x510 Series

STACKABLE GIGABIT SWITCHES

The Allied Telesis x510 Series of stackable Gigabit switches include a full range of security and resiliency features, coupled with easy management, making them the ideal choice for network access applications.

PoE plus

AlliedWare Plus™ OPERATING SYSTEM

Allied Telesis x510 Series switches are a high-performing and feature-rich choice for today's networks. They offer a versatile solution for enterprise applications. With a choice of 24-port and 48-port models with 10Gigabit uplink ports, plus the power of VCStack™ (Virtual Chassis Stacking), the x510 Series can connect anything from a small workgroup to a large business.

VCStack™

Easy management

The x510 Series runs the advanced AlliedWare Plus™ fully featured operating system, delivering a rich feature set and an industry-standard CLI. The CLI reduces training requirements and is consistent across all AlliedWare Plus devices, simplifying network management.

Network resiliency

The convergence of network services in the enterprise has led to increasing demand for highly available networks with minimal downtime. VCStack, in conjunction with link aggregation, provides a network with no single point of failure and an easy solution for resiliency in access applications. The addition of EPSRing™ resilient ring protocol ensures distributed network segments have high speed, resilient access to online resources and applications.

EPSRing™

The x510 Series can form a VCStack of up to four units for enhanced resiliency and simplified device management. Full EPSRing support and VCStack LD (Long Distance), which enables stacks to be created over long distance fiber links, make the x510 Series the perfect choice for distributed environments.

Reliable

The x510 Series was designed with reliability in mind, and guarantees continual delivery of essential services. With dual built-in power supplies and near-hitless online stack reconfiguration, reconfiguration and maintenance may be performed without affecting network uptime. Dual internal PSUs eliminate the need for an external Redundant Power Supply (RPS), which occupies valuable rack space. The x510 Series also features front-to-back cooling, making it ideal for data center applications.

Secure

Advanced security features protect the network from the edge to the core. Unprecedented control over user access is provided with Network Access Control (NAC), mitigating threats to network infrastructure. This ensures the network is accessed only by known users and devices — all users' adherence to network security policies is checked, and then either access is granted or remediation is offered. Secure access can also be provided for guests. A secure network environment is guaranteed. The x510 Series offers

powerful control over network traffic types, secure management options, loop guard to protect against cabling mistakes, and tri-authentication for comprehensive access control.

Future-proof

The x510 Series ensures a future-proof network, with superior flexibility coupled with the ability to stack multiple units. All x510 Series models come with 10 Gigabit uplinks ports and a comprehensive IPv6 feature set, to ensure they are ready for future network traffic demands.

Environmentally Friendly

The x510 Series supports Energy Efficient Ethernet, automatically reducing the power consumed by the switch whenever there is no traffic on a port. This sophisticated feature can significantly reduce operating costs by reducing the power requirements of the switch and any associated cooling equipment.

eco friendly

New Features

» Energy Efficient Ethernet (EEE)
» Find me
» DHCPv6
» PIM-SMv6
» VRRPv3
» MLDv2
» OSPFv3 authentication

Key Features

VCStack (Virtual Chassis Stacking)

» Create a Virtual Chassis Stack (VCStack) of up to four units with 40Gbps of stacking bandwidth to each unit. VCStack provides a highly available system where network resources are spread out across stacked units, reducing the impact if one of the units fails. Aggregating switch ports on different units across the stack provides excellent network resiliency.

EPSRing (Ethernet Protection Switched Ring)

» EPSRing and 10 Gigabit Ethernet allow several x510 switches to form a high speed protected ring capable of recovery within as little as 50ms. This feature is perfect for high performance and high availability in enterprise networks.

» Super-Loop Protection (SLP) enables a link between two EPSR nodes to be in separate EPSR domains, improving redundancy and network fault resiliency.

Industry-leading Quality of Service (QoS)

» Comprehensive low-latency wire-speed QoS provides flow-based traffic management with full classification, prioritization, traffic shaping and min/max bandwidth profiles. Enjoy boosted network performance and guaranteed delivery of business-critical Ethernet services and applications. Time-critical services such as voice and video take precedence over non-essential services such as file downloads, maintaining responsiveness of Enterprise applications.

Loop Protection

» Thrash limiting, also known as rapid MAC movement, detects and resolves network loops. It is highly user-configurable — from the rate of looping traffic to the type of action the switch should take when it detects a loop.

» With thrash limiting, the switch only detects a loop when a storm has occurred, which can potentially cause disruption to the network. To avoid this, loop detection works in conjunction with thrash limiting to send special Loop Detection Frame (LDF) packets that the switch listens for. If a port receives an LDF packet, you can choose to disable the port, disable the link, or send an SNMP trap. This feature can help to detect loops before a network storm occurs avoiding the risk and inconvenience of traffic disruption.

Power over Ethernet Plus (PoE+)

» With PoE, a separate power connection to media endpoints such as IP phones and wireless access points is not necessary. PoE+ reduces costs and provides even greater flexibility, providing the capability to connect devices requiring more power (up to 30 Watts)—for example, tilt and zoom security cameras.

Link Layer Discovery Protocol – Media Endpoint Discovery (LLDP – MED)

» LLDP-MED extends LLDP basic network endpoint discovery and management functions. LLDP-MED allows for media endpoint specific messages, providing detailed information on power requirements, network policy, location discovery (for emergency call services) and inventory.

Voice VLAN

» Voice VLAN automatically separates voice and data traffic into two different VLANs. This automatic separation places delay-sensitive traffic into a voice dedicated VLAN, which simplifies QoS configurations.

Multicast Support

» Multicast support ensures streaming video traffic is efficiently managed and forwarded in today's converged networks.

Open Shortest Path First (OSPFv3)

» OSPF is a scalable and adaptive routing protocol for IP networks. The addition of OSPFv3 adds support for IPv6 and further strengthens the Allied Telesis focus on next generation networking.

sFlow

» sFlow is an industry standard technology for monitoring high speed switched networks. It provides complete visibility into network use, enabling performance optimization, usage accounting/billing, and defense against security threats. Sampled packets sent to a collector ensure it always has a real-time view of network traffic.

Dynamic Host Configuration Protocol (DHCP) Snooping

» DHCP servers allocate IP addresses to clients, and the switch keeps a record of addresses issued on each port. IP source guard checks against this DHCP snooping database to ensure only clients with specific IP and/or MAC address can access the network. DHCP snooping can be combined with other features, like dynamic ARP inspection, to increase security in layer 2 switched environments, and also provides a traceable history, which meets the growing legal requirements placed on service providers.

Network Access Control (NAC)

» NAC allows for unprecedented control over user access to the network, in order to mitigate threats to network infrastructure. Allied Telesis x510 switches use 802.1x port-based authentication in partnership with standards-compliant dynamic VLAN assignment, to assess a user's adherence to network security policies, and either grant access or offer remediation.

» If multiple users share a port, then multi-authentication can be used. Different users on the same port can be assigned into different VLANs, and so given different levels of network access. Additionally, a guest VLAN may be configured to provide a catch-all for users who aren't authenticated.

Tri-authentication

» Authentication options on the x510 Series also include alternatives to 802.1x port-based authentication, such as web authentication to enable guest access and MAC authentication for end points that do not have an 802.1x supplicant. All three authentication methods—802.1x, MAC-based and Web-based—can be enabled simultaneously on the same port. This is called tri-authentication.

Premium Software License

» By default, the x510 Series offers a comprehensive Layer 2+ feature set that includes static L3 routing and IPv6 management features. The feature set can easily be elevated to full Layer 3 by applying the premium software license. This adds dynamic routing protocols and L3 multicasting capabilities.

Dynamic Host Configuration Protocol (DHCPv6)

» DHCPv6 is used to dynamically assign IPv6 addresses to hosts from a central location. Acting as DHCPv6 client enables the switch to receive an IPv6 address, and acting as server enables the switch to dynamically allocate IPv6 addresses to hosts. The DHCPv6 server and client both support the Prefix Delegation feature which allocates a whole IPv6 subnet to a DHCP client. The client, in turn, can allocate addresses from this subnet to the hosts that are connected to it.

Find Me

» In busy server rooms comprising of a large number of equipment racks, it can be quite a job finding the correct switch quickly among many similar units. The 'Find me' feature is a simple visual way to quickly identify the desired physical switch for maintenance or other purposes, by causing its LEDs to flash in a specified pattern.
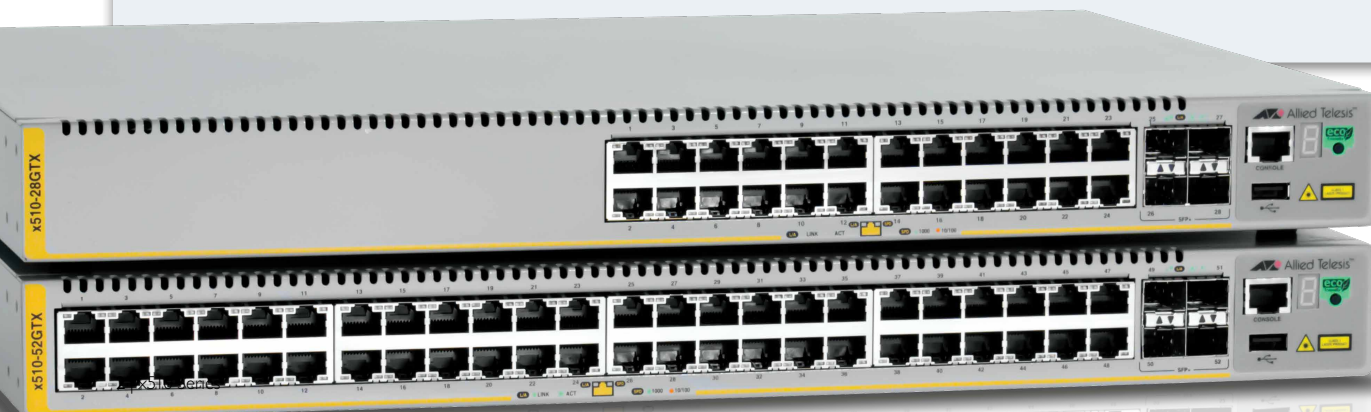
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Key Solutions
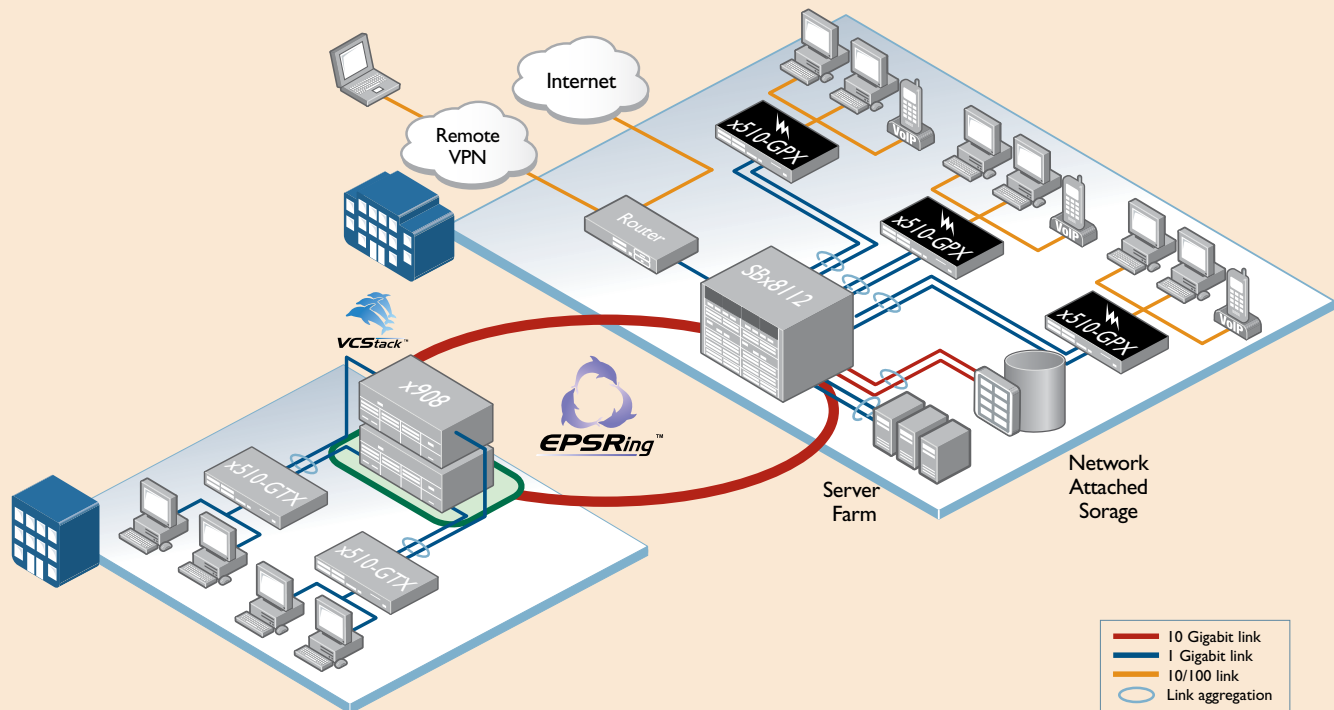
Peace of mind at the network edge

Allied Telesis x510 Series switches make the ideal choice at
the network edge where security, resiliency and flexibility
are required. In the above diagram, security is enforced
using Network Access Control (NAC) combined with tri-
authentication to prevent unauthorized users and devices from
connecting to the network. Link aggregations are used to provide
both resiliency back to the core switches and an increase in
available bandwidth over a single link. Flexibility is ensured with
the range of interface types and PoE options available on the
x510 Series and the ability to stack the switches if required.

x510 Series | Stackable Gigabit Switches

Specifications

PRODUCT	10/100/1000T (RJ-45) COPPER PORTS	100/1000X SFP PORTS	1/10 GIGABIT SFP+ PORTS	10 GIGABIT STACKING PORTS	MAX POE+ PORTS	SWITCHING FABRIC	FORWARDING RATE
AT-x510-28GTX	24	-	2	2*	-	128Gbps	95.2Mpps
AT-x510-28GPX	24	-	2	2*	24	128Gbps	95.2Mpps
AT-x510-28GSX		24	2	2*	-	128Gbps	95.2Mpps
AT-x510-52GTX	48	-	2	2*	-	228Gbps	130.9Mpps
AT-x510-52GPX	48	-	2	2*	48	228Gbps	130.9Mpps

* Stacking ports can be configured as additional 10G Ethernet ports when unit is not stacked

Performance
» 40Gbps of stacking bandwidth
» Supports 13kB Jumbo frames
» Wirespeed multicasting
» 4094 configurable VLANs
» Up to 16K MAC addresses
» Up to 2K IPv4 routes or up to 1K IPv6 routes
» 512MB DDR SDRAM, 64MB flash memory
» Packet buffer memory: AT-x510-28 - 2MB
　　　　　　　　　　　 AT-x510-52 - 4MB

Reliability
» Modular AlliedWare Plus Operating System
» Internal redundant power supply units (PSUs) load share, providing uninterrupted power and extra reliability
» Full environmental monitoring of PSUs, fans, temperature and internal voltages. SNMP traps alert network managers in case of any failure

Power Characteristics
» AC Voltage: 90 to 260V (auto-ranging)
» Frequency: 47 to 63Hz

Expandability
» Stack up to four units in a VCStack
» Premium license option for additional features
   (available in a future release)

Flexibility and compatibility
» SFP ports on AT-x510-28GSX switch support any combination of 10/100/1000T, 100FX, 100BX, 1000SX, 1000LX, 1000ZX or 1000ZX CWDM SFPs
» SFP+ ports will support any combination of 1000X, 1000SX, 1000LX, 1000ZX, 1000ZX CWDM SFPs or 10G-SR, 10G-LR SFP+ modules
» Stacking ports can be configured as 10G Ethernet ports
» Port speed and duplex configuration can be set manually or by auto-negotiation

Diagnostic Tools
» Built-In Self Test (BIST)
» Find-Me device locator
» Optical Digital Diagnostic Monitoring (DDM)
» Ping polling for IPv4 and IPv6
» Port mirroring
» TraceRoute for IPv4 and IPv6

General Routing
» Black hole routing
» Directed broadcast forwarding
» DNS relay
» Equal Cost Multi Path (ECMP) routing
» UDP broadcast helper (IP helper)

IPv6 Features
» DHCPv6 relay, DNSv6, and NTPv6
» IPv4 and IPv6 dual stack
» Device management over IPv6 networks with SNMPv6, Telnetv6 and SSHv6

Management
» Front panel 7-segment LED provides at-a-glance status and fault information
» Console management port on the front panel for ease of access
» Eco-friendly mode allows ports and LEDs to be disabled to save power
» Web-based Graphical User Interface (GUI)
» Industry-standard CLI with context-sensitive help
» Powerful CLI scripting engine and built-in text editor
» Comprehensive SNMP MIB support for standards-based device management
» Event-based triggers allow user-defined scripts to be executed upon selected system events
» USB interface allows software release files, configurations and other files to be stored for backup and distribution to other devices
» Port and MAC-based VLANs

Quality of Service
» Limit bandwidth per port or per traffic class down to 64kbps
» Wirespeed traffic classification with low latency essential for VoIP and real-time streaming media applications
» Policy-based QoS based on VLAN, Port, MAC and general packet classifiers
» Policy-based storm protection
» Extensive remarking capabilities
» Taildrop for queue congestion control
» Strict priority, weighted round robin or mixed scheduling

Resiliency Features
» Stacking ports can be configured as 10G Ethernet ports
» Control Plane Prioritization (CPP) ensures the CPU always has sufficient bandwidth to process network control traffic
» Dynamic link failover (host attach)
» EPSRing (Ethernet Protection Switched Rings)
» EPSR SuperLoop Protection (SLP)
» Long-Distance stacking (LD-VCStack)
» Loop protection: loop detection and thrash limiting
» PVST+ compatibility mode
» STP root guard
» VCStack fast failover minimizes network disruption

Security Features
» Port and VLAN-based Access Control Lists (ACLs)
» Configurable auth-fail and guest VLANs
» BPDU protection
» DHCP snooping, IP source guard and Dynamic ARP Inspection (DAI)
» DoS attack blocking and virus throttling
» Dynamic VLAN assignment
» MAC address filtering and MAC address lock-down
» Network Access and Control (NAC) features manage endpoint security
» Port-based learn limits (intrusion detection)
» Private VLANs provide security and port isolation for multiple customers using the same VLAN
» Secure Copy (SCP)
» Strong password security and encryption
» Tri-authentication: MAC-based, web-based and IEEE 802.1x
» Authentication, Accounting and Authorization (AAA)

Environmental Specifications
» Operating temperature range:
  0°C to 45°C (32°F to 113°F)
  Derated by 1°C per 305 meters (1,000 ft)
  Operation up to 50°C (122°F) for limited periods
» Storage temperature range:
  -25°C to 70°C (-13°F to 158°F)
» Operating relative humidity range:
  5% to 90% non-condensing
» Storage relative humidity range:
  5% to 95% non-condensing
» Operating altitude:
  3,048 meters maximum (10,000 ft)

Electrical Approvals and Compliances
» EMC: EN55022 class A, FCC class A, VCCI class A, ICES-003 class A
» Immunity: EN55024, EN61000-3-levels 2 (Harmonics), and 3 (Flicker) – AC models only

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
» China RoHS compliant

Country of Origin
» Singapore

Physical Specifications

PRODUCT	WIDTH	DEPTH	HEIGHT	MOUNTING	WEIGHT	
					UNPACKAGED	PACKAGED
AT-x510-28GTX	440 mm (17.32 in)	290 mm (11.46 in)	44 mm (1.73 in)	1RU Rack-mount	5.6 kg (12.3 lb)	7.6 kg (16.8 lb)
AT-x510-28GPX	440 mm (17.32 in)	320 mm (12.66 in)	44 mm (1.73 in)	1RU Rack-mount	6.3 kg (13.9 lb)	8.8 kg (19.4 lb)
AT-x510-28GSX	440 mm (17.32 in)	290 mm (11.46 in)	44 mm (1.73 in)	1RU Rack-mount	5.8 kg (12.8 lb)	7.8 kg (17.2 lb)
AT-x510-52GTX	440 mm (17.32 in)	290 mm (11.46 in)	44 mm (1.73 in)	1RU Rack-mount	6.0 kg (13.2 lb)	8.0 kg (17.6 lb)
AT-x510-52GPX	440 mm (17.32 in)	320 mm (12.66 in)	44 mm (1.73 in)	1RU Rack-mount	6.7 kg (14.8 lb)	9.2 kg (20.3 lb)

Power and Noise Characteristics

PRODUCT	NO POE LOAD			FULL POE+ LOAD			MAX POE POWER	MAX 15.4W POE PORTS	MAX 30W POE+ PORTS
	MAX POWER CONSUMPTION	MAX HEAT DISSIPATION	NOISE	MAX POWER CONSUMPTION	MAX HEAT DISSIPATION	NOISE			
AT-x510-28GTX	52W	180 BTU/h	45 dBA	-	-	-	-	-	-
AT-x510-28GPX	67W	230 BTU/h	45 dBA	530W	1800 BTU/h	55 dBA	370W	24	12
AT-x510-28GSX	74W	252 BTU/h	45 dBA	-	-	-	-	-	-
AT-x510-52GTX	86W	290 BTU/h	45 dBA	-	-	-	-	-	-
AT-x510-52GPX	93W	320 BTU/h	45 dBA	550W	1900 BTU/h	55 dBA	370W	24	12

Noise: tested to ISO7779; front bystander position

Latency (microseconds)

PRODUCT	SPEED			
	10MBPS	100MBPS	1GBPS	10GBPS
AT-x510-28GTX	117µs	14.4µs	4.4µs	3.1µs
AT-x510-52GTX	119µs	16.8µs	6.7µs	4.9µs

Standards and Protocols

AlliedWare Plus Operating System
Version 5.4.3

Authentication
RFC 1321   MD5 Message-Digest algorithm
RFC 1828   IP authentication using keyed MD5

Encryption
FIPS 180-1   Secure Hash standard (SHA-1)
FIPS 186   Digital signature standard (RSA)
FIPS 46-3   Data Encryption Standard (DES and 3DES)

Ethernet
IEEE 802.1AX Link aggregation (static and LACP)
IEEE 802.2   Logical Link Control (LLC)
IEEE 802.3   Ethernet
IEEE 802.3ab 1000BASE-T
IEEE 802.3ad Static and dynamic link aggregation
IEEE 802.3ae 10 Gigabit Ethernet
IEEE 802.3af Power over Ethernet (PoE)
IEEE 802.3at Power over Ethernet Plus (PoE+)
IEEE 802.3az Energy Efficient Ethernet (EEE)
IEEE 802.3u   100BASE-X
IEEE 802.3x   Flow control - full duplex operation
IEEE 802.3z   1000BASE-X

General 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 919   Broadcasting Internet datagrams
RFC 922   Broadcasting Internet datagrams in the presence of subnets
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 1542   Clarifications and extensions for BootP
RFC 1591   Domain Name System (DNS)
RFC 1812   Requirements for IPv4 routers
RFC 1918   IP addressing
RFC 2581   TCP congestion control

IPv6 Features
RFC 1981   Path MTU discovery for IPv6
RFC 2460   IPv6 specification
RFC 2464   Transmission of IPv6 packets over Ethernet networks
RFC 3484   Default address selection for IPv6

RFC 3596   DNS extensions to support IPv6
RFC 4007   IPv6 scoped address architecture
RFC 4193   Unique local IPv6 unicast addresses
RFC 4291   IPv6 addressing architecture
RFC 4443   Internet Control Message Protocol (ICMPv6)
RFC 4861   Neighbor discovery for IPv6
RFC 4862   IPv6 Stateless Address Auto-Configuration (SLAAC)
RFC 5014   IPv6 socket API for source address selection
RFC 5095   Deprecation of type 0 routing headers in IPv6
RFC 5175   IPv6 Router Advertisement (RA) flags option
RFC 6105   IPv6 Router Advertisement (RA) guard

Management
AT Enterprise MIB
SNMPv1, v2c and v3
IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
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 the SNMP
RFC 1227   SNMP MUX protocol and MIB
RFC 1239   Standard MIB
RFC 2011   SNMPv2 MIB for IP using SMIv2
RFC 2012   SNMPv2 MIB for TCP using SMIv2
RFC 2013   SNMPv2 MIB for UDP using SMIv2
RFC 2096   IP forwarding table MIB

RFC 2578	Structure of Management Information v2 (SMIv2)
RFC 2579	Textual conventions for SMIv2
RFC 2580	Conformance statements for SMIv2
RFC 2674	Definitions of managed objects for bridges with traffic classes, multicast filtering and VLAN extensions
RFC 2741	Agent extensibility (AgentX) protocol
RFC 2787	Definitions of managed objects for VRRP
RFC 2819	RMON MIB (groups 1,2,3 and 9)
RFC 2863	Interfaces group MIB
RFC 3164	Syslog protocol
RFC 3176	sFlow: a method for monitoring traffic in switched and routed networks
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 the SNMP
RFC 3417	Transport mappings for the SNMP
RFC 3418	MIB for SNMP
RFC 3621	Power over Ethernet (PoE) MIB
RFC 3635	Definitions of managed objects for the Ethernet-like interface types
RFC 3636	IEEE 802.3 MAU MIB
RFC 4188	Definitions of managed objects for bridges
RFC 4318	Definitions of managed objects for bridges with RSTP
RFC 4560	Definitions of managed objects for remote ping, traceroute and lookup operations
RFC 6527	Definitions of managed objects for VRRPv3

Multicast Support

IGMP query solicitation
IGMP snooping
IGMP/MLD multicast forwarding (IGMP/MLD proxy)
MLD snooping (v1 and v2)

RFC 2236	Internet Group Management Protocol v2 (IGMPv2)
RFC 3376	IGMPv3

Quality of Service (QoS)

IEEE 802.1p	Priority Tagging
RFC 2211	Specification of the Controlled-Load Network Element Service
RFC 2474	DiffServ Precedence for 8 queues/port
RFC 2475	DiffServ Architecture
RFC 2597	DiffServ Assured Forwarding (AF)
RFC 2697	A Single-Rate Three-Color Marker
RFC 2698	A Two-Rate Three-Color Marker
RFC 3246	DiffServ Expedited Forwarding (EF)

Resiliency Features

IEEE 802.1D	MAC bridges
IEEE 802.1s	Multiple Spanning Tree Protocol (MSTP)
IEEE 802.1w	Rapid Spanning Tree Protocol (RSTP)
RFC 5798	Virtual Router Redundancy Protocol version 3 (VRRPv3) for IPv4 and IPv6

Security Features

SSH remote login
SSLv2 and SSLv3
TACACS+ accounting and authentication
IEEE 802.1X authentication protocols (TLS, TTLS, PEAP and MD5)
IEEE 802.1X multi-supplicant authentication
IEEE 802.1X port-based network access control

RFC 2246	TLS protocol v1.0
RFC 2865	RADIUS
RFC 2866	RADIUS accounting
RFC 2868	RADIUS attributes for tunnel protocol support
RFC 3546	Transport Layer Security (TLS) extensions
RFC 3579	RADIUS support for Extensible Authentication Protocol (EAP)
RFC 3580	IEEE 802.1x RADIUS usage guidelines
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

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 1350	Trivial File Transfer Protocol (TFTP)
RFC 1985	SMTP service extension
RFC 2049	MIME
RFC 2131	DHCPv4 (server, relay and client)
RFC 2132	DHCP options and BootP vendor extensions
RFC 2554	SMTP service extension for authentication
RFC 2616	Hypertext Transfer Protocol - HTTP/1.1
RFC 2821	Simple Mail Transfer Protocol (SMTP)
RFC 2822	Internet message format
RFC 3046	DHCP relay agent information option (DHCP option 82)
RFC 3315	DHCPv6 (server, relay and client)
RFC 3633	IPv6 prefix options for DHCPv6
RFC 3646	DNS configuration options for DHCPv6
RFC 3993	Subscriber-ID suboption for DHCP relay agent option
RFC 4330	Simple Network Time Protocol (SNTP) version 4
RFC 5905	Network Time Protocol (NTP) version 4

VLAN Support

Generic VLAN Registration Protocol (GVRP)
IEEE 802.1Q   Virtual LAN (VLAN) bridges
IEEE 802.1v   VLAN classification by protocol and port
IEEE 802.3ac VLAN tagging

Voice over IP (VoIP)

LLDP-MED   ANSI/TIA-1057
Voice VLAN

Ordering Information

Feature Licenses

NAME	DESCRIPTION	INCLUDES
AT-FL-x510-01	x510 premium license*	» RIP » OSPF » PIMv4-SM, DM & SSM » EPSR master » VLAN double tagging (Q in Q) » RIPng » OSPFv3 » MLDv1 & v2 » PIMv6-SM

* Premium license available in the near future

Switches

AT-x510-28GTX-xx
24-port 10/100/1000T stackable switch with 4 SFP+ ports and 2 fixed power supplies

AT-x510-28GPX-xx
24-port 10/100/1000T PoE+ stackable switch with 4 SFP+ ports and 2 fixed power supplies

AT-x510-28GSX-xx
24-port 100/1000X SFP stackable switch with 4 SFP+ ports and 2 fixed power supplies

AT-x510-52GTX-xx
48-port 10/100/1000T stackable switch with 4 SFP+ ports and 2 fixed power supplies

AT-x510-52GPX-xx
48-port 10/100/1000T PoE+ stackable switch with 4 SFP+ ports and 2 fixed power supplies

Where xx = 10 for US power cord
20 for no power cord
30 for UK power cord
40 for Australian power cord
50 for European power cord

1000Mbps SFP Modules

AT-SPTX
1000T 100 m copper

AT-SPSX
1000SX GbE multi-mode 850 nm fiber up to 550 m

AT-SPEX
1000X GbE multi-mode 1310 nm fiber up to 2 km

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

AT-SPLX10/I
1000LX GbE single-mode 1310 nm fiber up to 10 km industrial temperature

AT-SPBD10-13
1000LX GbE Bi-Di (1310 nm Tx, 1490 nm Rx) fiber up to 10 km

AT-SPBD10-14
1000LX GbE Bi-Di (1490 nm Tx, 1310 nm Rx) fiber up to 10 km

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

AT-SPZX80
1000ZX GbE single-mode 1550 nm fiber up to 80 km

100Mbps SFP Modules

AT-SPFX/2
100FX multi-mode 1310 nm fiber up to 2 km

AT-SPFX/15
100FX single-mode 1310 nm fiber up to 15 km

AT-SPFXBD-LC-13
100BX Bi-Di (1310 nm Tx, 1550 nm Rx) fiber up to 10 km

AT-SPFXBD-LC-15
100BX Bi-Di (1550 nm Tx, 1310nm Rx) fiber up to 10 km

100Mbps SFP modules are only compatible with the SFP ports on the AT-x510-28GSX switch.

10GbE SFP+ Modules

AT-SP10SR
10GSR 850 nm short-haul, 300 m with MMF

AT-SP10LR
10GLR 1310 nm medium-haul, 10 km with SMF

AT-SP10TW1
1 meter SFP+ direct attach cable

AT-SP10TW3
3 meter SFP+ direct attach cable

AT-SP10TW7
7 meter SFP+ direct attach cable

Stacking Modules

AT-StackXS/1.0
1 meter stacking cable
(includes 2 stacking modules)

AT-StackOP/0.3
Optical stacking module
850 nm short-haul, 300 m with MMF
(Two modules required per switch)

AT-StackOP/9.0
Optical stacking module
1310 nm medium-haul, 9 km with SMF
(Two modules required per switch)