Operation Manual

Shenzhen ZhiYun Technology Co.
-2019-

Legal Statement

(hereinafter referred to as "ZhiYun Technology"), you agree to the following terms and conditions.

This product meets the design requirements for environmental protection and personal safety, and the storage, use and disposal of the product shall be in accordance with the requirements of the product manual, relevant contract or relevant national laws and regulations.

The Company reserves the right to modify and improve the products described in this manual without prior notice, and to revise or withdraw this document at any time.

If there is any ambiguity in this document, please consult with our company or agents or sellers.

Preface

Overview

This document provides an overview of the general features of the 4G router to help the reader understand the basic information about the features.

Readers

Technicians
Marketers

Versions

The product and specification versions corresponding to the introduction of this document are as follows.

Product Name	Spec Sheet Version
ZhiYun 4G Industrial Router General Operation Manual	V1.1

Chapter 1 Product Overview

1.1 Introduction

In recent years, the development of WiFi is obvious to everyone. Today, WiFi has spread to all corners of the world, from offices to homes, from hotels to cafes, from train stations to airports, as long as you open your laptop you can search for WiFi signals, people can surf the Internet, send and receive emails and watch videos wirelessly anytime and anywhere. This is all thanks to the massive popularity of WiFi routers.

The development of technology, the evolution of technology, every day is giving birth to new things, and the rapid changes in wireless technology, more new things have brought unlimited opportunities for development.

With the arrival of the 5G era and the realization of high-speed data transmission in wireless cellular networks, WiFi routers also have the possibility of using wireless cellular networks to access the Internet.

This router is an industrial IoT high-speed router, fully compatible with 4G/3.5G/3G/2.5G network, flagship configuration, VPN link, industrial-grade protection, wide temperature, wide voltage design, can easily set up high-speed, stable wireless transmission network, using the public LTE network to provide users with wireless long-distance data transmission capabilities.

The 4G routers all use high-performance industrial-grade 32-bit communication processors and industrial-grade wireless modules, with embedded real-time operating system as the software support platform, while providing RS232/485, Ethernet LAN, Ethernet WAN and WiFi interfaces, which can simultaneously connect serial devices, Ethernet devices and WiFi devices to achieve transparent data transmission and routing functions.

At present, this industrial grade 4G router has a mature scheme of system stability, which can ensure that the device is always online; the whole product adopts metal shell, anti-interference and anti-radiation, and the hardware adopts industrial grade design; the system comes with watchdog protection, and additionally loaded with system monitoring protection; after strict design, testing and 10 years of practical application, the product performance is stable and reliable.

This product has been widely used in finance, transportation, monitoring, electric power, mobile Internet of things and telecommunications Internet of things and other industries.

1.2 Product illustration

The current picture shows one of this series

1.3 Characteristics

- Supports hundreds of 3G/4G wireless modules, basically plug-and-play
- Intelligent anti-dropout, support online detection, online maintenance, dropout automatic redial, ensure that the device is always online
- Cloud-based remote backend management, ad push, remote upgrade and remote configuration
- Support for USB storage devices
- Local network PHP browsing with remote synchronization of locally stored content
- Support serial TCP/UDP transparent data transfer or serial AT command transfer
- SMS control routing online and offline, short line notification of routing status
- Support VPN secure tunnel function, including PPTP, L2TP, openvpn
- Complete and robust router with support for multiple Internet access methods: auto-assignment, assigned IP, PPPoE, WiFi relay
- Support iptables firewall, various network protocols
- Support serial port local TFTP, web software upgrade
- Dynamic DDNS support: support for peanut shells and dyndns domain name providers

Support 4G backup network, seamlessly switch to 4G network when wired disconnection, and automatically detect wired recovery

Chapter 2 Equipment Installation

2.1 Operating conditions

Operating system requirements	Windows XP and above Linux 2.6 and above MAC OS : 10.3.7 and above
Browser Requirements	IE: 9.0 and above (lower versions of IE are not well compatible with the page) Safari: 1.2.4 and above Firefox: 2.0.0.8 and above Google-Chrome:49 and above
Operating temperature	-20-70°C

2.2 Installation Instructions

1、Fix the router in a suitable position.
2、Insert the SIM card into the SIM card slot.
3、Power on the router.
4、Use network cable or wireless network to connect to the router
5、The router can automatically 3G/4G dial-up internet without basic configuration

Chapter 3 Setup Preparation

Please log in to the web page to set up before using it.

3.1 Checking the computer configuration

Before accessing the Web Setup page, your computer also needs to meet the following requirements.

An Ethernet card is installed.

A Web browser (Microsoft Internet Explorer 6.0 or higher) is installed.

The TCP/IP protocol is installed and enabled.

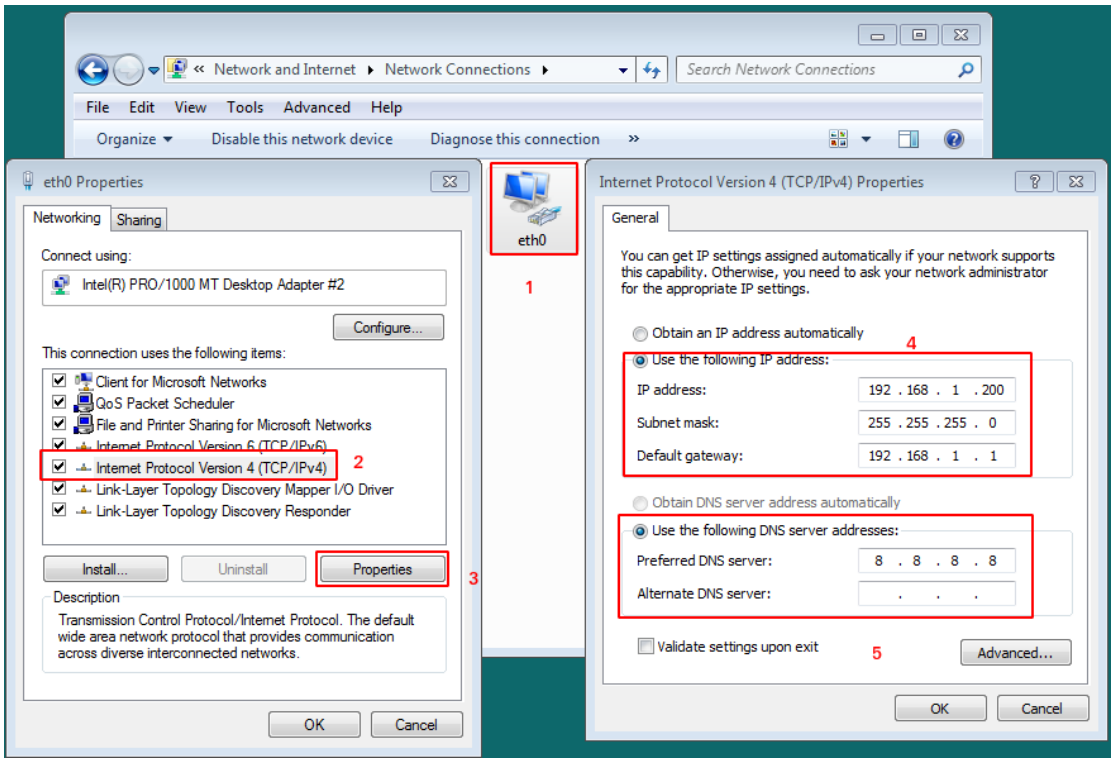
3.2 Establishing a network connection

You can connect your computer to the router by following these steps.

3.2.1 Setting the IP address of the computer

Before accessing the Web Setup page, we recommend that you set your computer to "Obtain an IP address automatically" and "Obtain a DNS server address automatically" so that the router can automatically assign an IP address. If you need to assign a static IP address to the computer, you need to set the computer's IP address in the same subnet as the router's LAN port IP address (the default IP address of the router's LAN port is: 192.168.1.1 with subnet mask 255.255.255.0).

"Control Panel" - "Network and Internet" - "Network connections".



3.2.2 Connecting via WiFi

Detect the wireless network connection of the wireless router (displayed in Figure 3.2), search for and connect to the SSID number starting with "ar550_".

Figure 3.2.1 The wireless router detected by the computer

3.2.3 Confirm that the computer is connected to the router

Once your computer shows that it has successfully obtained an IP address, use the Ping command to confirm that the computer and the router are connected successfully.

For example, in a Windows 7 environment, execute the Ping command: Ping 192.168.1.1

If the screen shows the following, the computer has successfully established a connection with the router.

```
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Figure 3.2.3 The ping command displays Figure 1

If the screen displays the following, it means the computer and router failed to connect.

```
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Destination host unreachable.
Destination host unreachable.
Destination host unreachable.
Destination host unreachable.

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Figure 3.2.3 The ping command displays Figure 2

When the connection fails, please do the following checks.

1. Hardware connection: The indicator light corresponding to the LAN port connected to the router panel and the NIC light on the computer must be on. If it is not lit, it means the network cable is not in good contact. 2.

2. Computer TCP/IP property configuration: If the LAN management IP address of the router is 192.168.1.1, the IP address of the computer must be any free address from 192.168.1.2 to 192.168.1.254, the IP address of the computer and the LAN port address of the router must be in the same IP subnet.

3 Login to the router

Next, you will log in to the Router Web Setup page.

Enter "http://192.168.1.1" in the address bar of your web browser, and enter your login user name and password in the pop-up box. The first time you log in, please enter the default user name: admin and password: admin.

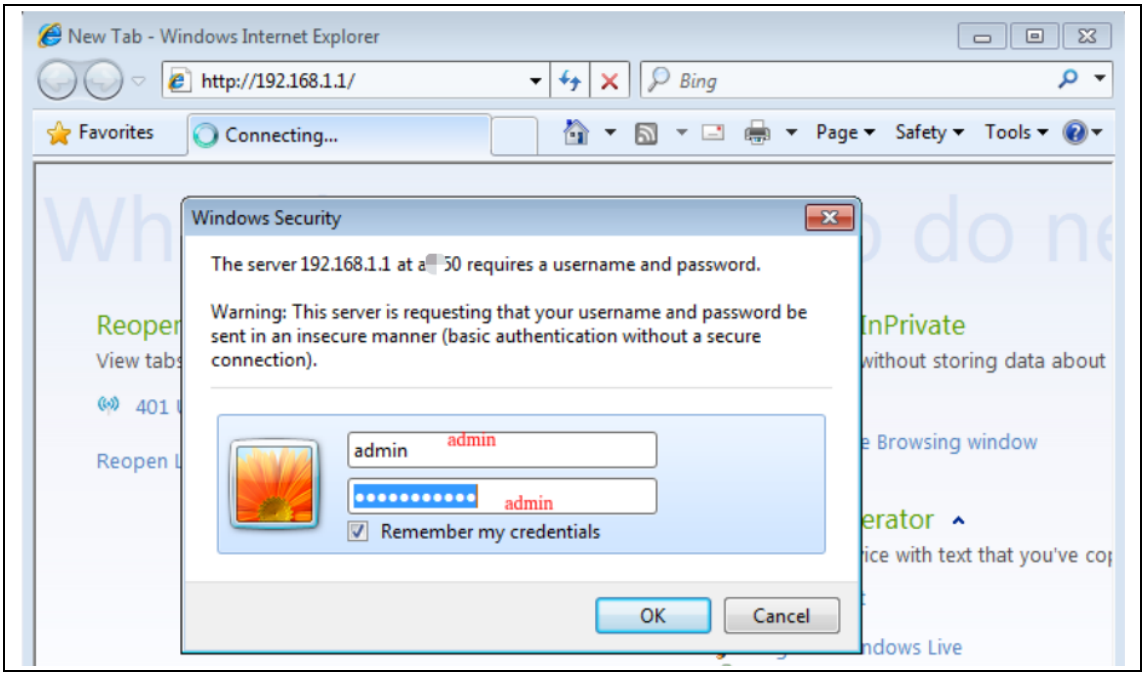


Figure 3.3 Login pop-up box

3.4 Enter the Router Web Setting Page

After successful login, you can enter the Web Setup page, and then you can set and manage the router, please refer to the following section for the specific settings.

3.5 Exit the Router Web Setting Page

Click the [Exit] item in the first-level menu, and then confirm to exit the Web Setting page. You can also close the web browser directly to exit.

Chapter 4 Home

In "Home", the left side provides icons such as "WAN status information", "wifi quick settings", "terminal information" and "3G/4G status", while the right side provides specific information or settings for the left category.

4.1 WAN status and WAN priority setting

"Home" - "wan status and wan priority settings".

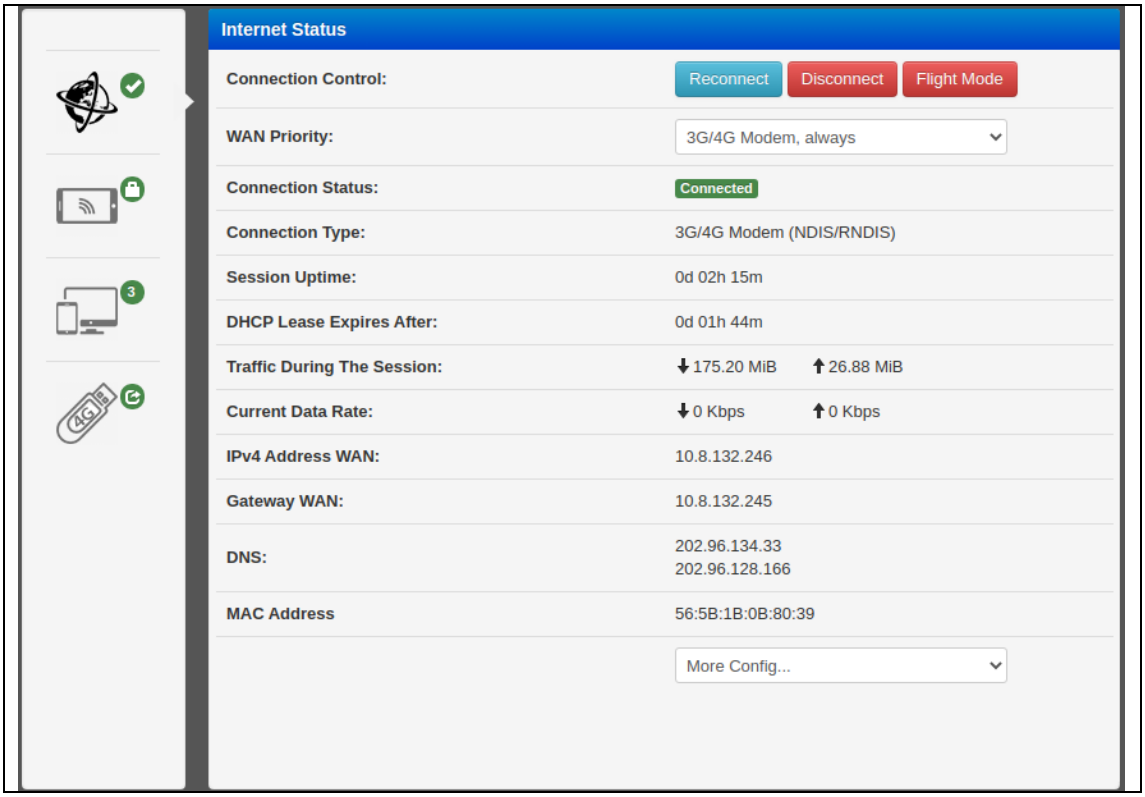


Figure 4.1 Home Page

<table>
<tr><th>Left side large category</th><th>Specific categories on the right</th><th>Function Description</th></tr>
<tr><td rowspan="6">WAN Status</td><td>Connection Control</td><td>You can manually control the "connect" and "disconnect" of the WAN.
If you disconnect the network manually, the router will not reconnect automatically.</td></tr>
<tr><td>WAN Priority</td><td>Select the Internet mode of the router.:<table><tr><td>Broadband WAN or WISP (always)</td><td>Wired bandwidth or wireless relay Internet mode</td></tr><tr><td>3G/4G Modem (always)</td><td>3G/4G Internet access mode</td></tr><tr><td>3G/4G Modem (when there is no external network connection)</td><td>4G backup mode</td></tr></table></td></tr>
<tr><td>Networking Status</td><td>Whether the external network is connected</td></tr>
<tr><td>Networking Type</td><td>Specific ways of accessing the Internet at that time</td></tr>
<tr><td>Extranet connection time</td><td>Indicates the total number of hours that the external network is not down</td></tr>
<tr><td>Remaining lease term</td><td>The lease duration of this IP address when the IP address is currently</td></tr>
</table>

		assigned to this router by the external network. The IP address duration assigned to the 4G router will vary in different places in the 4G network, which can be noted here. But this does not affect the specific online time of the router! The WAN connection time of the router mainly depends on the "external network connection time".
	Extranet connection traffic	Total traffic information for the current WAN interface's downlink and uplink
	Current connection rate	Current WAN interface downlink and uplink rates
	IPv4 Address WAN	IP address of WAN
	Gateway WAN	Gateway address of WAN
	DNS	The DNS information obtained by WAN
	MAC Address	The MAC address information of the physical interface corresponding to the WAN port. In 4G Internet mode, this MAC is the MAC address of the 4G module.

Table 4.1 Home page interface description

4.2 WIFI Quick Setup

"Home" - "WIFI Quick Settings":

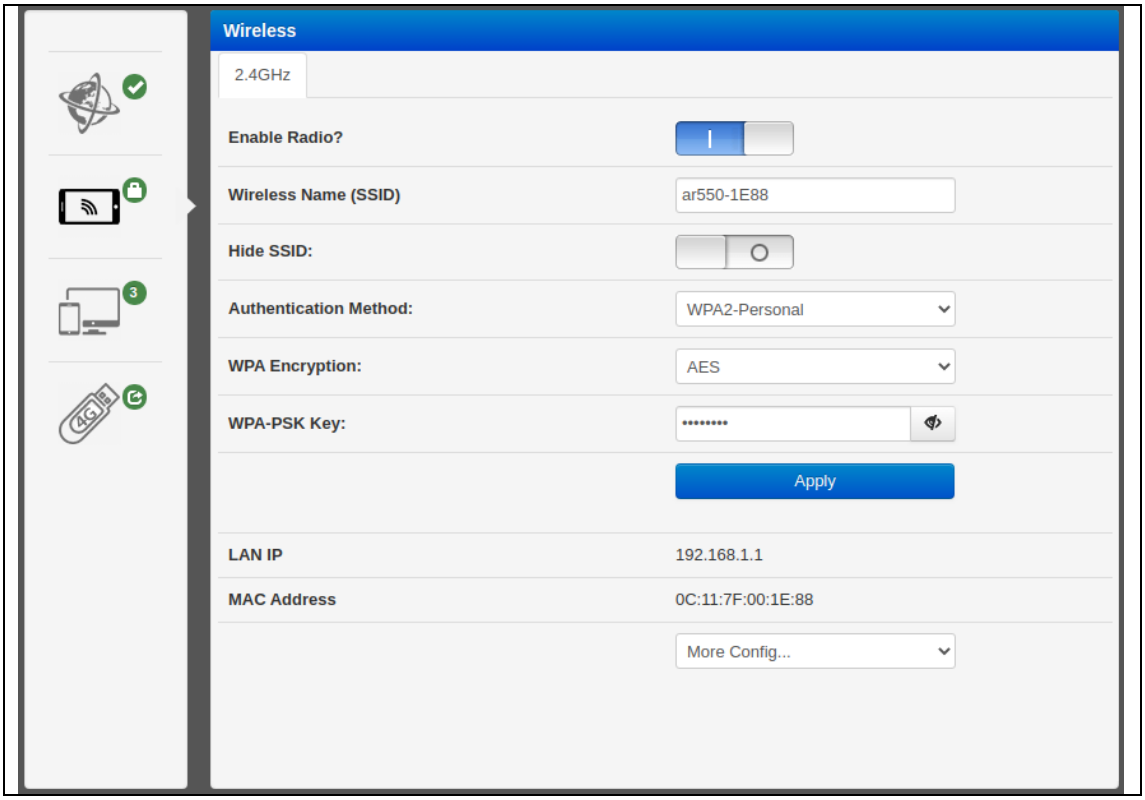


Figure 4.2 WIFI Quick Setup

The interface items are described in the following table.

Interface items	Description
Enable Wireless	wifi RF on or off
Wireless Name (SSID)	ASCII or Chinese wireless SSID name (this router WIFI support Chinese characters)
Hide SSID	Turn on or off the WIFI SSID broadcast, after opening the wireless SSID normal state can not be searched
Authentication method	Wireless authentication method, usually directly with WPA2-Personal
WPA encryption	Encryption method, generally AES is used normally
IP Address	WIFI and LAN are under one VLAN, so the management address is the same.
MAC Address	MAC address of the wireless

Table 4.2 WIFI Quick Setup Interface Description

4.3: Terminal information

"Home" - "Terminal information":

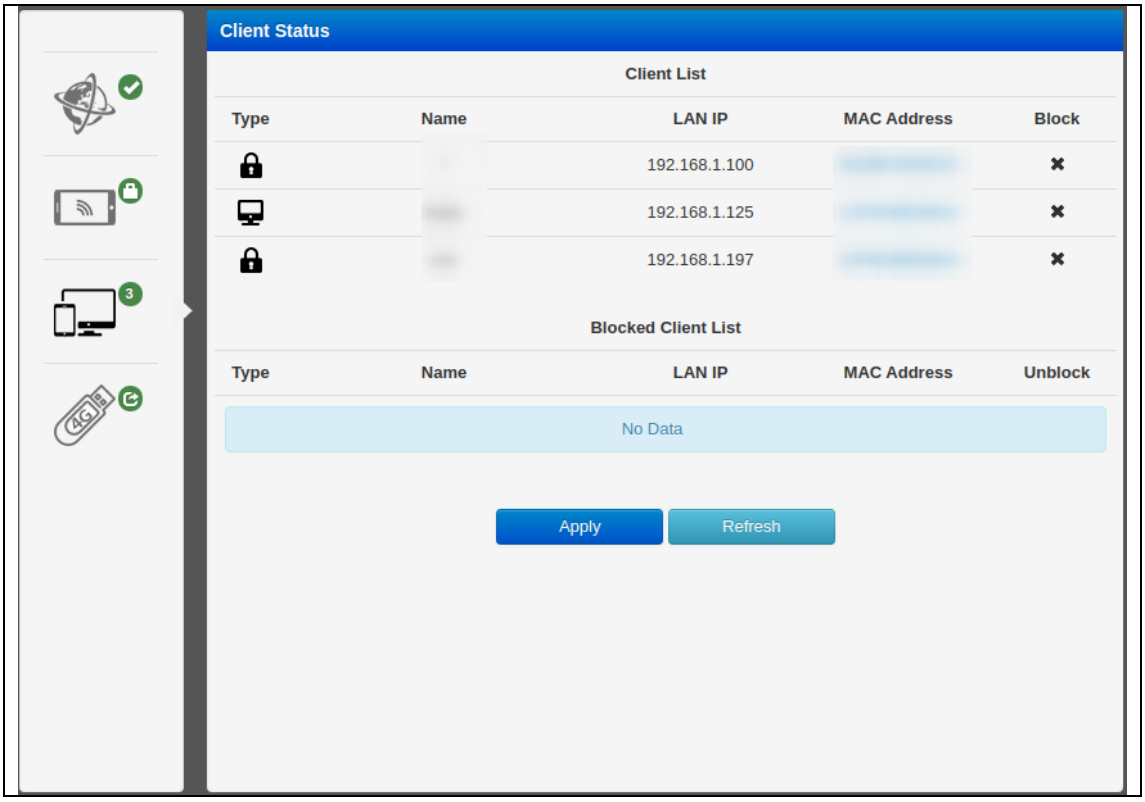


Figure 4.3 Terminal information

The interface items are described in the following table.

Interface items	Description
Connected Devices	Terminal devices currently connected to the router
Blocked devices	You can quickly block access to the external network for the selected device by clicking on the "Block" button "X" of the "Connected devices" button.

4.3 Terminal information interface description

4.4、3G/4GStatus

"Home" - "3G/4G Status":

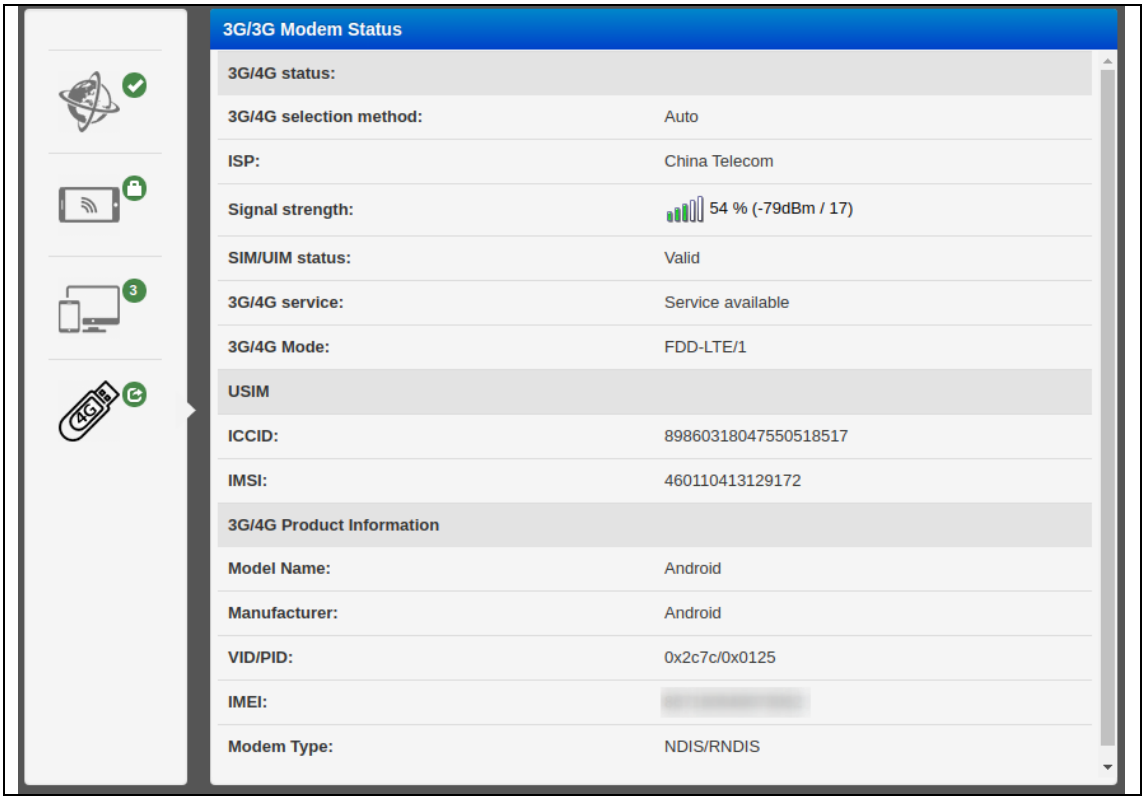


Figure 4.4 3G/4G module status

The interface items are described in the following table.

Interface items	Description
3G/4G Network Status	
3G/4G Network Status	Automatic matching: The router automatically matches the operator information of the SIM card used. Insert SIM card to dial-up internet automatically Manual setting: Manual setting is required when VPDN private network card; manual setting is required for operators that are not in the automatic matching list. If the SIM card cannot be automatically identified, you can contact R&D to add the matching information.
3G/4G operators	Identify which operator based on SIM card information, currently supports nearly 300 operators around the world
Signal strength	Percentage of signal strength in the current environment where the 3G/4G module is used
SIM/UIM status	Is the SIM card valid. If it is invalid, it may not be a good contact can be reinserted. At present, there are roughly the following states: 1. 1. valid: the SIM card can dial up the Internet 2. PIN code: If the SIM card has a PIN code, you need to add the PIN code in the 3G/4G settings and then dial up the number.
3G/4G services	Whether the service is available or not, there are several states as follows. Service available: The registration network is successful and Internet access is available. Restricted service: Most of them are SIM default.

	Power-saving mode and hibernate mode: Generally the 4G module is not compatible with the current SIM card.
3G/4G network type	Current network mode and injection network frequency band
USIM card information	
ICCID	Integrate circuit card identity The ICCID is the unique identification number of the IC card, which consists of 20 digits.
IMSI	International Mobile SubscriberIdentification Number (IMSDN) is a marker that distinguishes mobile subscribers and is stored in the SIM card, which can be used to distinguish valid information of mobile subscribers. Its total length is no more than 15 digits, and it also uses the numbers from 0 to 9. MCC is the code of the country to which the mobile user belongs, accounting for 3 digits, and the MCC of China is 460; MNC is the mobile network number, consisting of at most two digits, used to identify the mobile communication network to which the mobile user belongs; MSIN is the mobile user identification code, used to identify the mobile user in a mobile communication network. For example, the beginning is 46000 is China Mobile users, 46001 is Unicom users, 46003 is Telecom users
3G/4G Module Information	
Model Name	Read directly from the 4G module, many are directly displayed Android
Manufacturer	Read directly from the 4G module, many are directly displayed Android
VID/PID	3G/4G vid,pid information
IMEI	International Mobile Equipment Identity (IMEI), commonly known as cell phone serial number, cell phone "serial number", is used to identify each individual cell phone and other mobile communication equipment in the cell phone network, equivalent to the identity card of cell phones.
Modem Type	3G/4G module drive type, i.e., the router is compatible with this mechanical sound drive method

Table Interface Description

Remark.

A SIM card with ICCID and IMSI inside. ICCID is the identification of the card and IMSI is the identification of the user. ICCID is only used to distinguish the SIM card, not for authentication of access to the network. IMSI, on the other hand, is verified in the operator's server when accessing the network. ICCID can be forged, you can use a blank multi-number card, write IMSI and KI, as long as the cracked IMSI and KI, you can access the network, and ICCID can be any 20-digit number.

Table 4.4 3G/4G status interface description

Chapter 5 Status

In "Status", the left side provides "System Log", "Network Traffic" and "Interface Information". Three major categories of system information are provided on the left side, and the specific categories on the right side. The categories are as follows.

Left side large category	Specific categories on the right	Function Description
System log	System log	Router syslog information from the kernel
	DHCP Lease	Information of the endpoints in the current router that are assigned IP addresses by DHCP
	Port Forwarding	In-system port mapping table
	Routing Table	Intra-system routing table. Static routes may be added when using VPN, so they can be displayed here.
	Web Session Table	Specific entries of NAT session table for each terminal in the network.
Network traffic	Real-time traffic map	Real-time traffic diagram of each interface in the system
	Recent 24-hour traffic map	Statistical information for 24 hours
	Single Day Flow Chart	Date specific traffic summary information
	Single Month Flow Chart	Traffic summary information on a monthly basis
Interface Information	Wireless Interface	Information of 2.4G and 5.8G interfaces respectively You can view the connection rate, signal strength and other information of each terminal
	Wired network port	Real-time information on wired interfaces

5.1 System Status

Displays the current operating status of the system:

"Status" - "System Log":

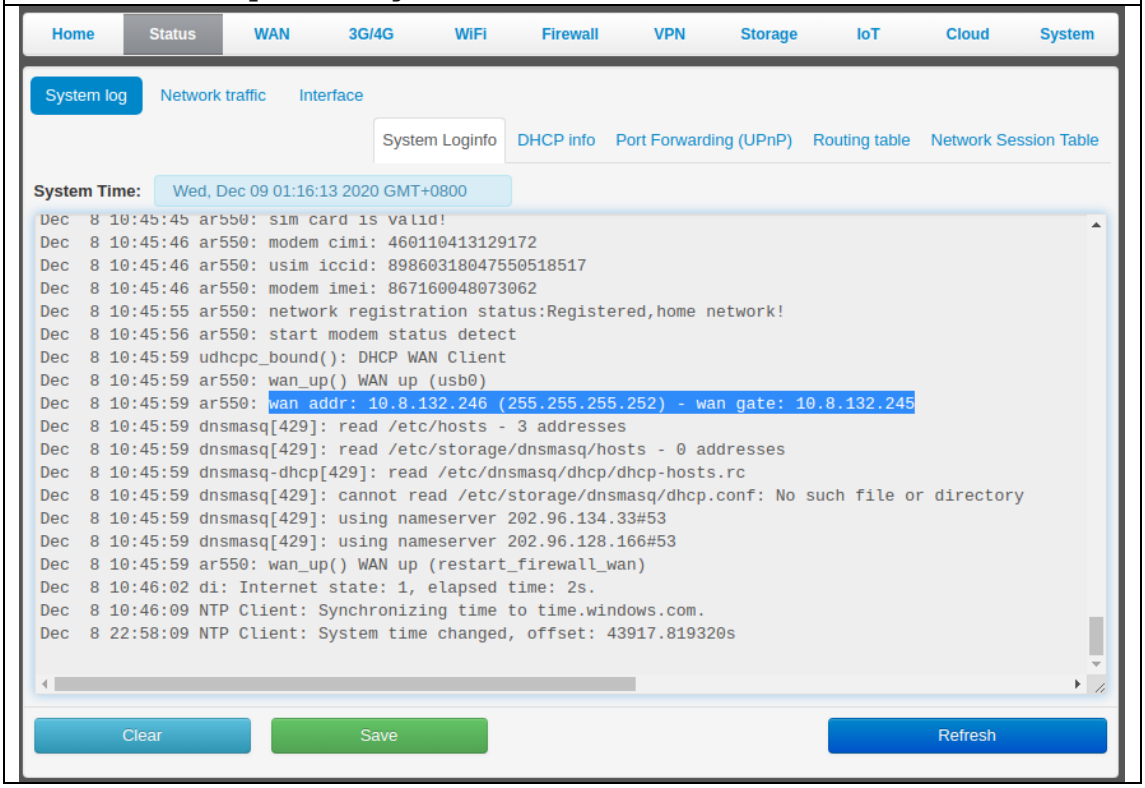


Figure 5.1 System operation status

The interface items are described in the following table.

Interface items	Description
System time	The current time of the system
Clear	Clicking on it will clear the log information
Save	You can save the log information in "syslog.txt" and download it locally
Refresh	Refresh Log

Table 5.1 System log interface description

5.2 DHCP information

In the DHCP information page, the information of the terminals in the current system that are automatically assigned IPs by DHCP is displayed. When the terminal is configured as a static IP, it will not be displayed in the DHCP information.

"Status" - "System log" : "DHCP information":

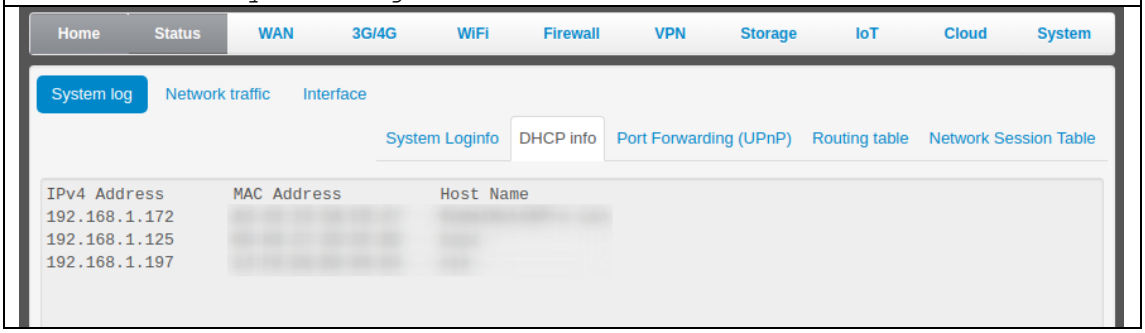


Figure 5.2 DHCP information

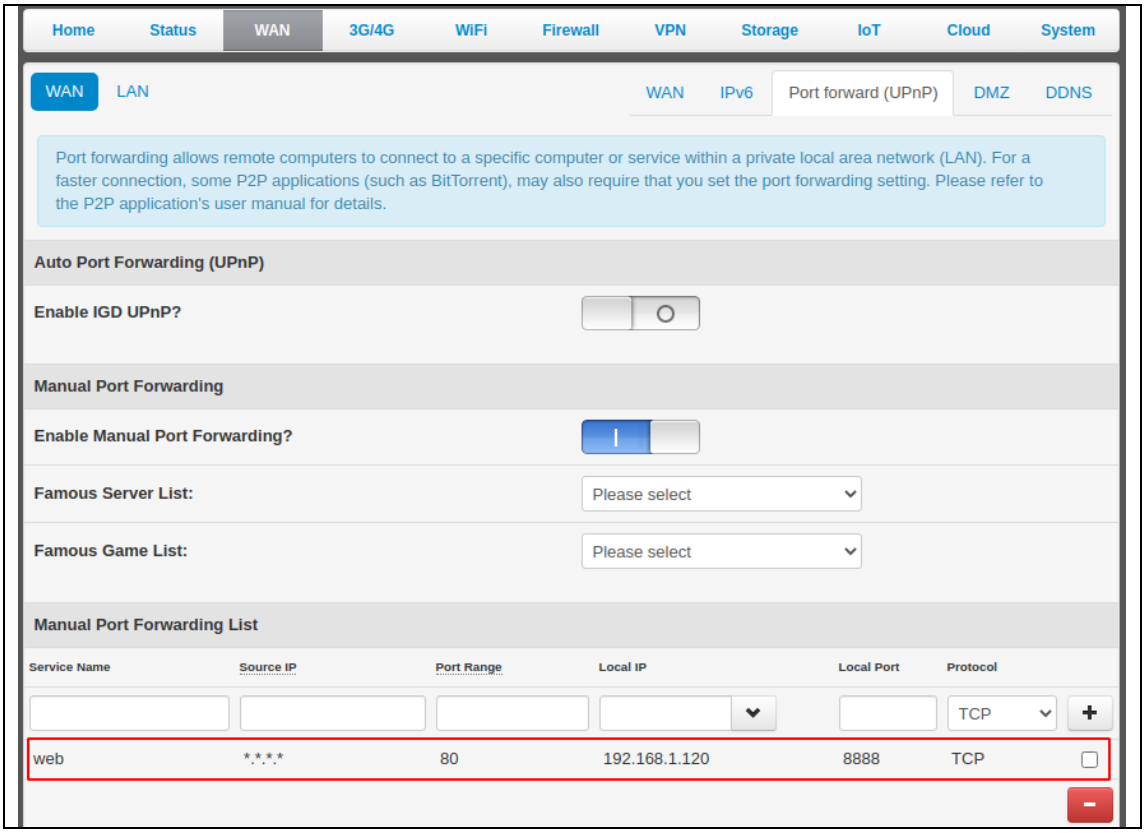
The interface items are described in the following table.

Interface items	Description
IPv4 Address	IP address assigned by DHCP server
MAC Address	MAC address of the terminal device's network card
Host Name	Host name of the terminal device

Table 5.2 Description of DHCP information interface

5.3 Port Forwarding (UPnP)

When the "port forwarding" function is set in the router, the information of the configured forwarding entries will be displayed here. For example, if the router has mapped the web service on port 8888 of 192.168.1.120 on the internal network to the external network, the port forwarding entry is added as follows.



In "Network" - "WAN (external network)" ---- "Port Forwarding (UPnP)" configure.

When the port forwarding function is configured, the following information will be displayed in the current port forwarding table.

"Status" - "System Log" : "Port Forwarding (UPnP)"

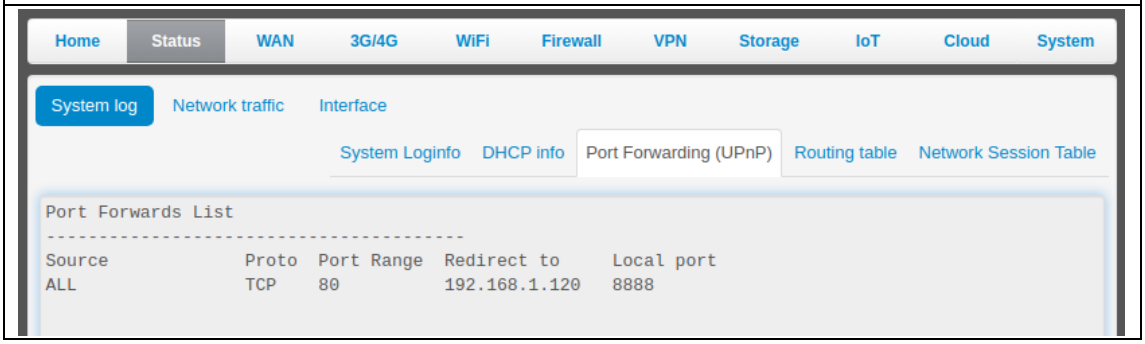


Figure 5.3 Port Forwarding (UPnP)

The interface items are described in the following table.

Interface Item Description	Interface Item Description
Source	An external IP address, i.e., an external device to access the current intranet server. all means no restriction on external devices. If it is a specific IP address IP_1, it means that only hosts with IP_1 are allowed to access the current intranet server
Proto	Port forwarding
Port Range	The source port number on which access is initiated from the external network. The requirement here must be 80.
Redirect to	Generally TCP/UPD, in TCP/IP four-layer mode, the specific service is generally bound by the "transport layer" and port number, so the general protocol choice is TCP or UDP.
Local port	The service port of the host providing services on the intranet.

Table 5.3 Port Forwarding (UPnP) Interface Description

5.4 Routing Table

Routing table information records a topology of the current router to the network, indicating the path from which traffic to a certain network address is sent out.

"Status" - "System Log" : "Routing table"

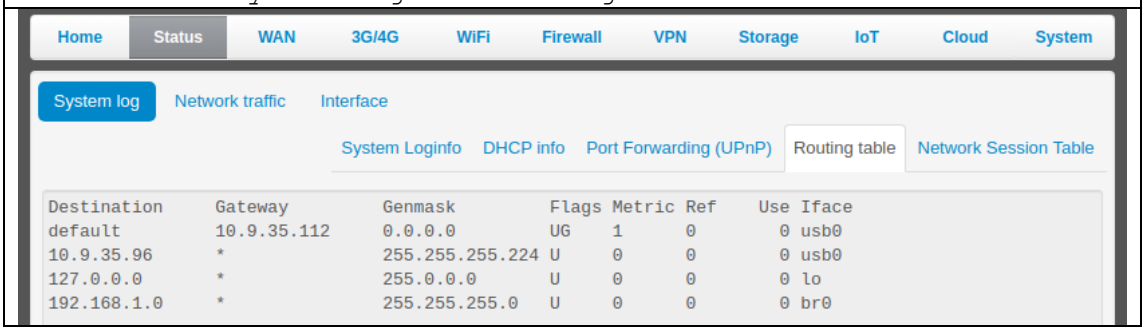


Figure 5.4 Routing Table

View the routing table information, which is generally used in VPN inter-subnet routing. You can check if a static route entry needs to be added when going to the VPN client's intranet, which can then be checked by here to see if it was added successfully.

The interface entries are described in the following table.

Interface Item	Interface Item Description

<table>
<tr><th>Description</th><th></th></tr>
<tr><td>Destination</td><td>The destination network or host. default indicates that it is a default route entry, that is, network traffic that cannot be forwarded from a direct port in this router is sent to the default route entry.</td></tr>
<tr><td>Gateway</td><td>which is the next-hop network address. That is, network traffic is sent to this interface for forwarding.</td></tr>
<tr><td>Genmask</td><td>The mask controls the network bits from which the specific subnet gateway or broadcast address can be obtained.</td></tr>
<tr><td>Flags</td><td>Marker:<table><tr><td>U</td><td>Active Routing</td></tr><tr><td>UG</td><td>Active Gateways</td></tr><tr><td>H</td><td>Hosts</td></tr></table></td></tr>
<tr><td>Metric</td><td>Routing distance, the number of transitions required to reach a given network. It can be generally understood as passing through a router is one hop.</td></tr>
<tr><td>Ref</td><td>Routing entry reference count, generally not used.</td></tr>
<tr><td>Use</td><td>The number of times this routing entry has been looked up by the routing software.</td></tr>
<tr><td>Iface</td><td>The egress interface corresponding to the routing table entry:<table><tr><td>wwan0</td><td>indicates a 4G network card</td></tr><tr><td>lo</td><td>is the local loopback address, which is generally used for testing.</td></tr><tr><td>br0</td><td>It can be understood as the local intranet interface, which is a virtual interface used to subdivide different physical interfaces in the same VLAN as the management interface of the intranet.</td></tr></table></td></tr>
</table>

Table 5.4 Routing Table Interface Description

5.5 Network Session Table

The network session table displays the nat session information of the intranet end devices recorded in the current router. This

information can roughly analyze the external network connection information of a certain terminal device.

If a terminal device has a lot of external connection information, it means that this device occupies a lot of network resources.

"Status" - "System log" : "Network session table"

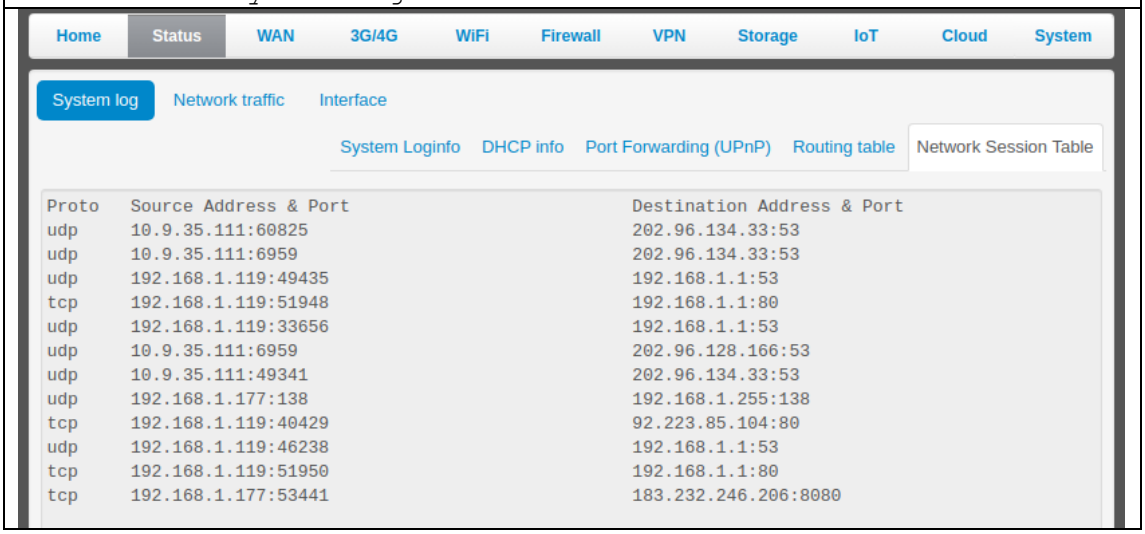


Figure 5.5 Network session table

Chapter 6 Network

In "Network", the left side of the secondary menu provides two categories of functions, "WAN (external network)" and "LAN (internal network)", and the right side is the specific category of the left category On the right side are the specific categories of the left category. The categories on the right are as follows.

Left side large category	Specific categories on the right	Function Description
WAN (external network)	WAN	The specific configuration of WAN Internet access method
	IPv6 Settings	IPv6 configuration
	Port Forwarding (UPnP)	Configuration of port mapping
	Isolation Zone (DMZ)	DMZ Hosting Configuration
	Dynamic Domain Name Resolution (DDNS)	DDNS dynamic domain name configuration
LAN (internal network)	LAN	LAN Gateway Configuration
	DHCP server	LAN side DHCP server configuration
	Routing Settings	Static routing configuration
	Bridge Setup	Multi-segment configuration

	Switch Settings	Network port properties configuration

6.1 WAN side configuration

6.1.1 WAN Internet settings

Configure the wired Internet access mode of the router, the main Internet access modes are "IPoE:Dynamic IP", "PPPoE" and "IPoE:Static IP" Internet access modes. These are the main Internet access methods other than 4G Internet access.

6.1.1.1 IPoE:Dynamic IP

"Network" - "WAN (external network)" - "WAN".

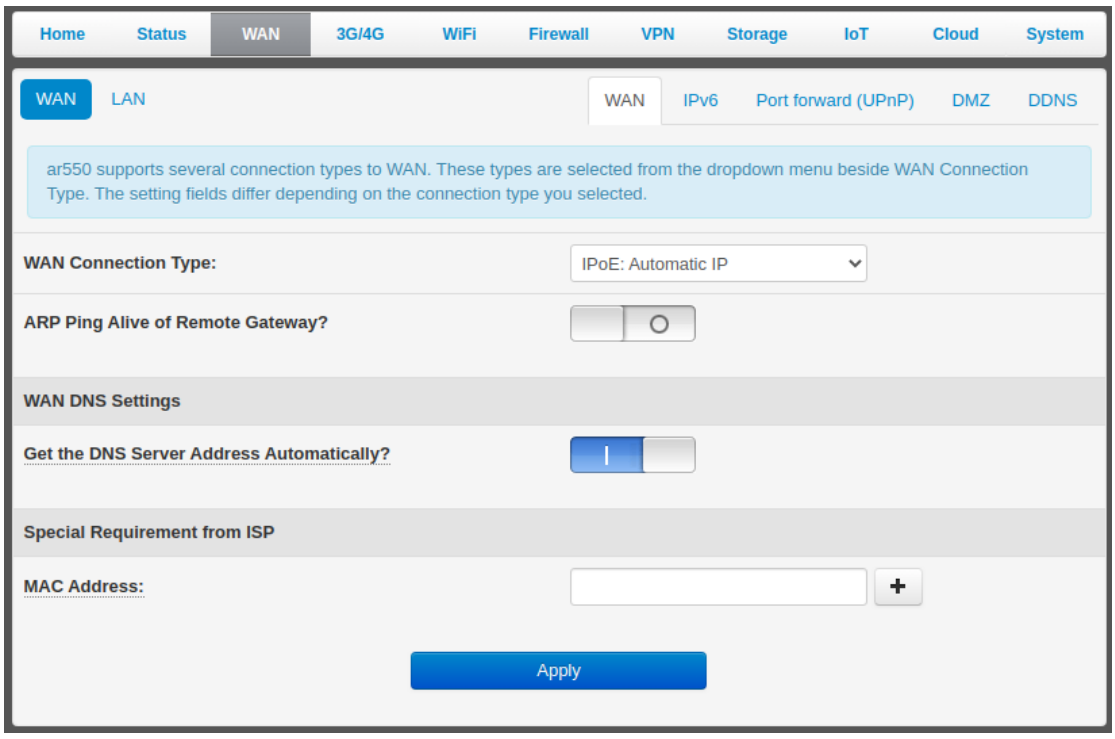


Figure 6.1.1.1 IPoE: Dynamic IP Settings

The interface items are described in the following table.

Interface items	Description
ARP status detection	When the router uses dynamic IP access, it uses arp status detection to detect the connectivity with the front-end gateway, and reconnects if the arp does not work.
Automatic DNS acquisition	If you turn it off, you will need to configure the DNS address manually.
MAC Address	MAC address clone of WAN port.

Table 6.1.1.1 IPoE:Dynamic IP Settings Interface Description

6.1.1.2 IPoE: Static IP

For static IP access, you need to manually fill in the IP address and DNS server address for Internet access.

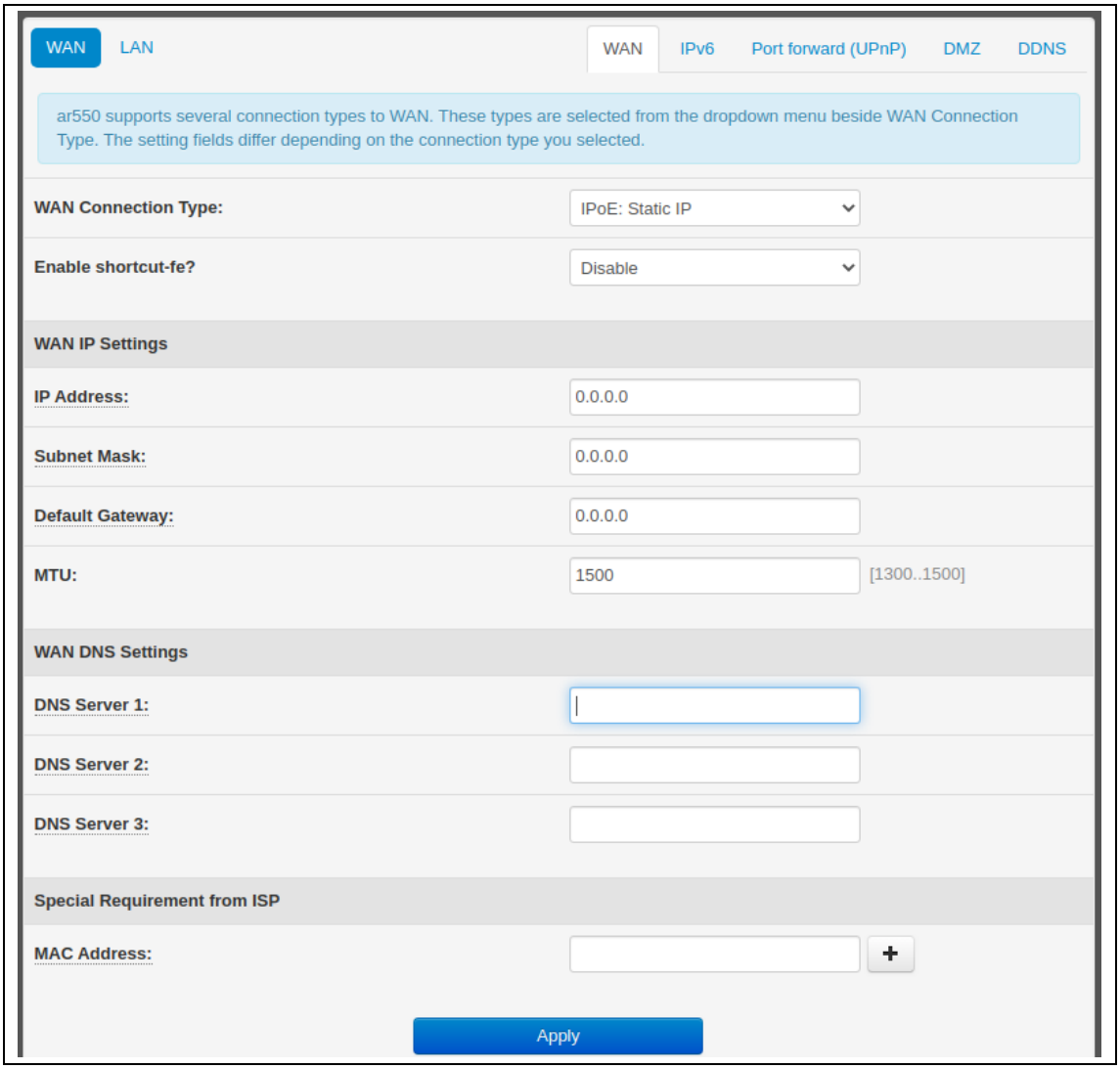


Figure 6.1.1.2 IPoE: Static IP Settings

The interface items are described in the following table.

Interface items	描述
IP Address	Static IP address given by the operator
subnet mask	The subnet mask for the static IP given by the operator
Default Gateway	Carrier's gateway address
MTU	MTU size required by operators
DNS Server	DNS server address requested by the operator
MAC Address	MAC address cloning of WAN port

Table 6.1.1.2 IPoE:Static IP Settings Interface Description

6.1.1.3 PPPoE setting

General fiber access operator ADSL network is PPPoE internet access method

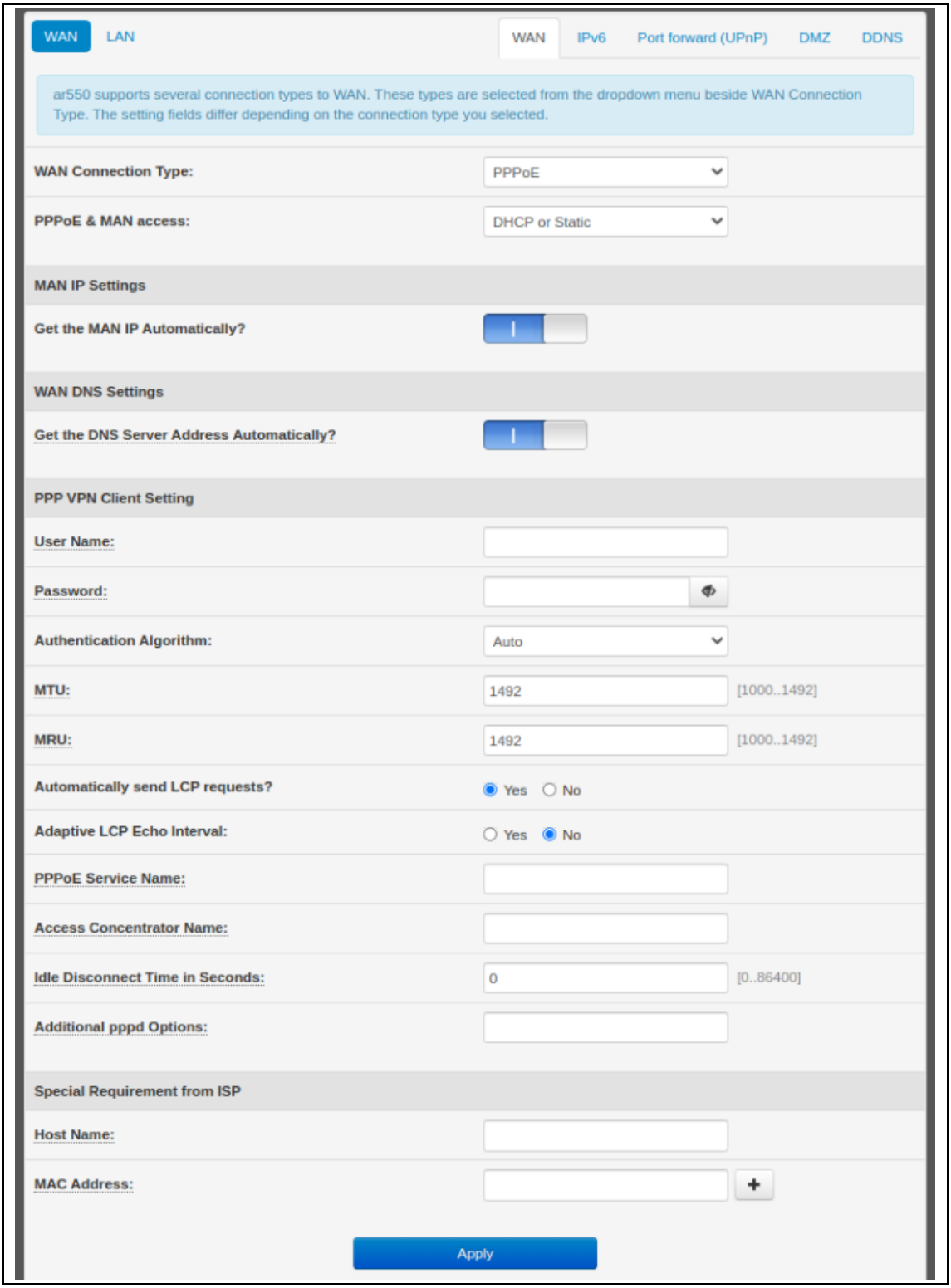


Figure 6.1.1.3 PPoE Settings

The interface items are described in the following table.

Interface items	Description
IP Address	Static IP address given by the operator
Automatic MAN IP acquisition	MAN means metropolitan area network, here is to get the IP address for Internet access from the operator automatically only If the current PPPoE Internet access is assigned by the operator with static IP, fill in the IP address of PPPoE Internet access manually
Automatic DNS acquisition	Automatically obtain DNS information or manually configure DNS domain name resolution addresses
PPP Client Setup	
User Name	The user name provided by your ISP for the PPP family of connection types (e.g., PPPoE, PPTP, or L2TP) must be entered
Password	Password provided by the Internet Service Provider (ISP), mandatory field
Authentication algorithm	PAP,CHAP wait for the "handshake authentication protocol" to connect with the operator, the default value can be
MTU	The maximum unit of transmission for PPPoE packets. The default value is 1492, change this setting only if required by your ISP
MRU	The maximum receiving unit of the packet, it is recommended to maintain the original setting
Automatically send LCP requests	PPP link echo signal packet configuration. The default is to send an ehco signal to the PPP server in 20 seconds. If the PPP server does not respond for 6 consecutive times, the PPP will disconnect and reconnect.
Adaptive Link Control Protocol (LCP) Response Interval	Auto-negotiation of the LCP-ehco send and response interval with the PPP server
Network Service Name	Some ISP operators may require this parameter to be specified. Please check with your ISP operator and fill in the following fields if necessary
Access signal concentrator name	Some ISP operators may require this parameter to be specified. Please check with your ISP operator and fill it in if necessary.
Idle disconnect time in seconds	Set to terminate the connection between you and the ISP after a specific time interval. A value of 0 allows unlimited interval time
pppd additional options	There are many PPP parameters, so if there is a special connection that requires specific parameters, you can add them here. Normally, you can add a debug option

	here, so that the dial-up connection will print a detailed communication log, which is convenient for testing.
Special settings for operators	
MAC Address	Sometimes ISPs monitor the MAC addresses of devices connected to their services and do not allow network connections with new MAC addresses. In this case you can use MAC address cloning to write the MAC address of the original device here

Table 6.1.1.3 Description of PPoE setup interface

6.1.2 IPv6 Settings

"Network" - "WAN (external network)" - "IPv6 settings".

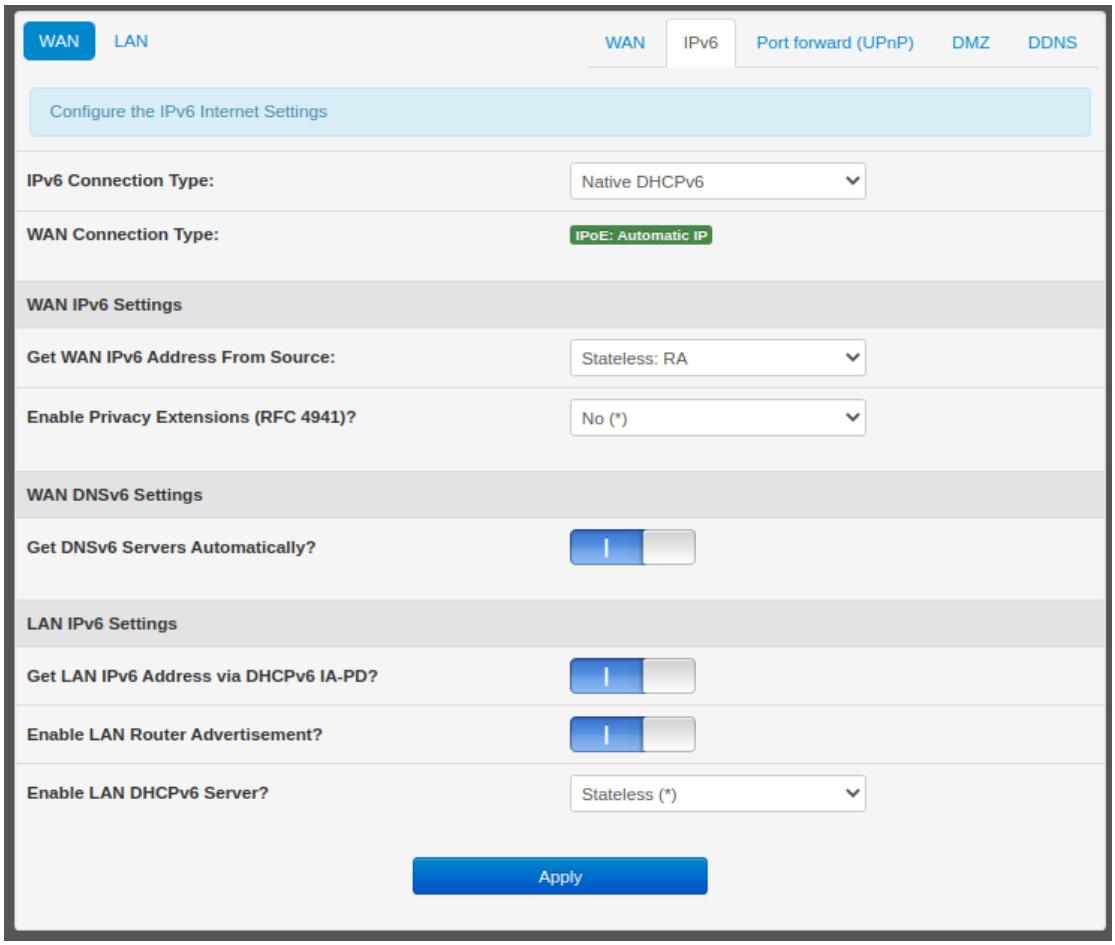


Figure 6.1.2 IPv6 Settings

6.1.3 Port Forwarding (UPnP)

"Network" - "WAN (external network)" - "Port Forwarding (UPnP)".

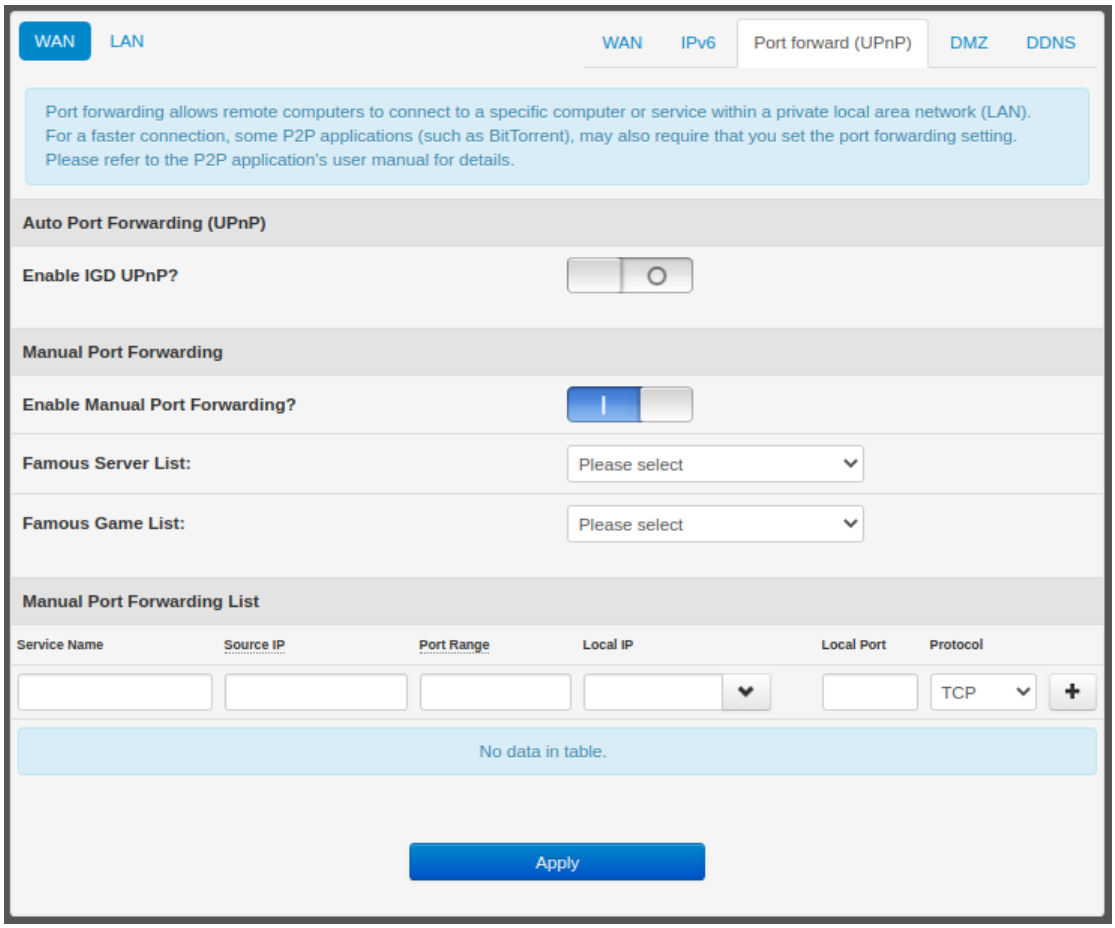


Figure 6.1.3 Port Forwarding (UPnP) Settings

The interface items are described in the following table.

Interface items	Description
ARP status detection	Some gaming or real time communication applications use the same port when they have a common IP address and will abort. Because they need to use a unique port for each session, the "IGD UPnP" feature is turned on to automatically create NAT forwarding for these applications. In engineering scenarios it is usually turned off.
Manual Port Mapping	
Common Protocols	Mapping rules for some common protocols

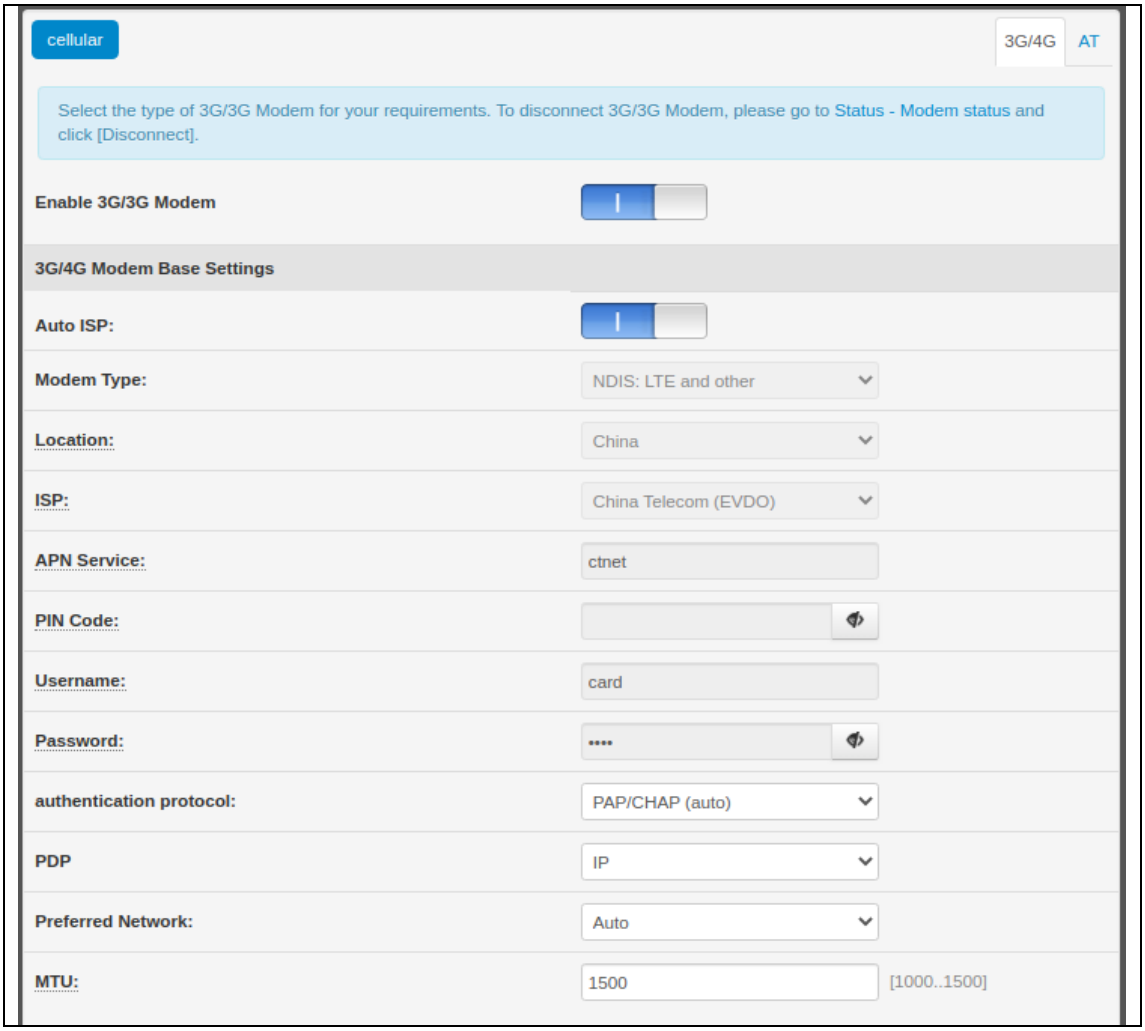
Service Name	Give a name to the current mapping rule
Source IP address	The IP address when accessing the intranet from the outside, usually written as " *. *. *. *" for an external arbitrary address
Port Range	Port range: a) Specify the port, e.g. [95]. b) Specify the port range, e.g. [103 : 315] or [> 100] or [< 65535]
Intranet IP address	IP address of the internal server
Local Port	Port of a service on an internal server
协议	TCP/UDP protocols, or other IP layer protocols
"+" sign to add	After configuring the above information, click the "+" sign to add to the list, you can add up to 64 rules

Table 6.1.3 Port Forwarding (UPnP) Setting Interface Description

Chapter 7 3G/4G

7.1 3G/4G dial-up configuration

“3G/4G”:


cellular
3G/4G
AT
Select the type of 3G/3G Modem for your requirements. To disconnect 3G/3G Modem, please go to Status - Modem status and click [Disconnect].
Enable 3G/3G Modem
3G/4G Modem Base Settings
Auto ISP:
Modem Type:
NDIS: LTE and other
Location:
China
ISP:
China Telecom (EVDO)
APN Service:
ctnet
PIN Code:
Username:
card
Password:
authentication protocol:
PAP/CHAP (auto)
PDP
IP
Preferred Network:
Auto
MTU:
1500
[1000..1500]

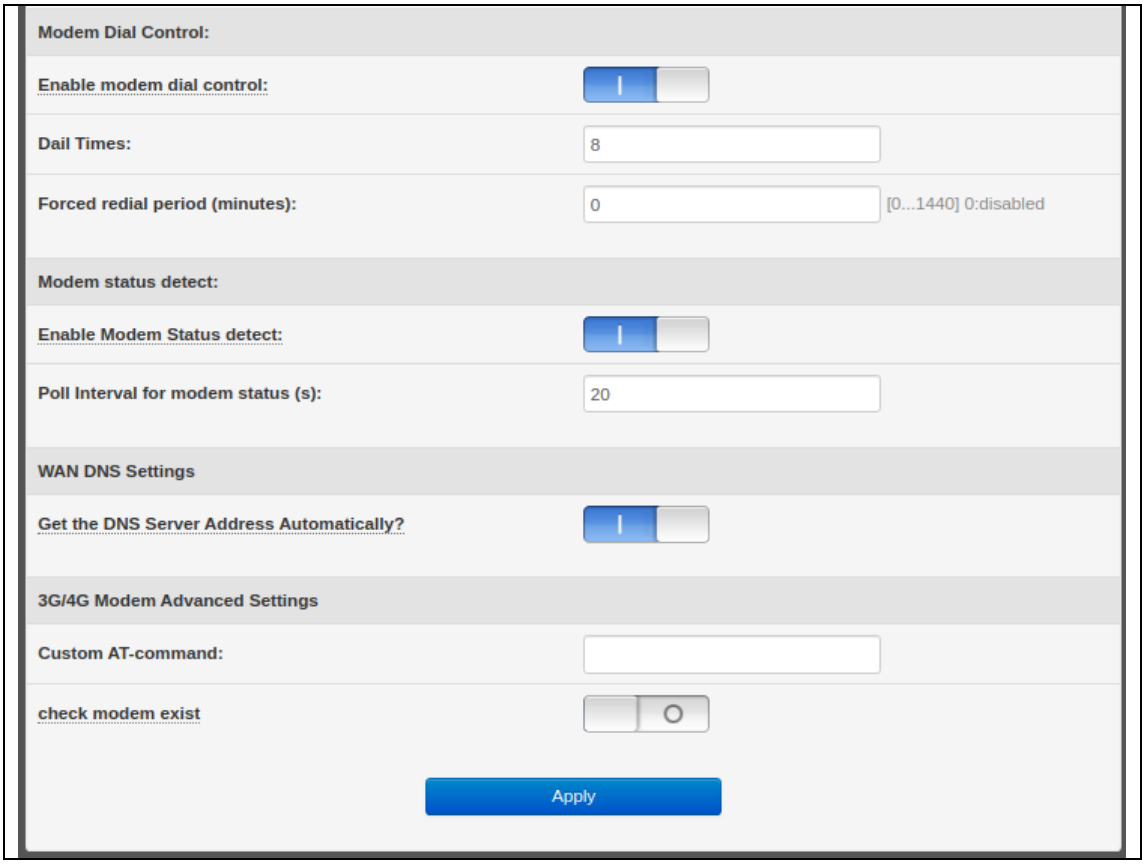


Figure 7.1 3G/4G dial-up settings

The interface items are described in the following table.

Interface items	Description
Enable 3G/4G Modem	Whether to open the 3G/4G dial-up function, if closed, the router will not be dial-up connection
3G/4G Modem Basic Setup	
Automated Service Provider Matching	After inserting the SIM card, let the router automatically recognize the SIM card information for dial-up parameter configuration. If not automatically, you usually need to fill in: 1. Modem type 2. APN service 3. user name and password
Modem Type	NDIS: 4G module dialing type RAS: 3G module dialing type The router has been strictly adapted to the internal dialing type of the communication module, here to keep the automatic recognition can
Country	Generally for automatic recognition, it does not matter if you choose the wrong one. This parameter has nothing to do with the final dialing parameters
ISP	Generally for automatic recognition, it does not matter if you choose the wrong one. This parameter has nothing to do with the final dialing parameters
APN Services	"Access Point Name" is a parameter that must be configured when accessing the Internet, which

	determines which access method is used to access the mobile network. Generally, the router automatically matches the SIM card information. However, when using VPDN private network card, you must fill in the APN information assigned by ISP, APN is not correct, then you can not access the network normally.
PIN code	For SIM card with PIN code, you must write PIN code before dialing. PIN code is called Personal Identification Number, which is the personal identification code of SIM card. PIN code is a kind of security measure to protect SIM card to prevent others from stealing SIM card, if the PIN code is enabled, then you have to input 4 to 8 digits PIN code after each power on. When the PIN code is entered three times incorrectly, the card will be automatically locked and prompted to enter the PUK code to unlock it. It is necessary to use the service password to call the operator's customer service hotline, which will inform the initial PUK code, and the PIN code will be unlocked after entering the PUK code.
User Name	Generally, it is automatically recognized. For VPDN private network card, you must fill in the information given by the ISP, otherwise it cannot be authenticated and thus cannot access to the operator's network.
Password	Generally, it is automatically recognized. For VPDN private network card, you must fill in the information given by the ISP, otherwise it cannot be authenticated and thus cannot access to the operator's network.
Authentication method	Generally, it is automatically recognized. For VPDN cards, you must follow the information given by your ISP, otherwise you will not be able to pass the authentication and access to the carrier's network.
PDP	The PDP context provides a packet connection for exchanging IP packets between the UE and the network side. It is generally kept as "IP" by default.
Preferred Network	Customize the module's network type, usually "Auto", to let the module automatically register the network with good signal. Here you can also select 3G network for dial-up.
MTU	Generally 1500 remains the same
Modem dial-up control	
Turn on modem disconnection redial	Enable the router disconnection redial function, that is, the router 3G/4G network disconnection, the router can automatically reconnect
Dialing times	Re-dial limit, when the limit is reached, the router will automatically reboot
Modem status detection	
Turn on modem	Whether to open 3G/4G status real-time detection

status detection	
Detection interval	How many seconds to detect the status of 3G/4G network. This function detects the status of the network in real time, when there is a problem with 3G/4G signal or network, the router will redial, if it still can't dial up the Internet after the specified number of times, the router will reboot
Extranet DNS settings	
Automatic DNS acquisition	Whether to obtain DNS automatically
3G/4G Modem Advanced Settings	
Custom AT commands	Some modules may have some special initialization work to handle before dialing, so you can add a special AT command initialization sequence here to initialize this part of the AT command before the router does the dialing
modem hardware detection	The router will automatically reboot when the presence of 3G/4G module is not detected

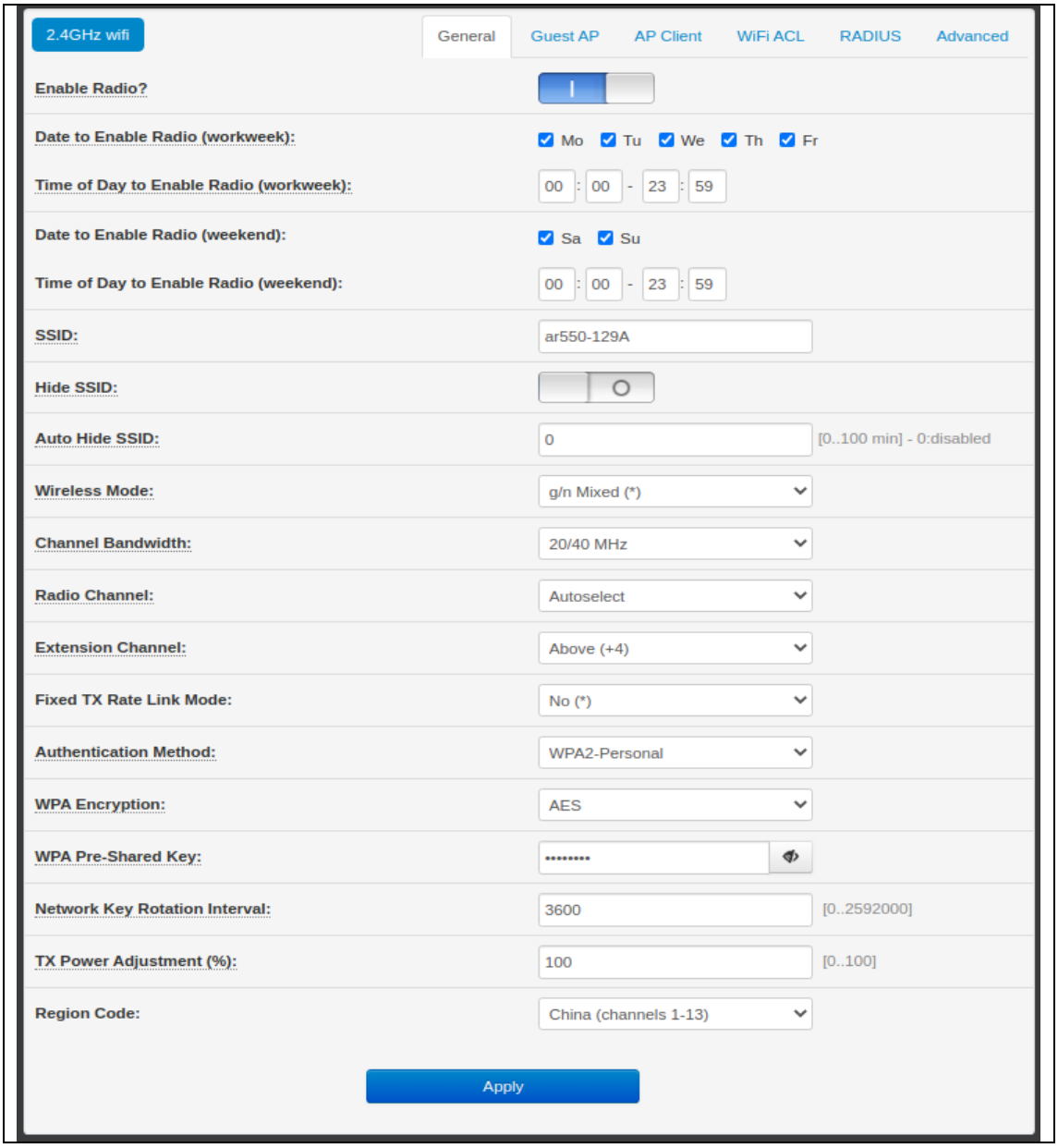
Table 7.1 3G/4G interface description

Chapter 8 WIFI

Left side large category	Specific categories on the right	Function Description
2.4GHz wifi or 5.8G Hz wifi	Basic Settings	Basic setup of wifi
	Network Guest	Wireless guest network basic settings
	Wireless Bridge	Wireless Bridge Setup
	Wireless Access Control	Wireless Access Control
	RADIUS Settings	Wireless RADIUS authentication
	Advanced Settings	Wireless Advanced Settings

8.1 Basic setup

Basic settings



The interface items are described in the following table.

Interface items	Description
Enable Wireless	Select [Yes] to enable Radio function
Enable date (weekday)	Date to Enable Radio (workweek)
Enable time period (weekday)	Time of Day to Enable Radio (workweek)
Enable Date (Weekend)	Date to Enable Radio (weekend)
Enable Time Period (Weekend)	Time of Day to Enable Radio (weekend)
Wireless SSID	Set the name of the wireless network
Hide SSID	Hide SSID broadcast

Auto-hide SSID	After this function is turned on, the SSID of ROUTERMODEL will be hidden automatically for several minutes after the WAN side external network connection is successful. If the value is 0, it means that this function is turned off.
Wireless Mode	This item allows you to select any of these options for the Wireless Mode of your 802.11n interface.
Channel Broadband	Select a wide channel bandwidth to obtain a high transmission rate.
Wireless Channel	The radio channel for wireless connection operation.
Extended Channel	Select the extension channel used in the 20/40 MHz channel bandwidth mode. 802.11n uses the extension channel to get extra speed.
Fixed transmit rate connection mode	Specify modulation rate
Authentication method	This field enables the authentication methods for wireless clients.
WPA Encryption	WPA Encyption to encrypt data
WPA key	WPA key
Network Key Rotation Interval	This field specifies the interval (sec) after which a WPA group key is changed. Enter 0 (zero) to indicate that a periodic key-change is not required.
Transmit power adjustment (%)	Adjust antenna power to enhance the quality of trasmittion.
Area Code	Select different channel areas

:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception,
which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different
from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help.

To maintain compliance with FCC’s RF Exposure guidelines, This equipment should be installed and operated with minimum 20cm distance between the radiator and your body: Use only the supplied antenna.