x320-10GH

Gigabit Layer 3 PoE++ Switch

The Allied Telesis x320-10GH Gigabit Layer 3 PoE++ switch offers an impressive set of features in a compact design. Flexible PoE capabilities support the high power devices found in today's smart buildings and business environments.

Overview
Allied Telesis x320-10GH is secure and reliable, with advanced power connectivity features – and provides great value to meet the needs of today's connected business, with the ability to provide up to 90 Watts of PoE power on all ports.

Flexible PoE
The x320-10GH supports commonly used PoE standards, providing the 15.4 Watts of PoE (802.3af), the 30 Watts of PoE+ (802.3at), and the 60 or 90 Watts of PoE++ (802.3bt[1]).

Continuous PoE
Continuous PoE allows the x320-10GH to be restarted without affecting the supply of power to connected devices. Smart lighting, security cameras, and other PoE devices will continue to operate during a software upgrade on the switch.

Powerful Network Management
Meeting the increased management requirements of modern converged networks, Allied Telesis Autonomous Management Framework™ (AMF) automates many everyday tasks including configuration management. The complete network can be managed as a single virtual device with powerful centralized management features. Growing the network can be accomplished with plug-and-play simplicity, and network node recovery is fully zero-touch.

AMF secure mode increases network security with management traffic encryption, authorization, and monitoring. AMF Guestnode allows third party devices, such as IP phones and security cameras, to be part of an AMF network.

Network resiliency
Allied Telesis Ethernet Protection Switched Ring (EPSRing™), and the standards-based G.8032 Ethernet Ring Protection, ensure that distributed network segments have high-speed, resilient access to online resources and applications.

Secure
A secure network environment is guaranteed. The x320-10GH offers powerful control over network traffic types, secure management options, loop guard to protect against cabling mistakes, and tri-authentication for comprehensive access control.

The x320-10GH uses 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 solutions. Tri-authentication ensures the network is only accessed by designated users and devices. Secure access is also available for guests.

Security from malicious network attacks is provided by a comprehensive range of features such as DHCP snooping, STP root guard, BPDU protection, and access control lists. Each of these can be configured to perform a variety of actions upon detection of a suspected attack or malfunctions.

Environmentally friendly
The x320-10GH supports Energy Efficient Ethernet (EEE), 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.

The x320-10GH is fanless, providing silent operation, which makes it ideal for work area deployment.

Key Features

- AlliedWare Plus Enterprise-class operating system
- Allied Telesis Autonomous Management Framework™ (AMF)
- Up to 90 Watts of PoE power per port
- Continuous PoE
- EPSRing™ and G.8032 for resilient rings
- Energy Efficient Ethernet saves power
- Active Fiber Monitoring
- Static and dynamic routing
- Fanless design for silent operation
- Flexible deployment
- Wide operating temperature range

[1] Support for the 802.3bt standard coming soon

Key Features

Allied Telesis Autonomous Management Framework™ (AMF)

- Allied Telesis Management Framework (AMF) is a sophisticated suite of management tools that provide a simplified approach to network management. Common tasks are automated or made so simple that the every-day running of a network can be achieved without the need for highly-trained, and expensive, network engineers. Powerful features like centralized management, auto-backup, auto-upgrade, auto- provisioning and auto-recovery enable plug-and-play networking and zero-touch management.
- AMF secure mode encrypts all AMF traffic, provides unit and user authorization, and monitors network access to greatly enhance network security.
- AMF Guest-node allows Allied Telesis wireless access points and further switching products, as well as third party devices such as IP phones and security cameras, to be part of an AMF network.

Power over Ethernet (PoE+ and PoE++)

- The x320-10GH supports up to 90 Watts (PoE++) on all ports. This enables powering high power devices such as high resolution PTZ cameras with heater/blowers for outdoor applications, enhanced infrared lighting and lighting controllers, remote Point of Sale (POS) kiosks, and more.

Flexible deployment

- The x320-10GH can operate from -10 to +55 degrees Celsius, and with a fanless design, is ideally suited for flexible deployment in smart buildings and other business environments.

PWR300 (External Power Supply)

- This PWR300 is the external Power Supply Unit (PSU) for x320-10GH. One PWR300 will power the switch and provide PoE power. Up to three PWR300 PSUs can be used to increase the available PoE power, and enable power supply redundancy.

Continuous PoE

- Continuous PoE allows the switch to be restarted without affecting the supply of power to connected devices. Smart lighting, security cameras, and other PoE devices will continue to operate during a software upgrade on the switch.

Ethernet Protection Switched Ring (EPSRing™)

- EPSRing allows several x320-10GH 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.

G.8032 Ethernet Ring Protection

- G.8032 provides standards-based high-speed ring protection, that can be deployed stand-alone, or interoperate with Allied Telesis EPSR.
- Ethernet Connectivity Fault Monitoring (CFM) proactively monitors links and VLANs, and provides alerts when a fault is detected.

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. Boosted network performance and guaranteed delivery of business-critical Ethernet services and applications are provided. Time-critical services such as voice and video take precedence over non-essential services such as file downloads, maintaining responsiveness of Enterprise applications.

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.

Open Shortest Path First (OSPFv2, OSPFv3)

- OSPF is a scalable and adaptive routing protocol for IP networks. The addition of OSPFv3 provides support for IPv6 and further strength for 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.

Active Fiber Monitoring (AFM)

- Active Fiber Monitoring prevents eavesdropping on fiber communications by monitoring received optical power. If an intrusion is detected, the link can be automatically shut down, or an operator alert can be sent.

Tri-authentication

- Authentication options on the x320-10GH also include alternatives to IEEE 802.1x port-based authentication, such as web authentication to enable guest access and MAC authentication for endpoints that do not have an IEEE 802.1x supplicant. All three authentication methods—IEEE 802.1x, MAC-based and Web-based—can be enabled simultaneously on the same port for tri-authentication.

TACACS+ Command Authorization

- Centralize control of which commands may be issued by a specific user of an AlliedWare Plus device. TACACS+ command authorization complements authentication and accounting services for a complete AAA solution.

Premium Software License

- By default, the x320-10GH offers a comprehensive Layer 2 and Lite Layer 3 feature set that includes static routing and IPv6 management features. The feature set can easily be elevated to Basic Layer 3 by applying the premium software license. This adds dynamic routing protocols and Layer 3 multicasting capabilities.

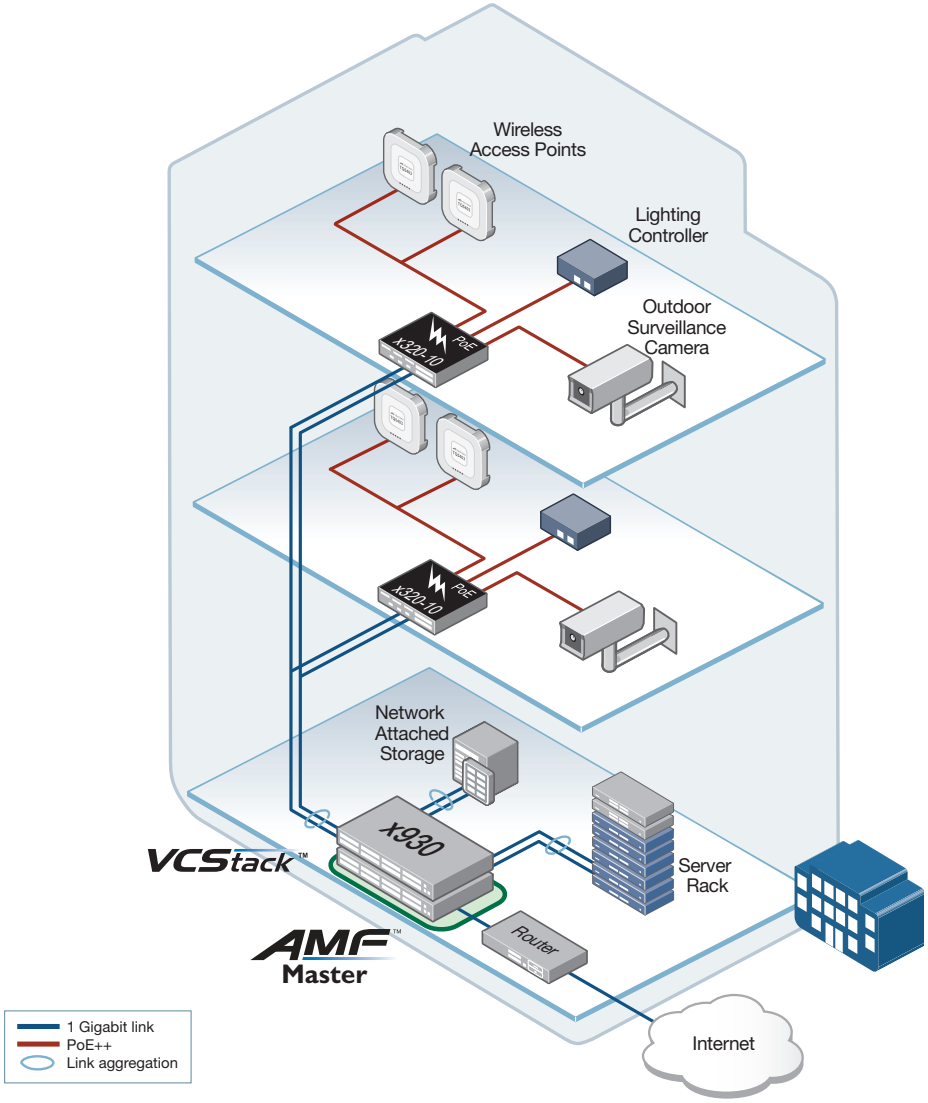
VLAN ACLs

- Simplify access and traffic control across entire segments of the network. Access Control Lists (ACLs) can be applied to a Virtual LAN (VLAN) as well as a specific port.

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.

Key Solutions



Enable today's smart buildings with flexible PoE

More than ever, PoE powered devices are converging on the Enterprise network to enable smooth business operation, with central management of building security and systems, as well as online user connectivity. The x320-10GH is ideal for these modern business networks, with flexible PoE provision to connect and power a wide range of network and IoT devices.

The x320-10GH provides up to 90 Watts of PoE power per port, and as shown in the diagram can support high-power devices such as high resolution outdoor PTZ cameras with heater/blowers, advanced LED lighting controllers and more.

With its fanless design for silent operation, and supporting a wide temperature range, the x320-10GH offers very flexible deployment options, and is an ideal solution for today's smart buildings and converged business networks.

Specifications

PRODUCT	POE++ ENABLED PORTS	1000X SFP PORTS	SWITCHING FABRIC	FORWARDING RATE
x320-10GH	8	2	24Gbps	14.9Mpps

Performance
- Supports 10KB jumbo frames
- Wire speed multicasting
- 4094 configurable VLANs
- Up to 16K MAC addresses
- Up to 2K multicast entries
- 512MB DDR3 SDRAM, 128MB NAND flash memory
- Packet buffer memory: 1.5MB

Reliability
- Modular AlliedWare Plus operating system
- Full environmental monitoring of PSU, fans, temperature and internal voltages. SNMP traps alert network managers in case of any failure

Expandability
- Versatile licensing options for additional features

Flexibility and Compatibility
- 1G-SFP ports on x320 will support any combination of Allied Telesis 1000Mbps SFP modules listed in this document under Ordering Information
- Port speed and duplex configuration can be set manually or by auto-negotiation

Diagnostic Tools
- Active Fiber Monitoring detects tampering on optical links
- Built-In Self Test (BIST)
- Cable fault locator (TDR)
- Connectivity Fault Management (CFM) - Continuity Check Protocol (CCP) for use with G.8032 ERPS
- Find-me device locator
- Automatic link flap detection and port shutdown
- Optical Digital Diagnostic Monitoring (DDM)
- Ping polling for IPv4 and IPv6
- Port mirroring
- Trace Route for IPv4 and IPv6
- Uni-Directional Link Detection (UDLD)

IPv4 Features
- Black hole routing
- Directed broadcast forwarding
- DNS relay
- Equal Cost Multi Path (ECMP) routing
- Policy-based routing
- Route maps and redistribution (OSPF and RIP)
- Static unicast and multicast routing for IPv4
- UDP broadcast helper (IP helper)

IPv6 Features
- DHCPv6 client and relay
- DNSv6 client and relay
- IPv4 and IPv6 dual stack
- IPv6 aware storm protection and QoS
- IPv6 hardware ACLs
- Device management over IPv6 networks with SNMPv6, Telnetv6 and SSHv6
- NTPv6 client and server
- Static unicast and multicast routing for IPv6
- Log to IPv6 hosts with Syslog v6

Management
- Allied Telesis Autonomous Management Framework (AMF) enables powerful centralized management and zero-touch device installation and recovery
- 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
- Comprehensive SNMP MIB support for standards-based device management
- Built-in text editor
- 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
- Management stacking allows up to 24 devices to be managed from a single console

Quality of Service
- 8 priority queues with a hierarchy of high priority queues for real time traffic, and mixed scheduling, for each switch port
- Limit bandwidth per port or per traffic class down to 64kbps
- Wire speed traffic classification with low latency essential for VoIP and real-time streaming media applications
- IPv6 QoS support
- Policy-based QoS based on VLAN, port, MAC and general packet classifiers
- Policy-based storm protection
- Extensive remarking capabilities
- Queue scheduling options for Strict priority, weighted round robin or mixed scheduling
- Type of Services (ToS) IP precedence and DiffServ marking based on layer 2, 3 and 4 headers

Resiliency Features
- 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) with Super-Loop Protection (SLP) and enhanced recovery for extra resiliency
- Loop protection: loop detection and thrash limiting
- PVST+ compatibility mode
- STP root guard

Security Features
- Access Control Lists (ACLs) based on layer 3 and 4 headers
- Configurable auth-fail and guest VLANs
- Authentication, Authorization and Accounting (AAA)
- Bootloader can be password protected for device security
- 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
- RADIUS group selection per VLAN or port
- Secure Copy (SCP)
- Secure File Transfer (SFTP) client
- Strong password security and encryption
- Tri-authentication: MAC-based, web-based and IEEE 802.1x
- Web-based authentication

Environmental Specifications
- Operating temperature range: -10°C to 55°C (14°F to 131°F)
- 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: 3,000 meters maximum (9,843 ft)

Electrical Approvals and Compliances
- EMC: EN55032 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

Restrictions on Hazardous Substances (RoHS) Compliance
- EU RoHS compliant
- China RoHS compliant

Physical Specifications

PRODUCT	WIDTH X DEPTH X HEIGHT	MOUNTING	WEIGHT		PACKAGED DIMENSIONS
			UNPACKAGED	PACKAGED	
x320-10GH	210 x 180 x 42.5 mm (8.26 x 7.08 x 1.67 in)	Rack-mount	1.6 kg	2.7 kg	417 x 336 x 151 mm (16.42 x 13.23 x 1.67 in)

Power Characteristics

PRODUCT	MAXIMUM POE POWER (using PWR300 redundant PSUs)	MAXIMUM POE PORTS SUPPORTED					NO POE LOAD		FULL POE LOAD	
		POE (7.5W)	POE (15.4W)	POE + (30W)	POE ++ (60W)	POE ++ (90W)	MAX POWER CONSUMPTION (W)	MAX HEAT DISSIPATION (BTU/H)	MAX POWER CONSUMPTION (W)	MAX HEAT DISSIPATION (BTU/H)
x320-10GH	240W (PWR300 x 1)	8	8	8	4	2	21	71	320	218
	480W (PWR300 x 2)	8	8	8	8	5			600	409
	720W (PWR300 x 3)	8	8	8	8	8			880	600

Latency (microseconds)

PRODUCT	PORT SPEED	
	100MBPS	1GBPS
x320-10GH	5.4µs	3.0µs

Standards and Protocols

AlliedWare Plus Operating System

Version 5.5.0

Authentication

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

Cryptographic Algorithms

FIPS Approved Algorithms

Encryption (Block Ciphers):

- AES (ECB, CBC, CFB and OFB Modes)
- 3DES (ECB, CBC, CFB and OFB Modes)

Block Cipher Modes:

- CCM
- CMAC
- GCM
- XTS

Digital Signatures & Asymmetric Key Generation:

- DSA
- ECDSA
- RSA

Secure Hashing:

- SHA-1
- SHA-2 (SHA-224, SHA-256, SHA-384. SHA-512)

Message Authentication:

- HMAC (SHA-1, SHA-2(224, 256, 384, 512)

Random Number Generation:

- DRBG (Hash, HMAC and Counter)

Non FIPS Approved Algorithms

RNG (AES128/192/256)
DES
MD5

Encryption (management traffic only)

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

Ethernet Standards

IEEE 802.2 Logical Link Control (LLC)
IEEE 802.3 Ethernet
IEEE 802.3ab 1000BASE-T
IEEE 802.3af Power over Ethernet (PoE)
IEEE 802.3at Power over Ethernet up to 30W (PoE+)
IEEE 802.3bt Power over Ethernet Plus Plus (PoE++)[1]
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

IPv4 Features

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 3056 Connection of IPv6 domains via IPv4 clouds
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 including AMF MIB and SNMP traps
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 1724 RIPv2 MIB extension
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

[1] Support for the 802.3bt standard coming soon

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

Bootstrap Router (BSR) mechanism for PIM-SM
IGMP query solicitation
IGMP snooping (IGMPv1, v2 and v3)
IGMP snooping fast-leave
IGMP/MLD multicast forwarding (IGMP/MLD proxy)
MLD snooping (MLDv1 and v2)
PIM for IPv6
RFC 1112 Host extensions for IP multicasting (IGMPv1)
RFC 2236 Internet Group Management Protocol v2 (IGMPv2)
RFC 2710 Multicast Listener Discovery (MLD) for IPv6
RFC 2715 Interoperability rules for multicast routing protocols
RFC 3306 Unicast-prefix-based IPv6 multicast addresses
RFC 3376 IGMPv3
RFC 3810 Multicast Listener Discovery v2 (MLDv2) for IPv6
RFC 3956 Embedding the Rendezvous Point (RP) address in an IPv6 multicast address
RFC 3973 PIM Dense Mode (DM)
RFC 4541 IGMP and MLD snooping switches
RFC 4601 Protocol Independent Multicast - Sparse Mode (PIM-SM): protocol specification (revised)
RFC 4604 Using IGMPv3 and MLDv2 for source-specific multicast
RFC 4607 Source-specific multicast for IP

Open Shortest Path First (OSPF)

OSPF link-local signaling
OSPF MD5 authentication
OSPF restart signaling
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 2740 OSPFv3 for IPv6
RFC 3101 OSPF Not-So-Stubby Area (NSSA) option
RFC 3509 Alternative implementations of OSPF area border routers
RFC 3623 Graceful OSPF restart
RFC 3630 Traffic engineering extensions to OSPF
RFC 4552 Authentication/confidentiality for OSPFv3
RFC 5329 Traffic engineering extensions to OSPFv3

Quality of Service (QoS)

IEEE 802.1p Priority tagging
RFC 2211 Specification of the controlled-load network element service
RFC 2474 DiffServ precedence for eight 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

ITU-T G.8023 / Y.1344 Ethernet Ring Protection Switching (ERPS)
IEEE 802.1ag CFM Continuity Check Protocol (CCP)
IEEE 802.1AX Link aggregation (static and LACP)
IEEE 802.1D MAC bridges
IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
IEEE 802.3ad Static and dynamic link aggregation
RFC 5798 Virtual Router Redundancy Protocol version 3 (VRRPv3) for IPv4 and IPv6

Routing Information Protocol (RIP)

RFC 1058 Routing Information Protocol (RIP)
RFC 2080 RIPng for IPv6
RFC 2081 RIPng protocol applicability statement
RFC 2082 RIP-2 MD5 authentication
RFC 2453 RIPv2

Security Features

SSH remote login
SSLv2 and SSLv3
TACACS+ accounting, authentication and authorisation (AAA)
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 2818 HTTP over TLS ("HTTPS")
RFC 2865 RADIUS authentication
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
RFC 5246 Transport Layer Security (TLS) v1.2
RFC 5280 X.509 certificate and Certificate Revocation List (CRL) profile
RFC 5425 Transport Layer Security (TLS) transport mapping for Syslog
RFC 5656 Elliptic curve algorithm integration for SSH
RFC 6125 Domain-based application service identity within PKI using X.509 certificates with TLS
RFC 6614 Transport Layer Security (TLS) encryption for RADIUS
RFC 6668 SHA-2 data integrity verification for SSH

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 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 802.1ad Provider bridges (VLAN stacking, Q-in-Q)
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

Feature Licenses

NAME	DESCRIPTION	INCLUDES
AT-FL-x320-01	x320 premium license	▶ OSPF (256 routes) ▶ PIMv4-SM, DM, and SSM ▶ RIPng (256 routes) ▶ OSPFv3 (256 routes) ▶ PIMv6-SM and SSM ▶ MLD v1/v2 ▶ VLAN double tagging (Q-in-Q)
AT-FL-x320-8032	ITU-T G.8032 license	▶ G.8032 ring protection ▶ Ethernet CFM
AT-FL-x320-CPOE	Continuous PoE license	▶ Continuous PoE power

Ordering Information

Switches

19 inch rack-mount brackets included

AT-x320-10GH
8-port 10/100/1000T PoE++ switch with 2 SFP ports, and 3 external PSU ports[2]

Power Supplies

AT-PWR300-xx
300W PoE power supply (for x320-10GH and GS980EM/10H switches)

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

[2] Power supplies must be ordered separately

SFP Modules

AT-SPTX
1000T 100 m copper

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

AT-SPSX/I
1000SX GbE multi-mode 850 nm fiber up to 550 m industrial temperature

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-SPLXI0/I
1000LX GbE single-mode 1310 nm fiber up to 10 km industrial temperature

AT-SPBDI0-13
1000LX GbE Bi-Di (1310 nm Tx, 1490 nm Rx) fiber up to 10 km

AT-SPBDI0-14
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

AT-SPBD20-13/I
1000BX GbE Bi-Di (1310 nm Tx, 1550 nm Rx) fiber up to 20 km

AT-SPBD20-14/I
1000BX GbE Bi-Di (1490 nm Tx, 1310 nm Rx) fiber up to 20 km

AT-SPBD40-13/I
1000LX GbE single-mode Bi-Di (1310 nm Tx, 1490 nm Rx) fiber up to 40 km, industrial temperature

AT-SPBD40-14/I
1000LX GbE single-mode Bi-Di (1490 nm Tx, 1310 nm Rx) fiber up to 40 km, industrial temperature

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