Allied Telesis

AT-8948

Multilayer IPv4 and IPv6 Switch

AT-8948

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

Industry-leading Features

The AT-8948 offers performance, flexibility, and reliability. Packaged in a compact 1RU standard rack mount chassis, the AT-8948 is a highly featured access solution incorporating 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 hot-swappable dual power supplies.

Policy-Based 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 AT-8948 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 (SLAs). For enterprise customers, the AT-8948 QoS features protect productivity by guaranteeing performance of business-critical applications including VoIP services, and help restore and maintain responsiveness of enterprise applications in the networked workplace.

IPv6 Capability

The AT-8948P (IPv6 option) is one of the few switches on the market today that can provide high performance wire-speed IPv6 unicast and multicast routing, and IPv6 QoS features. The AT-8948P pushes IPv6 capability to the network edge and allows IPv6 early-adopters to get a head start in the migration to next generation IPv6 networks.

Key Features

- Huge capabilities and flexibility compressed into 1RU form factor
- Front to back cooling for optimum rack/cabinet airflow
- Operating temperature to 50°C (122°F)
- Internal dual hot-swappable AC or DC load-sharing power supplies remove the need for an expensive and rack space wasting RPS
- Layer 2 and 3 IPv4 and IPv6 routing all at wire-speed [1]
- Built from a 37.6 Gbps switch fabric yielding 13.1 Million packets per second performance
- Provides 256K Layer 3 IPv4 address table entries [2]
- Supports full 4096 VLANS with VLAN double tagging
- Private VLANs
- Supports 4096 Layer 3 interfaces
- Fixed ports: 48 x 10/100T on the front panel
- 4 x SFP (Small Form Pluggable) gigabit uplinks on the front panel
- A Compact Flash port, accessible via the front panel, which enables configurations and other files to be saved or transferred between switches
- Asynchronous management port available via the front panel for ease of access
- SFP uplink ports will support any combination of 1000BASE-T, 1000BASE-SX, 1000BASE-LX or 1000BASE-ZX
- Full environmental monitoring, with alerts to network manager in case of failure of any PSU or FAN
- Extensive wire-speed traffic classification
- Policy-based QoS features
- Min / max bandwidth control with bandwidth slice resolution down to 1Kbps
- Buffered max bandwidth control at egress on all ports, and on each of 8 egress queues per port
- Three drop precedence (green, yellow and red) per priority queue on egress for improved TCP-IP bandwidth limiting performance
- SNMP MIB available for monitoring QoS traffic counters
- Low latency for voice and multi-media support
- SNMPv3 with extensive MIB support
- Advanced routing protocols OSPF, BGP-4, IS-IS, RIP and RIPv2, DVMRP, PIM-SM, PIM-DM
- Support for equal cost multi path (ECMP) routing in hardware
- Multiple Spanning Tree Protocol (MSTP) (802.1s)
- Management stacking
- Port trunking
- Port mirroring
- Wire-speed multicasting
- Secure SSH capability on management and access
- 802.1x support
- DHCP Snooping
- DHCP Option 82
- EPSR

[1] *An optional accelerator card is required to expand the IPv6 capability to wire-speed performance.*

[2] *For 256K Layer 3 IPv4 address table entries 256 MB SDRAM must be fitted.*

Reliability
Dual internal hot-swappable load-sharing power supplies provide ultimate space-saving reliability and redundancy for maximum service uptime. Both 110/240VAC and -48VDC PSU versions are available. There is no requirement for an external RPS, and combined with front-to-back cooling and a 1RU height, the AT-8948 is perfect for the high-density rack environment where conditions are demanding and space is at a premium.

Flexibility
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 AT-8948 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 AT-8948 is a superior access switching solution, bringing true intelligence to the edge.

Performance

Reliability
MTBF
AT-8948: 300,000 hours[3]

Acoustic noise
46.0 dB

Power Characteristics
AC Voltage: 100-240V AC ±10% auto ranging
Frequency: 47-63Hz
DC Voltage: 40-60V DC

Power Consumption
AT-8948A: 47 Watts (160 BTU/hour) maximum
AT-8948P: 90 Watts (307 BTU/hour) maximum

Environmental Specifications
Operating Temperature Range:
0°C – 50°C (32°F – 122°F)

Storage Temperature Range:
-25°C – 70°C (-13°F – 158°F)

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

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

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

Physical Dimensions
AT-8948:
Height: 44.5mm (1.75")
Width: 440mm (16.7")
Depth: 440mm (16.7")[4]
Mounting: 19" rack mountable, 1 RU form-factor
Weight: (AT-8948 including one AT-PWR01 and one AT-FAN01) 7.1 kg (15.7 lbs) unpackaged, 9.1 kg (20.1 lbs) packaged
Ship dimensions: 580mm / 22.84 inches x 530mm / 20.87 inches x 145mm / 5.71 inches (L x W x D)

AT-PWR01 and AT-FAN01
Height: 41mm (1.6")
Width: 225mm (8.9")
Depth: 130mm (5.1")
PSU weight (AT-PWR01) (AC or DC):
1.0 kg (2.2 lbs) unpackaged or 1.8 kg (4.0 lbs) packaged
Fan only module weight (AT-FAN01):
0.6 kg (1.3 lbs) unpackaged or 1.4 kg (3.1 lbs) packaged

Electrical Approvals & Compliances
EMC
EN55022 class A, FCC class A, VCCI class A
Immunity: EN55024, EN61000-3-2/3

Safety
UL60950, CAN/CSA-C22.2 No. 60950-00, EN60950, AS/NZS3260
Certification: UL, cUL, TUV

Country of Origin
Singapore

[3] *This is with two PSUs installed and a spare PSU carried.*

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

Standards and Protocols
Software Release 2.9.1

BGP-4
RFC 1771 Border Gateway Protocol 4
RFC 1966 BGP Router Reflection
RFC 1997 BGP Communities Attribute
RFC 1998 Multi-home Routing
RFC 2385 Protection of BGP Sessions via the TCP MD5 Signature Option
RFC 2439 BGP Route Flap Damping
RFC 2858 Multiprotocol Extensions for BGP-4
RFC 2918 Route Refresh Capability for BGP-4
RFC 3065 Autonomous System Confederations for BGP
RFC 3392 Capabilities Advertisement wiht BGP-4

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

Ethernet
RFC 894 Ethernet II Encapsulation
RFC 1321 MD5
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 793 TCP
RFC 826 ARP
RFC 903 Reverse ARP
RFC 925 Multi-LAN ARP
RFC 950 Subnetting, ICMP
RFC 1027 Proxy ARP
RFC 1035 DNS
RFC 1055 SLIP
RFC 1122 Internet Host Requirements
RFC 1142 OSI IS-IS Intra-domain Routing Protocol
RFC 1144 Van Jacobson's Compression
RFC 1256 ICMP Router Discovery Messages
RFC 1288 Finger
RFC 1332 The PPP Internet Protocol Control Protocol (IPCP)
RFC 1519 CIDR
RFC 1542 BootP
RFC 1552 The PPP Internetworking Packet Exchange Control Protocol (IPXCP)
RFC 1570 PPP LCP Extensions
RFC 1582 RIP on Demand Circuits
RFC 1661 The Point-to-Point Protocol (PPP)
RFC 1762 The PPP DECnet Phase IV Control Protocol (DNCP)
RFC 1812 Router Requirements
RFC 1877 PPP Internet Protocol Control Protocol Extensions for Name Server Addresses
RFC 1918 IP AddressingExtensions.

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 2125 The PPP Bandwidth Allocation Protocol (BAP) / The PPP Bandwidth Allocation Control Protocol (BACP)
RFC 2131 DHCP
RFC 2132 DHCP Options and BOOTP Vendor
RFC 2390 Inverse Address Resolution Protocol
RFC 2516 A Method for Transmitting PPP Over Ethernet (PPPoE)
RFC 2661 L2TP
RFC 2822 Internet Message Format
RFC 3046 DHCP Relay Agent Information Option
RFC 3232 Assigned Numbers
RFC 3993 Subscriber-ID Sub-option for DHCP Relay Agent Option
ISO 9542 End System to Intermediate System Protocol
http://www.iana.org/assignments/bootp-dhcp-parameters BootP and DHCP parameters

IP Multicasting

RFC 1075 DVMRP
RFC 1112 Host Extensions
RFC 2236 IGMPv2
RFC 2362 PIM-SM
RFC 2715 Interoperability Rules for Multicast Routing Protocols
RFC 3973 PIM-DM
draft-ietf-idmr-dvmrp-v3-9 DVMRP
draft-ietf-magma-snoop-02 IGMP and MLD snooping switches

IPv6

RFC 1981 Path MTU Discovery for IPv6
RFC 2080 RIPng for IPv6
RFC 2365 Administratively Scoped IP Multicast
RFC 2375 IPv6 Multicast Address Assignments
RFC 2460 IPv6
RFC 2461 Neighbour Discovery for IPv6
RFC 2462 IPv6 Stateless Address Autoconfiguration
RFCRFC 2463 ICMPv6
RFC 2464 Transmission of IPv6 Packets over Ethernet Networks
RFC 2465 Allocation Guidelines for Ipv6 Multicast Addresses
Management Information Base for IP Version 6: Textual Conventions and General Group
RFC 2466 Management Information Base for IP Version 6: ICMPv6 Group
RFC 2472 IPv6 over PPP
RFC 2526 Reserved IPv6 Subnet Anycast Addresses
RFC 2529 Transmission of IPv6 over IPv4 Domains without Explicit Tunnels
RFC 2710 Multicast Listener Discovery (MLD) for IPv6
RFC 2711 IPv6 Router Alert Option
RFC 2851 Textual Conventions for Internet Network Addresses
RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers
RFC 3056 Connection of IPv6 Domains via IPv4 Clouds
RFC 3307 Allocation Guidelines for IPv6 Multicast Addresses
RFC 3315 DHCPv6
RFC 3484 Default Address Selection for IPv6
RFC 3513 IPv6 Addressing Architecture
RFC 3587 IPv6 Global Unicast Address Format
RFC 3596 DNS Extensions to support IPv6
RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6

Management

RFC 1155 MIB
RFC 1157 SNMP
RFC 1212 Concise MIB definitions
RFC 1213 MIB-II
RFC 1493 Bridge MIB
RFC 1643 Ethernet MIB
RFC 1657 Definitions of Managed Objects for BGP-4 using SMIv2
RFC 2011 SNMPv2 MIB for IP using SMIv2
RFC 2012 SNMPv2 MIB for TCP using SMIv2
RFC 2096 IP Forwarding Table MIB
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 2790 Host MIB
RFC 2819 RMON (groups 1,2,3 and 9)
RFC 2856 Textual Conventions for Additional High Capacity Data Types
RFC 2863 The Interfaces Group MIB
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
RFC 3619 EPSR
RFC 3636 Definitions of Managed Objects for IEEE 802.3 MAUs
RFC 3768 VRRP
draft-ietf-bridge-8021x-00.txt Port Access Control MIB
IEEE 802.1AB LLDP

OSPF

RFC 1245 OSPF protocol analysis
RFC 1246 Experience with the OSPF protocol
RFC 2328 OSPFv2

QoS

RFC 2205 Reservation Protocol
RFC 2211 Controlled-Load
RFC 2474 DSCP
RFC 2475 An Architecture for Differentiated Services
RFC 2597 Assured Forwarding PHB
RFC 2697 A Single Rate Three Color Marker
RFC 2698 A Two Rate Three Color Marker
RFC 2819 RMON (groups 1,2,3 and 9)
RFC 2863 The Interfaces Group MIB
RFC 3246 Expedited Forwarding PHB
RFC 3636 Definitions of Managed Objects for IEEE 802.3 MAUs
IEEE 802.1p Priority Tagging
IEEE 802.1AB LLDP

RIP

RFC 1058 RIPv1
RFC 2082 RIPv2 MD5 Authentication
RFC 2453 RIPv2

Security

RFC 959 FTP
RFC 1413 IDP
RFC 1492 TACACS
RFC 1779 X.500 String Representation of Distinguished Names.
RFC 1858 Fragmentation
RFC 2284 EAP
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
RFC 2865 RADIUS
RFC 2866 RADIUS Accounting
RFC 2868 RADIUS Attributes for Tunnel Protocol Support
RFC 3280 X.509 Certificate and CRL profile
RFC 3580 IEEE 802.1X Remote Authentication Dial In User Service (RADIUS) Usage Guidelines
draft-grant-tacacs-02.txt TACACS+
Ddraft-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
Diffe-Hellman

Services

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
FRC 951 BootP
RFC 1091 Telnet terminal-type option
RFC 1179 Line printer daemon protocol
RFC 1305 NTPv3
RFC 1350 TFTP
RFC 1510 Network Authentication
RFC 1542 Clarifications and Extensions for the Bootstrap protocol
RFC 1945 HTTP/1.0
RFC 1985 SMTP Service Extension
RFC 2049 MIME
RFC 2156 MIXER
RFC 2284 EAP
RFC 2821 SMTP
RFC 3280 X.509 Certificate and CRL profile

SSL

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

STP / RSTP

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

AT-8948 | Multilayer IPv4 and IPv6 Switch

Ordering Information

AT-8948A-xx
4 x 1000BASE-X SFP uplink + 48 x 10/100BASE-T IPv4 and IPv6 switch with 128MB of SDRAM.
990 number: 990-10203-xx

AT-8948P-xx
4 x 1000BASE-X SFP uplink + 48 x 10/100BASE-T IPv4 and IPv6 switch with 256MB of SDRAM and an IPv6 accelerator card factory fitted.
990 number: 990-10206-xx

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

The AT-8948A-xx is shipped with 128MB SDRAM of memory that supports 15K IPv4 routes. With 256MB SDRAM or 512MB the AT-8948A-xx supports up to 256K IPv4 routes.

The AT-8948P-xx is shipped with 256MB SDRAM of memory that supports up to 256K IPv4 routes or 64K IPv6 routes.

Both the AT-8948A-xx and the AT-8948P-xx are shipped with 32MB SDRAM for Quality of Service packet buffering. Both the AT-8948A-xx and the AT-8948P-xx include a single PSU module and a fan only module (this is a blanking module containing cooling fans that occupies the spare PSU position. It is required when this PSU is not present).

IPv6 Accelerator Card
AT-ACC01 Wire-speed IPv6 accelerator card.
(A minimum of 256MB of SDRAM is required if this card is to be fitted)
990 number: 990-97705-00
FCC code: Class A
Ship weight: 0.6Kg / 1.4lbs
Ship dimensions: 320mm / 12.60 inches x 225mm / 8.86 inches x 63mm / 2.48 inches (L x W x D)

NB: Specifying the AT-8948P-xx will ensure that the IPv6 accelerator card and 256MB SDRAM will be factory fitted. Ordering of this card separately will require it to be retro-fitted, which must be performed by a qualified service technician.

SDRAM
AT-SD128A-00 128MB SDRAM
Order number: 990-12213-00

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

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

SFP modules
AT-SPTX
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

Power Supply Units
AT-PWR01-xx spare hot-swappable load-sharing power supply module for the AT-8948
990 number: 990-001084-xx

Where -xx = 10 for U.S. power cord
20 for no power cord
30 of U.K. power cord
40 for Asia/Pacific power cord
50 for European power cord
80 for 48V DC power supply

AT-FAN01-00 spare fan only blanking module for the AT-8948
990 number: 990-001085-00

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

980 number: 980-10038-00

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

980 number: 980-10039-00

AT-AR-VLANDTAG -00
VLAN double tagging upgrade
980-number: 980-10041-00

AT-AR-3DES-00
3DES upgrade
980 number: 980-10000-yyy

Where yyy= 00 for 1 shot
01 for 1 MTAC
05 for 5 MTACs
10 for 10 MTACs
25 for 25 MTACs
50 for 50 MTACs
100 for 100 MTACs
250 for 250 MTACs

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 & 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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