

x530 Series

Stackable Multi-Gigabit Layer 3 Switches



The Allied Telesis x530 Series of stackable Multi-Gigabit Layer 3 switches feature high capacity, resiliency and easy management, making them the ideal choice for demanding distribution and high-speed connectivity applications.



Overview

Allied Telesis x530 Series switches are a high-performing and feature-rich choice for today's networks. They offer a versatile solution for enterprise applications. With 20 or 40 x 10M/100M/1 Gigabit ports, 4 or 8 x 100M/1/2.5/5 Gigabit ports, and 10 Gigabit uplinks, plus the power of Virtual Chassis Stacking (VCStack™), the x530 Series can connect any size business.

Network automation

Vista Manager™ EX bundled with Allied Telesis Autonomous Management Framework™ (AMF) meets the increasing management requirements of modern networks. While AMF allows an entire network to be securely and easily managed as a single virtual device, Vista Manager EX provides an intuitive and powerful graphical tool for monitoring and managing AMF wired and Autonomous Wave Control (AWC) wireless devices.

Device and network management

The Device GUI enables graphical monitoring of key switch features to support easy management.

Integrated into the Device GUI, Vista Manager™ mini supports visibility and management of AMF wired and AWC wireless network devices, making it ideal as a one-stop solution for small to medium-sized networks.

AWC is an intelligent, easy to use Wireless LAN controller that automatically maintains optimal wireless coverage. Vista Manager mini includes AWC floor and heat maps showing wireless coverage. It also supports AWC Channel Blanket hybrid operation, providing maximum performance and seamless roaming, as well as AWC Smart Connect for simplified deployment, and a resilient Wi-Fi network solution using wireless uplink connectivity.

Resilient

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.

x530 Series can form a VCStack of up to eight¹ units. In conjunction with link aggregation, VCStack provides an enhanced resiliency with no single point of failure to meet today's increasing demand for high-available networks with minimal downtime.

With Long Distance Stacking (VCStack LD), it allows stacks to be created over fibre links, making the x530 Series the perfect choice for distributed environment.

Reliable

Dual built-in power supplies guarantees the delivery of essential services, and near-hitless online stack reconfiguration enables maintenance to be performed without affecting network uptime.

The x530DP models feature dual hot-swappable power supplies to maximize uptime, and which also support higher PoE power budgets.

Secure

The x530 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.

Power over Ethernet

Connect and power a variety of endpoints with the 30 watts of PoE+. For even more power, the x530DP provides 60 watts of PoE++ to support high resolution PTZ cameras, enhanced lighting controllers, and other high power devices.

High-speed wireless

2.5 and 5 Gigabit connectivity supports

high-speed wireless, and avoids the need to upgrade existing Cat5e/6 cables.

Environmentally friendly

The x530 Series support Energy Efficient Ethernet (EEE), automatically reducing the power consumed by the switch whenever there is no traffic on a port.

Key Features

- ▶ Allied Telesis Autonomous Management Framework™ (AMF)
- ▶ VCStack™ up to 8¹ units locally, or over long distance
- ▶ Multi-Gigabit Ethernet ports for 1G/2.5G/5G
- ▶ 2.5/5G for high-speed wireless APs
- ▶ Up to 60W PoE++ power per port (x530DP models)
- ▶ EPSR™ (master and transit) and G.8032 ERPS for resilient rings
- ▶ OpenFlow for SDN
- ▶ Active Fiber Monitoring (AFM)
- ▶ Upstream Forwarding Only (UFO)
- ▶ VLAN Translation
- ▶ Multicast Source Discovery Protocol (MSDP)
- ▶ Link Monitoring
- ▶ VXLAN static tunnels
- ▶ AT-Vista Manager mini enables:
 - ▶ Wired and wireless network visibility
 - ▶ AWC wireless network management
 - ▶ AWC-Channel Blanket hybrid wireless
 - ▶ AWC-Smart Connect wireless uplinks
- ▶ FIPS 140-2 certified

¹ Up to 4 units supported if using 1Gbps ports for stacking

Key Features

Vista Manager mini

- ▶ Integrated into the Device GUI, Vista Manager mini provides full network visibility of AMF wired and AWC wireless devices. Manage and simplify wireless deployment with AWC-Smart Connect, and support optimal wireless performance from AWC hybrid operation with maximum throughput and a seamless Wi-Fi user experience.

Allied Telesis Autonomous Management Framework™ (AMF)

- ▶ AMF is a sophisticated suite of management tools that provide a simplified approach to zero-touch network management.
- ▶ Any x530 Series can operate as the AMF network master, storing firmware and configuration backups for other network nodes. The AMF master enables auto-provisioning and auto-upgrade by providing appropriate files to new network members. New network devices can be pre-provisioned, making installation easy because no onsite configuration is required.
- ▶ AMF Guestnode allows Allied Telesis wireless APs and other switching products, as well as third-party devices such as IP phones and security cameras, to be part of an AMF network.

AWC Wireless Management

- ▶ Optimize wireless network performance with the Autonomous Wave Controller (AWC), built-in to the x530 Series. AWC analyzes wireless traffic patterns and automatically reconfigures access points to meet demand.
- ▶ Wireless network operation in multi-channel, single-channel (Channel Blanket), and hybrid (multi-channel and Channel Blanket) modes, supports maximum data throughput and seamless roaming for the most flexible wireless solution available.
- ▶ AWC-Smart Connect (AWC-SC) enables plug-and-play wireless network growth, as new APs only need a power connection, and will then automatically create resilient wireless uplink connections to other APs.

Virtual Chassis Stacking (VCStack™)

- ▶ The x530 Series supports VCStack up to 8 units (or 4 units if using 1Gbps ports for stacking). VCStack, in conjunction with link aggregation, provides a high available system where network resources are spread out across stacked units, providing excellent resiliency.

Long-Distance Stacking (VCStack LD)

- ▶ VCStack LD allows a VCStack to be created over longer distances, perfect for distributed network environments.

Ethernet Protection Switched Ring (EPSRing™)

- ▶ EPSRing and 10 Gigabit Ethernet allow several x530 Series switches to form high-speed protected rings 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.
- ▶ The x530 Series switches can act as the ESPR Master, or be deployed as EPSR transit nodes, in a high-speed ring.

G.8032 Ethernet Ring Protection

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

Multi-Gigabit Ethernet

- ▶ The new IEEE 802.3bz standard (also known as “NBASE-T”) allows traffic speeds of greater than 1 Gigabit on legacy Cat5e cable. The x530 Series supports both 2.5 and 5 Gigabit connectivity allowing high-speed wireless access points to run at full capacity without re-cabling.

Power over Ethernet Plus (PoE+ and 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 flexibility, with the x530 Series supplying up to 30W per port (PoE+) to endpoints.
- ▶ The x530DP models support up to 60W per port (PoE++) to connect high power devices such as high resolution PTZ cameras, enhanced infrared lighting and lighting controllers, remote Point of Sale (POS) kiosks, and more.

Active Fiber Monitoring (AFM)

- ▶ AFM 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.

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.

Virtual Routing and Forwarding (VRF Lite)

- ▶ VRF Lite provides Layer 3 network virtualization by dividing a single switch into multiple independent virtual routing domains. With independent routing domains, IP addresses can overlap without causing conflict, allowing multiple customers to have their own secure virtual network within the same physical infrastructure. VRF Lite supports both unicast and multicast traffic.
- ▶ The built-in DHCP Server on the x530 Series is VRF aware, enabling the supply of IP addresses to clients across multiple isolated networks.

High Reliability

- ▶ The x530 Series feature front to back cooling and dual fixed internal PSUs. DP models feature dual hot-swap PSUs for maximum uptime.

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 (up to 5 collectors can be configured) ensure it always has a real-time view of network traffic.

VLAN Mirroring (RSPAN)

- ▶ VLAN mirroring allows traffic from a port on a remote switch to be analyzed locally. Traffic being transmitted or received on the port is duplicated and sent across the network on a special VLAN.

Premium Software License

- ▶ By default, the x530 Series offers a comprehensive Layer 2 and basic Layer 3 feature set that includes static 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 Layer 3 multicasting capabilities.

Upstream Forwarding Only (UFO)

- ▶ UFO lets you manage which ports in a VLAN can communicate with each other, and which only have upstream access to services, for secure multi-user deployment.

VLAN Translation

- ▶ VLAN Translation allows traffic arriving on a VLAN to be mapped to a different VLAN on the outgoing paired interface.
- ▶ It is common for a network Service Provider (SP) to give each customer their own unique VLAN, yet at the customer location give all customers the same VLAN-ID for tagged packets to use on the wire. SPs can use VLAN Translation to change the tagged packet's VLAN-ID at the customer location to the VLAN-ID for tagged packets to use within the SP's network.
- ▶ This feature is also useful in Enterprise environments where it can be used to merge two networks together, without manually reconfiguring the VLAN numbering scheme.

Software Defined Networking (SDN)

- ▶ OpenFlow is a key technology that enables the use of SDN to build smart applications that unlock value and reduce cost.

Multicast Source Discovery Protocol (MSDP)

- ▶ MSDP enables two or more PIM-SM (Sparse Mode) domains to share information on active multicast sources, for more efficient forwarding of multicast traffic.

Link Monitoring (Linkmon)

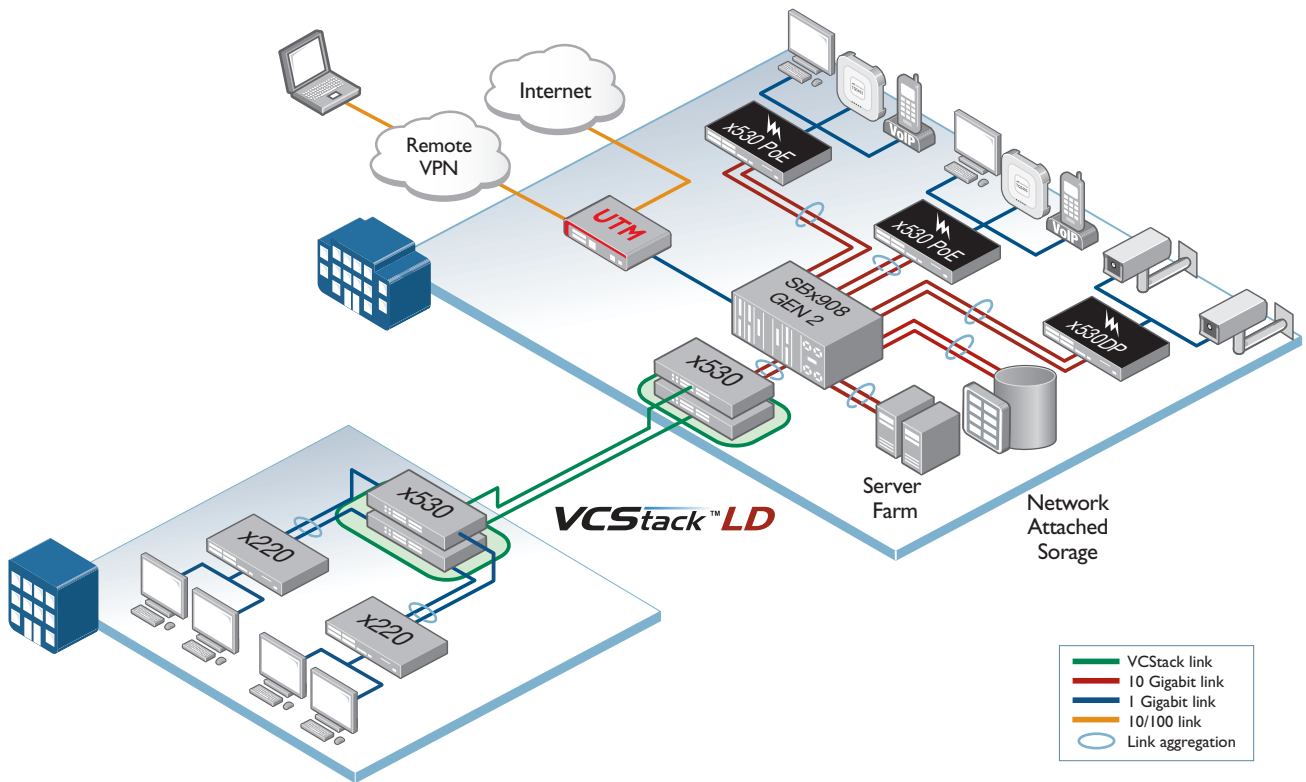
- ▶ Linkmon enables network health monitoring by regularly sending probes over key links to gather metrics comprising latency, jitter, and probe loss. This supports pro-active network management, and can also be used with triggers to automate a change to device or network configuration in response to the declining health of a monitored link.

Virtual Extensible LAN (VXLAN) tunnels.

- ▶ VXLAN tunnels let you join two or more L2 networks over an L3 IP network to form a single L2 broadcast domain. VXLAN adds scalability to cloud computing environments. The x530 Series supports static VXLAN tunnels.

Key Solutions

Distribution and Edge Connectivity



Resilient distributed switching

Allied Telesis x530 Series switches are ideal for distribution solutions, where resiliency and flexibility are required. In the above diagram, distribution switches utilize long distance VCStack LD to create a single virtual unit out of multiple devices. By using fiber stacking connectivity, units can be kilometers apart—perfect for a distributed environment.

When combined with link aggregation, VCStack provides a solution with no single point of failure that fully utilizes all network bandwidth.

Allied Telesis x530 Series switches support Enterprises and their use of business-critical online resources and applications, with a resilient and reliable distributed solution.

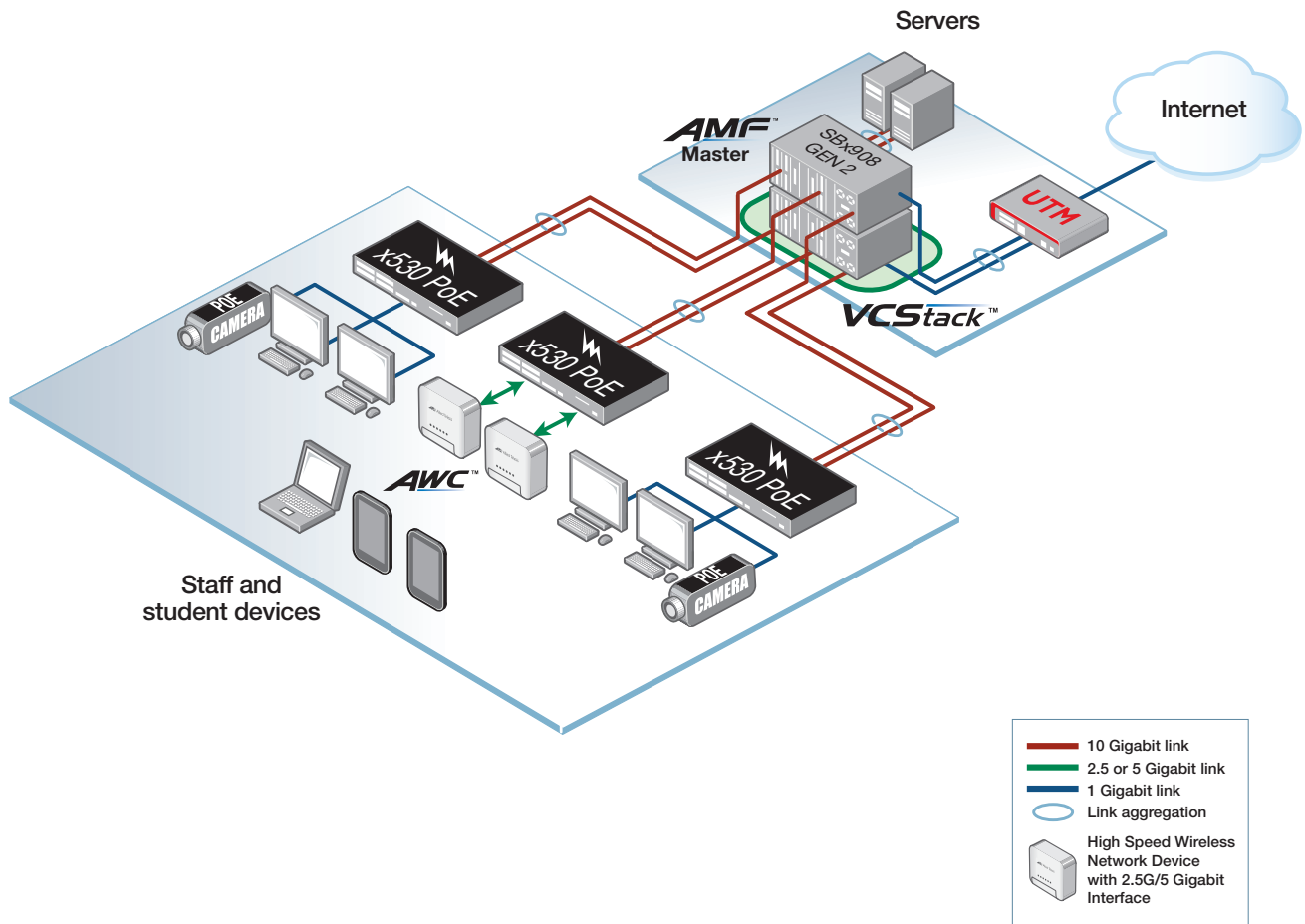
Peace of mind at the network edge

Allied Telesis x530 Series switches are the ideal choice for 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 aggregation is used to provide resiliency back to the core chassis, and to increase available bandwidth over a single link.

The x530 can provide the full 30 Watts of PoE+ per port to connect and power a wide range of devices. The x530DP models supply up to 60 Watts of PoE++ power for connecting devices such as 4K PTZ security cameras.

Key Solutions

Multi-Gigabit Connectivity



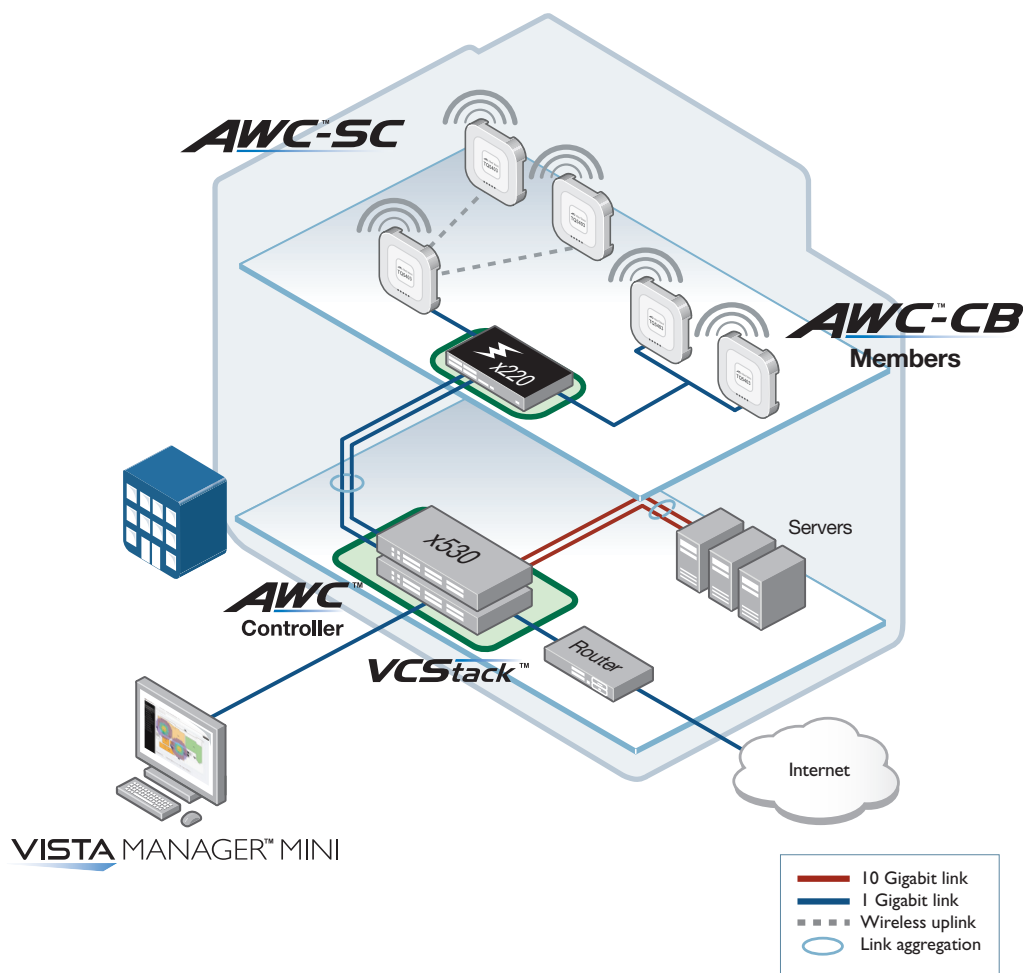
2.5/5G Multi-Gigabit connectivity

The x530 Series feature 4 or 8 Multi-Gigabit ports which enable higher speed connectivity at 2.5 or 5Gbps.

This supports new applications such as Wave 2 wireless access points to maximize data throughput and remove bottlenecks, increasing the effectiveness of the WiFi network. It also enables network backbone upgrades from 1 to 5 Gbps without the need to replace existing Cat5e and Cat6/6A cables.

Key Solutions

Integrated wireless LAN management



Allied Telesis Autonomous Wave Controller (AWC) offers solutions for two of the most common problems with Wireless LANs: initial setup complexity and on-going performance degradation. Initial WLAN set-up usually requires a site survey to achieve the best coverage; and performance of WLANs can often change over time as external sources of radio interference reduce coverage and bandwidth. These issues can be time-consuming to identify and resolve.

AWC features an intelligent process that automatically recalibrates the signal strength and radio channel of each Access Point (AP) for optimal WLAN performance. AWC Smart Connect (AWC-SC) uses wireless uplink connections between APs, so deployment is as easy as plugging in and powering on the new APs, which automatically extend the Wi-Fi network, creating a resilient solution.

Vista Manager mini is integrated into the Device GUI of the x530 Series and provides an ideal solution for modern enterprise networks, enabling management of both the wired (with AMF) and wireless (with AWC) networks to be automated. This reduces both the time and cost of network administration, as well as maximizing network performance for a superior user experience.

Up to 5 TQ Series wireless APs can be managed for free, and up to a further 40 APs (max 45) with feature licenses, available separately.

On some AP models, hybrid channel blanket enables multi-channel and single-channel WiFi operation simultaneously. This supports seamless roaming and maximum throughput. Channel Blanket licenses are available for up to 40 APs. For plug-and-play wireless deployment AWC-SC licenses are available for up to 40 APs.

Specifications

PRODUCT	10/100/1000T (RJ-45) COPPER PORTS	100M/1/2.5/5 GIGABIT PORTS	1/10 GIGABIT SFP+ PORTS	STACKING PORTS	POE ENABLED PORTS	POE++ ENABLE PORTS	SWITCHING FABRIC	FORWARDING RATE
x530-28GTxm	20	4	4	2*	-	-	160Gbps	119 Mpps
x530-28GPxm	20	4	4	2*	24	-	160Gbps	119 Mpps
x530-52GTxm	40	8	4	2*	-	-	240Gbps	179Mpps
x530-52GPxm	40	8	4	2*	48	-	240Gbps	179Mpps
x530DP-28GHxm	20	4	4	2*	24	24	160Gbps	119 Mpps
x530DP-52GHxm	40	8	4	2*	48	24 (ports 25-48)	240Gbps	179Mpps

* Stacking ports can be configured as additional 1G/10G Ethernet ports when the switch is not stacked

Performance

- ▶ 40Gbps of stacking bandwidth when using front panel 10G SFP+ ports
- ▶ 10KB L2 and 9KB L3 Jumbo frames
- ▶ 4094 configurable VLANs
- ▶ Up to 16K MAC addresses
- ▶ Up to 128 Link Aggregation Groups (LAGS) - any combination of static and dynamic (LACP)
- ▶ 1GB DDR3 SDRAM, 256MB NAND flash memory
- ▶ Packet buffer memory: 1.5MB

Reliability

- ▶ Modular AlliedWare Plus operating system
- ▶ Internal dual fixed PSUs, providing uninterrupted power and extra reliability. The x530DP models feature dual hot-swappable power supplies
- ▶ Full environmental monitoring of PSUs, fans, temperature and internal voltages. SNMP traps alert network managers in case of any failure

Expandability

- ▶ Stack up to eight¹ units in a VCStack
- ▶ Versatile licensing options for additional features

Flexibility and Compatibility

- ▶ 10G SFP+ ports will support any combination of Allied Telesis 1000Mbps SFP and 10GbE SFP+ modules and direct attach cables listed in this document under Ordering Information
- ▶ Port speed and duplex configuration can be set manually or by auto-negotiation
- ▶ Front-panel SFP+ stacking ports can be configured as 1G/10G Ethernet ports

Diagnostic Tools

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

IPv4 Features

- ▶ Equal Cost Multi Path (ECMP) routing
- ▶ Static unicast and multicast routing for IPv4
- ▶ UDP broadcast helper (IP helper)
- ▶ Directed broadcast forwarding
- ▶ Black hole routing

- ▶ DNS relay
- ▶ Policy-based routing
- ▶ Route redistribution (OSPF, RIP, and BGP)
- ▶ Virtual Routing and Forwarding Lite (VRF-Lite) up to 64 domains

IPv6 Features

- ▶ Device management over IPv6 networks with SNMPv6, Telnetv6 and SSHv6
- ▶ IPv4 and IPv6 dual stack
- ▶ IPv6 over IPv4 tunneling (manual configuration only)
- ▶ Log to IPv6 hosts with Syslog v6
- ▶ NTPv6 client and server
- ▶ DNSv6 client, DNSv6 relay
- ▶ DHCPv6 server, relay, and client
- ▶ Static IPv6 unicast and multicast routing
- ▶ IPv6 aware storm protection and QoS
- ▶ IPv6 hardware ACLs
- ▶ IPv6 Ready certified

Management

- ▶ Industry-standard CLI with context-sensitive help
- ▶ Built-in text editor and powerful CLI scripting engine
- ▶ Comprehensive SNMP MIB support for standards-based device management
- ▶ Console management port on the front panel for ease of access
- ▶ Event-based triggers allow user-defined scripts to be executed upon selected system events
- ▶ Eco-friendly mode allows ports and LEDs to be disabled to save power
- ▶ USB interface allows software release files, configurations and other files to be stored for backup and distribution to other devices
- ▶ Front panel 7-segment LED provides at-a-glance status and fault information
- ▶ Autonomous Management Framework (AMF) enables powerful centralized management and zero-touch device installation and recovery. Try AMF for free with the built-in Starter license
- ▶ Web-based Graphical User Interface (GUI)

Quality of Service

- ▶ IP precedence and DiffServ marking based on Layer 2, 3 and 4 headers
- ▶ Queue scheduling options for strict priority, weighted round robin or mixed scheduling
- ▶ Taildrop for queue congestion control
- ▶ Extensive remarking capabilities
- ▶ Policy-based QoS based on VLAN, port, MAC and general packet classifiers
- ▶ Limit bandwidth per port or per traffic class down to 64kbps

- ▶ 8 priority queues with a hierarchy of high priority queues for real time traffic, and mixed scheduling, for each switch port
- ▶ Policy-based storm protection
- ▶ Wirespeed traffic classification with low latency essential for VoIP and real-time streaming media applications

Resiliency Features

- ▶ EPSRing (Ethernet Protection Switched Rings) with SuperLoop Protection (SLP) and enhanced recovery
- ▶ EPSR Master or transit node deployment
- ▶ STP root guard
- ▶ Loop protection: thrash limiting and loop detection
- ▶ Dynamic link failover (host attach)
- ▶ Control Plane Prioritization (CPP) ensures the CPU always has sufficient bandwidth to process network control traffic
- ▶ PVST+ compatibility mode
- ▶ VCStack fast failover minimizes network disruption
- ▶ SFP+ stacking ports can be configured as 10G Ethernet ports
- ▶ Long-Distance VCStack using fiber modules (VCStack-LD)
- ▶ BPDU forwarding

Security Features

- ▶ Federal Information Processing Standard Publication 140-2 (FIPS 140-2) certified
- ▶ MAC address filtering and MAC address lock-down
- ▶ Learn limits (intrusion detection) for single ports or LAGs
- ▶ Access Control Lists (ACLs) based on layer 3 and 4 headers
- ▶ Dynamic ACLs assigned via port authentication
- ▶ ACL Groups enable multiple hosts/ports to be included in a single ACL, reducing configuration
- ▶ Private VLANs provide security and port isolation for multiple customers using the same VLAN
- ▶ Secure Copy (SCP)
- ▶ BPDU protection
- ▶ Network Access and Control (NAC) features manage endpoint security
- ▶ Dynamic VLAN assignment
- ▶ Tri-authentication: MAC-based, web-based and IEEE 802.1x
- ▶ DoS attack blocking and virus throttling
- ▶ DHCP snooping, IP source guard and Dynamic ARP Inspection (DAI)
- ▶ Strong password security and encryption
- ▶ Auth fail and guest VLANs
- ▶ Secure File Transfer Protocol (SFTP) client

¹ Up to 4 units supported if using 1Gbps ports for stacking

x530 Series | Stackable Multi-Gigabit Layer-3 Switches

- ▶ Authentication, Authorisation and Accounting (AAA)
- ▶ Bootloader can be password protected for device security
- ▶ Configurable ACLs for management traffic
- ▶ RADIUS group selection per VLAN or port
- ▶ RADIUS Proxy

Environmental Specifications

- ▶ Operating temperature range:
0°C to 50°C (32°F to 122°F)
0°C to 65°C (32°F to 149°F) (x530DP models)
- ▶ 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)

Software Defined Networking (SDN)

- ▶ OpenFlow v1.3 with support for encryption, connection interruption and inactivity probe

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, FIPS 140-2

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	
x530-28GTxm	441 x 323 x 44 mm (17.36 x 12.72 x 1.73 in)	Rack-mount	4.8 kg (10.58 lb)	6.8 kg (14.99 lb)	563 x 534 x 128 mm (22.16 x 21.02 x 5.04 in)
x530-28GPxm	441 x 421 x 44 mm (17.36 x 16.57 x 1.73 in)	Rack-mount	6.3 kg (13.90 lb)	8.3 kg (18.29 lb)	563 x 534 x 128 mm (22.16 x 21.02 x 5.04 in)
x530-52GTxm	441 x 323 x 44 mm (17.36 x 12.72 x 1.73 in)	Rack-mount	5.3 kg (11.60 lb)	7.3 kg (16.00lb)	563 x 534 x 128 mm (22.16 x 21.02 x 5.04 in)
x530-52GPxm	441 x 421 x 44 mm (17.36 x 16.57 x 1.73 in)	Rack-mount	6.9 kg(15.20 lb)	8.9 kg(19.60 lb)	563 x 632 x 128 mm (22.16 x 24.88 x 5.04 in)
x530DP-28GHxm	441 x 421 x 44 mm (17.36 x 16.57 x 1.73 in)	Rack-mount	5.4 kg (11.82 lb)	7.5 kg (16.49 lb)	557 x 548 x153 mm (21.93 x 21.57 x 6.02 in)
x530DP-52GHxm	441 x 421 x 44 mm (17.36 x 16.57 x 1.73 in)	Rack-mount	5.6 kg (12.26 lb)	7.7kg (17.02 lb)	557 x 548 x153 mm (21.93 x 21.57 x 6.02 in)

Power and Noise Characteristics

PRODUCT	NO POE LOAD			FULL POE+ LOAD			MAX POE POWER (W)	POE SOURCING PORTS			
	MAX POWER CONSUMPTION (W)	MAX HEAT DISSIPATION (BTU/H)	NOISE (DBA)	MAX POWER CONSUMPTION (W)	MAX HEAT DISSIPATION (BTU/H)	NOISE (DBA)		POE (7.5W)	POE (15.4W)	POE + (30W)	POE ++ (60W)
x530-28GTxm	55	188	42	-	-	-	-	-	-	-	-
x530-28GPxm	77	264	44	900	614	44	740	24	24	24	-
x530-52GTxm	85	290	42	-	-	-	-	-	-	-	-
x530-52GPxm	88	300	42	970	661	42	740	48	48	24	-
x530DP-28GHxm	110	375	54	1840	6279	63	1480	24	24	24	24
x530DP-52GHxm	150	512	54	1930	6586	63	1480	48	48	48	24

Noise: tested to ISO7779; front bystander position

Latency (microseconds)

PRODUCT	PORT SPEED (µs)					
	10MBPS	100MBPS	1GBPS	2.5GBPS	5GBPS	10GBPS
x530-28GTxm	30.12	7.38	4.05	7.74	5.28	1.63
x530-28GPxm	30.12	7.38	4.05	7.74	5.28	1.63
x530-52GTxm	30.77	8.79	5.41	9.27	6.69	1.63
x530-52GPxm	30.77	8.79	5.41	9.27	6.69	1.63
x530DP-28GHxm	30.12	7.38	4.05	7.74	5.28	1.63
x530DP-52GHxm	30.77	8.79	5.41	9.27	6.69	1.63

Standards and Protocols

AlliedWare Plus Operating System

Version 5.5.1-2

Authentication

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

Border Gateway Protocol (BGP)

BGP dynamic capability

BGP outbound route filtering
RFC 1772 Application of the Border Gateway Protocol (BGP) in the Internet
RFC 1997 BGP communities attribute
RFC 2385 Protection of BGP sessions via the TCP MD5 signature option
RFC 2439 BGP route flap damping
RFC 2545 Use of BGP-4 multiprotocol extensions for IPv6 inter-domain routing
RFC 2858 Multiprotocol extensions for BGP-4
RFC 2918 Route refresh capability for BGP-4

RFC 3392 Capabilities advertisement with BGP-4
RFC 3882 Configuring BGP to block Denial-of-Service (DoS) attacks
RFC 4271 Border Gateway Protocol 4 (BGP-4)
RFC 4360 BGP extended communities
RFC 4456 BGP route reflection - an alternative to full mesh iBGP
RFC 4724 BGP graceful restart
RFC 4893 BGP support for four-octet AS number space
RFC 5065 Autonomous system confederations for BGP

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 802.3ae 10 Gigabit Ethernet
- IEEE 802.3af Power over Ethernet (PoE)
- IEEE 802.3at Power over Ethernet up to 30W (PoE+)
- IEEE 802.3az Energy Efficient Ethernet (EEE)
- IEEE 802.3bt Power over Ethernet up to 60W (PoE++)
- IEEE 802.3bz 2.5GBASE-T and 5GBASE-T ("multi-gigabit")
- 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 2711 IPv6 router alert option
- RFC 3484 Default address selection for IPv6
- RFC 3587 IPv6 global unicast address format
- RFC 3596 DNS extensions to support IPv6
- RFC 4007 IPv6 scoped address architecture
- RFC 4193 Unique local IPv6 unicast addresses
- RFC 4213 Transition mechanisms for IPv6 hosts and routers
- 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
- Optical DDM 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 1724 RIPv2 MIB extension
- 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 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 4022 MIB for the Transmission Control Protocol (TCP)
- RFC 4113 MIB for the User Datagram Protocol (UDP)
- RFC 4188 Definitions of managed objects for bridges
- RFC 4292 IP forwarding table MIB
- RFC 4293 MIB for the Internet Protocol (IP)
- RFC 4318 Definitions of managed objects for bridges with RSTP
- RFC 4502 RMON 2

- RFC 4560 Definitions of managed objects for remote ping, traceroute and lookup operations
- RFC 5424 The Syslog protocol
- 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 and PIM SSM 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 3618 Multicast Source Discovery Protocol (MSDP)
- 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
- 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
- RFC 5340 OSPFv3 for IPv6 (partial support)

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 2560 X.509 Online Certificate Status Protocol (OCSP)
 RFC 2818 HTTP over TLS ("HTTPS")
 RFC 2865 RADIUS authentication
 RFC 2866 RADIUS accounting
 RFC 2868 RADIUS attributes for tunnel protocol support
 RFC 2986 PKCS #10: certification request syntax specification v1.7
 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 5176 RADIUS CoA (Change of Authorization)
 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
 Static VXLAN tunnels (part of RFC 7348)

Voice over IP (VoIP)

LLDP-MED ANSI/TIA-1057
 Voice VLAN

Feature Licenses

NAME	DESCRIPTION	INCLUDES	STACK LICENSING
AT-FL-x530-01	x530 premium license	<ul style="list-style-type: none"> ▶ OSPFv2 (12,000 routes) ▶ BGP4/4+ (5,000 routes) ▶ PIMv4-SM, DM and SSM v4 ▶ VLAN double tagging (Q-in-Q) ▶ VLAN translation ▶ RIPng (5,000 routes) ▶ OSPFv3 (6,000 routes) ▶ MLDv1/v2 ▶ PIM-SMv6/SSMv6 ▶ RADIUS-Full ▶ VRF-Lite (64 domains) ▶ UDLD ▶ VXLAN 	▶ One license per stack member
AT-SW-AM10-1YR²	Cumulative AMF Master license	▶ AMF Master license for up to 10 nodes for 1 year	▶ One license per stack
AT-SW-AM10-5YR²	Cumulative AMF Master license	▶ AMF Master license for up to 10 nodes for 5 years	▶ One license per stack
AT-FL-x530-8032	ITU-T G.8032 license	<ul style="list-style-type: none"> ▶ G.8032 ring protection ▶ Ethernet CFM 	▶ One license per stack member
AT-FL-x530-CPOE	Continuous PoE license	▶ Continuous PoE power for GPX models	▶ One license per stack member
AT-FL-x530-MSTK	Mixed stacking license	▶ Stack x530 with x530L switches	▶ One license per stack member
AT-FL-x530-OF13-1YR	OpenFlow license	▶ OpenFlow v1.3 for 1 year	▶ Not supported on a stack
AT-FL-x530-OF13-5YR	OpenFlow license	▶ OpenFlow v1.3 for 5 years	▶ Not supported on a stack
AT-SW-AWC10-1YR³	Cumulative AWC license	▶ Autonomous Wave Control (AWC) license for up to 10 access points for 1 year	▶ One license per stack
AT-SW-AWC10-5YR³	Cumulative AWC license	▶ Autonomous Wave Control (AWC) license for up to 10 access points for 5 years	▶ One license per stack
AT-SW-CB10-1YR⁴	Cumulative AWC-CB license	▶ AWC Channel Blanket license for up to 10 access points for 1 year	▶ One license per stack
AT-SW-CB10-5YR⁴	Cumulative AWC-CB license	▶ AWC Channel Blanket license for up to 10 access points for 5 years	▶ One license per stack
AT-SW-SC10-1YR⁵	Cumulative AWC-SC license	▶ AWC Smart Connect license for up to 10 access points for 1 year	▶ One license per stack
AT-SW-SC10-5YR⁵	Cumulative AWC-SC license	▶ AWC Smart Connect license for up to 10 access points for 5 years	▶ One license per stack

² Purchase one license per 10 nodes (up to 40 nodes maximum)

³ 5 APs can be managed for free. Purchase one license per 10 additional APs (up to 40 APs maximum)

⁴ Channel Blanket is not available as a free service. Both an AWC-CB license and an AWC license are required for Channel Blanket to operate. Purchase one AWC-CB license per 10 APs (up to 40 APs maximum). This feature is supported on TQ6602, TQ5403, and TQ5403e access points

⁵ Smart Connect is not available as a free service. Both an AWC-SC license and an AWC license are required for Smart Connect to operate. Purchase one AWC-SC license per 10 APs (up to 40 APs maximum). This feature is supported on TQ5403, TQ5403e and TQm5403 access points

Ordering Information

Switches

19 inch rack-mount brackets included

AT-x530-28GTXm-xx

20-port 10/100/1000T and 4-port 100M/1/2.5/5G stackable switch with 4 SFP+ ports and 2 fixed power supplies

AT-x530-28GPXm-xx

20-port 10/100/1000T and 4-port 100M/1/2.5/5G PoE+ stackable switch with 4 SFP+ ports and 2 fixed power supplies

AT-x530-52GTXm-xx

40-port 10/100/1000T and 8-port 100M/1/2.5/5G stackable switch with 4 SFP+ ports and 2 fixed power supplies

AT-x530-52GPXm-xx

40-port 10/100/1000T and 8-port 100M/1/2.5/5G PoE+ stackable switch with 4 SFP+ ports and 2 fixed power supplies

AT-x530DP-28GHXm-xx

20-port 10/100/1000T and 4-port 100M/1/2.5/5G PoE++ stackable switch with 4 SFP+ ports and dual hotswap PSU bays

AT-x530DP-52GHXm-xx

40-port 10/100/1000T and 8-port 100M/1/2.5/5G PoE++ stackable switch with 4 SFP+ ports and dual hotswap PSU bays

AT-RKMT-SL01

For DP model only

AT-BRKT-J22

Wall-mount kit for x530-28GTXm and 52GTXm

AT-VT-Kit3

Management Cable (USB to Serial Console)

Power Supplies

For x530DP models

AT-PWR150-xx

150W system power supply

AT-PWR250-xx

250W system power supply

AT-PWR250-80

250W DC system power supply

AT-PWR800-xx

800W system and PoE power supply

AT-PWR1200-xx

1200W system and PoE power supply

10G SFP+ Modules

Any 10G SFP+ module or cable can be used for stacking with the front panel 10G ports

AT-SP10SR

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

AT-SP10SR/I

10GSR 850 nm short-haul, 300 m with MMF industrial temperature

AT-SP10LR

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

AT-SP10LRa/I

10GLR 1310 nm medium-haul, 10 km with SMF industrial temperature

AT-SP10LR20/I

10GER 1310 nm long-haul, 20 km with SMF industrial temperature

AT-SP10ER40/I

10GER 1550 nm long-haul, 40 km with SMF industrial temperature

AT-SP10ZR80/I

10GER 1550 nm long-haul, 80 km with SMF industrial temperature

AT-SP10TM

1G/2.5G/5G/10G, 100m copper, TAA⁶

AT-SP10BD10/I-12

10 GbE Bi-Di (1270 nm Tx, 1330 nm Rx) fiber up to 10 km industrial temperature, TAA⁶

AT-SP10BD10/I-13

10 GbE Bi-Di (1330 nm Tx, 1270 nm Rx) fiber up to 10 km industrial temperature, TAA⁶

AT-SP10BD20-12

10 GbE Bi-Di (1270 nm Tx, 1330 nm Rx) fiber up to 20 km, TAA⁶

AT-SP10BD20-13

10 GbE Bi-Di (1330 nm Tx, 1270 nm Rx) fiber up to 20 km, TAA⁶

AT-SP10BD40/I-12

10 GbE Bi-Di (1270 nm Tx, 1330 nm Rx) fiber up to 40 km industrial temperature, TAA⁶

AT-SP10BD40/I-13

10 GbE Bi-Di (1330 nm Tx, 1270 nm Rx) fiber up to 40 km industrial temperature, TAA⁶

AT-SP10TW1

1 meter SFP+ direct attach cable

AT-SP10TW3

3 meter SFP+ direct attach cable

1000Mbps SFP Modules

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-SPSX/I

1000SX GbE multi-mode 850 nm fiber up to 550 m industrial temperature

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 (LC) GbE Bi-Di (1310 nm Tx, 1490 nm Rx) fiber up to 10 km

AT-SPBD10-14

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

AT-SPBD40-13/I

1000LX (LC) GbE single-mode Bi-Di (1310 nm Tx, 1490 nm Rx) fiber up to 40 km, industrial temperature

AT-SPBD40-14/I

1000LX (LC) GbE single-mode Bi-Di (1490 nm Tx, 1310 nm Rx) fiber up to 40 km, industrial temperature

AT-SPLX40

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

⁶ Trade Act Agreement compliant

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