



## SwitchBlade® x908

### Advanced Layer 3 Modular Switch



The Allied Telesis SwitchBlade® x908 industry leading modular switch incorporates eight high-speed 30Gbps expansion bays, delivering a new generation of high performance. The SwitchBlade x908 provides scalable and versatile switching solutions for today's Enterprise networks.

The highly configurable SwitchBlade x908 3RU modular switch incorporates an advanced IPv4 L3 feature set with wire-speed IPv6 hardware capability, future proofing the network.

Featuring dual hot-swap PSUs, an advanced QoS feature set, multicasting support, and LAN resiliency support, the SwitchBlade x908 also provides Service Provider capabilities such as a large L3 route table, and EPSR support.

Stacking between two units is supported via fixed stacking connectors on the rear of the chassis, providing 80Gbps of stacking bandwidth. Stacking of more than two units is via expansion modules (XEMs) on the front panel.

Configurable up to 96 gigabit with PoE<sup>1</sup> or up to 16 x 10GbE<sup>2</sup> ports. The XEMs are compatible with the x900-24X and x900-12XT/S.

The SwitchBlade x908 incorporates the AlliedWare Plus™ Operating System, using an industry standard Command Line Interface (CLI), facilitating effortless manageability.

Expansion module options:

- AT-XEM-STK Stacking XEM
- AT-XEM-1XP 1 x 10GbE (XFP)
- AT-XEM-12S 12 x 100/1000BASE-X SFP ports
- AT-XEM-12T 12 x 10/100/1000BASE-T (RJ-45) ports
- Future modules to include 12 x GbE with PoE<sup>1</sup> and 2 x 10GbE<sup>2</sup>

Port Density:

- 96 x GbE ports per switch
- 8 x 10GbE ports (16 with XEM-2XP)<sup>2</sup> per switch
- 1344 x GbE ports per rack
- 112 x 10GbE ports per rack (224 with XEM-2XP)<sup>2</sup>

#### Key Features

##### Expandability

- 8 high speed 30Gbps expansion bays
- 2 x 40Gbps stacking connectors on the rear of the chassis, for use as high availability stacking links for 2 SwitchBlade x908s<sup>3</sup>
- Stacking of up to 4 SwitchBlade x908s using the stacking module, XEM-STK<sup>4</sup>

##### Performance

- 640Gbps Switching fabric
- 262Mpps forwarding rate (with current XEM modules. Capable of up to 476Mpps)
- Extensive wire-speed traffic classification for ACLs and QoS
- Supports 10KB Jumbo frame size for data center and server aggregation applications
- Wire-speed multicasting

##### Flexibility & Compatibility

- Eight 30Gbps expansion bays supporting a choice of modules, including 1 x 10GbE, 12 x 1GbE (SFP), 12 x 1GbE (RJ45), and stacking for port flexibility and application versatility
- XEM modules compatible with x900-24X and x900-12XT/S
- Gigabit SFP ports will support any combination of 10/100/1000BASE-T, 100BASE-FX, 100BASE-BX, 1000BASE-SX, 1000BASE-LX, 1000BASE-ZX or 1000BASE-ZX CWDM SFPs

##### 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 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

##### Resiliency

- STP, RSTP, MSTP (802.1s)
- Link Aggregation (802.3ad LACP)
- VRRP
- EPSR

##### VLAN Support

- Supports 4096 VLANs
- Private and Dynamic VLANs
- VLAN Double Tagging

##### Security

- Private VLANs, providing security and port isolation of multiple customers using the same VLAN
- 802.1x support

##### Quality of Service

- Policy based QoS features
- Highly configurable traffic classification
- Extensive remarking capabilities, to fit in with any network's QoS scheme
- Control plane traffic prioritization
- Mixed scheduling, to support complex traffic queuing requirements
- 8 QoS queues per port
- Two-rate three-color (green, yellow, red) bandwidth metering, with burst sizes for improved TCP-IP bandwidth limiting performance and bandwidth resolution down to 1Kbps
- Low switching latency essential for Voice over IP (VoIP) and real-time streaming media applications

##### Management

- Out of band 10/100/1000 Ethernet management port and console management port, both on the front panel for ease of access
- An SD memory card socket on the front panel, allowing software release files, configurations and other files to be stored for backup and distribution to other switches
- Port mirroring
- SSH and SNMPv3 for secure management
- RADIUS Authentication

# SWITCHBLADE® x908 | Advanced Layer 3 Modular Switch

## Performance

### Wire speed switching

The SwitchBlade x908 has fully non-blocking switching on all ports, so IPv4 Layer 2 switching and Layer 3 routing occur at wire speed. This is ideal for high-end server deployments, and when aggregating gigabit connections.

### Aggregation at Layer 2 and Layer 3

Ideal for access aggregation applications at Layer 2. A large L3 route table provides support for thousands of IP interfaces, essential when aggregating complex IP networks.

### Industry-leading Quality of Service

Operating at wire-speed, QoS boosts network performance and guarantees the delivery of business-critical Ethernet services and applications.

Enterprise and Education customers can be sure that time-critical services like voice and video applications will take precedence over non-essential services like file downloads. Unmatched QoS accuracy is achieved with a bandwidth limit resolution down to 1Kbps, which is ideal for precise control of Enterprise desktop-based VoIP applications.

Service Providers (SPs) can offer customers bandwidth and performance profiles tailored to their needs.

## Reliability

The SwitchBlade x908 switch operates with one Power Supply Unit (PSU); installing a second PSU provides redundancy. Internal PSUs eliminate the need for an external Redundant Power Supply (RPS) that occupies valuable rack space. Built-in redundancy guarantees the continued delivery of essential services. The SwitchBlade® x908 also features front-to-back cooling, which increases its reliability.

## Multicasting

The SwitchBlade x908 has a high multicast group capacity. This allows SPs to offer as many video services to their customers as possible, maximizing their per-port revenue. Extensive multicast protocol support includes PIM-SM and IGMPv3.

## Security

The SwitchBlade x908 has 802.1x user authentication. This is essential for Enterprise networks needing to prevent intruders from accessing their network. Other security features include Private VLANs.

## Easy management options

Administrators can choose from a range of secure remote management options including SNMPv3 and SSH.

## Flexibility

The high speed expansion modules provide copper or fiber connectivity possibilities, delivering the ultimate in flexibility.

Expansion module options:

- AT-XEM-STK Stacking XEM
- AT-XEM-IXP 1 x 10GbE (XFP)
- AT-XEM-I2S 12 x 100/1000BASE-X SFP ports
- AT-XEM-I2T 12 x 10/100/1000BASE-T (RJ-45) ports

All of these modules provide non-blocking performance, while the ten gigabit uplinks make the SwitchBlade x908 ideal for aggregating gigabit to the desktop or for gigabit uplinks from Fast Ethernet switches.

## Ethernet Protected Switched Rings

Ethernet Protected Switched Rings (EPSR) and 10 GbE modules allow the SwitchBlade x908, with a number of x900 switches or iMAPs, to form a protected ring with sub 50ms failover. This feature is perfect for high performance at the core of Enterprise or Provider Access networks.

## Stacking

Virtual Chassis Stacking provides a highly available system where network resources can be spread out across a number of stacked nodes, thus reducing the impact of any one of the stacked nodes failing. Switch ports on different nodes across the stack can be aggregated together to provide excellent high availability characteristics. Excellent scalability can be achieved in that individual stacked nodes can be inserted into, and removed from, the stack as bandwidth and feature requirements in the network evolve.

On the SwitchBlade x908, stacking can be achieved by using the two connectors on the rear of the chassis, where each connector is capable of providing 40Gbps of stacking bandwidth. When stacking more than two units, this can be achieved via a XEM module on the front panel. The stacking XEM module provides two proprietary 15Gbps stacking links allowing up to 4 nodes to be aggregated.

<sup>1</sup> PoE XEM, expected availability late 2008. Standard copper XEM available now.

<sup>2</sup> XEM-2XP (2 x XFP) XEM module, expected availability, late 2008.

<sup>3</sup> It is not possible to use the rear stacking ports and the XEM-STK in the same stack.

<sup>4</sup> AlliedWare Plus software release 5.2.1 supports stacking of 2 units. Support for more than 2 units will be available in a future release.

### Medium Business

- Flexibility
- Room to Grow

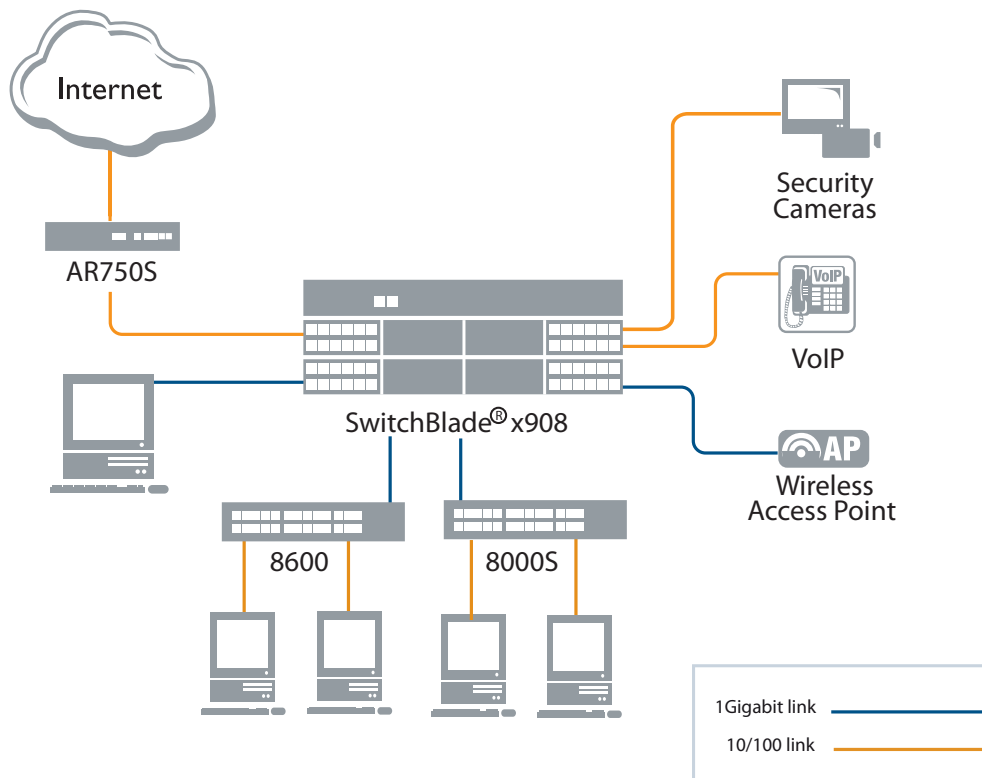


Diagram I: Medium Business

Diagram I illustrates the SwitchBlade x908 in a Medium Business network. This is ideal for customers who want to deploy a network solution that will accommodate today's needs as well as scale to meet their future needs. Inherent in the architecture of Allied Telesis products is the ability to implement modular growth as necessary.

Gigabit Ethernet ports are added to provide connectivity directly to the SwitchBlade x908. These ports are used to provide Video and VoIP connectivity directly to the center of the network. Further copper ports are added to allow for direct connection of servers to the SwitchBlade x908. Copper ports are added through the XEM-12T, a 12 port Gigabit Ethernet copper module. The SwitchBlade x908 links the network to the Internet over a 100Mb copper link via an AR750S router.

A XEM-12S, a 12 port (100/1000 BASE-X SFP) expansion module, is added to allow for fiber uplinks from the edge switches to the SwitchBlade x908. As the company expands, additional fiber and copper XEM modules can be added, allowing the network to adapt in response to business needs.

The high-speed expansion bays provide copper or fiber connectivity possibilities, delivering the ultimate in flexibility and providing complete non-blocking traffic throughput.

## SWITCHBLADE® x908 | Advanced Layer 3 Modular Switch

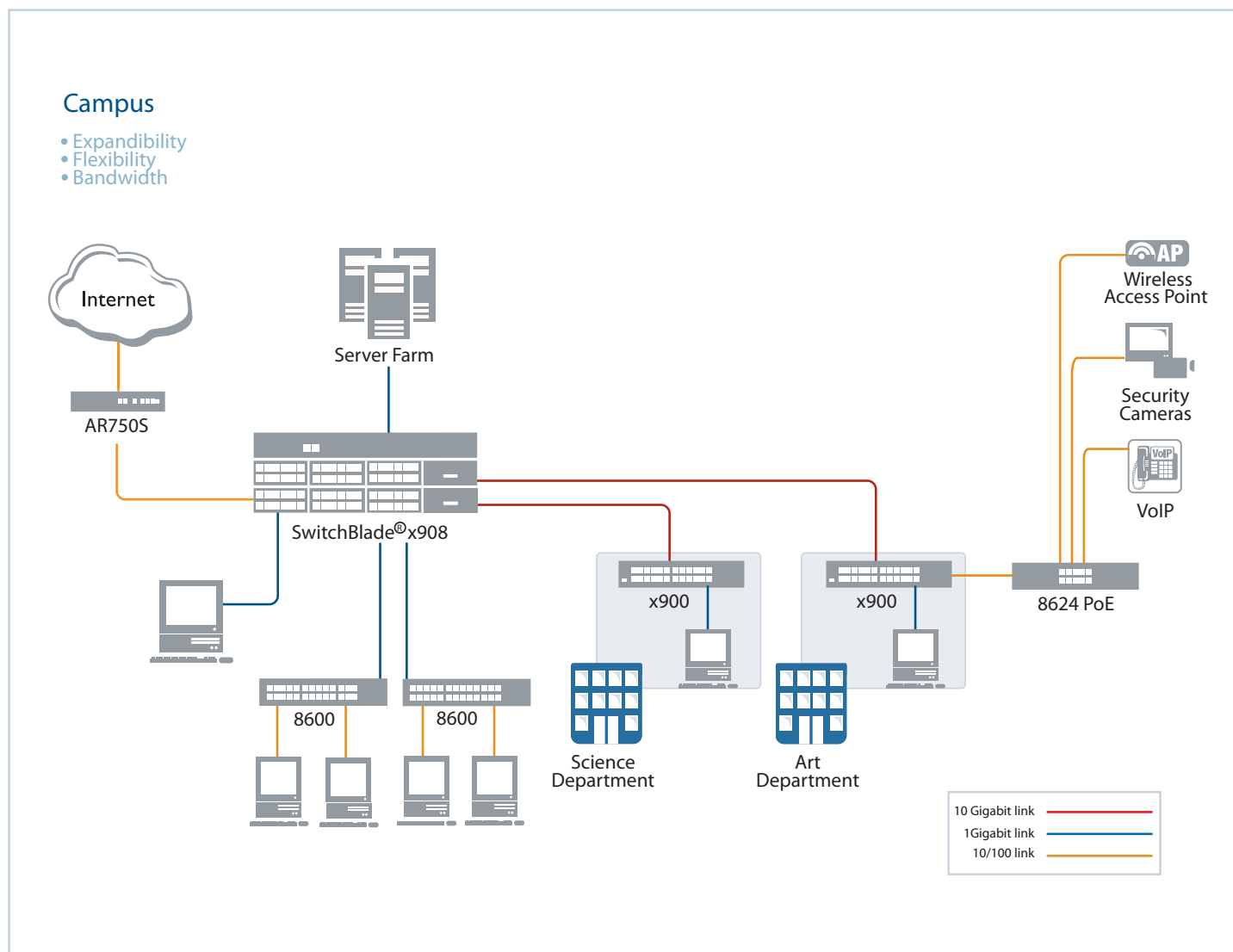


Diagram 2: Campus

Diagram 2 illustrates the SwitchBlade x908 in an Enterprise Campus network.

Education providers are able to offer high speed connection to the desktop for power users and utilize high-capacity uplinks for maximum throughput of high-density traffic.

Servers and management work stations are attached directly to the core of the network using Gigabit Ethernet via XEM-I2T modules. Links from the server farm to the core can be trunked to allow for greater bandwidth and resiliency. Industry leading QoS features on the SwitchBlade x908 allow important server traffic to be prioritized over less critical network traffic.

In the main building, edge switches uplink to the SwitchBlade x908 core switch, using fiber connections to the XEM-I2S, a 12 port (100/1000 BASE-X SFP) expansion module. Other buildings uplink to the core using 10 Gigabit links from x900 switches to the XEM-IXP modules on the SwitchBlade x908. This enables large files, video and voice to be transferred without compromising service agreements.

For further expansion in the core, or in the other departments, the XEM-STK stacking module provides two proprietary 15Gbps stacking links using special stacking cables. Excellent scalability can be achieved in that individual stacked nodes can be inserted into, and removed from, the stack as bandwidth and feature requirements in the network evolve. Further to this, the SwitchBlade x908 supports proprietary 40Gbps stacking links allowing a further SwitchBlade x908 to be added to the core without compromising bandwidth between the units.

## SWITCHBLADE® x908 | Advanced Layer 3 Modular Switch

### Enterprise Core

- Redundancy
- Resiliency
- Reliability

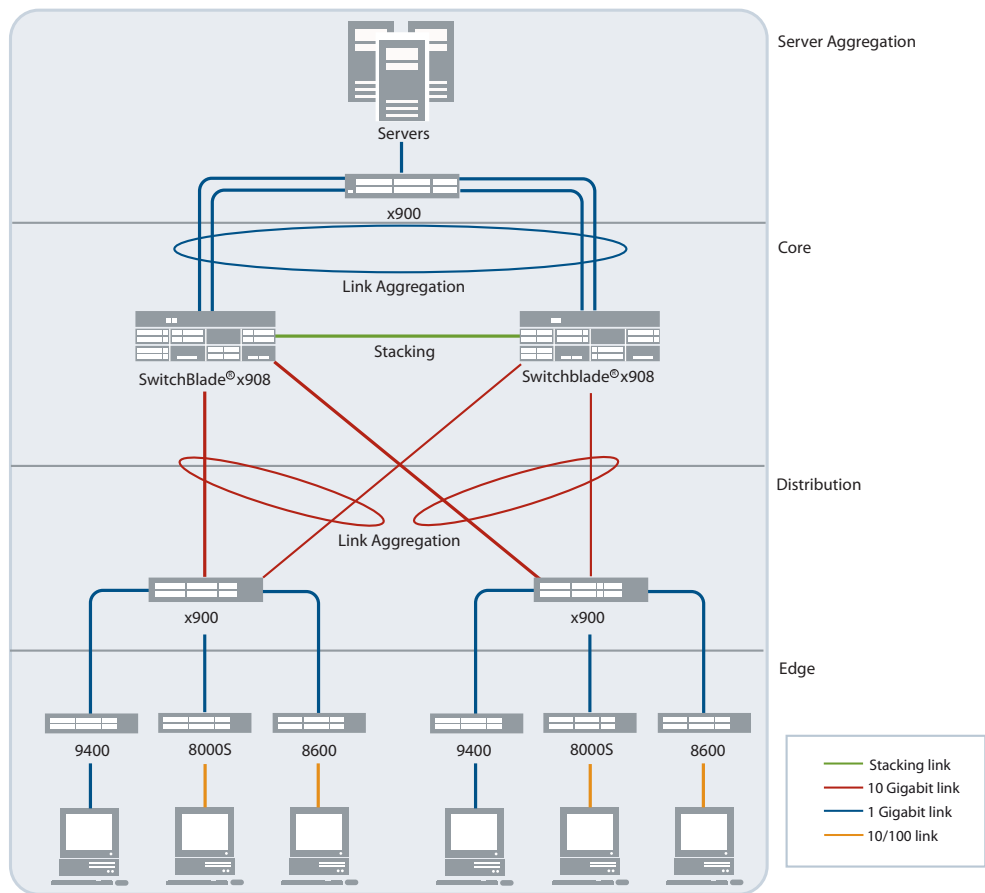


Diagram 3: Enterprise Core

With two 40Gbps stacking ports on the rear of the device, the SwitchBlade x908 is an ideal solution for Enterprises wanting to create a resilient core without going to the expense of a full chassis solution. The use of stacking across the two devices allows them to appear as a single node on the network.

10GbE expansion modules and hotswappable XFPs provide high-speed, high-capacity fiber uplinks.

Link aggregation between the stacked core and distribution layer; as illustrated in Diagram 3, provides increased bandwidth as well as resiliency. Link aggregation to the servers creates a resilient connection to important data.

The SwitchBlade x908 switch allows two power supplies to be installed. Able to operate with one Power Supply Unit (PSU), installing a second PSU provides redundancy and the ability to support dual feed where needed.

Internal PSUs eliminate the need for an external Redundant Power Supply (RPS) which occupies valuable rack space. Built-in redundancy guarantees the continued delivery of essential services.

Comprehensive low-latency Quality of Service (QoS) features operating at wire-speed, provide flow-based traffic management with full classification, prioritization, traffic shaping and min/max bandwidth profiles. For Enterprise customers, the SwitchBlade x908 QoS features protect productivity by guaranteeing performance of business-critical applications (including VoIP services), and help to restore and maintain responsiveness of Enterprise applications in the workplace.

## SWITCHBLADE® x908 | Advanced Layer 3 Modular Switch

### Service Provider

- Redundancy
- Resiliency
- Advanced Traffic Management

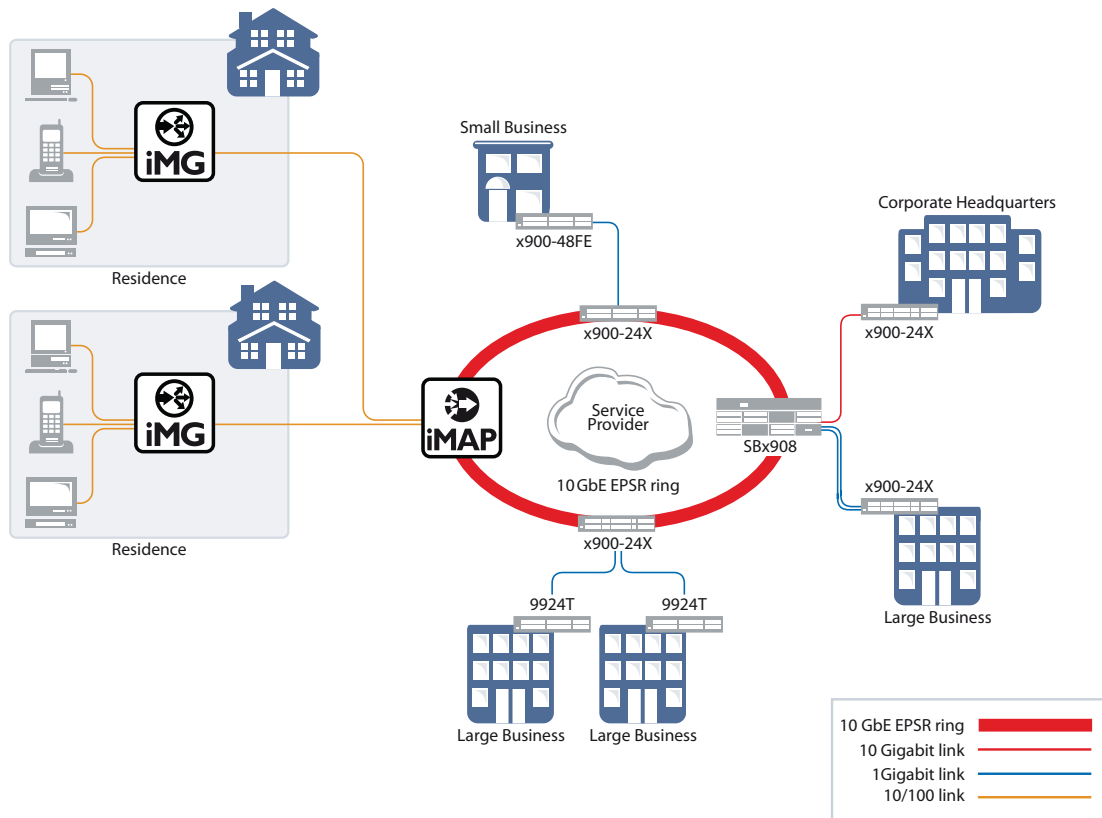


Diagram 4: Service Provider

Ethernet Protected Switched Rings (EPSR) and 10 GbE modules allow the SwitchBlade x908, with a number of x900 switches or iMAPs, to form a high speed protected ring with sub 50ms failover, as illustrated in Diagram 4 above. This feature is perfect for high performance at the core of enterprise or provider access networks.

The SwitchBlade x908 QoS features are ideal for Service Providers wanting to ensure maximum availability of premium voice, video and data services, and at the same time manage customer service level agreements. Comprehensive, low latency Quality of Service (QoS) features operating at wire-speed provide flow-based traffic management with full classification, prioritization, traffic shaping and min/max bandwidth profiles.

The SwitchBlade x908 has a high multicast group capacity. This allows Service Providers to offer as many video services to their customers as possible, maximizing their per-port revenue. The SwitchBlade x908 Advanced Modular switch provides maximum Gigabit Ethernet port density in a 3RU chassis. A high degree of flexibility future-proofs your investment against changes in network infrastructure, topologies, and physical link requirements.

New XEM modules will provide greater Ethernet connectivity options in the future allowing the network to adapt in response to business needs.

Able to operate with one Power Supply Unit (PSU), installing a second PSU provides redundancy and the ability to support dual feed where needed. Internal PSUs eliminate the need for an external Redundant Power Supply (RPS) which occupies valuable rack space. Built-in redundancy guarantees the continued delivery of essential services.

# SWITCHBLADE® x908 | Advanced Layer 3 Modular Switch

## Performance

640Gbps Switching Fabric  
Up to 256K IPv4 routes  
Up to 16K MAC addresses  
Up to 4K layer 2 multicast groups  
Up to 1K layer 3 IPv4 multicast groups  
4K VLANs  
512MB DDR SDRAM SODIMM  
Separate packet buffer memory  
64MB Flash Memory

## Reliability

MTBF  
SwitchBlade x908: 150K Hours  
(calculated using Telcordia SR-332 (Issue 1, May 2001) at 25°C ambient operating temperature)

## Power Characteristics

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

DC Voltage: 36 to 72V

## Power Consumption<sup>5</sup>

SwitchBlade x908: 510W (maximum)

## Environmental Specifications

Operating Temperature Range:  
0°C to 40°C (32°F to 104°F)  
*Derated by 1°C per 305 Meters (1000ft)*

Storage Temperature Range:  
-30°C to 70°C (-13°F to 158°F)

Operating Relative Humidity Range:  
5% to 80% non-condensing

Storage Relative Humidity Range:  
5% to 95% non-condensing

Altitude:  
3,050 Meters maximum (10,000ft)

## SBx908 Physical Dimensions

Height: 132mm  
Width: 440mm  
Depth: 456mm  
Mounting: 3 RU form-factor

## XEM Physical Dimensions

Height: 45mm  
Width: 109mm  
Depth: 253mm

## PSU Physical Dimensions

Height: 40mm  
Width: 84mm  
Depth: 299mm

## SBx908 Weights

Chassis with blanking plates  
(shipping config) 14.32 kg

Packaged chassis  
(shipping config) ~16.7 kg

Chassis with  
4 x PSUs & 8 x XEMs ~25.2 kg

## XEM Weights

XEM Weight 0.82 kg  
XEM weight packaged ~1.4 kg

## PSU Weights

PSU weight 1.32 kg  
PSU weight packaged with 1 cable ~1.9 kg

## Electrical Approvals and Compliances

EMC: EN55022 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

## Country of Origin

Singapore

## Standards and Protocols

AlliedWare Plus™ Operating System Version  
5.2.1

## Authentication

RFC 1321 MD5 Message-Digest Algorithm  
RFC 1828 IP Authentication using Keyed MD5  
RFC 2082 RIP-2 MD5 Authentication

## Border Gateway Protocol (BGP)

BGP Dynamic Capability  
BGP Graceful Restart  
BGP Outbound Route Filtering  
Extended Communities Attribute  
RFC 1771 Border Gateway Protocol 4 (BGP-4)  
RFC 1772 Application of the Border Gateway Protocol 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 2796 BGP Route Reflection - An Alternative to Full Mesh IBGP  
RFC 2858 Multiprotocol Extensions for BGP-4  
RFC 2918 Route Refresh Capability for BGP-4  
RFC 3065 Autonomous System Confederations for BGP  
RFC 3107 Carrying Label Information in BGP-4  
RFC 3392 Capabilities Advertisement with BGP-4

## Encryption

FIPS 180-1 Secure Hash Standard (SHA-1)  
FIPS 186 Digital Signature Standard (RSA)  
FIPS 46-3 Data Encryption Standard (DES & 3DES)

## Ethernet

IEEE 802.2 Logical Link Control  
IEEE 802.3 Ethernet CSMA/CD  
IEEE 802.3ab 1000BASE-T  
IEEE 802.3ad Link Aggregation  
IEEE 802.3ad (LACP) Link Aggregation Control Protocol  
IEEE 802.3ae 10 Gigabit Ethernet  
IEEE 802.3u 100BASE-T  
IEEE 802.3x Flow Control - Full Duplex Operation  
IEEE 802.3z Gigabit Ethernet

## General Routing

ECMP Equal Cost Multi Path routing  
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 903 Reverse ARP  
RFC 919 Broadcasting Internet datagrams  
RFC 922 Broadcasting Internet datagrams in the presence of subnets  
RFC 925 Multi-LAN ARP  
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)

<sup>5</sup> Excludes PoE



RFC 1541 DHCPv4 Client & Server  
RFC 1542 Clarifications & Extensions for the Bootstrap Protocol  
RFC 1700 Assigned Numbers  
RFC 1812 Requirements for IPv4 Routers  
RFC 1918 IP Addressing  
RFC 2131 DHCP  
RFC 2132 DHCP Options and BOOTP Vendor Extensions.  
RFC 2581 TCP Congestion Control  
RFC 3046 DHCP Relay Agent Information Option (DHCP Option 82)  
RFC 3232 Assigned Numbers  
RFC 3993 Subscriber-ID Suboption for DHCP Relay Agent Option

## Management

IEEE802.1-PAE-MIB Port Access Control MIB  
IEEE802.3-LAG-MIB Link Aggregation MIB  
IGMP MIB  
MSTP MIB  
PIM MIB  
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 SNMP  
RFC 1227 SNMP MUX protocol and MIB  
RFC 1239 Standard MIB  
RFC 1493 Bridge MIB  
RFC 1724 RIPv2 MIB Extension  
RFC 1757 RMON (groups 1,2,3 and 9)  
RFC 1850 OSPFv2 MIB  
RFC 2011 SNMPv2 MIB for IP using SMIv2  
RFC 2012 SNMPv2 MIB for TCP using SMIv2  
RFC 2096 IP Forwarding Table MIB  
RFC 2239 Definitions of Managed Objects for IEEE 802.3 Medium Attachment Units (MAUs)  
RFC 2674 Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering  
RFC 2787 Definitions of Managed Objects for VRRP  
RFC 2790 Host MIB  
RFC 2819 RMON MIB  
RFC 2863 Interfaces Group MIB  
RFC 2932 IPv4 Multicast Routing MIB  
RFC 3164 Syslog Protocol  
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 SNMP  
RFC 3417 Transport Mappings for the SNMP  
RFC 3418 MIB for SNMP  
RFC 3635 Definitions of Managed Objects for the Ethernet-like Interface Types

## Multicast Support

Bootstrap Router for PIM-SM  
IGMP & MLD snooping switches  
IGMP Proxy  
IGMP Snooping  
RFC 1112 Host extensions for IP multicasting  
RFC 2236 Internet Group Management Protocol, version 2 (IGMPv2)  
RFC 2362 PIM-SM  
RFC 2715 Interoperability Rules for Multicast Routing Protocols  
RFC 3376 IGMPv3

## Open Shortest Path First (OSPF)

Graceful OSPF Restart  
OSPF Link-local Signaling  
OSPF Restart Signaling  
OSPF TE Extensions  
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 3101 OSPF Not-So-Stubby Area (NSSA) Option  
RFC 3509 Alternative Implementations of OSPF Area Border Routers

## Quality of Service

Differentiated Services  
IEEE 802.1p Priority Tagging  
Combined strict priority & WRR queuing  
RFC 2211 Specification of the Controlled-Load Network Element Service  
RFC 2474 Definition of the Differentiated Services Field (DS Field)  
RFC 2475 An Architecture for Differentiated Services  
RFC 2597 Assured Forwarding PHB Group  
RFC 2697 A Single-Rate Three-Color Marker  
RFC 2698 A Two-Rate Three-Color Marker  
RFC 3246 Expedited Forwarding PHB (Per-Hop Behavior)

## Redundancy

EPSR Ethernet Protection Switched Rings  
IEEE 802.1D Spanning Tree Protocol (STP) - MAC Bridges  
IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)  
IEEE 802.1t - 2001 802.1D maintenance  
IEEE 802.1w - 2001 Rapid Spanning Tree Protocol (RSTP)  
RFC 3768 Virtual Router Redundancy Protocol (VRRP)

## Routing Protocols

RFC 1058 Routing Information Protocol (RIP)  
RFC 2453 RIP version 2

## Security Features

802.1x Authentication protocols (TLS, TTLS & PEAP)  
IEEE 802.1x Port Based Network Access Control Port Security (intrusion detection)  
Bridge Protocol Data Unit Protection  
RFC 2246 TLS Protocol v1.0  
RFC 3546 Transport Layer Security (TLS) Extensions  
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  
SSH Remote Login  
SSLv2  
SSLv3

## 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 1305 Network Time Protocol, version 3 (NTPv3)  
RFC 1350 Trivial File Transfer Protocol (TFTP)  
RFC 1985 SMTP Service Extension  
RFC 2049 MIME  
RFC 2554 SMTP Service Extension for Authentication  
RFC 2821 Simple Mail Transfer Protocol (SMTP)  
RFC 2822 Internet Message Format  
SCP Secure Copy

## VLAN Support

IEEE 802.1ad VLAN double tagging (Q-in-Q)  
IEEE 802.1Q Virtual LANs  
IEEE 802.1v VLAN classification by protocol & port  
IEEE 802.3ac VLAN tagging



# SWITCHBLADE® x908 | Advanced Layer 3 Modular Switch

## Ordering Information

### AT-SBx908

Advanced Layer 3 Modular Switch  
8 x 30 Gigabit Expansion Bays  
Order Number: 990-001305-00

Note that NO power supplies ship with the base chassis product, they must be ordered separately.

### Power supply and fan module

**AT-PWR05** Hot-swappable AC load-sharing power supply  
Order number: 990-002013-zz

**AT-PWR05-80<sup>6</sup>** Hot-swappable DC load-sharing power supply  
Order number: 990-002107-80

**AT-PWR07<sup>7</sup>** PoE power supply  
Order number: 990-002110-zz

Where zz = 10 for U.S. power cord  
20 for no power cord  
30 for U.K. power cord  
40 for Asia/Pacific power cord  
50 for European power cord

**AT-FAN03<sup>8</sup>** Spare Fan Module  
Order number: 990-002032-00

### Expansion Modules

**AT-XEM-IXP**  
1 x 10GbE (XFP)  
Order number: 990-000997-00

**AT-XEM-12S**  
12 x 100/1000BASE-X SFP ports  
Order number: 990-000998-00

**AT-XEM-12T**  
12 x 10/100/1000BASE-T (RJ-45) ports  
Order number: 990-000999-00

**AT-XEM-STK<sup>9</sup>**  
Stacking XEM Module  
Order number: 990-001626-00

### XEM Stacking Cables

**AT-XEM-STK-CBL0.5**  
0.5 meter stacking cable  
Order number: 990-002063-00

**AT-XEM-STK-CBL2.0**  
2.0 meter stacking cable  
Order number: 990-002064-00

### Rear Chassis Stacking Cable

**AT-HS-STK-CBL1.0**  
1.0 meter stacking cable  
Order number: 990-002116-00

### SFP Modules<sup>10</sup>

**AT-SPFXBD-LC-13**  
100BASE-BX Bi-Di (1310nm Tx, 1550 Rx) fiber up to 15km

**AT-SPFXBD-LC-15**  
100BASE-BX Bi-Di (1550nm Tx, 1310 Rx) fiber up to 15km

**AT-SPFX/2**  
100BASE-FX 1310nm fiber up to 2km

**AT-SPFX/15**  
100BASE-FX 1310nm fiber up to 15km

**AT-SPFX/40**  
100BASE-FX 1310nm fiber up to 40km

**AT-SPTX**  
10/100/1000 BASE-T 100m Copper

**AT-SPSX**  
**1000BASE-SX**  
GbE multi-mode 850nm fiber

**AT-SPLX10**  
**1000BASE-LX**  
GbE single-mode 1310nm fiber up to 10km

**AT-SPLX40**  
**1000BASE-LX**  
GbE single-mode 1310nm fiber up to 40km

**AT-SPLX40/1550**  
**1000BASE-LX**  
GbE single-mode 1550nm fiber up to 40km

**AT-SPZX80**  
**1000BASE-LX**  
GbE single-mode 1550nm fiber up to 80km

### 10GbE XFP Modules

#### For use with XEM-IXP

**AT-XPSR**  
**10GBASE-SR**  
850nm Short-haul, 300m with MMF

**AT-XPLR**  
**10GBASE-LR**  
1310nm Medium-haul, 10km with SMF

**AT-XPER40**  
**10GBASE-ER**  
1550nm Long-haul, 40km with SMF

### Feature licenses

**AT-FL-SBX9-01**  
SBx908 Advanced Layer 3 license:  
• OSPF  
• BGP4  
• PIMv4  
• VLAN double tagging (Q in Q)  
Order number: 980-000130

<sup>6</sup> Available Q2, 2008

<sup>7</sup> Available late 2008

<sup>8</sup> For spares only - Fan modules are included with chassis.

<sup>9</sup> The XEM-STK does not ship with any stacking cables.

<sup>10</sup> Please check with your sales representative for ROHS compliance on SFP modules

# SWITCHBLADE® x908 | Advanced Layer 3 Modular Switch

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## About Allied Telesis

Allied Telesis is part of the Allied Telesis Group. Founded in 1987, the company is a global provider of secure Ethernet/IP access solutions and an industry leader in the deployment of IP Triple Play networks over copper and fiber access infrastructure. Our POTS-to-10G iMAP integrated Multiservice Access Platform and iMG intelligent Multiservice Gateways, in conjunction with advanced switching, routing and WDM-based transport solutions, enable public and private network operators and service providers of all sizes to deploy scalable, carrier-grade networks for the cost-effective delivery of packet-based voice, video and data services. Visit us online at [www.alliedtelesis.com](http://www.alliedtelesis.com).

## Service and Support

Allied Telesis provides value-added support services for its customers under its Net.Cover programs. For more information on Net.Cover support programs available in your area, contact your Allied Telesis sales representative or visit our website.

## RoHS

Allied Telesis RoHS-compliant product conforms to the European Union Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic equipment. Allied Telesis ensures RoHS conformance by requiring supplier Declarations of Conformity, monitoring incoming materials, and maintaining manufacturing process controls.

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