Huawei AirEngine AirEngine 8771-X1T Access Point Datasheet

Product Overview

Huawei AirEngine 8771-X1T is an indoor access point (AP) in compliance with Wi-Fi 7 (802.11be). It can simultaneously provide services on 2.4 GHz (4x4 MIMO), 5 GHz (4x4 MIMO), and 6 GHz (4x4 MIMO) frequency bands, achieving a device rate of up to 18.67 Gbps. The AirEngine 8771-X1T excels in innovative application scenarios such as metacosm, XR remote collaboration, XR telemedicine, and XR interactive teaching.



AirEngine 8771-X1T

- Triple-radio: 2.4 GHz (4x4 MIMO) + 5 GHz (4x4 MIMO) + 6 GHz (4x4 MIMO), achieving rates of up to 1.376 Gbps, 5.765 Gbps, and 11.53 Gbps respectively, and 18.67 Gbps for the device.

Frequency Band	Channel Bandwidth	MIMO	Peak Data Rate	Wi-Fi Standard
6 GHz	320 MHz	4x4	11.53 Gbps	802.11a/n/ac/ac Wave 2/ax/be
5 GHz	160 MHz	4x4	5.765 Gbps	802.11a/n/ac/ac Wave 2 /ax/be
2.4 GHz	40 MHz	4x4	1.376 Gbps	802.11b/g/n/ax/be

- 6 GHz radio that can be switched to the 5 GHz radio flexibly, adapting to scenarios where the use of the 6 GHz frequency band is not clear yet.
- 2 x 10GE electrical ports and 1 x 10G SFP+ port. The 10G SFP+ optical port supports 300 m long-distance PoE++ power supply with hybrid cable 2.0.
- Built-in dynamic-zoom smart antennas that can flexibly work in omnidirectional or high-density coverage mode. The former mode promises wider coverage, while the latter mode maximizes performance and optimizes user experience in dense environments. It makes the AP capable of adapting to omnidirectional and high-density scenarios dynamically based on STA access requirements.
- USB interface can be used for external IoT expansion (supporting protocols such as ZigBee and RFID).
- Installation type can be wall-mounting and ceiling-mounting.
- Bluetooth serial interface-based O&M through built-in Bluetooth and CloudCampus APP.
- Fat, Fit, and cloud working modes.

Feature Descriptions

Wi-Fi 7 (802.11be) standard

Wi-Fi 7 (Wi-Fi 7) is the next-generation Wi-Fi standard to be launched, also known as IEEE 802.11be or extremely high throughput (EHT). Based on Wi-Fi 6, Wi-Fi 7 introduces technologies such as 320 MHz bandwidth, 4096-quadrature amplitude modulation (QAM), multi-resource unit (RU), multi-link operation (MLO), enhanced multi-user multiple-input multiple-output (MU-MIMO), and multi-access point coordination. Drawing on these cutting-edge technologies, Wi-Fi 7 delivers a higher data transmission rate and lower latency than Wi-Fi 6. Wi-Fi 7 is expected to support a throughput of up to 30 Gbps, about three times that of Wi-Fi 6.

Wi-Fi 7 vs. Wi-Fi 6

Based on the Wi-Fi 6 standard, Wi-Fi 7 introduces a plurality of new technologies. The following compares Wi-Fi 6 and Wi-Fi 7.

	Wi-Fi 6	Wi-Fi 7
IEEE standard	802.11ax	802.11be
Maximum transmission rate	9.6 Gbps	30 Gbps
Frequency band	2.4 GHz, 5 GHz, 6 GHz (Wi-Fi 6E)	2.4 GHz, 5 GHz, and 6 GHz
Security protocol	WPA3	WPA3
Channel bandwidth	20 MHz, 40 MHz, 80 MHz, 160 MHz, 80+80 MHz	Up to 320 MHz
Modulation mode	1024-QAM OFDMA	4096-QAM OFDMA
MIMO	8x8 UL/DL MU-MIMO	16x16 UL/DL MU-MIMO

New Features in Wi-Fi 7

Wi-Fi 7 aims to increase the WLAN throughput to 30 Gbps and provide low-latency access assurance. To achieve this goal, the standard defines modifications to both the physical layer (PHY) and MAC layer. Compared with Wi-Fi 6, Wi-Fi 7 brings the following technical innovations:

Up to 320 MHz Bandwidth

The 2.4 GHz and 5 GHz frequency bands are unlicensed spectrums that limited and congested. When running emerging applications (such as VR/AR), existing Wi-Fi networks inevitably encounter low quality of service (QoS). To achieve a maximum of 30 Gbps throughput, Wi-Fi 7 will support the 6 GHz of frequency band and extend new bandwidth modes, including contiguous 240 MHz, non-contiguous 160+80 MHz, contiguous 320 MHz, and non-contiguous 160+160 MHz.

Multi-RU

In Wi-Fi 6, each user can send or receive frames only on the RUs allocated to them, which greatly limits the flexibility of spectrum resource scheduling. To resolve this problem and further improve spectrum efficiency, Wi-Fi 7 defines a mechanism for allocating multiple RUs to a single user. To balance the implementation complexity and spectrum utilization, the standard specifications impose certain restrictions on RU combination. That is, small RUs (containing fewer than 242 tones) can be combined only with small RUs, and large RUs (containing greater than or equal to 242 tones) can be combined only with large RUs. Small RUs and large RUs can be combined together.

Higher-Order 4096-QAM

The highest order modulation supported by Wi-Fi 6 is 1024-QAM, which allows each modulation symbol to carry up to 10 bits. To further improve the rate, Wi-Fi 7 introduces 4096-QAM so that each modulation symbol can carry 12 bits. With the same coding, 4096-QAM in Wi-Fi 7 can achieve a 20% rate increase compared with 1024-QAM in Wi-Fi 6.

Multi-Link Mechanism

To efficiently utilize all available spectrum resources, the industry is in urgent need to introduce new spectrum management, coordination, and transmission mechanisms on the 2.4 GHz, 5 GHz, and 6 GHz frequency bands. The TGbe defines multi-link aggregation technologies, including the MAC architecture of enhanced multi-link aggregation, multi-link channel access, and multi-link transmission.

More Data Streams and Enhanced MIMO

Wi-Fi 7 increases the number of spatial streams from 8 to 16, increasing the theoretical physical transmission rate by more than twice than Wi-Fi 6. With more data streams, Wi-Fi 7 supports distributed MIMO. That is, 16 data streams can be provided by multiple access points at the same time, meaning that multiple APs need to coordinate with each other.

Multi-AP Coordination

In the current 802.11 protocol framework, there is not much coordination between APs. Common WLAN functions, such as automatic radio calibration and smart roaming, are vendor-defined features. Multi-AP coordination aims to optimize channel selection and adjust loads between APs to achieve efficient utilization and balanced allocation of radio resources. Coordinated scheduling between multiple APs in Wi-Fi 7 involves inter-cell coordinated planning in the time and frequency domains, inter-cell interference coordination, and distributed MIMO. This reduces interference between APs and greatly improves the utilization of air interface resources.

Multi-AP coordination can be implemented in various methods, such as coordinated orthogonal frequency division multiple access (C-OFDMA), coordinated spatial reuse (CSR), coordinated beamforming (CBF), and joint transmission (JXT).

Wi-Fi 7 Application Scenarios

New functions introduced by Wi-Fi 7 will significantly improve the data transmission rate and deliver lower latency. These highlights will contribute to the development of emerging applications:

- Video stream
- Video/Voice conference
- Online gaming
- Real-time collaboration
- Cloud/Edge computing
- Industrial IoT
- Immersive AR/VR
- Interactive telemedicine

Cloud-based Management

The AP can be managed via cloud, then no need to deploy a WLAN AC and an authentication server. In cloud-based management mode, abundant authentication functions, such as pre-shared key (PSK) authentication, Portal authentication, SMS authentication, and social media authentication, can be implemented. This mode significantly simplifies the networking and reduces the capital expenditure (CAPEX). In addition, multiple advanced functions, such as online cloud-based network planning, cloud-based deployment, cloud-based inspection, and cloud-based O&M, can be implemented through Huawei cloud management platform. In multi-branch deployment scenarios, cloud APs are pre-configured on the cloud management platform firstly. Then on site, you only need to power on the cloud APs and connect them to switch ports, then scan the QR code to implement AP plug-and-play. Pre-configurations are automatically delivered to devices, greatly shortening the network deployment time. The cloud management platform can monitor the network status, device status, and terminal connection status of all sites of a tenant in a comprehensive and intuitive way to learn the network and service running status in real time.

Basic Specifications

Fat/Fit AP mode

Item	Description
WLAN features	Compliance with IEEE 802.11a/b/g/n/ac/ac Wave 2/ax/be Maximum ratio combining (MRC) Space time block code (STBC) Cyclic Delay Diversity (CDD)/Cyclic Shift Diversity (CSD) Beamforming Multi-user multiple-input multiple-output (MU-MIMO) Uplink/downlink OFDMA (Orthogonal frequency division multiple access) Compliance with 4096-quadrature amplitude modulation (QAM) and compatibility with 1024-QAM, 256-QAM, 64-QAM, 16-QAM, 8-QAM, quadrature phase shift keying (QPSK), and binary phase shift keying (BPSK)

Item	Description
	Target wake time (TWT) Low-density parity-check (LDPC) Frame aggregation, including A-MPDU (Tx/Rx) and A-MSDU (Tx/Rx) 802.11 dynamic frequency selection (DFS) Short guard interval (GI) in 20 MHz, 40 MHz, 80 MHz, 160 MHz, and 320 MHz modes Priority mapping and scheduling that are compliant with Wi-Fi multimedia (WMM) to implement priority-based data processing and forwarding. Automatic and manual rate adjustment (the rate is adjusted automatically by default) WLAN channel management and channel rate adjustment **NOTE** *For detailed management channels, see the Country Code & Channel Compliances.* Automatic channel scanning and interference avoidance Separate service set identifier (SSID) hiding configuration for each AP, supporting Chinese SSIDs Signal sustain technology (SST) Unscheduled automatic power save delivery (U-APSD) Control and Provisioning of Wireless Access Points (APs) in Fit AP mode Automatic login in Fit AP mode Extended Service Set (ESS) in Fit AP mode Advanced cellular coexistence (ACC), minimizing the impact of interference from cellular networks Multi-user call admission control (CAC) 802.11k and 802.11v smart roaming 802.11r fast roaming (≤ 50 ms)
Network features	Compliance with IEEE 802.3ab Auto-negotiation of the rate and duplex mode and automatic switchover between the Media Dependent Interface (MDI) and Media Dependent Interface Crossover (MDI-X) Compliance with IEEE 802.1q SSID-based VLAN assignment Uplink VLAN trunks on Ethernet ports Management channel of the AP's uplink port in tagged and untagged mode DHCP client, obtaining IP addresses through DHCP Tunnel data forwarding and direct data forwarding Application identification and QoS classification when AP local forwarding (also called direct forwarding), which can significantly improve voice quality for applications such as Skype, QQ, and WeChat STA isolation in the same VLAN IPv4/IPv6 access control lists (ACLs) Link Layer Discovery Protocol (LLDP) Link Aggregation Control Protocol (LACP) Uninterrupted service forwarding upon CAPWAP channel disconnection in Fit AP mode Unified authentication on the AC in Fit AP mode AC dual-link backup in Fit AP mode Network Address Translation (NAT) in Fat AP mode IPv6 in Fit AP mode Soft Generic Routing Encapsulation (GRE) Telemetry in Fit AP mode, quickly collecting AP status and application experience parameters

Item	Description
	IPv6 Source Address Validation Improvements (SAVI) Multicast Domain Name Service (mDNS) gateway protocol
QoS features	WMM parameter management for each radio WMM power saving Priority mapping for upstream packets and flow-based mapping for downstream packets Queue mapping and scheduling User-based bandwidth limiting Adaptive bandwidth management (automatic bandwidth adjustment based on the user quantity and radio environment) to improve user experience Airtime scheduling Air interface HQoS scheduling Application acceleration for VR and mobile gaming Application identification Intelligent multimedia scheduling
Security features	Open system authentication WEP authentication/encryption using a 64-bit, 128-bit, 152-bit or 192-bit encryption key WPA2-PSK authentication and encryption (WPA2-Personal) WPA2-802.1X authentication and encryption (WPA2-Enterprise) WPA3-SAE authentication and encryption (WPA3-Personal) WPA3-802.1X authentication and encryption (WPA3-Enterprise) WPA-WPA2 hybrid authentication WPA2-WPA3 hybrid authentication WPA2-PPSK authentication and encryption in Fit AP mode Wireless intrusion detection system (WIDS) and wireless intrusion prevention system (WIPS), including rogue device detection and containment, attack detection and dynamic blacklist, and STA/AP blacklist and whitelist 802.1X authentication, MAC address authentication, and Portal authentication DHCP snooping Dynamic ARP Inspection (DAI) IP Source Guard (IPSG) 802.11w Protected Management Frames (PMF) IPsec/DTLS hardware encryption
Maintenance features	Unified management and maintenance on the AC in Fit AP mode Automatic login, automatic configuration loading, and plug-and-play (PnP) in Fit AP mode Automatic batch upgrade in Fit AP mode Telnet STelnet using SSHv2 SFTP using SSHv2 Remote wireless O&M through the Bluetooth serial interface Web system-based AP management in Fat AP mode, login through HTTP or HTTPS Real-time configuration monitoring and fast fault locating using the NMS SNMP v1/v2/v3 in Fat AP mode System status alarm Network Time Protocol (NTP) in Fat AP mode
BYOD	**NOTE**

Item	Description
	The AP supports bring your own device (BYOD) only in Fit AP mode. Device type identification according to the organizationally unique identifier (OUI) in the MAC address Device type identification according to the user agent (UA) information in an HTTP packet Device type identification according to DHCP options The RADIUS server delivers packet forwarding, security, and QoS policies according to the device type carried in the RADIUS authentication and accounting packets.
Location service	**NOTE** *The AP supports the location service only in Fit AP mode.* Wi-Fi terminal location Working with the location server to locate rogue devices
Spectrum analysis	**NOTE** *The AP supports spectrum analysis only in Fit AP mode.* Identification of more than eight interference sources including Bluetooth devices, microwave ovens, cordless phones, ZigBee devices, game controllers, 2.4 GHz/5 GHz wireless video and audio devices, and baby monitors Working with the location server to locate interference sources and perform spectrum analysis on them

Cloud-based management mode

Item	Description
WLAN features	Compliance with IEEE 802.11a/b/g/n/ac/ac Wave 2/ax/be Maximum ratio combining (MRC) Space time block code (STBC) Beamforming Multi-user multiple-input multiple-output (MU-MIMO) Uplink/downlink OFDMA (Orthogonal frequency division multiple access) Compliance with 4096-quadrature amplitude modulation (QAM) and compatibility with 1024-QAM, 256-QAM, 64-QAM, 16-QAM, 8-QAM, quadrature phase shift keying (QPSK), and binary phase shift keying (BPSK) Low-density parity-check (LDPC) Frame aggregation, including A-MPDU (Tx/Rx) and A-MSDU (Tx/Rx) 802.11 dynamic frequency selection (DFS) Priority mapping and packet scheduling based on a Wi-Fi Multimedia (WMM) profile to implement priority-based data processing and forwarding WLAN channel management and channel rate adjustment **NOTE** *For detailed management channels, see the Country Code & Channel Compliances.* Automatic channel scanning and interference avoidance Service set identifier (SSID) hiding Signal sustain technology (SST) Unscheduled automatic power save delivery (U-APSD) Automatic login
Network features	Compliance with IEEE 802.3ab Auto-negotiation of the rate and duplex mode and automatic switchover between the Media

Item	Description
	Dependent Interface (MDI) and Media Dependent Interface Crossover (MDI-X) Compliance with IEEE 802.1q SSID-based VLAN assignment VLAN trunk on uplink Ethernet ports Management channel of the AP uplink port in tagged and untagged mode DHCP client, obtaining IP addresses through DHCP Tunnel data forwarding and direct data forwarding STA isolation in the same VLAN IPv4/IPv6 access control lists (ACLs) Link Layer Discovery Protocol (LLDP) Link Aggregation Control Protocol (LACP) Uninterrupted service forwarding upon CAPWAP channel disconnection in Fit AP mode Unified authentication on the AC in Fit AP mode AC dual-link backup in Fit AP mode Network Address Translation (NAT) in Fat AP mode IPv6 in Fit AP mode Soft Generic Routing Encapsulation (GRE) IPv6 Source Address Validation Improvements (SAVI) Multicast Domain Name Service (mDNS) gateway protocol
QoS features	WMM parameter management for each radio WMM power saving Priority mapping for upstream packets and flow-based mapping for downstream packets Queue mapping and scheduling User-based bandwidth limiting Airtime scheduling Application acceleration for VR and mobile gaming Air interface HQoS scheduling
Security features	Open system authentication WEP authentication/encryption using a 64-bit, 128-bit, 152-bit or 192-bit encryption key WPA2-PSK authentication and encryption (WPA2-Personal) WPA2-802.1X authentication and encryption (WPA2-Enterprise) WPA3-SAE authentication and encryption (WPA3-Personal) WPA3-802.1X authentication and encryption (WPA3-Enterprise) WPA-WPA2 hybrid authentication WPA2-WPA3 hybrid authentication 802.1x authentication, MAC address authentication, and Portal authentication DHCP snooping Dynamic ARP Inspection (DAI) IP Source Guard (IPSG)
Maintenance features	Unified management and maintenance on the Agile Controller Automatic login and configuration loading, and plug-and-play (PnP) Batch upgrade Telnet STelnet using SSHv2

Item	Description
	SFTP using SSHv2 Remote wireless O&M through the Bluetooth console port Web-based local AP management through HTTP or HTTPS Real-time configuration monitoring and fast fault locating using the NMS System status alarm Network Time Protocol (NTP)

Technical Specifications

Item		Description
Technical specifications	Interface type	2 x 100M/1000M/2.5GE/5GE/10GE BASE-T RJ-45 auto-sensing 1 x 1G/10G SFP+ 1 x USB 2.0 port NOTE ● *The 10GE electrical port supports PoE input.* ● *The 10G optical port supports the 10GE optical module, GE optical module, or hybrid module (supporting PoE input).*
	Bluetooth	BLE 5.2
Power specifications	Power input	● DC: 48 V ± 10% ● PoE power supply: in compliance with 802.3at
Environmental specifications	Operating temperature	-10°C to +50°C
	Storage temperature	-40°C to +70°C
Radio specifications	Antenna type	Built-in dynamic-zoom smart antennas
	Maximum number of SSIDs for each radio	≤ 16
	Maximum number of users	≤ 1536 (512/Radio) NOTE ● *The actual number of users varies according to the environment.*
Reliability	MTBF	53.2 years (466276.5 hours)

Standards Compliance

Item	Description		
Safety standards	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1	● UL 62368-1 ● EN 62368-1 ● IEC 62368-1	● GB 4943.1 ● CAN/CSA 22.2 No.60950-1
Radio	● ETSI EN 300 328	● ETSI EN 301 893	● AS/NZS 4268

Item	Description		
standards			
EMC standards	• EN 301 489-1 • EN 301 489-17 • EN 60601-1-2 • EN 55024 • EN 55032 • EN 55035	• GB 9254 • GB 17625.1 • GB 17625.2 • AS/NZS CISPR32 • CISPR 24 • CISPR 32 • CISPR 35	• IEC/EN61000-4-2 • IEC/EN 61000-4-3 • IEC/EN 61000-4-4 • IEC/EN 61000-4-5 • IEC/EN61000-4-6 • ICES-003
IEEE standards	• IEEE 802.11a/b/g • IEEE 802.11n • IEEE 802.11ac • IEEE 802.11ax	• IEEE 802.11h • IEEE 802.11d • IEEE 802.11e • IEEE 802.11k	• IEEE 802.11v • IEEE 802.11w • IEEE 802.11r • IEEE 802.3bz
Security standards	• 802.11i, Wi-Fi Protected Access (WPA), WPA2, WPA2-Enterprise, WPA2-PSK, WPA3, WAPI • 802.1X • Advanced Encryption Standards (AES), Temporal Key Integrity Protocol (TKIP), WEP, Open • EAP Type(s)		
EMF	• EN 62311	• EN 50385	
RoHS	• Directive 2002/95/EC & 2011/65/EU	• (EU)2015/863	
Reach	• Regulation 1907/2006/EC		
WEEE	• Directive 2002/96/EC & 2012/19/EU		

More Information

For more information about Huawei WLAN products, visit http://e.huawei.com or contact us in the following ways:

- Global service hotline: http://e.huawei.com/en/service-hotline
- Logging in to the Huawei enterprise technical support website: http://support.huawei.com/enterprise/
- Sending an email to the customer service mailbox: support_e@huawei.com

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