Huawei AirEngine 8761-X1 Access Point Datasheet

Product Overview

AirEngine 8761-X1 is next-generation 802.11ax wireless access points (APs) with built-in smart antennas released by Huawei. It provides services simultaneously on both the 2.4 GHz and 5 GHz bands, at a rate of up to 1.15 Gbps at 2.4 GHz (4x4 MIMO), 4.8 Gbps at 5 GHz (8x8 MIMO), and 5.95 Gbps for the device. This AP supports 10 Gbit/s Ethernet ports, which eliminates the bottleneck of upstream bandwidth and enables enterprise users to enjoy high-quality wireless services. These strengths make the AP apply to high-bandwidth services such as HD video streaming, multimedia, and desktop cloud applications.

AirEngine 8761-X1

- Provides services simultaneously on both the 2.4 GHz and 5 GHz bands, at a rate of up to 1.15 Gbit/s at 2.4 GHz (4x4:4), 4.8 Gbit/s at 5 GHz (8x8:8), and 5.95 Gbit/s for the device.
- Provides a 10GE uplink interface that supports 100M/1000M/2.5G/5G auto-sensing.
- Supports Bluetooth serial interface-based O & M through built-in Bluetooth and CloudCampus APP.
- USB port can be used for external IoT expansion (supporting protocols such as ZigBee, and RFID).
- Supports the Fat, Fit, and Cloud three working modes.

NOTE

- *The device rate is the theoretical speed of Wi-Fi and may vary based on different environments or devices.*

Feature Descriptions

Wi-Fi 6 (802.11ax) standard

- As the latest generation Wi-Fi standards of IEEE 802.11, 802.11ax improves user experience in high-density access scenarios and supports 2.4 GHz and 5 GHz frequency bands.
- MU-MIMO on both the 2.4 GHz and 5 GHz frequency bands, allowing an AP to transmit data to and receive data from multiple STAs simultaneously and multiplying the utilization of radio spectrum resources.
- Wi-Fi 6 supports 1024 QAM (quadrature amplitude modulation), improving data transmission efficiency by 25% compared with the 802.11ac (256 QAM).
- OFDMA scheduling enables multiple users to receive and send information at the same time, reducing latency and improving network efficiency.
- Spatial reuse (SR) technology uses basic service set (BSS) coloring to enable APs and STAs to distinguish BSSs and allows multiple STAs to transmit data at the same time.
- The target wake time (TWT) allows APs and STAs to negotiate the sleep and wake time with each other, thereby improving the battery life of the STAs.

MU-MIMO

- The MU-MIMO technology enables an AP to send data to multiple STAs simultaneously, which doubles the radio spectrum resource usage, increases the number of access users and bandwidth, and improves user experience in high-density access scenarios.

Smart Antenna Array Technology

- The AP equipped with the dual-band smart antenna array and intelligent switchover algorithm can intelligently detect the application environment and access density, achieving more accurate signal coverage and interference suppression. This design helps provide the optimal signal coverage direction and signal quality for each STA, bringing seamless wireless network access experience to the users.

High-speed Access

- The AP supports new technologies such as 1024 QAM (quadrature amplitude modulation), more available data subcarriers, and more efficient symbol scheduling, which enable the 2.4 GHz radio to reach 1.15 Gbit/s, the 5 GHz radio to reach 4.8 Gbit/s, and the entire device to reach 5.95 Gbit/s.

Uplink Bandwidth @ 10GE

- Provides 10GE uplink ports to meet the requirements of 802.11ax APs for uplink bandwidth exceeding 5 Gbit/s.

High Density Boost Technology

In high-density scenarios, Huawei uses the following technologies to address challenges such as terminal access problems, data congestion, and poor roaming performance.

SmartRadio For Air Interface Optimization

- Load balancing during smart roaming: The load balancing algorithm can work during smart roaming for load balancing detection among APs on the network after STA roaming to adjust the STA load on each AP, improving network stability.
- Intelligent DFA technology: The dynamic frequency assignment (DFA) algorithm is used to automatically detect adjacent-channel and co-channel interference, and identify any 2.4 GHz redundant radio. Through automatic inter-AP negotiation, the redundant radio is automatically switched to another mode (dual-5G AP models support 2.4G-to-5G switchover) or is disabled to reduce 2.4 GHz co-channel interference and increase the system capacity.
- Intelligent conflict optimization technology: The dynamic enhanced distributed channel access (EDCA) and airtime scheduling algorithms are used to schedule the channel occupation time and service priority of each user. This ensures that each user is assigned relatively equal time for using channel resources and user services are scheduled in an orderly manner, improving service processing efficiency and user experience.

Air Interface Performance Optimization

- In high-density scenarios where many users get access to the network, increased number of low-rate STAs consumes more resources on the air interface, reduces the AP capacity, and lowers user experience. Therefore, Huawei APs will check the signal strength of STAs during access and rejects access from weak-signal STAs. At the same time, the APs monitor the rate of online STAs in real time and forcibly disconnect low-rate STAs so that the STAs can reassociate with APs that have stronger signals. The terminal access control technology can increase air interface use efficiency and allow access from more users.

5G-prior Access

- The APs support both 2.4G and 5G frequency bands. The 5G-prior access function enables an AP to steer STAs to the 5 GHz frequency band first, which reduces the load and interference on the 2.4 GHz frequency band while improving the user experience.

Wired and Wireless Dual Security Guarantee

To ensure data security, Huawei APs integrate wired and wireless security measures and provide comprehensive security protection.

Terminal Wireless Access Authentication and Encryption

- The APs support WEP, WPA/WPA2-PSK, WPA/WPA2-PPSK, WPA/WPA2/WPA3-802.1x, WPA3-SAE and WAPI authentication/encryption modes to ensure security of the wireless network. The authentication mechanism is used to authenticate user identities so that only authorized users can get access to the network resources. The encryption mechanism is used to encrypt data transmitted over wireless links to ensure that the data can only be received and parsed by expected users.

Analysis on Non-Wi-Fi Interference Sources

- Huawei APs can analyze the spectrum of non-Wi-Fi interference sources and identify them, including baby monitors, Bluetooth devices, digital cordless phones (at 2.4 GHz frequency band only), wireless audio transmitters (at both the 2.4 GHz

and 5 GHz frequency bands), wireless game controllers, and microwave ovens. Coupled with Huawei eSight, the precise locations of the interference sources can be detected, and the spectrum of them displayed, enabling the administrator to remove the interference in a timely manner.

Rogue Device Monitoring

- Huawei APs support WIDS/WIPS, and can monitor, identify, defend, counter, and perform refined management on the rogue devices, to provide security guarantees for air interface environment and wireless data transmission.

AP Wired Access Authentication and Encryption

- The AP access control ensures validity of APs. The CAPWAP link protection and DTLS encryption provide security assurance, improving data transmission security between the AP and the AC.

Automatic Radio Calibration

- The AP generates an AP topology based on the collected signal strength, channel parameters, etc. of the surrounding APs. The AP automatically adjusts its transmit power and channel based on the loads and interference caused by authorized APs, rogue APs, and non-Wi-Fi devices. This feature ensures optimal network performance while improving the network reliability and user experience.

Automatic Application Identification

- Huawei APs support smart application control technology to implement visualized control on Layer 4 to Layer 7 applications.

Traffic Identification

- Working with WLAN ACs, APs can identify more than 1600 common applications in various office scenarios. Based on the identification results, APs implement the policy control, such as priority adjustment, scheduling, blocking, and rate limiting, on user services to better use bandwidth resources, improve the service level of key services, and ensure the quality of service (QoS).

Traffic Statistics Collection

- Traffic statistics of each application can be collected globally, by SSID, or by users, enabling the network administrators to know the application use status on the network. The network administrator or operator can implement visualized control on service applications of the smart terminals to enhance security and ensure effective bandwidth control.

Leader AP

- The leader AP integrates some functions of the WLAN AC and can be used to manage Fit APs in small- and medium-sized enterprises and stores. In addition, the clients do not need to purchase the AP management licenses, which effectively saves the overall investment.

Cloud-based Management

- The AP can be managed via cloud, eliminating the need to deploy a WLAN AC. 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 with no authentication server. 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. During onsite network deployment, you only need to power on the cloud APs, connect them to the network ports of switches, and implement plug-and-play (PnP) of the APs by scanning the QR codes. The pre-configurations then are automatically delivered to the APs, significantly shortening the network deployment time. The cloud management platform can monitor the network status, device status, and STA connection status of all sites in a comprehensive and intuitive manner.

Basic Specifications

Fat/Fit AP Mode

Item	Description

Item	Description
WLAN features	Compliance with IEEE 802.11ax and compatibility with IEEE 802.11a/b/g/n/ac/ac Wave 2 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) Orthogonal Frequency Division Multiple Access (OFDMA) Preamble puncturing Per-packet power control BSS Color TxBF Compliance with 1024-QAM and compatibility with 256-QAM/64-QAM/16-QAM/8-QAM/QPSK/BPSK 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, and 80 MHz modes Priority mapping and scheduling that are compliant with Wi-Fi multimedia (WMM) to implement priority-based data processing and forwarding. Either automatic or manual rate adjustment mode is supported. (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 (CAPWAP) in Fit AP mode Extended Service Set (ESS) in Fit AP mode Multi-user CAC Advanced cellular coexistence (ACC), minimizing the impact of interference from cellular networks 802.11k and 802.11v smart roaming 802.11r fast roaming (≤ 50 ms) Hotspot2.0
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 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 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

Item	Description
	WeChat STA isolation in the same VLAN IPv4/IPv6 access control lists (ACLs) Link Layer Discovery Protocol (LLDP) 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 Telemetry in Fit AP mode, quickly collecting AP status and application experience parameters Soft Generic Routing Encapsulation (GRE) IPv6 Source Address Validation Improvements (SAVI) Multicast Domain Name Service (mDNS) gateway protocol: supports AirPlay and AirPrint service sharing between users of different VLANs
QoS features	Priority mapping and packet scheduling based on a Wi-Fi Multimedia (WMM) profile to implement priority-based data processing and forwarding 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 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 edition) WPA2-802.1x authentication and encryption (WPA2 enterprise edition) WPA3-SAE authentication and encryption (WPA3 personal edition) WPA3-802.1x authentication and encryption (WPA3 enterprise edition) WPA-WPA2 hybrid authentication WPA2-WPA3 hybrid authentication WPA2-PPSK authentication and encryption in Fit AP mode WAPI authentication and encryption Wireless intrusion detection system (WIDS) and wireless intrusion prevention system (WIPS), including rogue device detection and countermeasure, 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

Item	Description
EAP types	EAP-TLS, EAP-TTLS, EAP-PEAP, EAP-CHAP, EAP-SIM, EAP-AKA, EAP-GTC, EAP-FAST, EAP-PEAP, EAP-MD5, EAP-MSCHAPv2, PEAPv0, PEAPv1
Maintenance features	Unified management and maintenance on the AC in Fit AP mode Automatic login and configuration loading, and plug-and-play (PnP) in Fit AP mode Batch upgrade in Fit AP mode Telnet STelnet using SSH v2 SFTP using SSH v2 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** *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.
Spectrum analysis	**NOTE** *The AP supports spectrum analysis only in Fit AP mode.* Identification of several interference sources such as Blooth devices, microwave ovens, cordless phones, ZigBee devices, game controllers, 2.4GHz/5GHz wireless video and audio devices, baby monitors, etc. 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 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) Orthogonal frequency division multiple access (OFDMA) Preamble puncturing Per-packet power control BSS Color TxBF Compliance with 1024 QAM (quadrature amplitude modulation) and compatibility with 256-QAM, 64-QAM, 16-QAM, 8-QAM, quadrature phase shift keying (QPSK), and binary phase shift keying

Item	Description
	(BPSK) 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, and 80 MHz modes 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 Table of 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)
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 DHCP client, obtaining IP addresses through DHCP STA isolation in the same VLAN Access control lists (ACLs) Unified authentication on the cloud-based management platform Network Address Translation (NAT) Telemetry in Fit AP mode, quickly collecting AP status and application experience parameters
QoS features	Priority mapping and packet scheduling based on a Wi-Fi Multimedia (WMM) profile to implement priority-based data processing and forwarding 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 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 edition) WPA2-802.1x authentication and encryption (WPA2 enterprise edition) WPA3-SAE authentication and encryption (WPA3 personal edition) WPA3-802.1x authentication and encryption (WPA3 enterprise edition) WPA-WPA2 hybrid authentication WPA2-WPA3 hybrid authentication 802.1x authentication, MAC address authentication, and Portal authentication DHCP snooping

Item	Description
	Dynamic ARP Inspection (DAI) IP Source Guard (IPSG)
EAP types	EAP-TLS, EAP-TTLS, EAP-PEAP, EAP-CHAP, EAP-SIM, EAP-AKA, EAP-GTC, EAP-FAST, EAP-PEAP, EAP-MD5, EAP-MSCHAPv2, PEAPv0, PEAPv1
Maintenance features	Unified management and maintenance on the cloud-based management platform Automatic login and configuration loading, and plug-and-play (PnP) Batch upgrade Telnet STelnet using SSH v2 SFTP using SSH v2 Wireless O&M through the Bluetooth serial port Web local AP management through HTTP or HTTPS Real-time configuration monitoring and fast fault location using the NMS System status alarm Network Time Protocol (NTP)

Technical Specifications

Item		Description
Technical specifications	Dimensions (H x W x D)	220mm×220mm×57mm
	Weight	1.8kg
	Interface type	1 x 10/100/1000M (RJ-45) 1 x 100M/1000M/2.5G/5G/10G (RJ-45) 1 x USB
	BLE	BLE5.2
	LED indicator	Indicates the power-on, startup, running, alarm, and fault states of the system.
Power specifications	Power input	DC: 43.2V ~ 57.6V PoE power supply: In compliance with 802.3bt
	Maximum power consumption	23.5 W (excluding USB) **NOTE** *The actual maximum power consumption depends on local laws and regulations.*
Environmental specifications	Operating temperature	-10°C to +50°C
	Storage temperature	–40°C to +70°C
	Operating humidity	5% to 95% (non-condensing)
	Altitude	–60 m to +5000 m
	Atmospheric pressure	53 kPa to 106 kPa
Radio specifications	Antenna type	Built-in smart antennas
	Antenna gain	2.4GHz: 4 dBi

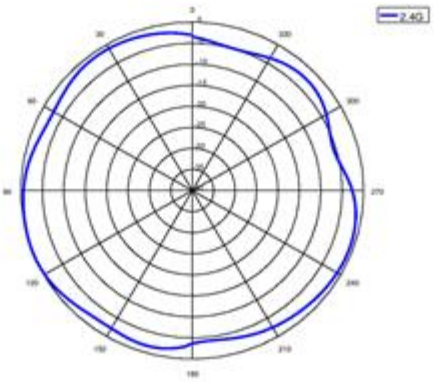
Item		Description
		5GHz: 6 dBi **NOTE** • *The gains above are the single-antenna peak gains.* • *The equivalent antenna gains after combining all of the 2.4 GHz or 5 GHz antennas: 4 dBi for 2.4 GHz; 2 dBi for 5 GHz.*
	Maximum number of SSIDs for each radio	≤ 16
	Maximum number of users	≤1024 **NOTE** *The actual number of users varies according to the application environment.*
	Maximum transmit power	2.4G: 24 dBm (combined power) 5G: 27 dBm (combined power) **NOTE** *The actual transmit power depends on local laws and regulations.*
	Power increment	1 dBm
	Frequency bands	2.400 to 2.4835 GHz ISM 5.150 to 5.250 GHz U-NII-1 5.250 to 5.350 GHz U-NII-2A 5.470 to 5.725 GHz U-NII-2C 5.725 to 5.850 GHz U-NII-3/ISM **NOTE** The available bands and channels are dependent on the configured regulatory domain (country).

Standards Compliance

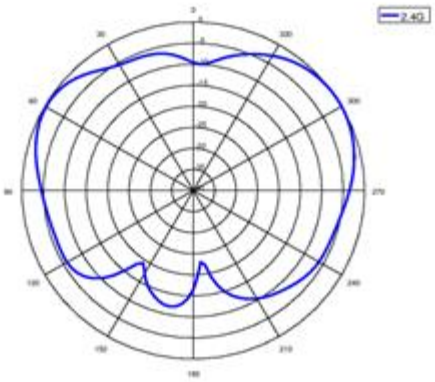
Item	Description		
Safety standards	• UL 60950-1 • EN 60950-1 • IEC 60950-1	• UL 62368-1 • EN 62368-1 • IEC 62368-1	• GB 4943.1 • CAN/CSA 22.2 No.60950-1
Radio standards	• ETSI EN 300 328	• ETSI EN 301 893	• AS/NZS 4268
EMC standards	• EN 301 489-1 • EN 301 489-17 • EN 60601-1-1 • EN 60601-1-2 • EN 55024 • 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	• IEEE 802.11a/b/g	• IEEE 802.11h	• IEEE 802.11v

Item	Description		
standards	• IEEE 802.11n • IEEE 802.11ac • IEEE 802.11ax	• IEEE 802.11d • IEEE 802.11e • IEEE 802.11k	• IEEE 802.11w • IEEE 802.11r
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		

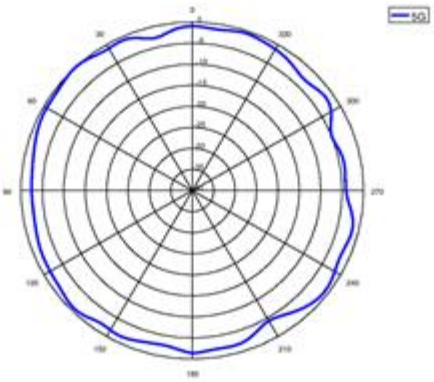
Antennas Pattern



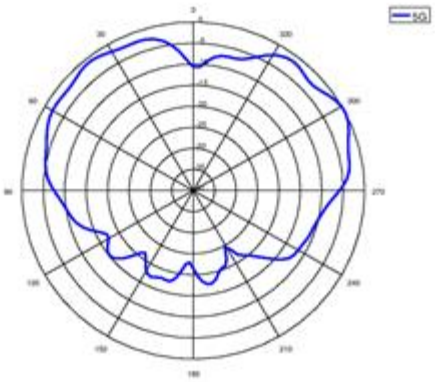
2.4G (Horizontal)



2.4G (Vertical)



5G (Horizontal)



5G (Vertical)

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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