HUAWEI B320-323 LTE CPE V100R001

Product Description

Issue   04

Date   2023-11-06

Huawei Device Co., Ltd.

Huawei Device Co., Ltd.

About This Document

Summary

This document provides information regarding the features, main functions and services, technical specifications, and technical references of the product.

This document includes:

Chapter	Details
1 Product Overview	Provides an overview of the product.
2 Technical Specifications	Describes the specifications of the product hardware, software, and user interface.
3 Services and Applications	Describes the main functions and applications of the product.
4 System Structure and Scenario Constraints	Describes the product system structure.
5 Technical References	Describes the standards and communication protocols of the product.
6 Packing List	Describes the devices and accessories that comprise the product package

📖 NOTE

The document is an invitation to offer but not an offer. It is intended to describe the general features and functions of a product. The features and functions of certain products may vary with the requirements of customers.

History

Issue	Date	Details
01	2023-08-03	Initial official release.
02	2023-08-23	Add VoIP description.
03	2023-10-09	Increase the LTE TDD rate.
04	2023-11-06	Modify the UL rate of LTE FDD.

Acronyms and Abbreviations

Acronym or Abbreviation	Full Spelling
3GPP	3rd Generation Partnership Project
ACS	Auto Configuration Server
AES	Advanced Encryption Standard
ALG	Application Layer Gateway
AMR-NB	Adaptive Multi-Rate compression - Narrowband
AMR-WB	Adaptive Multi-Rate compression - Wideband
AP	Access Point
APN	Access Point Name
ARP	Address Resolution Protocol
CLAT	Customer-side Translator
CPE	Customer Premises Equipment
CS	Circuit Switched
CSFB	Circuit Switched Fallback
DBDC	Dual Band Dual Concurrent
DC-HSPA+	Dual-Carrier - High Speed Packet Access Evolution
DHCP	Dynamic Host Configuration Protocol
DL	Downlink
DMZ	Demilitarized Zone
DNS	Domain Name Server
DTMF	Dual-Tone Multi-Frequency
EDGE	Enhanced Data rates for Global Evolution
E-UTRA	Evolved Universal Terrestrial Radio Access Network
FDD	Frequency Division Duplex
HOTA	Huawei Firmware Over the Air
HSPA	High Speed Packet Access
HSPA+	High Speed Packet Access Evolution
GPRS	General Packet Radio Service
IEEE	Institute of Electrical and Electronics Engineers

Acronym or Abbreviation	Full Spelling
IP	Internet Protocol
IPSec	Internet Protocol Security
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ICMP	Internet Control Message Protocol
L2TP	Layer Two Tunneling Protocol
LAN	Local Area Network
LED	Light Emitting Diode
LTE	Long Term Evolution
MAC	Media Access Control
MDI	Medium Dependent Interface
MDIX	Medium Dependent Interface Crossover
MIMO	Multi-input Multi-output
MME	Mobility Management Entity
NAT	Network Address Translation
NAPT	Network Address and Port Translation
PC	Personal Computer
PCC	Primary Component Carrier
PGW	PDN Gateway
PIN	Personal Identification Number
PLAT	Provider-side Translator
PPTP	Point-to-Point Tunneling Protocol
QAM	Quadrature Amplitude Modulation
QR	Quick Response
RFC	Request For Comments
RTCP	Real-time Transport Control Protocol
RTP	Real-time Transport Protocol
SAMBA	System for Advanced Mobile Broadband Applications
SCC	Secondary Component Carrier
SCP	Service Control Point

Acronym or Abbreviation	Full Spelling
SDRAM	Synchronous Dynamic Random Access Memory
SDP	Session Description Protocol
SGW	Serving Gateway
SIP	Session Initiation Protocol
SMA	SubMiniature version A
SMS	Short Message
SOHO	Small Office Home Office
SSID	Service Set Identifier
TDD	Time Division Duplex
TD-SCDMA	Time Division-Synchronous Code Division Multiple Access
TKIP	Temporal Key Integrity Protocol
UE	User Equipment
UL	Uplink
UMTS	Universal Mobile Telecommunications System
UPnP	Universal Plug and Play
USB	Universal Serial Bus
USIM	UMTS Subscriber Identity Module
VPN	Virtual Private Network
WAN	Wide Area Network
WEP	Wireless Encryption Protocol
Wi-Fi	Wireless Fidelity
WMM	Wi-Fi Multimedia
WPA/WPA2-PSK	Wi-Fi Protected Access/Wi-Fi Protected Access II - Pre-Shared Key
WPA2-PSK	Wi-Fi Protected Access II - Pre-Shared Key
WPS	Wi-Fi Protected Setup

Contents

1 Product Overview

The HUAWEI LTE CPE B320-323 is a Long Term Evolution (LTE) wireless gateway for multiple users in household or small office environments. It enables users to access the Internet.

The B320-323 supports 3GPP Release 13 with LTE CAT 4. The supported service functions are as follows:

- Data service: LTE FDD: DL 195 Mbps, UL 105 Mbps; LTE TDD: DL 146 Mbps, UL 23 Mbps
- Working band: LTE: B1/B3/B7/B8/B20/B38/B41; UMTS: B1/B8
- Voice service: CS/ VoIP (Optional) / VoLTE (Optional)
- Wi-Fi: 802.11 b/g/n. 2.4GHz Wi-Fi 2x2 MIMO up to 300Mbps. Maximum Users: 32
- Multi APN function (Optional) for Data, Voice (VoIP), TR-069 services
- Routing mode: NAT enable (Default) / Bridge mode (Optional)
- VPN client service (L2TP, PPTP)
- Customer management via WebUI or HUAWEI AI Life app
- Operator maintenance via TR-069 (Optional) and TR-143 (Optional)
- Huawei Firmware Over the Air (HOTA)

Figure 1-1 B320-323 appearance

2 Technical Specifications

2.1 Hardware Specifications

Table 2-1 Technical specifications of the B320-323 main unit

Item	Description	
Technical standard	WAN	3GPP Release 13
	LAN	IEEE 802.3/802.3u
	Wi-Fi	IEEE 802.11b/g/n
Working band/frequency	LTE	B1/B3/B7/B8/B20/B38/B41
	UMTS	B1/B8
	Wi-Fi	2.4 GHz: 2402-2483MHz,
External port	• One power adapter port • One phone port (RJ11) • One 100 Mbps LAN/WAN network port (RJ45) • One external LTE antenna port (SMA) • One SIM card slot (Nano-SIM)	
Antennas	• Built-in LTE/UMTS primary antenna • Built-in LTE/UMTS secondary antenna • Built-in Wi-Fi 2.4 GHz antenna	

Item	Description						
LED Indicators	• One Internet status indicator White: Connected to the Internet. Red: No SIM card is inserted or detected, or the SIM card has insufficient balance. • One Wi-Fi indicator On: Wi-Fi is enabled. Flash slowly: A pairable HiLink device is detected. Flash quickly: HiLink pairing is in progress/WPS connection is in progress. Off: Wi-Fi is disabled. 📖 NOTE • The indicator starts to flash slowly only when B320-323 detects a new HiLink device. • One group of signal strength indicators Signal reception available (more indicators mean better reception).						
Buttons	• One WPS button • The Wi-Fi indicator flashes slowly when the router detects a HiLink device. Press the WPS button to connect the HiLink device to the router's Wi-Fi. • When the Wi-Fi indicator is steady on, press the WPS button to enable WPS. • One Reset button						
Maximum transmit power	LTE	• B1/B3: 23.5 dBm • B7/B38: 23 dBm • B8/B20: 24 dBm • B41: 25 dBm					
	UMTS	• B1: 23.5 dBm • B8: 24 dBm					
	Wi-Fi	2.4G	802.11b	14 dBm			
			802.11g	16 dBm			
			802.11n-20M	16 dBm			
			802.11n-40M	16 dBm			
Receiving sensitivity	LTE	Band	1.4MHz (dBm)	3MHz (dBm)	5MHz (dBm)	10MHz (dBm)	15MHz (dBm)	20MHz (dBm)
		B1	/	/	-104.5	-101.8	-100.1	-98.9

Item	Description						
		B3	-109.9	-106.4	-104.5	-102.2	-100.4	-99.4
		B7	/	/	-103.6	-101.2	-99.4	-98.3
		B8	-111.5	-108.4	-105.9	-103.2	/	/
		B20	/	/	-104.6	-102.0	-100.6	-99.2
		B38	/	/	-104.0	-101.4	-99.3	-97.9
		B41	/	/	-103.9	-101.4	-99.3	-97.9
	UMTS	• B1: -110.6 dBm • B8: -111.2 dBm						
	Wi-Fi	• 2.4G 802.11b: -89.5 dBm • 2.4G 802.11g: -76 dBm • 2.4G 802.11n 20M: -74.3 dBm • 2.4G 802.11n 40M: -71.2 dBm						
Power consumption	≤ 12 W						
AC/DC power supply	• AC (input): 100V-240V 50Hz/60Hz • DC (output): 12V/1A						
Dimensions (Maximum)	125 mm (Width) x 125 mm (High) x 54.2 mm (Deep)						
Weight	About 160g (excluding the power adapter)						
Temperature	• Working temperature: 0°C to 40°C • Storage temperature: -20°C to +70°C						
Humidity	5% – 95% (non-condensing)						
Certification/Compliance	WEEE CE ErP Wi-Fi ROHS REACH GCF						

2.2 Antenna Specifications

2.2.1 Build-in LTE/UMTS Antenna

Table 2-2 LTE/UMTS antenna specifications

Item	Description
Frequency	LTE • B1: UL 1920-1980 MHz DL 2110-2170 MHz • B3: UL 1710-1785 MHz DL 1805-1880 MHz • B7: UL 2500-2570 MHz DL 2620-2690 MHz • B8: UL 880-915 MHz DL 925-960 MHz • B20: UL 832-862 MHz DL 791-821 MHz • B38: UL 2570-2620 MHz DL 2570-2620 MHz • B41: UL 2496-2690 MHz DL 2496-2690 MHz UMTS • B1: UL 1920-1980 MHz DL 2110-2170 MHz • B8: UL 880-915 MHz DL 925-960 MHz
Input impedance	50 Ω
Standing wave ratio	< 3
Main antenna efficiency	LTE • B1: -1.5dB • B3: -1.9dB • B7: -1.8dB • B8：-2.7dB • B20: -2.3dB • B38: -1.8dB • B41: -1.9dB UMTS • B1: -1.5dB • B8: -2.7dB
Diversity antenna efficiency	LTE • B1: -1.7dB • B3: -2.5dB • B7: -2.3 dB • B8: -3.1dB • B20: -1.8dB • B38: -2.5dB • B41: -2.3dB UMTS

Item	Description
	• B1: -1.7dB • B8: -3.1dB
Main antenna gain	LTE • B1: 2.9dBi • B3: 2.8dBi • B7: 2.3 dBi • B8: 2.5dBi • B20: 3dBi • B38: 3.7dBi • B41: 4.0dBi UMTS • B1: 2.9dBi • B8: 2.5dBi
Diversity antenna gain	LTE • B1: 3.1 dBi • B3: 3 dBi • B7: 3.2 dBi • B8: 2.7 dBi • B20: 3 dBi • B38: 3.5 dBi • B41: 3.6 dBi UMTS • B1: 3.1 dBi • B8: 2.7 dBi
TX/RX	1T2R
Polarization	Linear polarization

2.2.2 Build-in Wi-Fi Antenna

Table 2-3 Wi-Fi 2.4 GHz antenna specifications

Item	Description
Frequency	2402-2483MHz
Input impedance	50 Ω
Standing wave ratio	< 2
Efficiency	-3dB
Gain	1.8dBi
Polarization	Linear polarization

2.3 Software Specifications

Table 2-4 Software specifications

Item	Description		
LTE features	DL 2x2 MIMO		
	DL 256 QAM, UL 256 QAM		
Mobile network	APN management APN auto adapter		
Gateway	Router	• Supports the default route: 192.168.8.1. • Supports manual configuration of LAN IP addresses. • Supports Address Resolution Protocol (ARP).	
	DHCP server	• The DHCP server can be enabled or disabled. • The address pool of the DHCP server can be configured. • The lease can be configured. • The DNS relay under the DHCP server can be enabled.	
	NAT	• Supports NAT and NAPT (compliant with RFC2663, RFC3022, and RFC3027). • Supports cone NAT. • Supports Symmetric NAT.	
	ARP		
	ICMP		
	IPv4v6 dual stack IPv6 only (Optional , CLAT for LAN side IPv4 device access Internet) IPv4 only (Optional) 📖 NOTE When the CLAT function is enabled, the IPv4 device Internet access service cannot reach the maximum throughput. Under IPv6 only, NAT-base service (such as port forwarding and port triggering) is not available.		
	VPN pass-through		
VPN client	• Support L2TP VPN client • Support PPTP VPN client		
SMS	• Writing/sending/receiving • Writing/sending/receiving extra-long messages		

Item	Description	
Data service	LTE FDD: DL 195 Mbps, UL 105 Mbps LTE TDD: DL 146 Mbps, UL 23 Mbps	
	Wi-Fi 802.11b/g/n	
	Supports multi APNs (Optional, one for data, one for voice, and one for TR-069).	
Voice	VoIP (Optional)	Supports G.711a/G.711u/G.726 (-24/-32)/G.722/G.729 codec.
		Supports SIP (RFC3261).
		Supports SDP (RFC2327).
		Supports RTP/RTCP (RFC1889/RFC1890/RFC3550).
		Supports in-band/SIP info/RFC2833 DTMF.
		Supports the following phone features: • Caller ID generation • Call waiting • Call forwarding (unconditional, busy, and no answer forwarding) • Call hold • Three-way conference
	CS	Supports CS voice communication over UMTS networks.
		Supports circuit switched fallback (CSFB).
		Supports the following phone features: • Caller ID generation • Call waiting • Call forwarding (unconditional, busy, and no answer forwarding) • Call hold • Three-way conference • Originating Identification Presentation/Restriction • Outgoing Communication Barring
	VoLTE (Optional)	• Supports AMR-NB codec • Supports AMR-WB codec
		Supports SRVCC to UMTS
		Supports in-band/out-band (RFC2833) DTMF

Item	Description	
	Supports the following phone features: • Caller ID generation • Call waiting • Call forwarding (unconditional, busy, and no answer forwarding) • Call hold • Three-way conference • Originating Identification Presentation/Restriction • Outgoing Communication Barring	
Firewall setup	• Firewall enable/disable • URL filtering • LAN IP filtering • Port forwarding (Virtual server) • Port triggering (Special Application) • DMZ service • UPnP service • ALG settings	
LAN	• 10/100 Mbps auto-negotiation • IEEE 802.3/802.3u-compatible	
Wi-Fi	Broadcasts and hides service set identifiers (SSIDs)	
	Complies with IEEE 802.11b/g/n	
	WPS	
	WMM	
	Encryption	AES, and TKIP + AES
	Security mode	• Open • WPA2-PSK, AES • WPA/WPA2, Mix(TKIP/AES), WPA3-SAE • WPA2-PSK/WPA3-SAE
	MAC address authentication	• Supports the MAC address authentication whitelist. • Supports the MAC address authentication blacklist. • Supports a maximum of 32 MAC address entries.
	STA	• Supports inquiry of STA status. • Supports a maximum of 32 connected stations.

| Item	Description	
Operator maintenance (Optional)	• Supports TR-069 Amendment III • Supports TR-143 Amendment I	
USIM	PIN management and USIM card authentication	
NTP	Supports daylight saving time (DST) (Optional).	
Maintenance	Supports export of current diagnosis results and operation logs.	
HUAWEI AI Life APP	• View data traffic usage and SMS. • Manage connected devices. • Change CPE's SSID and password.	
System requirements	Operating system	Windows 8, Windows 8.1, Windows 10, Windows 11 (Not support Windows RT), MAC OS X 10.12, 10.13, 10.14 and 10.15.
	Web browser	• Microsoft Internet Explorer 9.0 and Microsoft Edge 14.0 with latest updates. • Firefox 60.0 with latest updates. • Chrome 60.0 with latest updates. • Safari 10.0 with latest updates. • Opera 51.2 with latest upgrades.
	Your computer's hardware system should meet or exceed the recommended system requirements for the installed OS version.	

3 Services and Applications

3.1 Data Services

The B320-323 can access the Internet through mobile networks and Ethernet networks. By connecting to the B320-323 using Wi-Fi or a network cable, users can obtain access to high-speed Internet services and establish a local area network (LAN).

3.1.1 Accessing the Internet through a Mobile Network

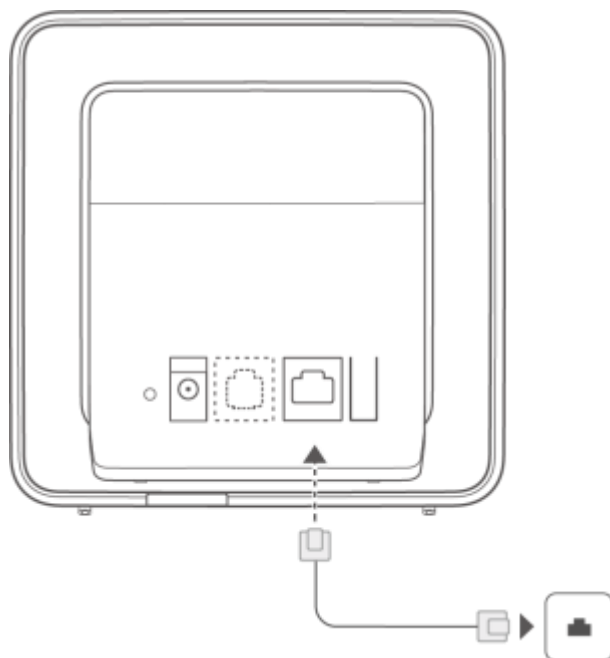The B320-323 can access the Internet through mobile networks.

Figure 3-1 Accessing the Internet through a mobile network
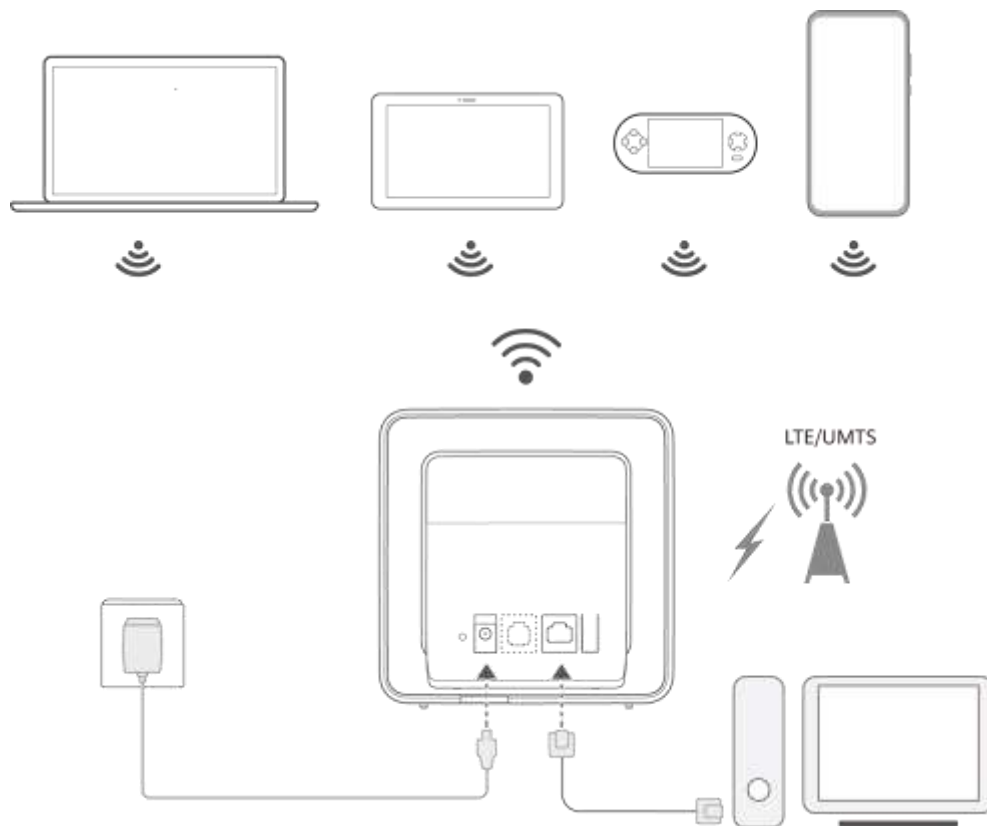
3.1.2 Accessing the Internet through an Ethernet Network

The B320-323's LAN/WAN port can be connected to a wall-mounted Ethernet port using a network cable.

Figure 3-2 Accessing the Internet through an Ethernet network

3.2 Voice Services

The B320-323 provides one telephone port that can be connected to telephones for calling.

3.3 SMS

The B320-323 supports message writing/sending/receiving and group sending (up to 50 -contacts at a time).

3.4 Security Service

The B320-323 supports comprehensive and robust security services. It provides a firewall function and PIN protection mechanisms. These features allow users to connect their computers to the Internet and simultaneously protect their computers against security threats from the Internet.

3.4.1 Firewall Service

The B320-323 supports the enabling or disabling of a firewall on the network connection, which protects the device and network from attacks by hackers on the Internet and controls access to the Internet.

3.4.2 MAC Filtering

The B320-323 supports configuration of the Media Access Control (MAC) address to restrict network access.

3.4.3 Wi-Fi Authentication

The gateway supports the following user authentication protocols for Wi-Fi:

- No encryption
- WPA2-PSK (AES), WPA/WPA2-PSK (TKIP/AES), Mix(TKIP/AES), WPA3-SAE, WPA2-PSK/WPA3-SAE.

3.5 VPN Function

3.5.1 VPN Client

VPN tunneling involves establishing and maintaining a logical network connection (that may contain intermediate hops). On this connection, packets constructed in a specific VPN protocol format are first encapsulated within some other base or carrier protocol, then transmitted between the VPN client and server, and finally decapsulated on the receiving side.

The B320-323 supports L2TP and PPTP tunneling protocols.
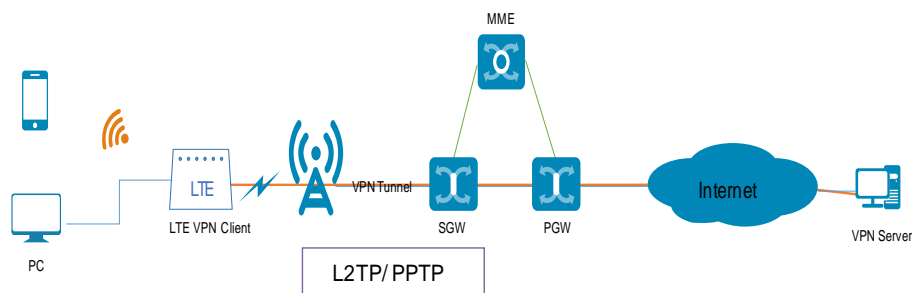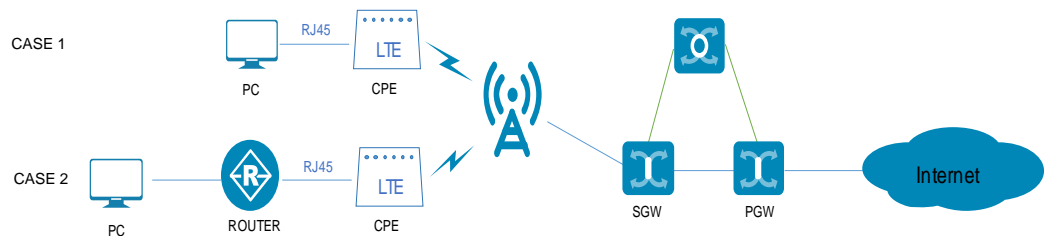

3.5.2 VPN Pass-Through

The B320-323 supports L2TP/PPTP VPN pass-through for the LAN side device. The LAN side device can create a VPN tunnel to the VPN server.
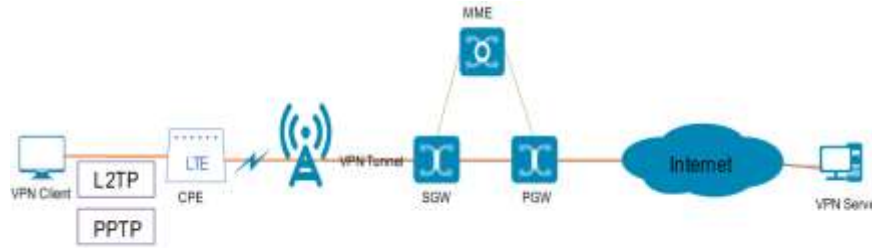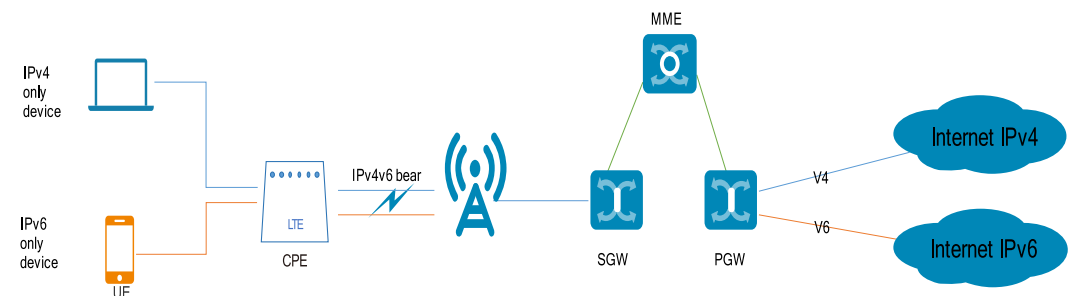
3.6 Bridge mode

The LTE CPE obtains the WAN IP address and passes it through to the PC (Case 1) or Router (Case 2), and then the PC (Case 1) or Router (Case 2) can directly use the WAP IP address.
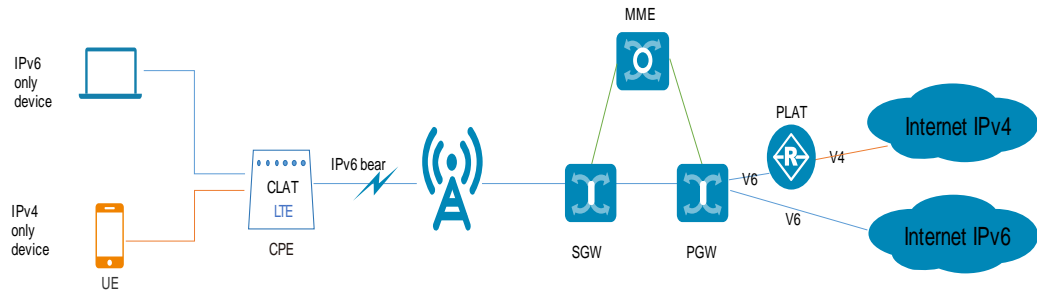

3.7 IPv6 Only and IPv4v6 Dual Stack

3.7.1 IPv4v6 Dual Stack

CPE provides dual stack function.

3.7.2 IPv6 Only (CLAT)

The LTE CPE supports IPv6 only with the transition solution CLAT for IPv4 device.

📖 NOTE

When the IPv6 only (CLAT) function is enabled, NAT-based functions (like DMZ/Port Forwarding/Port tigger) cannot be used.

When an IPv4 device accesses the Internet, the performance is degraded because packets need to be packetized and unpacked. However, IPv6 devices are not affected.

3.8 Multi-APN

The B320-323 supports the establishment and maintenance of three APNs. These three APN connections isolate data, voice, and remote management services on an operator's network.

The B320-323 supports an independent APN for CPE internal/VoIP/TR-069.
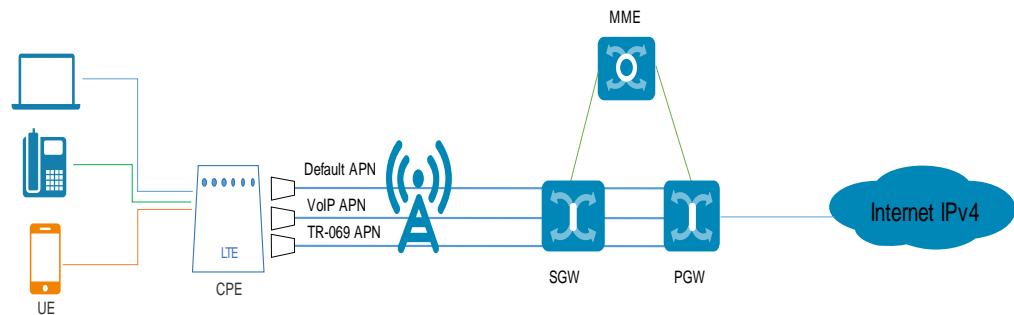

3.9 Customer management

3.9.1 WebUI

The B320-323 supports local configuration through the Web UI. You can perform device management and network configuration to ensure normal and stable performance.

3.9.2 HUAWEI AI Life app

Scan the QR code (can be found in the Quick Start Guide, giftbox and Web UI) to download the Huawei AI Life app and configure the router from your phone.

3.10 **Operator maintenance**

The B320-323 supports Operator maintenance through the TR-069. Operator remote manages the CPE software update/parameters configuration via TR-069.
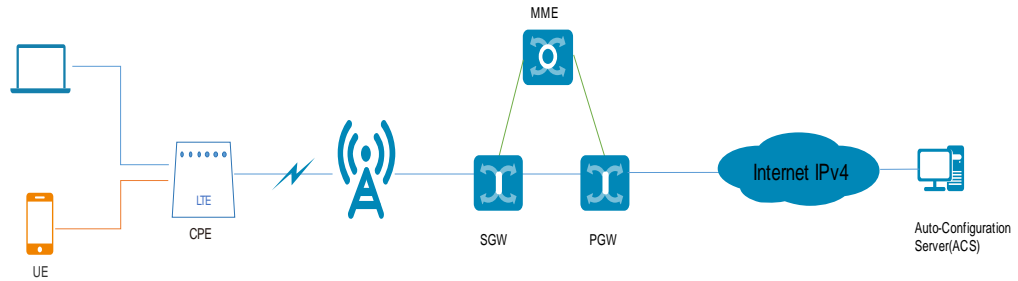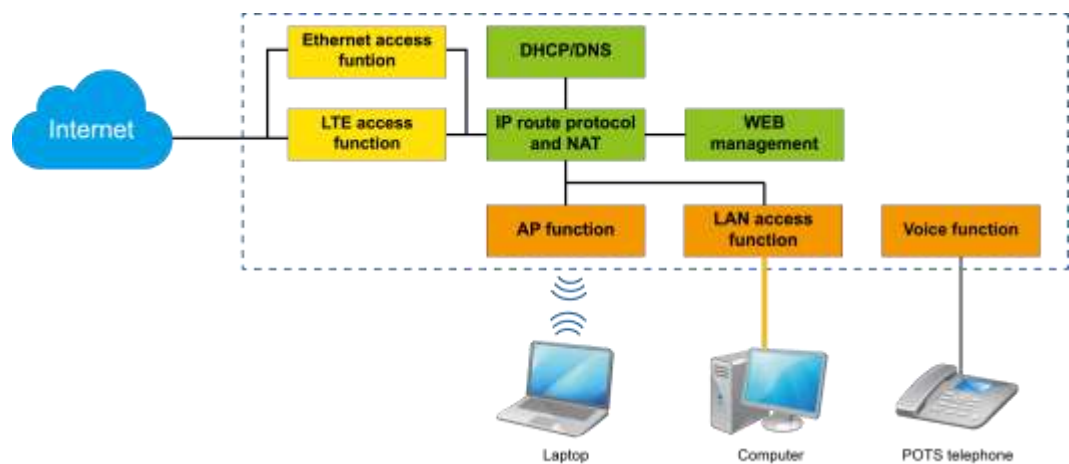

3.11 **HOTA**

The B320-323 supports the HOTA feature, which allows users to remotely update the device firmware through the HOTA server.

4 System Structure and Scenario Constraints

4.1 System Architecture

Figure 4-1 System structure

The following describes the modules shown in Figure 4-1.

- LTE access function: The B320-323 adopts the LTE access technology at the WAN side.

- LAN access function: One 10/100 Mbps Ethernet port are provided at the LAN side. The B320-323 provides the switching function for local networking and sharing of the broadband network when it is connected to terminal devices.

- AP function: An 802.11b/g/n -compliant Wi-Fi AP interface is provided for wireless networking at home. The interface is compliant with the IEEE 802.11b/g/n standard and the WPA2-PSK (AES), WPA/WPA2-PSK (TKIP/AES), Mix(TKIP/AES), WPA3-SAE, WPA2-PSK/WPA3-SAE security authentication mechanisms.

- DHCP/DNS: The DHCP server dynamically allocates IP addresses to PCs.

- Web-based management: You can configure the B320-323 and modify and view the configuration of the B320-323.

- IP routing protocol and NAT: The B320-323 has high-speed routing capability. With the built-in NAT, the B320-323, together with LTE terminals, can provide flexible broadband access solutions and networking schemes.

- Voice function: The B320-323 supports voice services.

4.2 Scenario Constraints

The B320-323 is a household wireless broadband access product designed for use in scenarios with relatively few network access devices and relatively low network reliability requirements, such as homes or small office and home offices (SOHOs).

The B320-323 is not an enterprise-grade product. It cannot be used by medium- or large-sized enterprises or in scenarios with high network reliability requirements, such as banks, securities agencies, traffic control, and communications device backhaul.

The B320-323 has the following constraints:

- When the Bridge mode is enabled, the HOTA function cannot be used.

- When the L2TP/PPTP VPN client function is enabled, the throughput performance will slow down.

- A maximum of 32 devices can be connected to the Wi-Fi in theory; the actual number of devices that can be connected and served depends on actual conditions.

5 Technical References

5.1 Standards and Communication Protocols

5.1.1 Standards and Communication Protocols of the Product

Table 5-1 Standards and communication protocols of the product

Item	Description
Physical layer	RFC894
ARP	RFC826
IP	RFC791, RFC1122, RFC1071, RFC1141, RFC1624, RFC792, RFC950, RFC1256
ICMP	RFC792, RFC950, RFC1256
TCP	RFC793
UDP	RFC768
DHCP	RFC1531, RFC1533
NAT	RFC1631, RFC2663, RFC3022, RFC3027

5.1.2 Standards and Communication Protocols of the Wireless Uu Interface

This device supports 3GPP Release 13.

6 Packing List

Table 6-1 Packing list

Description	Quantity	Remarks
Wireless Gateway	1	Standard
Power supply adapter	1	Standard
Quick Start	1	Standard
Ethernet cable	1	Optional
Phone cable	1	Optional
Warranty card	1	Optional

The HUAWEI B320-323 wireless gateway has an optional external antenna.