H3C WA6120X Wi-Fi 6 (802.11ax) Wireless Access Point

Overview

H3C WA6120X is a Wi-Fi 6 (802.11ax) outdoor access point (AP) individually developed by New H3C Technologies Co., Ltd. (H3C).

- The AP adopts a dual-band and four-stream design with a maximum access rate of 2.975 Gbps. For 5 GHz radio2 spatial streams, the maximum negotiation rate is 2.4 Gbps. For 2.4 GHz radio2 spatial streams, the maximum negotiation rate is 0.575 Gbps.
- Professional and beautiful design and wide-temperature-range resistance make it convenient for outdoor installation and debugging. The AP features flexible installation methods, including wall mounting, and pole mounting. It's widely deployed for professional smart coverage in outdoor scenarios such as wireless city, big stadium and scenic spot.

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Product features

Operating mode

The built-in all-in-one version of the WA6120X AP enables the switching of operating mode as required, to save the implementation costs and is usable upon unpacking.

Fit AP mode

The WA6120X supports the Fit AP mode and can be managed by the wireless controller equipped with the Comware system. In this networking mode, the user can locally manage the APs in batches.

Cloud AP mode

Factory default cloud mode. WA6120X supports H3C Cloudnet solution that enables wireless networking without hardware AC and authentication server. It can perform authentications via PPSK, PSK, Portal, SMS, and WeChat. Customized development is implemented for multi-branch scenarios such as hotel chains and supermarkets, enabling features such as easy deployment,

hierarchical and decentralized management, smart large screen at headquarters, and customized configuration templates. The Cloudnet smart O&M platform enables users to grasp the status of wireless devices, networks, and terminal devices, and allows for simple management and O&M. This helps to reduce customer capital investment and O&M labor costs, and increase efficiency.

Anchor AC mode

The WA6120X supports Anchor AC mode, a special mode designed to facilitate the management of APs in small wireless networks. Anchor AC has the following features:

- AC: If there are no ACs in the network, the AP in Anchor AC mode will serve as an AC to manage other Fit APs.
- AP: The radio interface provided by the AP can provide users with wireless access services.

In brief, in the Anchor AC mode, AP serves as both an AC and an AP. Compared with traditional networking of ACs and Fit APs, Anchor AC features lower cost and easy deployment, making it more suitable for small wireless networks.

Smart O&M

The visualized, measurable, and auto-optimized H3C smart O&M system facilitates operation and maintenance and saves labor costs.

Data visualization

The H3C smart O&M system collects and displays rich O&M data via telemetry techniques. On the terminal side, it records the terminal's roaming log, authentication log, signal strength, important packet interaction log, packet loss, latency, etc., and can identify over 150 reasons for terminal failures to go online, over 140 reasons for terminals to go offline, and over 100 reasons for authentication failures. On the AP side, it collects data such as AP association failures, reasons for detaching from the AC, traffic composition of each wired interface, error packet information, radio traffic composition, radio channel utilization, radio interference strength, and WIPS wireless attacks.

Measurability

The H3C smart O&M system has established a perfect evaluation system to measure the user experience, device health status, and network status, enabling the administrators to view and maintain the network easily.

Automatic optimization

The changing wireless network, radio environment, services, and user scale require the network to have the ability of automatic issue resolving and network optimization. The H3C smart O&M system features intelligent and progressive optimization. It can identify and analyze network issues automatically, and deliver policies for automatic issue resolving and network optimization. In this way, the network will always have high performance, low interference, and optimal user experience without human interference.

Security protection of wired and wireless networks

Terminal device access and admission security

With the wireless controller, wireless switches, and authentication system self-developed by H3C, WA6120X can support authentication and encryption via 802.1x, PSK, MAC address, PPPoE, Portal, WeChat, and SMS. This ensures network security.

Wireless intrusion prevention system (WIPS)

WA6120X supports WIPS. In combination with the wireless controller/wireless switch, it supports WIPS features such as

detection, intrusion detection, as well as blacklist and whitelist of rogue devices at the same time. The WIPS features enable the device to detect, identify, take countermeasures against, and effectively intercept rogue devices.

Wired network security

WA6120X supports wired access and control of APs. The wireless port of APs can be authenticated as an 802.1X client of the wired access network to ensure the legality of the AP. It guarantees the security of the wireless tunnel through encryption methods such as CAPWAP tunnel and DTLS.

Wired network security can be enhanced with the H3C Security Situational Awareness. When the wired terminal detects a security issue in the wireless terminal, a linkage mechanism will be triggered to notify the wireless controller to block the wireless access of the terminal, thereby ensuring network security.

Radio resource optimization and station access control policy

WA6120X supports the radio resource optimization policy (RROP). RROP is a collection of multiple wireless radio optimization methods. It is used to reduce or control the consumption of radio media resources caused by management packets, broadcast packets, and invalid packets. It helps to set aside more resources to provide the users with better wireless application services. RROP mainly contains radio resource optimization policies such as layer 2 isolation for wireless services, disabling low data rate, adjusting the Beacon interval, and disabling the broadcast probe function.

WA6120X supports the station access control policy (SACP), which guides the terminal client to access the optimal AP or wireless service and helps control and schedule the traffic of the terminal devices based on network applications. This improves the overall performance of the entire wireless network and improves the experience and effect of wireless access applications. SACP feature mainly includes terminal control policies such as the prohibition of clients with weak signals, spectrum guide, roaming guide, load sharing, ignorance of packets with weak signals, fair scheduling of radios, traffic shaping based on client link status, and smart bandwidth guarantee.

Radio resource management (RRM)

RRM monitors in real time the environmental conditions such as the utilization rate of radio channels, channel interference, and signal conflict through systematic intelligent radio management. Moreover, it adjusts in real time the radio parameters such as the working channel, bandwidth, and power to maintain optimal radio resource status. In this way, it enables auto network planning and auto network repair.

Application security

The unique H3C Wi-Fi 6 eXtreme Plus technology allows H3C to intelligently identify the user's application on the AP and save it as a snapshot. By comparing the subsequent user packets with the snapshot, the Wi-Fi 6 eXtreme Plus technology combined with the smart sorting technology can process the identified packets at high speed, enhancing DPI performance and DFI accuracy. When the AP detects that the user is using key services, the AP will perform targeted optimization during roaming and radio switching, providing the user with a smooth experience when using key services. When the user experience of audio and video services is affected by the high occupancy of the air interface, APs will jointly mobilize resources to ensure the traffic of key services and reserve air interface resources for key services, thus achieving application acceleration.

Roaming optimization

The wireless AP supports the fast BSS transition feature defined in the 802.11r standard that helps to facilitate the roaming of wireless users, reduce the possibility of network interruptions, and enhance roaming quality.

Through the 802.11k mechanism, the AP and the wireless client perform interactive detection and perceive multi-dimensional network topologies. The AC identifies and comprehensively calculates the roaming timing and access location of the wireless client from a full perspective and negotiates switching with the client via the 802.11v and 802.11r mechanisms. During the switching period, the AC will ensure the traffic of the downlink service, to achieve seamless switching and improve user experience.

Only 11ax access

WA6120X supports the only 11ax access feature. The Wi-Fi 6 (802.11ax) is backward-compatible with 802.11a/b/g/n/ac standard, so the users of the 802.11a/b/g/n/ac standard can access a Wi-Fi 6 (802.11ax) wireless access device. However, its compatibility causes a decline in the actual performance of devices with high access capabilities such as Wi-Fi 6 (802.11ax) to some extent. The H3C devices enable the user to set the access mode of a certain radio frequency to only 11ax (only users using Wi-Fi 6 (802.11ax) can access). This ensures bandwidth transmission and device performance.

Remote probing and analysis

WA6120X can act as a remote probing and analysis sensor with an independent RF scanning function. It can monitor and capture the full-band Wi-Fi packets in the coverage area, and report them to the local device in real time for administrators to perform troubleshooting and optimization analyses. All of this will not affect the normal access of APs. Remote probing can conduct a wireless packet mirroring for working channels, or polling of all channels to satisfy wireless network monitoring and maintenance requirements.

In Doctor AP mode, WA6120X can simulate the wireless terminals and corporate with the smart O&M platform to troubleshoot and analyze wireless radio failures. In this mode, APs will simulate the terminal devices to collect network information and synchronize it to the smart O&M platform for accurate fault diagnoses. The Doctor AP combined with the Cloudnet app and Cloudnet platform implements a three-dimensional analysis of the cloud network and accurate network fault location.

Orthogonal frequency division multiple access (OFDMA)

WA6120X supports OFDMA technology. An AP can divide wireless bandwidth and transmit data to multiple terminals simultaneously via different subcarriers. This reduces transmission latency caused by multi-user radio resource contention and backoffs and improves the user experience of low-latency applications such as speech output and video in multi-user scenarios.

Spatial reuse (SR)

WA6120X supports spatial reuse technology and basic service set (BSS) coloring technology. With these technologies, it identifies the color of the packets at the link layer to control the terminal device and adjusts transmit power to improve the reuse rate of channels in high-density deployment and avoid co-channel interference in case of simultaneous multi-user operation. This greatly improves the utilization rate of spectrum resources.

Orthogonal frequency division multiple access (TWT)

WA6120X supports the target wake times (TWT) technology. It allows the AP to uniformly schedule the wake-up and sleep time of the terminal, reducing contention and improving power efficiency by decreasing unnecessary wake-up times of the terminal.

Flexible forwarding

When the WA6120X AP is connected via a wide area network (WAN), the wireless access points (AP) are deployed in branch offices, while wireless access controllers (AC) are deployed in headquarters. In the traditional forwarding mode, all packets are sent from APs to ACs, and centrally forwarded by the AC. However, for WA6120X, the packets can be converted to wired packets on the wireless access device directly avoiding data packets sent through AC but forwarded locally, which significantly saves wired network bandwidth. Besides, WA6120X supports flexible policy-based forwarding and allows terminal devices of the same wireless service to implement centralized forwarding and local forwarding, so as to release export bandwidth and save costs of network bandwidth.

IPv4 and IPv6 dual stack (Native IPv6)

WA6120X is fully compliant with IPv6 and implements dual IPv4/IPv6 protocol stacks. It can automatically register on the wireless controller and provide wireless services no matter in an IPv4 or IPv6 network via broadcast, multicast, DHCP option 43, or DNS, so that it never runs as an information silo.

End user admission domination

End user admission domination (EAD) integrates network access and terminal security products, and implements enterprise security policies for user terminals that have accessed the network. When working with a security policy server, it can monitor users, remind, isolate, or boot them off when their systems are infected or not patched correctly. Only wireless clients that comply with security policies are admitted. This enhances overall wireless security.

Specifications

Hardware specifications

Attribute	WA6120X
Dimensions (excluding antenna connectors and mounting accessories)	250 × 101 × 110 mm（H x W x D）
Fixed port	2 × 10/100/1000M electrical port
Console port	1

Attribute	WA6120X
Built-in antenna	Omnidirectional antenna
Working frequencies	802.11ax/ac/n/a: 5.725 GHz - 5.850 GHz (China); 5.47 GHz - 5.725 GHz; 5.15 GHz - 5.35 GHz (China) 802.11ax/b/g/n: 2.4 GHz - 2.483 GHz (China)
Modulation technology	OFDM: BPSK@6/9Mbps, QPSK@12/18Mbps, 16-QAM@24Mbps, 64-QAM@48/54Mbps DSSS: DBPSK@1Mbps, DQPSK@2Mbps, CCK@5.5/11Mbps MIMO-OFDM(11n): MCS 0-15 MIMO-OFDM(11ac): MCS 0-9 MIMO-OFDM(11ax): MCS 0-11
Modulation mode	11b: DSS:CCK@5.5/11Mbps, DQPSK@2Mbps, DBPSK@1Mbps 11a/g: OFDM:64QAM@48/54Mbps, 16QAM@24Mbps, QPSK@12/18Mbps, BPSK@6/9Mbps 11n: MIMO-OFDM:BPSK, QPSK, 16QAM, 64QAM 11ac/ac wave2: MIMO-OFDM:BPSK, QPSK, 16QAM, 64QAM, 256QAM 11ax: MIMO-OFDM: BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM
Transmit power (combined power)	23 dBm (Varies depending on local laws and regulations)
Adjustable power granularity	1 dBm
Power consumption	≤16.32W
Reset/restoration to factory default	Supported
State LED	Alternating flashing mode, orange/green/blue for different working states, breathing mode
Operating temperature/storage temperature	-30ºC to +55ºC/-40ºC to +70ºC
Operating humidity/storage humidity	0% - 100% (non-condensing)
Protection degree	IP67
Safety compliance	GB 4943, EN/IEC/UL 60950-1, EN/IEC/UL 62368-1
EMC	EN 55024, EN 55032, EN 61000-3-2, EN 61000-3-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11, EN 60601-1-2, EN 301 489-1, EN 301 489-17
Environment	GB/T 2423, GB/T 13543, GB 4208
Radio frequency certification	FCC Part 15, EN 300 328, EN 301 893, and MIIT SRRC
MTBF	>850000H

Software specifications

Attribute	WA6120X

Positioning		Outdoor AP (5 GHz 2*2 MIMO + 2.4 GHz 2*2 MIMO)
Operating mode	Fit mode	Controlled by AC
	Cloud mode (Fat mode)	Controlled via Cloudnet or operates independently
	Anchor AC mode	Acts as AC to manage the fit AP
	Mode switching	Mode switching via command lines, ACs, Cloudnet, or reset button
11ax supported	Maximum Wi-Fi 6 (802.11ax) transmission speed	2.4 Gbps + 0.575 Gbps
	TWT	Supported
	BSS Color	Supported
	MU-MIMO	Supported
	OFDMA	Supported
	Only 11ax	Supported
WLAN basics	Working frequencies	5 GHz + 2.4 GHz
	A-MPDU	Supported
	A-MSDU	Supported
	Maximum likelihood demodulation (MLD)	Supported
	Maximal ratio combining (MRC)	Supported
	Spatial-Time block coding (STBC)	Supported
	Low-density parity check (LDPC)	Supported
WLAN extended	STA related	STA offline anomaly check, STA aging, statistics and status query
	User number limit	Supported
	Link integrity check	Supported
	Broadcast probe acknowledgment control	Supported
	Prohibition of client access with weak signals	Supported
	Hidden SSID	Supported
	WLAN RRM	Supported
	Wireless bridging	Supported
	Repeater mode	Supported
	Client mode	Available in Cloud mode
	Doctor AP	Available in Fit mode
	Remote AP	Available in Fit mode
	11k	Supported
	11v	Available in Fit mode
	11r	Available in Fit mode
Security control policies	Encryption	64- or 128- bit WEP, TKIP, CCMP, WPA3, and WAPI
		Multiple encryption key triggered dynamic unicast/multicast key update

	802.11i	Supported
	Authentication	802.1X authentication, MAC address authentication, PSK authentication, Portal authentication; Open system/shared key authentication; Enhanced open system authentication Mixed access of WPA, WPA2, WPA3, and Pre-RSNA users
	User isolation	Layer 2 user isolation SSID-based user isolation
	Forwarding security	Packet filtering, MAC address filtering, and broadcast storm suppression
	Wireless endpoint access	Wireless EAD supported
	SSID and VLAN binding	Supported
	Wireless Intelligent Application Aware (wIAA)	Supported
	WIDS/WIPS	Supported
	MFP (802.11w)	Supported
	802.1X Client	Supported
AAA	Radius Client	Supported
	Multiple-domain authentication server	Supported
	Backup authentication server	Supported
Layer 2 and layer 3 features	IP address configuration	Static IP or DHCP assigned IP (option 60)
	Native IPv6	Supported
	IPv6 Portal	Supported
	IPv6 SAVI	Supported
	ACL	IPv4/IPv6
	NAT	Supported
	PPPoE Client	Supported
	Local forwarding	Local forwarding based on SSID+VLAN supported in Fit mode
	Multicast	IGMP Snooping/MLD Snooping
QoS	802.11e	WMM
	Priority	Ethernet port based 802.1p identification and marking priority
		Priority mapping for wired and wireless connection
	Strategic QoS mapping	Distinctive QoS policies based on individual SSID/VLAN
	Layer 2 to Layer 4 packet filtering and traffic classification	Supported
	CAR	Supported
	User bandwidth management	Bandwidth allocation per STA All STAs sharing bandwidth with a common SSID Dynamical adjusting of the available bandwidth of the STAs in terms of service needs
	Load balancing	Traffic-based load balancing User-based load balancing Radio-based load balancing for dual-5G devices

	Spectrum guide	Supported
	Multicast enhancement	Multicast to unicast (IPv4/IPv6)
	CAC (Call Admission Control)	Session-based and channel usage-based CAC
	Application recognition	Supports audio and video optimization (eMDI/SQA/UCC) in Fit mode
	Airtime fairness (ATF)	Supported
Green features	Green AP mode	Supported
	Dynamic MIMO power saving	Supported
	Enhanced automatic power save delivery (E-APSD)	Supported
	SM Power Save	Supported
Management and maintenance	Centralized AC management	Fit mode: supports centralized management Cloud mode: supports version upgrade and mode switching
	Cloudnet management	Available in Cloud mode
	Local Web	Available in Cloud mode/Anchor AC mode
	Telnet	Available in Cloud mode/Anchor AC mode
	SSH	Available in Cloud mode/Anchor AC mode
	SNMP	Available in Cloud mode/Anchor AC mode
	Debug serial port	Supported
	Smart O&M	Available in Fit/Cloud mode

*Note: The option with "Supported" listed in the software specifications means that all AP modes support this option.

New H3C Technologies Co., Ltd.
Beijing headquarters
Building 1, Lei Shing Hong Center, No. 8 Guangshun South Street, Chaoyang District, Beijing
Post Code: 100102

Hangzhou headquarters
No. 466, Changhe Road, Binjiang District, Hangzhou
Post Code: 310052
Phone: 0571-86760000
Fax: 0571-86760001

http://www.h3c.com

Customer service hotline
400-810-0504

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