x900-12X AND 24X SERIES

Advanced Gigabit Layer 3+ Expandable Switches

x900-24XT
2 x 60Gbps expansion bays
24 x 10/100/1000BASE-T (RJ-45) copper ports

x900-24XT-N
NEBS Compliant[1]
2 x 60Gbps expansion bays
24 x 10/100/1000BASE-T (RJ-45) copper ports

x900-24XS
2 x 60Gbps expansion bays
24 x 100/1000BASE-X SFP ports

x900-12XT/S
1 x 60Gbps expansion bay
12 x combo ports (10/100/1000BASE-T copper or SFP)

Unmatched Flexibility

The x900 Layer 3+ switches have high-speed 60Gbps expansion bays which provide a high level of port flexibility and application versatility unmatched by any other 1RU Gigabit Ethernet switch on the market. The expansion modules can be used in a variety of configurations to provide tailored solutions that meet wide-ranging physical networking requirements.

10GbE expansion modules and hot-swappable XFPs provide high-speed, high-capacity fiber uplinks, with the option of either 10Gbps or 20Gbps uplink capacity to the network core. Resiliency can be achieved by using 10GbE modules and MSTP (802.1s) for fast failover on link failure. This is suitable for wiring closet aggregation of gigabit to the desktop links and aggregating gigabit uplinks from other network switches.

Ethernet Protected Switched Rings (EPSR) and 10 GbE modules allow several x900-24X switches 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.

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Key Features

Performance

- Layer 2 and 3 switching and routing at wire-speed
- Full IPv4 routing
- IPv6 routing option
- Built from a 168Gbps switch fabric yielding 71.4 Million packets per second performance (x900-24X)
- Provides up to 256K IPv4 route entries
- Supports full 4096 VLANs
- Supports 4096 Layer 3 interfaces
- VLAN double tagging
- Private VLANs, providing security and port isolation of multiple customers using the same VLAN
- Supports 10KB Jumbo frame size for data center and server aggregation applications
- Gigabit SFP ports will support any combination of 10/100/1000BASE-T, 100BASE-X, or 1000BASE-X SFPs
- Extensive wire-speed traffic classification for ACLs and QoS
- Advanced routing protocols OSPF, BGP-4, RIP, RIPv2, RIPng, PIM-SM.
- DHCP Option 82
- Wire-speed multicasting

Reliability and Future Proofing

- 60Gbps expansion bays support a choice of modules, including 1x 10GbE, 12 x 1GbE (SFP), 12 x 1GbE (RJ45), and stacking, for port flexibility and application versatility
- 1RU form factor, high port density and front-to-back cooling, ideal for high density rack and wiring closet installations
- For the x900-24X: Eliminates the need for redundant power supplies by providing power supplies that are hot-swappable and load-sharing
- Full environmental monitoring of PSUs, fans, temperature and internal voltages, with SNMP traps to alert network managers in case of any failure

Quality of Service

- Policy based QoS features
- Highly configurable traffic classification
- Buffered multiple packet remarking options at egress on all ports, and on each of 8 egress queues per port
- Two-rate three-color (green, yellow, red) bandwidth metering
- Low switching latency essential for Voice over IP (VoIP) and real-time streaming media applications

Resiliency

- Stack multiple units with the XEM-STK[2]
- STP, RSTP, MSTP (802.1s)
- Port trunking (802.3ad LACP)
- VRRP
- EPSR

Management

- Out of band 10/100/1000 Ethernet management port and asynchronous 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
- 802.1x support
- RMON (4 groups)

[1] *NEBS (Network Equipment Building System) is a series of safety and conformance standards applied to telecommunications equipment in North America.*

[2] *AlliedWare Plus software release 5.2.1 supports stacking of 2 x900-24X units. Support for more than 2 x900-24X units and the x900-12XT/S will be in a future release.*

x900-12X AND 24X SERIES | Advanced Gigabit Layer 3+ Expandable Switches

Combined with one or two 12-port 10/100/1000BASE-T (RJ-45) copper expansion modules, the x900 is ideal for gigabit to the desktop or gigabit aggregation applications. The 12 x 100/1000BASE-X (SFP) expansion modules offer variable port options, designed for aggregating mixed copper and fiber links in server farms and data center applications.

x900 Layer 3+ switches provide maximum Gigabit Ethernet port density in a compact 1RU chassis. Their high degree of flexibility future-proofs your investment against changes in network infrastructure, topologies, and physical link requirements.

Reliability

Dual hot-swappable AC or -48V DC load-sharing power supplies packaged in the x900-24X 1RU rack mount chassis, provide the ultimate in space saving, reliability and resiliency. These features, combined with front-to-back cooling, make the x900 series perfect for the high-density rack environment where space is at a premium.

Policy-Based Quality of Service

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 x900 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. For enterprise customers, the x900 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.

Performance

The x900-24X is a powerful Layer 3+ switch with a 168Gbps switching fabric, achieving wire-speed switching and routing performance with a forwarding rate of 71.4Mpps. It can support up to two wire-speed 10GbE ports for high performance, high capacity network applications.

The x900-12XT/S is a powerful Layer 3+ switch with a 84Gbps switching fabric, achieving wire-speed switching and routing performance with a forwarding rate of 35.7Mpps. It supports a 10GbE port for high performance, high capacity network applications.

Hardware Performance

Up to 256K IPv4 routes
Up to 16K MAC addresses maximum
Up to 4K layer 2 multicast groups
Up to 1K layer 3 IPv4 multicast groups
4K VLANs
512MB SDRAM
Separate packet buffer memory
64MB Flash Memory
Switching Fabric
- x900-24X 168Gbps
- x900-12XT/S 84Gbps

Forwarding Rate:
- x900-24X 71.4Mpps[3]
- x900-12XT/S 35.7Mpps[4]

Reliability

MTBF

x900-24X

With 1 PSU and 1 fan module: 93,700 hours
With 2 PSUs: 249,400 hours
(calculated using Telcordia SR-332 (Issue 1, May 2001) at 25°C ambient operating temperature)

x900-12XT/S

MTBF 103,000 hours

Power Characteristics

AC Voltage: 100 to 240V (+/-10% auto ranging)
Frequency: 47 to 63Hz
DC Voltage: 40 to 60V

Power Consumption

x900-24X

With 1 PSU and 1 fan module:
110 Watts (375 BTU/hr)
With 2 PSUs and 2 XEM-1XP modules:
191 Watts (652 BTU/hr)

x900-12XT/S

With 1 XEM-12: 104 Watts (355 BTU/hr)
With no XEM: 68 Watts (232 BTU/hr)

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:
-25°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)

Physical Dimensions

Height: 44.5mm (1.75")
Width: 440mm (16.7")
Depth: x900-24X: 440mm (16.7")[5]
x900-12XT/S: 350mm (13.2")[5]
Mounting: 19" rack mountable, 1RU form-factor

Weights

x900-24X:

With 1 PSU and 1 fan module:
7.3kg (16.1lbs), and 8.8kg (19.4lbs) packaged.
With 2 PSUs and 2 XEM-1XP modules:
9.3kg (20.5lbs), and 10.8kg (23.8lbs) packaged

x900-12XT/S:

No XEM: 5.3kg (11.6lbs), and 7.9kg (17.3lbs) packaged
With XEM-1XP fitted: 6.0kg (13.2lbs), and 8.6kg (18.9lbs) packaged

AT-PWR01 (AC or DC):

1.0kg, and packaged 1.8kg (3.9lbs) (AC) or 1.5kg (3.3lbs) (DC)

AT-FAN01:

0.6kg (1.3lbs), and 1.4kg (3.1lbs) packaged

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

NEBS: GR63, GR1089 level 3
x900-24XT-N and XEM-12S.

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

Country of Origin

Singapore

[3] *With two 12 x 1GbE expansion modules (SFP or RJ45) installed.*

[4] *With one 12 x 1GbE expansion modules (SFP or RJ45) installed.*

[5] *This depth measurement excludes the PSU handles.*

Standards and Protocols

AlliedWare Plus™ Operating System Software 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 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 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)
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

IPv6 Support

RFC 1886 DNS Extensions to support IPv6
RFC 1981 Path MTU Discovery for IPv6
RFC 2460 IPv6 specification
RFC 2461 Neighbour Discovery for IPv6
RFC 2462 IPv6 Stateless Address Autoconfiguration
RFC 2463 ICMPv6
RFC 2464 Transmission of IPv6 Packets over Ethernet Networks
RFC 2526 Reserved IPv6 Subnet Anycast Addresses
RFC 2711 IPv6 Router Alert Option
RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers
RFC 3056 Connection of IPv6 Domains via IPv4 Clouds
RFC 3484 Default Address Selection for IPv6
RFC 3513 IPv6 Addressing Architecture
RFC 3587 IPv6 Global Unicast Address Format

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 2080 RIPng for IPv6
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

Ordering Information

AT-x900-24XT

Advanced Gigabit Layer 3+ Expandable Switch
2 x High Speed Expansion Bays + 24 x 10/100/1000BASE-T (RJ-45) ports

1 PSU and fan only module
AT-x900-24XT-P-xx
990-002144-xx

2 PSUs
AT-x900-24XT-DP-P-zz
990-0002145-zz

AT-x900-24XT-N

NEBS Compliant Advanced Gigabit Layer 3+ Expandable Switch
2 x High Speed Expansion Bays + 24 x 10/100/1000BASE-T (RJ-45) ports

1 PSU and fan only module
AT-x900-24XT-N-P-85
Order number: 990-002151-85

2 PSUs
AT-x900-24XT-N-DP-P-85
Order number: 990-002152-85

AT-x900-24XS

Advanced Gigabit Layer 3+ Expandable Switch
2 x High Speed Expansion Bays +
24 x 100/1000BASE-X SFP ports

1 PSU and fan only module
AT-x900-24XS-P-xx
990-002146-xx

2 PSUs
AT-x900-24XS-DP-P-zz
990-0002147-zz

Where xx = 00 or 60 for all power cords
20 for no power cord
80 for 48V DC power supply

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
80 for 48V DC power supply

Power supply and fan module

AT-PWR01 Hot-swappable load-sharing power supply
Order number: 990-001084-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
80 for 48v DC power supply

AT-FAN01 Fan only module
Order number: 990-001085-00

AT-x900-12XT/S

Advanced Gigabit Layer 3+ Expandable Switch
1 x High Speed Expansion Bay + 12 x combo ports (10/100/1000BASE-T copper or SFP)
1 fixed AC PSU
Order number: 990-001940-60 (with power cords)
Order number: 990-001940-20 (without power cords)

Expansion Modules

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

AT-XEM-12S NEBS compliant
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[6]
2 x High Speed Stacking Ports
Order number: 990-001626-00

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

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

SFP Modules

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-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-SPTX[7]
10/100/1000BASE-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-ZX
GbE single-mode 1550nm fiber up to 80km

10GbE XFP Modules
For use with XEM-1XP

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-X900-01
x900 Advanced Layer 3 license:
- OSPF
- BGP4
- PIMv4
- VLAN double tagging (Q in Q)

Order number: 980-000127

AT-FL-X900-02[8]
x900 IPv6 Pack:
- IPv6 Static Routes
- IPv6 Management
- RIPng

Order number: 980-000128

[6] *The XEM-STK ships with no stacking cables.*

[7] *The AT-SPTX SFP is not supported on the x900-12XT/S.*

[8] *Available late 2008*

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.

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: www.alliedtelesis.com

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