x900-48

Enhanced Fast Ethernet Layer 3+ Switch

x900-48FE

48 x 10/100BASE-T copper ports
4 x 1000BASE-X SFP uplinks

x900-48FS

48 x 100BASE-X SFP ports (Fiber only)
4 x 1000BASE-X SFP uplinks

Industry-leading Features

The x900-48 offers performance, flexibility, and reliability, packaged in a compact 1RU standard rack mount chassis. The x900-48 is a highly featured access solution that incorporates a new generation switching core for wire-speed Layer 3 IPv4 and IPv6 routing, exceptional Quality of Service (QoS) features, and a robust hardware design with dual hot-swappable power supplies.

Policy-Based Per-Flow Quality of Service

Comprehensive, low latency QoS features operating at wire-speed provide flow-based traffic management with full classification, prioritization, traffic shaping and min/max bandwidth profiles. The x900-48 QoS features are ideal for service providers who want 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 x900-48 QoS features protect productivity by guaranteeing the performance of business-critical applications (including VoIP services), and help to restore and maintain the responsiveness of enterprise applications in the workplace.

Reliability

At 1RU high, with front-to-back cooling and load-sharing power supplies, the x900-48 is perfect for high-density rack environments where conditions are demanding and space is limited. The dual hot-swappable power supplies (available in both 100/240VAC and -48VDC PSU versions) eliminate the need for an external redundant power supply and provide reliability and redundancy for maximum service uptime.

Flexible Uplinks

Four hot-swappable gigabit SFP uplink ports can be aggregated to provide a total of 4Gbps of uplink bandwidth, and can support any combination of gigabit copper, or short haul and long haul fiber SFP modules. This flexibility of uplink interface options caters for multiple applications and connectivity requirements.

Power to Perform

The x900-48 top-of-the-line, multilayer switch is built to meet the needs of high performance network services. Together with Allied Telesis' advanced software feature set, AlliedWare, the x900-48 is a superior access switching solution, bringing true intelligence to the edge.

Fiber to the Home (FTTH)

With 48 100BASE-X SFP ports and four gigabit SFP uplinks, best-in-class QoS, 50°C operating temperature, and dual hot-swappable AC or DC power supplies, the high-density low-cost-per-port x900-48FS switch is the perfect solution for FTTH. Advanced QoS allows service providers to guarantee delivery of Triple Play content, while the x900-48FS high reliability guarantees maximum uptime, whether in a central office or roadside cabinet. The x900-48FS main ports support both single BiDi 100BASE-BX and dual-fiber 100BASE-FX hot-swappable SFPs, and the four uplink ports support gigabit fiber or copper SFPs.

Fiber to the Desk (FTTD)

Secure connections to the desktop are only guaranteed by using fiber. The x900-48FS is the ideal solution for FTTD, satisfying the security and budget requirements demanded by government agencies. With 48 100BASE-X SFP ports and four gigabit SFP uplinks, front-to-back cooling, and dual hot-swappable AC or DC power supplies, the x900-48FS switch delivers high reliability and low-cost-per-port.

Stress tested

All Allied Telesis products are strenuously tested using Highly Accelerated Life Test (HALT) and Highly Accelerated Stress Screening (HASS) procedures. Under the Allied Telesis HALT regimen, products are tested well past specified tolerance limits for heat, cold, vibration, shocks, and drops, to ensure that they are more than robust enough for real-world conditions.

x900-48 | Enhanced Fast Ethernet Layer 3+ Switch

Key Features

Performance

- Layer 2 and 3 IPv4 switching and routing all at wire-speed
- 37.6Gbps switch fabric yielding 13.1 Million packets per second performance
- Provides up to 256K Layer 3 address table entries
- Supports full 4096 VLANS with VLAN double tagging
- Private VLANs, providing security and port isolation of multiple customers using the same VLAN
- Supports 4096 Layer 3 interfaces
- Gigabit SFP ports will support any combination of 1000BASE-T, 1000BASE-SX, 1000BASE-LX or 1000BASE-ZX SFPs
- Extensive wire-speed traffic classification for ACLs and QoS
- Advanced routing protocols OSPF, BGP4, RIP and RIPv2, DVMRP, PIM-SM, PIM-DM
- Full IPv4 and IPv6 routing
- Wire-speed multicasting
- Supports equal cost multi path (ECMP) routing in hardware

Availability

- 1RU form factor, high port density and front to back cooling, ideal for high density rack and wiring closet installations
- Internal dual hot-swappable AC or DC load-sharing power supplies remove the need for an expensive and rack space wasting redundant power supply (RPS)
- 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 (QoS)

- 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

Resiliency

- MSTP (802.1s)
- SNMP MIB to monitor QoS traffic counters
- DHCP Snooping
- DHCP Option 82
- Management stacking
- EPSR
- Port trunking (802.3ad LACP)

Management

- Asynchronous management port on the front panel for ease of access
- A CompactFlash port, accessible via the front panel, enables configurations and other files to be saved or transferred between switches
- Port mirroring
- SSH and SNMPv3 for secure management
- SNMPv3 with extensive MIB support
- 802.1x support
- TACACS+

Performance

Reliability

MTBF
300,000 hours with 2 PSUs

Acoustic noise

46.0 dB

Power Characteristics

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

Power Consumption

85 Watts (290 BTU/hour) maximum

Environmental Specifications

Operating Temperature Range:
0°C to 50°C (32°F to 122°F)

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: 440mm (16.7")
Mounting: 19" rack mountable, 1RU form-factor
Weight: (x900-48FE with one AT-PWR01) 7.1kg (15.7lbs) unpackaged, 7.3kg (20.1lbs) packaged
Ship dimensions: 580mm / 22.84 inches x 530mm / 20.87 inches x 145mm / 5.71 inches (L x W x D)
AT-PWR01/AT-PWR02
Height: 40.6mm (1.6")
Width: 2225mm (8.9")
Depth: 130mm (5.1")
PSU weight: 1.0kg (2.2lbs) unpackaged or 1.8kg (4.0lbs) packaged

Electrical Approvals and Compliances

EMC: EN55022 class A, FCC class A, VCCI class A
Immunity: EN55024, EN61000-3-2/3

Safety

UL60950-1, CAN/CSA-C22.2 No. 60950-1-03, EN60950, AS/NZS60950.1
Certification: UL, cUL, TUV

Restrictions on Hazardous Substances (RoHS) Compliance

EU RoHS Compliant

Country of Origin

Singapore

Standards and Protocols

AlliedWare® Operating System Software Version 2.9.1

BGP-4

RFC 1771 Border Gateway Protocol 4
RFC 1997 BGP Communities Attribute
RFC 1998 Multi-home Routing
RFC 3065 Autonomous System Confederations for BGP
RFC 2842 Capabilities Advertisement with BGP-4
RFC 2858 Multiprotocol Extensions for BGP-4
RFC 2918 Route Refresh Capability for BGP-4
RFC 2439 BGP Route Flap Damping
RFC 2385 Protection of BGP Sessions via the TCP MD5 Signature Option

Encryption

RFC 2104 HMAC
RFC 2451 The ESP CBC-Mode Cipher Algorithms
FIPS 180 SHA-1
RFC 1321 MD5
FIPS 186 RSA
FIPS 46-3 DES
FIPS 46-3 3DES

Ethernet

RFC 894 Ethernet II Encapsulation
IEEE 802.1D MAC Bridges
IEEE 802.1Q Virtual LANs
IEEE 802.1v VLAN Classification by Protocol and Port
IEEE 802.2 Logical Link Control
IEEE 802.3ab 1000BASE-T
IEEE 802.3ac VLAN TAG
IEEE 802.3ad (LACP) Link Aggregation
IEEE 802.3u 100BASE-T
IEEE 802.3x Full Duplex Operation
IEEE 802.3z Gigabit Ethernet
GARP
GVRP

General Routing

RFC 768 UDP
RFC 791 IP
RFC 792 ICMP
RFC 1256 ICMP Router Discovery Messages
RFC 793 TCP
RFC 2822 Internet Message Format
RFC 826 ARP
RFC 903 Reverse ARP
RFC 925 Multi-LAN ARP
RFC 950 Subnetting, ICMP
RFC 1812 Router Requirements
RFC 1027 Proxy ARP
RFC 1055 SLIP
RFC 1122 Internet Host Requirements
RFC 1144 Van Jacobson's Compression
RFC 1288 Finger
RFC 2390 Inverse Address Resolution Protocol
RFC 2131 DHCP
RFC 1542 BootP
RFC 2132 DHCP Options and BOOTP Vendor Extensions.
RFC 3046 DHCP Relay Agent Information Option
RFC 3993 Subscriber-ID Suboption for DHCP Relay Agent Option
RFC 1035 DNS
RFC 1582 RIP on Demand Circuits
RFC 1918 IP Addressing
RFC 1701 GRE
RFC 1702 GRE over IPv4
RFC 3232 Assigned Numbers
RFC 1332 The PPP Internet Protocol Control Protocol (IPCP)
RFC 1334 PPP Authentication Protocols
RFC 1570 PPP LCP Extensions
RFC 1661 The Point-to-Point Protocol (PPP)
RFC 1762 The PPP DECnet Phase IV Control Protocol (DNCP)
RFC 1877 PPP Internet Protocol Control Protocol Extensions for Name Server Addresses
RFC 1962 The PPP Compression Control Protocol (CCP)
RFC 1968 The PPP Encryption Control Protocol (ECP)
RFC 1974 PPP Stac LZS Compression Protocol
RFC 1978 PPP Predictor Compression Protocol
RFC 1990 The PPP Multilink Protocol (MP)
RFC 1994 PPP Challenge Handshake Authentication Protocol (CHAP)
RFC 2125 The PPP Bandwidth Allocation Protocol (BAP) / The PPP Bandwidth Allocation Control Protocol (BACP)
RFC 2516 A Method for Transmitting PPP Over Ethernet (PPPoE)
RFC 2661 L2TP

High Availability

IEEE 802.1Q - 2003 MSTP (802.1s)
IEEE 802.1t - 2001 802.1D maintenance
IEEE 802.1w - 2001 RSTP
RFC 3619 EPSR

IPv6

RFC 3596 DNS Extensions to support IPv6
RFC 1981 Path MTU Discovery for IPv6
RFC 2080 RIPng for IPv6
RFC 3513 IPv6 Addressing Architecture
RFC 2375 IPv6 Multicast Address Assignments
RFC 2460 IPv6
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 2472 IPv6 over PPP
RFC 2526 Reserved IPv6 Subnet Anycast Addresses
RFC 3484 Default Address Selection for IPv6
RFC 2710 Multicast Listener Discovery (MLD) for IPv6
RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6
RFC 2711 IPv6 Router Alert Option
RFC 2529 Transmission of IPv6 over IPv4 Domains without Explicit Tunnels
RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers
RFC 3056 Connection of IPv6 Domains via IPv4 Clouds
RFC 3315 DHCPv6
RFC 3587 IPv6 Global Unicast Address Format
RFC 2365 Administratively Scoped IP Multicast
RFC 3307 Allocation Guidelines for IPv6 Multicast Addresses
RFC 2465 Allocation Guidelines for IPv6 Multicast AddressesManagement Information Base for IP Version 6: Textual Conventions and General Group
RFC 2466 Management Information Base for IP Version 6: ICMPv6 Group
RFC 2851 Textual Conventions for Internet Network Addresses

Management

RFC 1155 MIB
RFC 1157 SNMP
RFC 1212 Concise MIB definitions
RFC 1213 MIB-II
RFC 1643 Ethernet MIB
RFC 1493 Bridge MIB
RFC 2790 Host MIB
RFC 1515 Definitions of Managed Objects for IEEE 802.3 MAUs
RFC 1573 Evolution of the Interfaces Group of MIB-II
RFC 1657 Definitions of Managed Objects for BGP-4 using SMIv2
RFC 1757 RMON (groups 1,2,3 and 9)
RFC 2011 SNMPv2 MIB for IP using SMIv2
RFC 2012 SNMPv2 MIB for TCP using SMIv2
RFC 2096 IP Forwarding Table MIB
RFC 3768 VRRP
RFC 2576 Coexistence between V1, V2, and V3 of the Internet-standard Network Management Framework
RFC 2578 Structure of Management Information Version 2 (SMIv2)
RFC 2579 Textual Conventions for SMIv2
RFC 2580 Conformance Statements for SMIv2
RFC 2665 Definitions of Managed Objects for the Ethernet-like Interface Types
RFC 2674 Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering and Virtual LAN Extensions (VLAN)
RFC 2856 Textual Conventions for Additional High Capacity Data Types
RFC 3164 Syslog Protocol
RFC 3410 Introduction and Applicability Statements for Internet-Standard Management Framework
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 the SNMP
RFC 3416 Version 2 of the Protocol Operations for SNMP
RFC 3417 Transport Mappings for the SNMP
RFC 3418 MIB for SNMP
draft-ietf-bridge-8021x-00.txt Port Access Control MIB
CDP

OSPF

RFC 1245 OSPF protocol analysis
RFC 1246 Experience with the OSPF protocol
RFC 2328 OSPFv2
RFC 3101 The OSPF Not-So-Stubby Area (NSSA) Option
RFC 1587 The OSPF NSSA Option

QoS

RFC 1349 Type of Service in the IP Suite
RFC 2205 Reservation Protocol
RFC 2211 Controlled-Load
RFC 2475 An Architecture for Differentiated Services
IEEE 802.1p Priority Tagging
RFC 2697 A Single Rate Three Color Marker
RFC 2698 A Two Rate Three Color Marker

RIP

RFC 1058 RIPv1
RFC 1723 RIPv2

Security

RFC 959 FTP
RFC 1413 IDP
RFC 1492 TACACS
RFC 1779 X.500 String Representation of Distinguished Names.
RFC 1858 Fragmentation
RFC 2865 RADIUS
RFC 2866 RADIUS Accounting
RFC 2868 RADIUS Attributes for Tunnel Protocol Support
RFC 3580 IEEE 802.1X Remote Authentication Dial In User Service (RADIUS) Usage Guidelines
RFC 2459 X.509 Certificate and CRL profile
RFC 2510 PKI X.509 Certificate Management Protocols
RFC 2511 X.509 Certificate Request Message Format
RFC 2559 PKI X.509 LDAPv2
RFC 2585 PKI X.509 Operational Protocols
RFC 2587 PKI X.509 LDAPv2 Schema
Diffie-Hellman
draft-grant-tacacs-02.txt TACACS+
Draft-IETF-PKIX-CMP-Transport-Protocols-01 Transport Protocols for CMP
draft-ylonen-ssh-protocol-00.txt SSH Remote Login Protocol
IEEE 802.1x Port Based Network Access Control
PKCS #10 Certificate Request Syntax Standard

Services

RFC 2821 SMTP
RFC 854 Telnet Protocol Specification
RFC 855 Telnet Option Specifications
RFC 856 Telnet Binary Transmission
RFC 857 Telnet Echo Option
RFC 858 Telnet Suppress Go Ahead Option
RFC 932 Subnetwork addressing scheme
RFC 1305 NTPv3
RFC 1091 Telnet terminal-type option
RFC 1179 Line printer daemon protocol
RFC 1350 TFTP
RFC 1510 Network Authentication
RFC 2049 MIME
RFC 1985 SMTP Service Extension
RFC 2156 MIXER
RFC 1945 HTTP/1.0
RFC 2068 HTTP/1.1

SSL

RFC 2246 The TLS Protocol Version 1.0
draft-freier-ssl-version3-02.txt SSLv3

Ordering Information

Note:

xx = 00 for all power cords (x900-48FE and x900-48FE-N only)
20 for no power cord
60 for all power cords (x900-48SF only)
80 for 48V DC power supply

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-x900-48FE

Layer 3+ IPv4 and IPv6 switch:
48 x 10/1000BASE-T + 4 x 1000BASE-X SFP uplinks

1 PSU and 1 blanking plate*
AT-x900-48FE-xx
Order number: 990-000622-xx

2 PSUs
AT-x900-48FE-DP-zz
Order number: 990-001149-zz

AT-x900-48FS

Layer 3+ IPv4 and IPv6 switch:
48 x 100BASE-X SFP + 4 x 1000BASE-X SFP uplinks

1 PSU and 1 blanking plate*
AT-x900-48FS-xx
Order number: 990-002027-xx

2 PSUs
AT-x900-48FS-DP-zz
Order number: 990-002029-zz

IPv4 and BGP

The x900-48, which is shipped with 256MB SDRAM of memory, supports up to 256K IPv4 routes and 80K BGP routes. With 512MB SDRAM, the x900-48 supports up to 256K IPv4 routes and 292K BGP routes.

Power Supply Unit

AT-PWR01 hot-swappable load-sharing power supply module:
Ship dimensions: 286mm / 11.26 inches x 250mm / 9.84 inches x 145mm / 5.71 inches (L x W x D)
Order number: 990-001084-zz

AT-PWR02 hot-swappable load-sharing power supply module:
Ship dimensions: 286mm / 11.26 inches x 250mm / 9.84 inches x 145mm / 5.71 inches (L x W x D)
Order number: 990-001127-zz (zz cannot be 80)

NOTE:
- AT-PWR01 is for x900-48FE, and x900-48FS (DC) only
- AT-PWR02 is for x900-48FS (AC) only

They cannot be mixed.

SDRAM

AT-SD256B 256MB SDRAM
Order number: 990-001453-00

AT-SD512A 512MB SDRAM
Order number: 990-001346-00

CompactFlash

AT-CF128A 128MB CF Card
Order number: 990-000819-00

100 MB SFP modules (x900-48FS main ports only)

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

GbE SFP modules (uplinks only)

AT-SPTX
10/100/1000T 100m copper

AT-SPSX
GbE multi-mode 850nm fiber

AT-SPLX10
GbE single-mode 1310nm fiber up to 10km

AT-SPLX40
GbE single-mode 1310nm fiber up to 40km

AT-SPLX40/1550
GbE single-mode 1550nm fiber up to 40km

AT-SPZX80
GbE single-mode 1550nm fiber up to 80km

Feature Licenses

Note:

yyy= 00 for 1 temporary license
01 for 1 license
05 for 5 licenses
10 for 10 licenses
25 for 25 licenses
50 for 50 licenses
100 for 100 licenses
250 for 250 licenses

AT-AR-8900FL3UPGRD
AT-8900 full Layer 3 upgrade
- RSVP
- PIM DM
- PIM SM
- DVMRP
- VRRP

980 number: 980-10038-yyy

AT-8900ADVL3UPGRD
AT-8900 series advanced Layer 3 upgrade
- IPV6
- BGP-4

980 number: 980-10039-yyy

AT-AR-VLANDTAG
VLAN double tagging upgrade
980 number: 980-10041-yyy

AT-AR-3DES
3DES upgrade
980 number: 980-10000-yyy

* *A blanking plate is required when only one PSU is installed.*

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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