Allied Telesis

NEBS COMPLIANT

RAPIER 48w SWITCH

WAN Capable Layer 3 Fast Ethernet Switch

AT-RP48w

48 x 10/100BASE-T ports
2 x SFP ports
1 x NSM bay (supporting up to 4 PICs)

Performance

Allied Telesis' Rapier 48w Layer 3 10/100Mbps switch delivers an unprecedented level of integration and feature richness. With wirespeed Layer 2 switching and wirespeed Layer 3 IP routing on all ports, this switch is designed for high-performance desktop connectivity, workgroup and server farm aggregation or backbone applications. In addition to the impressive switching performance, the Rapier 48w brings a large set of optional high-level Layer 3 features for more advanced networking applications.

Progressive Features

The Rapier 48w Layer 3 switch comes complete with the feature rich operating system AlliedWare®, which includes Layer 3 IP Static Routing, RIP, RIPv2, VRRP and OSPFv2 routing protocols.

The Rapier 48w also includes an innovative "Find Me" feature allowing an individual switch to be located easily amongst other equipment.

Allied Telesis offers two optional feature licenses with the Rapier 48w, a Full Layer 3 upgrade and an Advanced Layer 3 upgrade.

The Full Layer 3 upgrade enables a set of additional routing protocols such as:

- DVMRP
- PIM-DM / PIM-SM
- RSVP

The Advanced Layer 3 upgrade provides a set of the specialized protocols, consisting of:

- IPv6
- BGP-4

Key Features

- Gigabit uplink modules for flexibility
- Option of AC or DC models
- Routing protocols including RIP v1/v2 and OSPF
- Layer 2/3/4 intelligence for traffic management
- 2.5RU
- NEBS Level 3 Compliant (DC model)

High Performance

- Wirespeed Layer 2 switching (port settings like ageing timer, mirroring, learning, trunking, link aggregation, port security)
- Wirespeed Layer 3 IP routing
- Wirespeed Layer 2/3/4+ filters (discard/forward/mirror/change priority)

Bandwidth Limiting

- Down to 64 Kbps ingress
- Down to 1 Mbps egress

Comprehensive Layer 2 Support

- 802.1Q port based VLAN (tagged)
- Up to 255 VLANs
- Static and Dynamic VLANs (GVRP, GARP)
- VLAN Relay, Private VLAN
- Up to 8,000 MAC Addresses
- Port security (MAC-based)

Quality of Service Features

- 802.1p (CoS)
- IP TOS/DiffServ
- 4 Queues per egress port (PQ/WRR/Bounded Delay WRR)
- Re-mapping CoS/ToS/DiffServ for ingress/egress
- QoS classifiers based on any of the following:
  - Port or VLAN
  - IP Source / Destination Address
  - TCP Source / Destination Port, Flag
  - UDP Source / Destination Port
  - Layer 4 protocol (ICMP, IGMP etc.)
  - IPX Destination Address, Source / Destination Socket, Packet type
  - MAC Source / Destination Address
  - Up to three 16-bit words inside the first 64 bytes of a packet

Multicast

- IGMP, IGMP snooping, IGMP proxy
- MVR
- Broadcast forwarding
- Static multicast forwarding
- PIM-SM, PIM-DM

Layer 3 Features

- IP RIPv1/v2
- OSPF v2
- VRRP
- BootP relay
- DNS relay

Resiliency

- Port Trunking with Link aggregation (802.3ad static) (LACP)
- STP/RSTP/MSTP (IEEE 802.1s)

Security

- SSH and SSL for management
- TACACS/TACACS+/RADIUS
- 802.1x port based access security
- Layer 2/3/4+ filters (permit or deny traffic)
- Storm control
- Remote Security Officer
- MD5 authentication
- PKI
- User Authentication Database

Management

- HTTP client/server
- Email client/SMTP
- CLI
- IP multihoming
- SNMPv3
- Trigger Facility
- RMON
- Management Stacking (proprietary)
- Editor
- Mail
- Configurable debugging
- Login banner
- LOAD via ASYN, TFTP, HTTP, LDAP
- Logging
- Scripting
- Multiple software image storage
- "Find Me" – switch locator feature ideal for large exchanges

RAPIER 48w SWITCH | Layer 3 Fast Ethernet Switch

Switching Features

The Rapier 48w includes a suite of advanced switching features such as IEEE 802.1Q VLAN Tagging, IGMPv2, 802.1p Traffic Prioritization of packets at Layer 3 and Layer 4, and broadcast and multicast traffic control. The Quality of Service (QoS) features offered by the Rapier 48w are particularly useful for Telco or Network Service Provider applications.

WAN Support - Rapier Switch/Router

The Rapier 48w supports an optional Network Services Module (NSM) with a variety of Port Interface Cards (PICs) to provide Wide Area Network connectivity for T1, DS3 and Asynchronous communications.

Bandwidth Limiting

The Rapier 48w switch comes with asymmetric, bidirectional bandwidth limiting at no additional cost. This is an ideal feature for customers needing to allocate the amount of bandwidth on a per port basis. With bandwidth limiting, network administrators can define throughput levels for each port and control access based on type of end user. These features are ideal for managing different applications like VoIP, Web browsing, video, email, and to regain control of traffic across the network. The bandwidth limiting on the Rapier 48w provides fine granularity with the ability to define ingress limits down to 64Kbps segments and egress limits down to 1Mbps segments. The segment definitions can be asymmetric and each port can be set to different values. An additional benefit is that loop back ports are not required.

Wirespeed Routing

A rich set of features is included to provide full support for multimedia Layer 4 applications. All switches include Layer 3 IP Static Routing, RIP, RIPv2, IGMPv2 and OSPFv2 routing protocols.

Summary of Features

Performance

Rapier 48w 9.6 x 2 = 19.2Gbps switching fabric, 10.1Mpps forwarding rate

14,880pps for 10Mbps Ethernet
148,800pps for 100Mbps Ethernet
1,488,000pps for 1000Mbps Ethernet

64MB RAM
32MB Flash Memory
350MHz PowerPC CPU

Latency

81 microseconds latency between 10Mbps ports
13 microseconds latency between 100Mbps ports
6 microseconds latency between 1000Mbps ports

Reliability

MTBF:
AT-RP48W AC Model 85,000 hours
AT-RP48W DC Model 65,000 hours
Fan Module 300,000 hours

Acoustics

61.0dB Maximum

Interface Connections

10/100TX Shielded RJ-45
1000X Multi-Mode fiber SC or MT
1000LX Single-Mode fiber SC
1000T Shielded RJ-45

Power Characteristics

Power: 100-240V AC Model
-40v to -60V DC Model
Power consumption max: 65W AC Model
95W DC Model

Environmental Specifications

Operating Temp: 0°C to 50°C (32°F to 122°F)
Non-Operating Temp: -25°C to 70°C (-13°F to 158°F)
Operating Humidity: 5% - 80% non-condensing
Non-Operating Humidity: 5% - 95% non-condensing

Physical Characteristics

Height 110mm (4.3")
Width 440mm (17.32")
Depth 230mm (9.0")
Unit weight: 7.0kg (15.5lbs)
Packaged weight: 8.5kg (18.7lbs)

Electrical/Mechanical Approvals

Electrical Safety: UL60950-1, CAN/CSA-C22.2 No. 60950-1-03, EN60950-1, AS/NZS 60950.1, EN 60825-1, 21 CFR 1040

Electromagnetic Compliance (AC model): FCC CFR47 Part 15 Class A, EN55022 Class A, VCCI Class A, AS/NZS CISPR22 Class A, EN61000-3-2/3, EN55024

Electromagnetic Compliance (DC model): FCC CFR47 Part 15 Class A

Standards and Protocols

Software Release 2.9.1

BGP-4

RFC 1771 Border Gateway Protocol 4
RFC 1966 BGP Route 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 with BGP-4

Ethernet

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 802.3ad (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 1144 Van Jacobson's Compression
RFC 1256 ICMP Router Discovery Messages
RFC 1288 Finger
RFC 1332 The PPP Internet Protocol Control Protocol (IPCP)
RFC 1378 The PPP AppleTalk Control Protocol (ATCP)
RFC 1518 CIDR
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 1701 GRE
RFC 1702 GRE over IPv4
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 Addressing
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 Extensions.
RFC 2390 Inverse Address Resolution Protocol
RFC 2516 A Method for Transmitting PPP Over Ethernet (PPPoE)
RFC 2822 Internet Message Format
RFC 2878 PPP Bridging Control Protocol (BCP)
RFC 2661 L2TP
RFC 3046 DHCP Relay Agent Information Option
RFC 3232 Assigned Numbers
RFC 3993 Subscriber-ID Sub-option for DHCP Relay Agent Option*
"IPX Router Specification", v1.2, Novell, Inc., Part Number 107-000029-001
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
RFC 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 3513 IPv6 Addressing Architecture
RFC 3315 DHCPv6
RFC 3484 Default Address Selection for IPv6
RFC 3587 IPv6 Global Unicast Address Format
RFC 3596 DNS Extensions to support IPv6
RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6

Frame Relay

RFC 1490, 2427 Multiprotocol Interconnect over Frame Relay
ANSI T1S1 Frame relay

Management

RFC 1155 MIB
RFC 1157 SNMP
RFC 1212 Concise MIB definitions
RFC 1213 MIB-II
RFC 1493 Bridge 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 3289 Management Information Base for the Differentiated Services Architecture
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 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
CDP

OSPF

RFC 1245 OSPF protocol analysis
RFC 1246 Experience with the OSPF protocol
RFC 1586 OSPF over Frame Relay
RFC 1793 Extending OSPF to Support Demand Circuits
RFC 2328 OSPFv2
RFC 3010 The OSPF Not-So-Stubby Area (NSSA) Option

QoS

RFC 2205 Reservation Protocol
RFC 2211 Controlled-Load
RFC 2474 DCSP in the IPv4 and IPv6 Headers
RFC 2475 An Architecture for Differentiated Services
RFC 2597 Assured Forwarding PHB Group
RFC 2697 A Single Rate Three Colour Marker
RFC 2698 A Two Rate Three Color Marker
RFC 3246 An Expedited Forwarding PHB (Per Hop Behavior)
IEEE 802.1p Priority Tagging

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+
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
Diffie-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
RFC 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 2217 Telnet Com Port Control Option
RFC 2821 SMTP

RAPIER 48w SWITCH | Layer 3 Fast Ethernet Switch

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

VoIP
RFC 2543 SIP
G.711 A/µ law Pulse code modulation (PCM) of voice frequencies
G.723.1 Dual rate speech coder for multimedia communications transmitting at 5.3 and 6.3 kbit/s
G.729 A/B (Optional) Coding of speech at 8 kbit/s using conjugate-structure algebraic-code-excited linear-prediction (CS-ACELP)
H.323 v2 Packet-based multimedia communications systems

X.25
RFC 1356 Multiprotocol Interconnect on X.25 and ISDN in the Packet Mode
ITU-T Recommendations X.25 (1988), X.121 (1988). X.25

Ordering Information

AT-RP48w-B-15
48 x 10/100Base-T (RJ-45)
Single AC PSU

AT-RP48w-B-85
48 x 10/100Base-T (RJ-45)
Single DC PSU with dual feeds
NEBS level 3 compliant

AT-FAN-04
Fan only module

WAN Access Options
Port Interface Card (PIC) Options

AT-AR020
Single software configurable E1/T1 interface that supports channelized / unchannelized Primary Rate ISDN / Frame Relay

AT-AR021S (V3)[1]
Single Basic Rate ISDN (S/T) interface

AT-AR024
Four asynchronous RS-232 interfaces to 115Kbps

[1] *AR021S (V3) requires AlliedWare® Operating System version 2.9.1-13 or later*

Network Service Modules

AT-AR040-B[2]
4 PIC slots

AT-AR048-B
1 unchannelised DS3 interface

SFP Modules

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

Software Upgrade Options

AT-AR-RPFL3UPGRD
Rapier Full Layer 3 Upgrade
- RSVP
- PIM DM / PIM SM
- DVMRP

AT-RPADVL3UPGRD
Rapier Series Advanced Layer 3 Upgrade
- IPv6
- BGP-4

[2] *Only two AT-AR020 allowed in AT-AR040-B.*

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 at www.alliedtelesis.com.

NEBS Compliance

Allied Telesis Network Equipment Building System (NEBS) compliant products adhere to the highest compliance level - NEBS Level 3. For additional information on NEBS Compliance and Allied Telesis NEBS compliant products, please visit us online at www.alliedtelesis.com.

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