Allied Telesis™

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.

eco friendly   PoE plus   AlliedWare Plus™ OPERATING SYSTEM   R6 READY

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 Gigabit and Multi-Gigabit ports, along with 10 Gigabit uplinks. The power and flexibility of Virtual Chassis Stacking (VCStack™) enables the x530 Series to 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 eight[1] 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 PoE. The flexible x530 series has models supporting the 30 watts of PoE+, and the 60 or 90 watts of PoE++, to support high resolution PTZ cameras, enhanced lighting controllers, and other high power devices.

[1] Up to 4 units supported if using 1Gbps ports for stacking
[2] For x530DP-28/52GHXm
[3] For x530-10/18GHXm
[4] Supported only on x530DP models

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 8[1] units locally, or over long distance
▶ Multi-Gigabit 1/2.5/5G ports
▶ Up to 90W PoE++ power per port (GHXm models)
▶ EPSR™ (master and transit) and G.8032 ERPS for resilient rings
▶ OpenFlow for SDN
▶ Active Fiber Monitoring (AFM)
▶ Upstream Forwarding Only (UFO)
▶ Bi-directional Forwarding Detection (BFD)
▶ VLAN Translation
▶ Multicast Source Discovery Protocol (MSDP)
▶ Link Monitoring
▶ VXLAN static tunnels
▶ 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
▶ Ethernet Alliance PoE Class 6[2] and Class 8[3] certified
▶ Reverse airflow option for flexible deployment[4]

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 throughout 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 PoE++ up to 60W per port, and the GHXm models up to 90W per port, 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. The GHXm models also support 2.5/5Gbps on all ports to connect and power devices over Multi-Gigabit networks.

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.

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.

Bidirection Forwarding Detection (BFD)

- BFD enables fast detection of link failures, so recovery time is minimized. BFD works with static routes, and also alongside BGP and OSPF dynamic routing protocols supporting faster shutdown of neighbor connections if a peer session goes down. When using VRF-Lite, BFD is supported globally or within a domain.

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
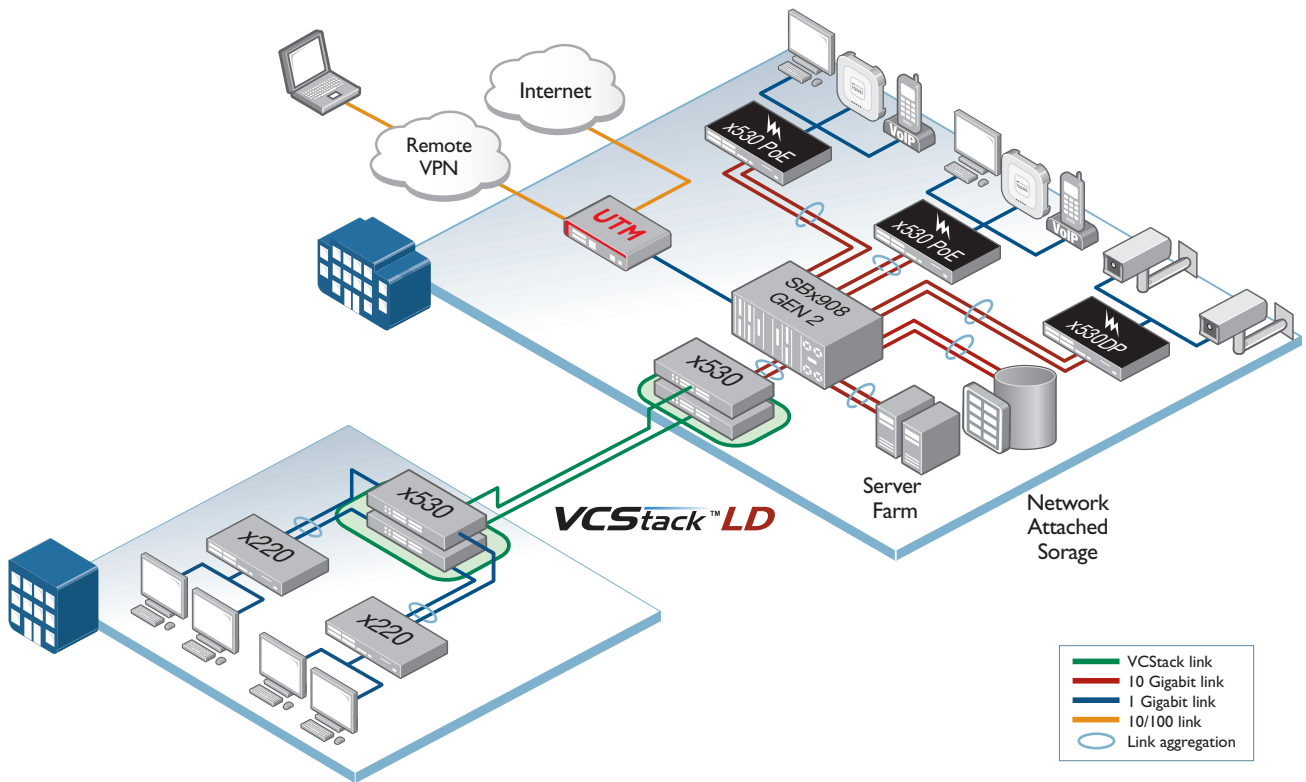
Resilient distributed switching

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 Series can provide 30 Watts of PoE+, or the 60 or 90 Watts of PoE++ per port (depending on model) to connect and power a wide range range of devices.

Key Solutions

Multi-Gigabit Connectivity

▬▬▬	10 Gigabit link
▬▬▬	2.5 or 5 Gigabit link
▬▬▬	1 Gigabit link
⬭	Link aggregation
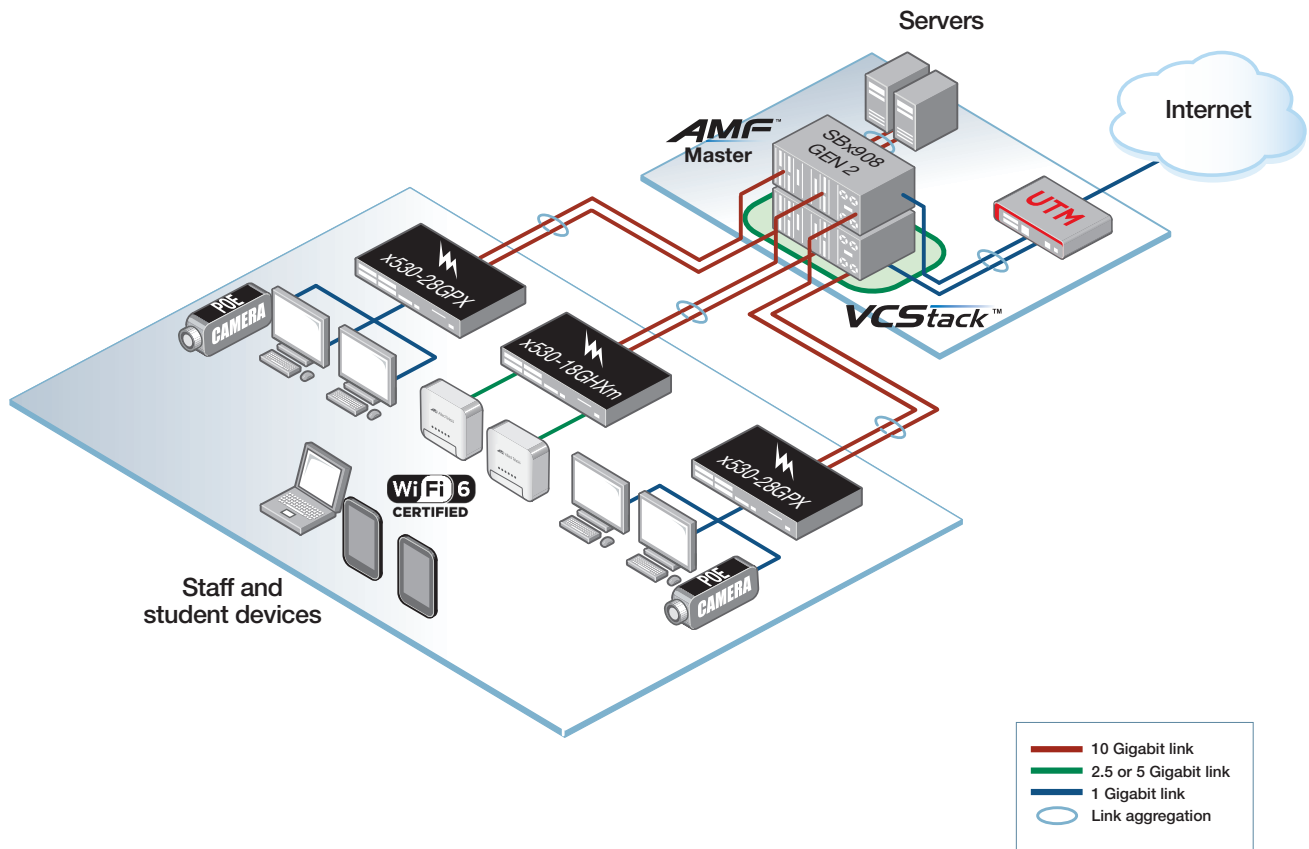
2.5/5G Multi-Gigabit connectivity
The x530 Series feature Multi-Gigabit ports which enable higher speed connectivity at 2.5 or 5Gbps.

This supports new applications, with the ability to connect and power Wi-Fi 6 APs at 2.5/5Gbps to remove bottlenecks and ensure maximum performance for many wireless user devices.

It also can support network backbone upgrades from 1 to 5 Gbps without the need to replace existing Cat5e and Cat6/6A building cables - enabling an easy high-value infrastructure and performance update.

Key Solutions

Integrated wireless LAN management
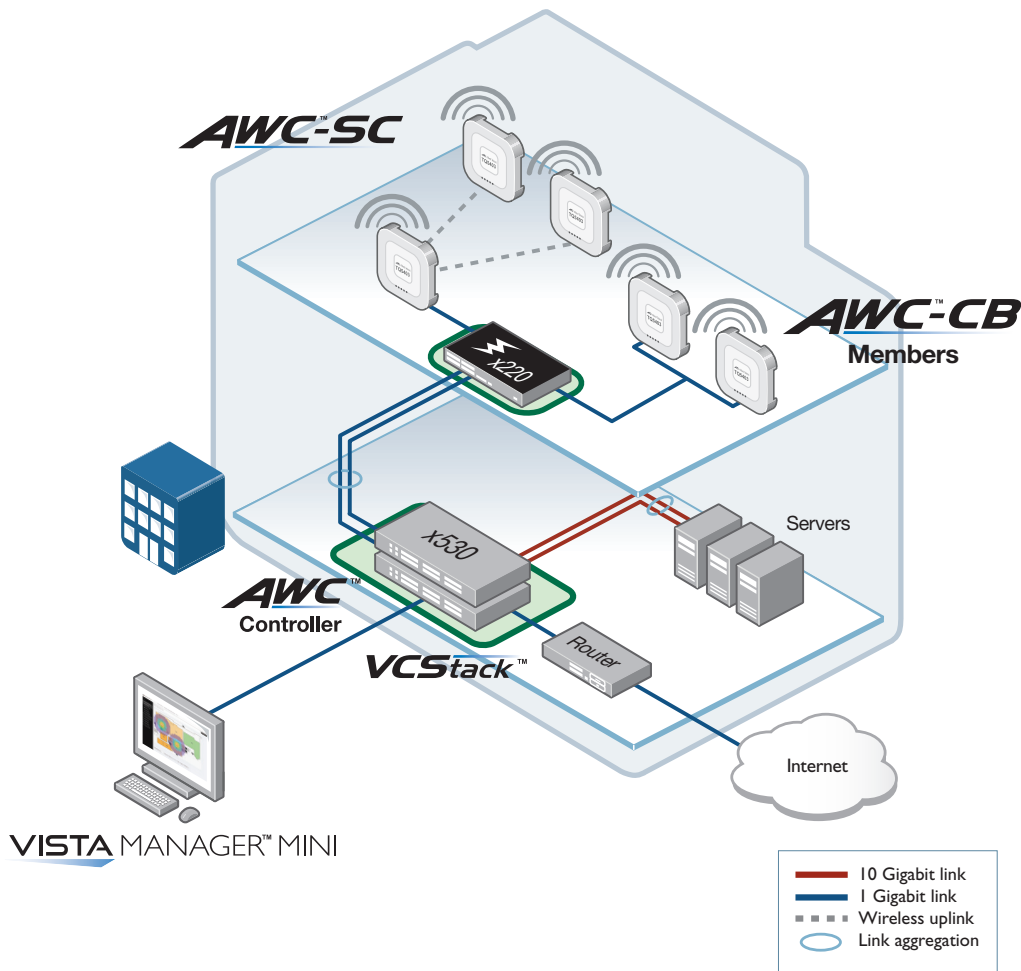
Allied Telesis Autonomous Wave Controller (AWC) offers solutions for two of the most common problems with Wireless LANs: initial setup complexity and on-going performance degradation. Initial WLAN set-up usually requires a site survey to achieve the best coverage; and performance of WLANs can often change 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 re-calibrates 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	SWITCHING FABRIC	FORWARDING RATE
x530-10GHXm	-	8	2	2*	8	120Gbps	89.2Mpps
x530-18GHXm	-	16	2	2*	16	200Gbps	148.8Mpps
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	160Gbps	119 Mpps
x530DP-52GHXm	40	8	4	2*	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 eight[1] 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
- Bi-directional Forwarding Detection (BFD)
- 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

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

x530 Series | Stackable Multi-Gigabit Layer-3 Switches

- ▶ 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
- ▶ 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	
x530-10GHXm	441 x 421 x 44 mm (17.36 x 16.57 x 1.73 in)	Rack-mount	6.6 kg (14.55 lb)	8.8 kg (19.40 lb)	575 x 555 x 155 mm (22.64 x 21.85 x 6.10 in)
x530-18GHXm	441 x 421 x 44 mm (17.36 x 16.57 x 1.73 in)	Rack-mount	6.7 kg (14.78 lb)	8.9 kg (19.62 lb)	557 x 548 x 153 mm (21.93 x 21.57 x 6.02 in)
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 (16.00 lb)	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 x 153 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)	7.7 kg (17.02 lb)	557 x 548 x 153 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)	POE ++ (90W)
x530-10GHXm	73	249	37	970	3309	37	720	8	8	8	8	8
x530-18GHXm	130	443	37	1400	4776	37	1000	16	16	16	16	11
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
x530-10GHXm	-	12.74	5.05	7.73	5.57	2.16
x530-18GHXm	-	11.61	5.29	7.61	5.61	2.05
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 5.5.2-1

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 90W (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

Ethernet Alliance
Gen2 PoE Class 6 Certified[2]
Gen2 PoE Class 8 Certified[3]

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)

[2] For x530DP-28/52GHXm
[3] For x530-10/18GHXm

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
RFC5880	Bidirectional Forwarding Detection (BFD)

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	▶ 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-AM10-1YR[5]	Cumulative AMF Master license	▶ AMF Master license for up to 10 nodes for 1 year	▶ One license per stack
AT-SW-AM10-5YR[5]	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	▶ 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-AWC10-1YR[6]	Cumulative AWC license	▶ Autonomous Wave Control (AWC) license for up to 10 access points for 1 year	▶ One license per stack
AT-SW-AWC10-5YR[6]	Cumulative AWC license	▶ Autonomous Wave Control (AWC) license for up to 10 access points for 5 years	▶ One license per stack
AT-SW-CB10-1YR-2022[7]	Cumulative AWC-CB and AWC-SC license	▶ AWC Channel Blanket and AWC Smart Connect license for up to 10 access points for 1 year	▶ One license per stack
AT-SW-CB10-5YR-2022[7]	Cumulative AWC-CB and AWC-SC license	▶ AWC Channel Blanket and AWC Smart Connect license for up to 10 access points for 5 years	▶ One license per stack

[5] Purchase one license per 10 nodes (up to 40 nodes maximum)

[6] 5 APs can be managed for free. Purchase one license per 10 additional APs (up to 40 APs maximum)

[7] Channel Blanket and Smart Connect are not available as free services. Both an AWC-CB license and an AWC license are required for Channel Blanket and/or Smart Connect to operate. Purchase one AWC-CB license per 10 APs (up to 40 APs maximum). Channel Blanket is supported on TQ6602, TQ5403, and TQ5403e access points. Smart Connect is supported on TQ5403, and TQ5403e access points

Ordering Information

Switches
19 inch rack-mount brackets included

AT-x530-10GHXm-xx
8-port 100M/1/2.5/5G PoE++ stackable switch with 2 SFP+ ports and 2 fixed power supplies

AT-x530-18GHXm-xx
16-port 100M/1/2.5/5G PoE++ stackable switch with 2 SFP+ ports and a 2 fixed power supplies

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 and Fan Supplies
For x530DP models

AT-PWR150-xx
150W system power supply

AT-PWR150R-xx
150 system power supply (reverse airflow)

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

AT-FAN10
Spare fan tray for the x530DP

AT-FAN10R-xx
Hot-swappable fan module (reverse airflow)

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, TAA[8]

AT-SP10BD10/I-12
10 GbE Bi-Di (1270 nm Tx, 1330 nm Rx) fiber up to 10 km industrial temperature, TAA[8]

AT-SP10BD10/I-13
10 GbE Bi-Di (1330 nm Tx, 1270 nm Rx) fiber up to 10 km industrial temperature, TAA[8]

AT-SP10BD20-12
10 GbE Bi-Di (1270 nm Tx, 1330 nm Rx) fiber up to 20 km, TAA[8]

AT-SP10BD20-13
10 GbE Bi-Di (1330 nm Tx, 1270 nm Rx) fiber up to 20 km, TAA[8]

AT-SP10BD40/I-12
10 GbE Bi-Di (1270 nm Tx, 1330 nm Rx) fiber up to 40 km industrial temperature, TAA[8]

AT-SP10BD40/I-13
10 GbE Bi-Di (1330 nm Tx, 1270 nm Rx) fiber up to 40 km industrial temperature, TAA[8]

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

[8] 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