video, remote storage and backup, and cloud computing.

The raw performance combined with high availability of the AT-SBx3112 also allows it to be deployed as both end-of-row and aggregation in data center applications, and in campus applications as the ultimate in network edge connectivity.

High-Availability Architecture

The x3112 is designed to deliver 99.999% reliability, while offering high availability with sub-millisecond hitless failover for mission-critical applications where uptime is essential such as data centers, hospitality, government, and financial institutions.

Dual Redundant Management/Fabric Modules inter-connecting through redundant paths to the line cards over a passive backplane, and Dual Redundant Power Options, ensures maximum system up-time. Power is delivered via up to two System Power Supplies, and two Power-over-Ethernet Supplies to ensure continual operation.

Power over Ethernet Plus (PoE+)

The x3112 supports IEEE 802.3at PoE+ (30W) to enable customers to future-proof their network. PoE+ provides greater power for applications such as IP surveillance cameras supporting pan, tilt and zoom, IP videophones, RFID readers, point-of sale or wireless access points.

Secure Management

Only authorized administrators can access the management interface of the SwitchBlade x3112. Protocols such as SSH provide an encrypted interface for both local and remote connections, with out of band management achieved though a dedicated gigabit port if required.

Securing the Network Edge

To ensure the protection of the data, it is important to control access to the network. Protocols such as IEEE 802.1x authentication guarantee that only known users are connected to the network. Unknown users who physically connect can be isolated to a pre-determined part of the network, offering guests such benefits as Internet access while ensuring the integrity of private network data.

Secure Differentiation

QoS schemes for x3112 access solutions are designed to ensure that application performance and availability are not impacted with network growth. Features such as IEEE 802.1p/Q enable tiered data services for residential, business and enterprise users or prioritize real-time applications such as IP phones and IP cameras.

Environmentally Friendly ECO-Switch

In keeping with our commitment to environmentally friendly processes and products, the x3112 is 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 include an ECO-Switch button on the front panel allowing conservation of additional power by turning off all diagnostic LED indicators when they are not required.

Key Features

Performance
» Dual fabric cards enable load sharing, providing 800Gbps throughput.

Power over Ethernet
» Power over Ethernet Plus provides standards-based IEEE 802.at class 4 for up to 80 10/100/1000T ports or IEEE 802.3af at class 3 for up to 155 10/100/1000T ports.

Ethernet Protection Switching Rings (EPSR)
» EPSR is a protection scheme for Ethernet networks, specifically for ring-based network topologies. EPSR provides a sub 50 milliseconds switching time for an Ethernet-based ring network, to maintain Layer 2 redundancy in the network. EPSR assists the multicast streams in being redirected around a faulty link in a ring network fast enough to result in an uninterrupted multicast service.

Spanning Tree
» Supports STP, RSTP and MSTP.

Link Aggregation Group (LAG)
» The x3112 supports a maximum of 127 LAGs configured on the system at one time. A maximum of eight member ports per LAG is supported.

VLAN and Tagging
» Supports 4K active VLANs.

Upstream Forwarding Only (UFO) Mode
» A VLAN can be created where all data on the VLAN from downstream ports must be forwarded only to the upstream port.

HVLAN (Port- and VLAN-based, VLAN Double Tagging)
» To help overcome the VLAN addressing limitation, an additional or outer tag can be added on top of the 802.1Q tagged or untagged frame. The use of the additional tag creates a hierarchical VLAN (HVLAN).

IGMP Snooping
» IGMP snooping allows the product to conserve network bandwidth by limiting the layer 2 forwarding of IP multicast packets only to the LAN segments that have expressed interest in receiving packets addressed to a multicast group.

Quality of Service (QoS)
» Classifies traffic based on user-defined flows such as voice, data or video services. Supports eight priority queues.

Access Control Lists (ACLs)
» Access Control Lists enable inspection of incoming frames and classify them based on various criteria. Specific actions can then be applied to these frames in order to more effectively manage the network traffic at Layer 2 through Layer 4. Typically ACLs are used as a security mechanism, either permitting or denying entry (hence the name Access Control) for frames in a group, but can also be applied to QoS.

Egress Port Rate Limiting
» Supports egress rate limiting for customer- and network-facing ports.

RADIUS/TACACS+ Authentication
» TACACS+ and RADIUS authentication operates by using an external server as a means to authenticate logins to the system.

802.1x Port Authentication
» 802.1x provides port-based network access control for restricting access to networks based on authentication information.

Secure Shell (SSHv2)
» Provides secure remote logins into the command-line interface (CLI).

Address Resolution Protocol (ARP) Filtering
» ARP filtering provides the ability to "authenticate" ARP messages to ensure that unauthorized ARP spoofing is not permitted.

Simple Network Management Protocol (SNMP)
» Supports SNMPv1 and SNMPv2c.

Link Layer Discovery Protocol (LLDP)
» LLDP is an application protocol that runs directly over Layer 2 in network elements to facilitate a centrally located network manager to derive the physical network topology the network elements are part of.
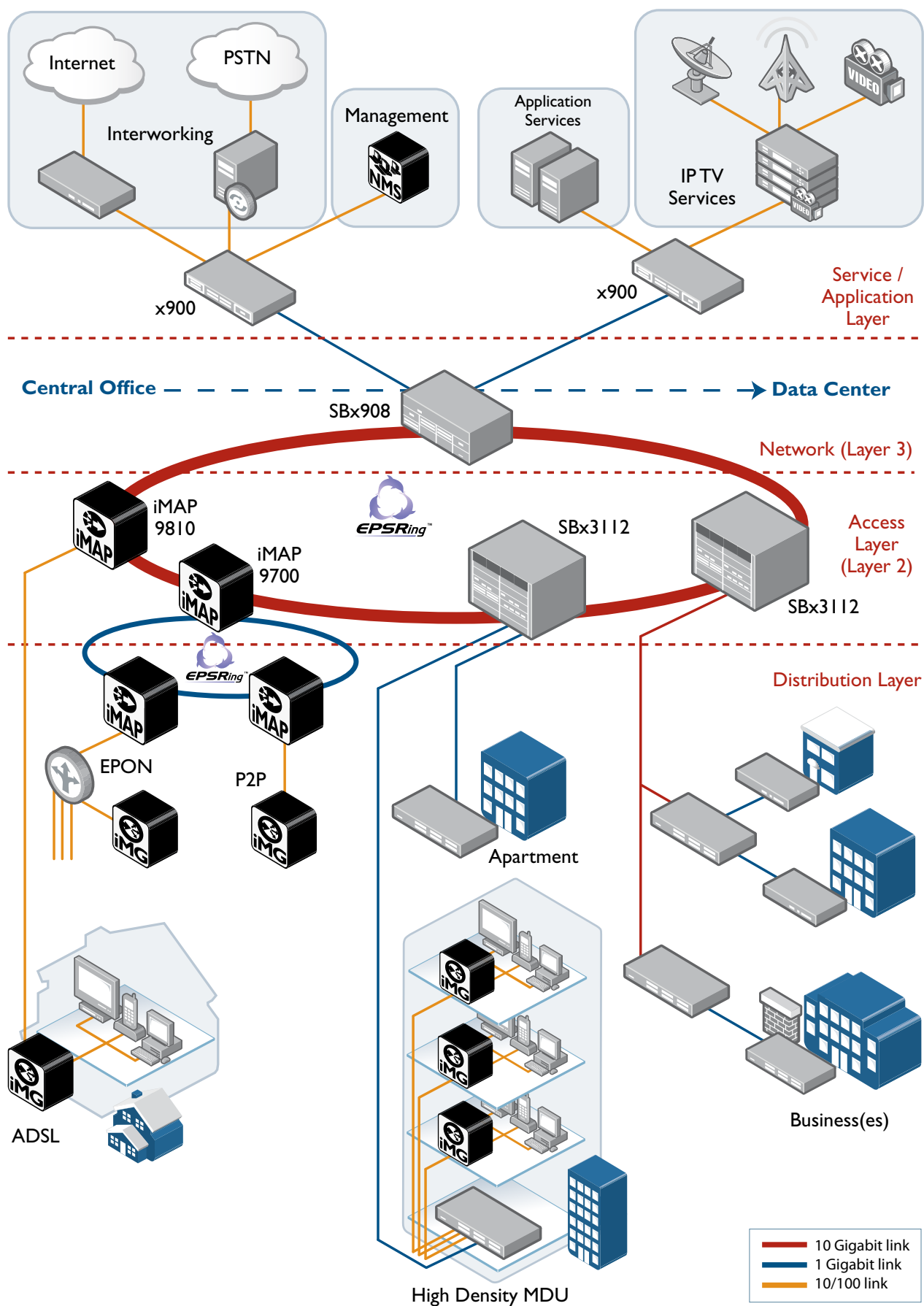
Remote Network Monitoring (RMON)
» A collection of traffic statistics over port interfaces, accrued in a specified time period.

Securing the Network
» Supports three levels of security: User, Manager, and Security Officer.

Secure Digital (SD) Card
» SD is used for file and log activities after the system has initialized.

eco friendly

Internet

PSTN

Interworking

Management

NMS

Application Services

IP TV Services

VIDEO

x900

x900

Service / Application Layer

Central Office — — — — — — — — — → **Data Center**

SBx908

Network (Layer 3)

iMAP 9810

EPSRing™

SBx3112

iMAP 9700

Access Layer (Layer 2)

SBx3112

iMAP

EPSRing™

iMAP

Distribution Layer

EPON

P2P

iMG

iMG

Apartment

ADSL

iMG

High Density MDU

Business(es)

	10 Gigabit link
	1 Gigabit link
	10/100 link

Product Specifications

System Capacity

AT-SBx31CFC (Controller Fabric Card)
512MB DDR2 SDRAM
512KB NVRAM
128MB Flash memory
32K MAC address
4K Active VLANs
16Mbit packet buffer memory

AT-SBx31GP24 (24 x 10/100/1000T PoE+ Line Card)
128MB DDR2 SDRAM
16MB Flash memory
16K MAC address
4K Active VLANs
12Mbit packet buffer memory

AT-SBx31XZ4 (4 x 10Gbps (XFP) Line Card))
128MB DDR2 SDRAM
16MB Flash memory
32K MAC address
4K Active VLANs
16Mbit packet buffer memory

AT-SBx31GS24 (24 x 100/1000 SFP Line Card)
128MB DDR2 SDRAM
16MB Flash memory
32K MAC address
4K Active VLANs
16Mbit packet buffer memory

Maximum Bandwidth
Non-blocking for all packet sizes
Throughput: 595 Mpps
Switch fabric: 800Gbps
Supports 10K byte jumbo packets

Wirespeed Switching on all Ethernet Ports
14,880pps for 10Mbps Ethernet
148,800pps for 100Mbps Ethernet
1,488,000pps for 1000Mbps Ethernet

Latency

AT-SBx31GP24	Latency (64 Byte)
10Mbit	244,261 ns
100Mbit	178,949 ns
1000Mbit	137,506 ns

AT-SBx31XZ4	Latency (64 Byte)
10Gbit	34,252 ns

AT-SBx31GS24	Latency (64 Byte)
100Mbit	TBD ns
1000Mibt	TBD ns

Port Configurations
Auto-negotiation, duplex, MDI/MDI-X, IEEE 802.3x flow control/back pressure
Head of Line (HOL) Blocking Prevention

Ethernet Specifications
RFC 894 Ethernet II Encapsulation
IEEE 802.1D MAC Bridges
IEEE 802.1Q Virtual LANs
IEEE 802.2 Logical Link Control
IEEE 802.3ab 1000BASE-T
IEEE 802.3ac VLAN TAG
IEEE 802.3u 100BASE-T
IEEE 802.3x Full Duplex Operation
IEEE 802.3z Gigabit Ethernet
IEEE 802.3af Power over Ethernet Class 3
IEEE 802.3at Power over Ethernet Class 4
Jumbo Frames (10K Bytes)

Spanning-Tree Protocol
IEEE 802.1D Spanning-Tree Protocol
IEEE 802.1w Rapid Spanning-Tree Protocol
IEEE 802.1s Multiple Spanning-Tree Protocol
BPDU Cop

Resiliency
EPSR
EPSR SuperLoop
Bi-Directional Forwarding Detection
Static Link Aggregation Groups (LAG)
Layer 2 Control Plane Prioritization
Hot-standby Controller Redundancy
System Power Redundancy
PoE+ Power Redundancy*

Multicast
RFC 1112 IGMP Snooping v1
RFC 2236 IGMP Snooping v2
Dynamic Multicast Router Detection
Set Top Box Mobility Control
Configurable Unknown Multicast Flooding

Security
RADIUS Client
TACACS+
User Account Management
SSHv2
BPDU Protection
DHCP Snooping
RFC 3042 DHCP Relay
DHCP Option 82 Insertion
Auto IP Filtering
ARP Filtering
Local ARP Discard
Access Control Lists (ACLs)
Password Recovery

Convergence
8 QoS Queues Per Port
Policy-Based QoS
Configurable User Priority-to-Queue Mapping
Egress Port Rate Limiting
Egress Queue Rate Limiting
Priority Tagging (IEEE 802.1p for ingress)
Remarking
Strict Priority Queue Servicing
IEEE 802.1ab Link Layer Discovery Protocol (LLDP)

Network Manageability
CLI Interface
Command Line Help
RFC 854 Telnet Server
Telnet Client
Out-of-band Ethernet / IP Management Interface
In-band Ethernet / IP Management Interface
Login Banner
TFTP Client
FTP Client
RFC 1157 SNMPv1
RFC 1902-1904 SNMPv2c
Command Scripting
Command Aliases
Time and Daylight Savings Time Management
SNTP
Syslog
Log Streaming
Log Filtering
DNS Client
Management Interface ICMP Support

MIB Support
RFC 1213 MIB-II
RFC 1573 MIB-II
RFC 2819 RMON MIB

Performance / Fault Management
RFC 1757 RMON Groups 1,2,3,9
RMON Threshold Crossing Alerts
User-defined Packet Counters
CPU Utilization Statistics
Alarm Management
Configurable Alarm Security
Port Outage Alarm Threshold
Thermal Monitoring
Power-up Diagnostics

Equipment Management
Profile Management
Auto-provisioning
Pre-provisioning
PoE Management

Layer 2 Switching / Control
FDB Management
Configurable MAC Removal Modes
Port-based VLAN Double Tagging (Q-in-Q)
TPID Editing
MAC Address Learning Limits
Protocol Tracing
Jumbo Frames (Layer 2 Forwarding)

VLAN
4K VLANs (802.1Q)
VLAN Management
Configurable VLAN Ingress Check
VLAN-based Double Tagging (Q-in-Q)
VLAN Translation
Upstream Forwarding Only (UFO) VLANs
UFO Control Protocol (UCP)

System Administration
Software Load Management
Network Booting
File Management
Binary Database Backup / Restore
Text Config File Backup / Restore

Hardware
Redundant Controller / Fabric Card
SD Removable Media supported only on AT-SBx31CFC
Redundant 1200W System Power Supply Units
Load-sharing 1200W PoE Power Supply Units
Fan Tray

RoHS Standards
Compliant with European and China RoHS standards

Package Description
SBx3112 chassis
Management cable (RJ-45 to DB-9)
Hardware kit accessories
Installation guide and CLI user's guide available at alliedtelesis.com/support/software

* Depends on PoE loading

Physical Specifications

Product	Dimensions (W x D x H)
AT-SBx3112 Chassis	48.03cm x 38.79cm x 31.01cm
AT-SBx31CFC Fabric Control Card	20.67cm x 31.32cm x 40.64cm
AT-SBx31GP24 PoE Line Card	20.67cm x 31.32cm x 40.64cm
AT-SBx31XZ4 XFP Line Card	20.67cm x 31.32cm x 40.64cm
AT-SBx31GS24 SFP Line Card	20.67cm x 31.32cm x 40.64cm
AT-SBx3161 System Power Supply	10.16cm x 32.21cm x 4.34cm
AT-SBx3165 PoE Power Supply	10.16cm x 32.21cm x 4.34cm
AT-SBx31FAN Tray	2.74cm x 33.35cm x 26.04cm

Product Weight

Product	Weight (kg / lbs)
AT-SBx3112 Chassis	17.77 kg (39.10 lb)
AT-SBx31CFC Fabric Control Card	1.09 kg (2.40 lb)
AT-SBx31GP24 PoE Line Card	1.06 kg (2.34 lb)
AT-SBx31XZ4 XFP Line Card	0.82 kg (1.80 lb)
AT-SBx31GS24 SFP Line Card	1.06 kg (2.34 lb)
AT-SBx3161 System Power Supply	2.75 kg (6.05 lb)
AT-SBx3165 PoE Power Supply	2.73 kg (6.00 lb)
AT-SBx31FAN Tray	1.82 kg (4.00 lb)

Power Specifications

AC Voltage / Frequency Requirements:	100-240 VAC, 50/60 Hz
AT-SBx3161	16A maximum @ 100V
AT-SBx3165	16A maximum @ 100V

Maximum power consumption

AT-SBx31CFC	48.3W
AT-SBx31GP24 POE	34.4W
AT-SBx31XZ4	48.3W
AT-SBx31GS24	56.3W

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

12V PSU	78.4% (100% load)
	81.8% (50% load)
56V PSU	81.3% (100% load)
	83.6% (50% load)

Heat dissipation

AT-SBx31CFC	164.91 BTU/hr
AT-SBx31GP24 POE	164.88 BTU/hr
AT-SBx31XZ4	117.44 BTU/hr
AT-SBx31GS24	192.21 BTU/hr

Power over Ethernet Specifications

Available Power over Ethernet	1200W @ 56 VDC (Using one PoE PSU)
IEEE 802.3at Class 4 (30W/port)	Max 40 ports
IEEE 802.3af Class 3 (15.4W/port)	Max 77 ports
IEEE 802.3af Class 2 (7.0W/port)	Max 171 ports
IEEE 802.3af Class 1 (4.0W/port)	Max 240 ports

Available Power over Ethernet	2400W @ 56 VDC (Using two PoE PSU)
IEEE 802.3at Class 4 (30W/port)	Max 80 ports
IEEE 802.3af Class 3 (15.4W/port)	Max 155 ports
IEEE 802.3af Class 2 (7.0W/port)	Max 240 ports
IEEE 802.3af Class 1 (4.0W/port)	Max 240 ports

IEEE 802.3at / IEEE 802.3af Mode ▶ Alternative A (MDI)

Environmental Specifications

Operating Temperature	-0°C to 40°C (32°F to 104°F)
Storage Temperature	-25°C to 70°C (-13°F to 158°F)
Operating Humidity	5% to 90% non-condensing
Storage Humidity	5% to 95% non-condensing
Operating Altitude Range	Up to 3,000m (9,843 ft)
Acoustic Noise	75.7dB

Acoustic noise measured at 40°C using the following products:

Product	Quantity
AT-SBx3112 Chassis	1
AT-SBx31CFC Fabric Control Card	2
AT-SBx31GP24 PoE Line Card	5
AT-SBx31XZ4 XFP Line Card	5
AT-SBx3161 System Power Supply	2
AT-SBx3165 PoE Power Supply	2
AT-SBx31FAN Tray	1

Safety and Electromagnetic Emissions Certifications

EMI/RFI	FCC Class A, EN55022 Class A, CISPR Class A
Immunity	EN55024
Electrical Safety	EN60950-1 (TUV), UL60950-1 (CULUS), EN60825
Safety Agency Approvals	CULUS, TUV, C-TICK, CE

Quality and Reliability

Product	MTBF
AT-SBx3112 Chassis	260,000
AT-SBx31CFC Fabric Control Card	310,000
AT-SBx31GP24 PoE Line Card	300,000
AT-SBx31XZ4 XFP Line Card	420,000
AT-SBx31GS24	300,000
AT-SBx3161 System Power Supply	460,000
AT-SBx3165 PoE Power Supply	460,000
AT-SBx31FAN Tray	460,000

Ordering Information

AT-SBx3112-96POE+
96 port Chassis Bundle
1 x SBx3112 Chassis
1 x SBx31CFC Fabric Control Card
4 x SBx31GP24 PoE line card
1 x SBx3161 System Power Supply
1 x SBx3165 PoE Power Supply
1 x SBx31FAN Tray

AT-SBx3112-8XR
8 x 10G port, Redundant Starter Bundle
1 x AT-SBx3112 Chassis
2 x AT-SBx31CFC Fabric Control Card
2 x AT-SBx31XZ4 XFP Ethernet Line Card
2 x AT-SBx3161 System Power Supply
1 x AT-SBx31FAN Tray

AT-SBx3112
Rack mount 12 slot chassis with fan tray

AT-SBx31CFC
Fabric switch controller line card

AT-SBx31GP24
24 port 10/100/1000Base-T PoE Ethernet line card

AT-SBx31XZ4
4 port 10GE XFP Ethernet line card

AT-SBx31GS24
24 port SFP Ethernet line card

AT-SBx3161-xx
1200W AC System Power Supply

AT-SBx3165-xx
1200W AC PoE Power Supply

AT-SBx31FAN Tray
Contains 4 fans, temperature sensors and controller board

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-SBx3161 or
   AT-SBx3165 power supplies.

Accessories

Small Form Pluggable Optics		Supported Platforms
AT-XPSR	XFP, MMF, 10Gbps, 300m, 850nm, LC	AT-SBx31XZ4
AT-XPLR	XFP, SMF, 10Gbps, 10km, 1310nm, LC	AT-SBx31XZ4
AT-XPER40	XFP, SMF, 10Gbps, 40km, 1550nm, LC	AT-SBx31XZ4
AT-XPER80	XFP, SMF, 10Gbps, 80km, 1550nm, LC	AT-SBx31XZ4
AT-SPSX	SFP, MMF, 1000Mbps, 220 / 500m, 850nm, LC	AT-SBx31GS24
AT-SPEX	SFP, MMF, 1000Mbps, 2km, 1310nm, LC	AT-SBx31GS24
AT-SPLX10	SFP, SMF, 1000Mbps, 10km, 1310nm, LC	AT-SBx31GS24
AT-SPLX40	SFP, SMF, 1000Mbps, 40km, 1310nm, LC	AT-SBx31GS24
AT-SPZX80	SFP, SMF, 1000Mbps, 80km, 1550nm, LC	AT-SBx31GS24
AT-SPBD10-13	SFP, SMF, 1000Mbps, 10km, 1310/1490nm, LC-BiDi	AT-SBx31GS24
AT-SPBD10-14	SFP, SMF, 1000Mbps, 10km, 1490/1310nm, LC-BiDi	AT-SBx31GS24
AT-SPFX/2	SFP, MMF, 100Mbps, 2km, 1310nm, LC	AT-SBx31GS24
AT-SPFXBD-LC-13	SFP, SMF, 100Mbps, 10km, 1310/1510nm, LC-BiDi	AT-SBx31GS24
AT-SPFXBD-LC-15	SFP, SMF, 100Mbps, 10km, 1510/1310nm, LC-BiDi	AT-SBx31GS24
AT-SPFX/15	SFP, SMF, 100Mbps, 15km, 1310nm, LC	AT-SBx31GS24

Allied Telesis

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

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