



5500 Industrial 4G/5G Wireless Router

Product User Manual

V3.0



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.

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

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.

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

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body

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1.Product Introduction.

1.1. Product Overview



5500 series router adopts industrial grade design, using high-performance 64 bit embedded ARM architecture dedicated network processors, embedded industrial grade, high-performance, multi band mobile communication processing modules, supporting high-speed mobile broadband networks such as 5G, TDD/FDD-LTE etc., providing customers with convenient and fast Internet access or dedicated network transmission. Optional embedded Wi Fi modules or multiple LAN ports are available, providing customers with wired fixed network or wireless WLAN shared high-speed broadband connections for their terminals; Simultaneously supporting VPN (OpenVPN, IPSec, L2TP, PPTP) functions to build secure tunnels, widely used in industries such as finance, power, environmental protection, petroleum, transportation, and security.

5500 series router provides users with a web-based configuration interface and CLI command line configuration, which can be configured through a web browser or Telnet/SSL.

WTIwireless provides users with an M2M terminal product management platform, which remotely manages all Router terminals. Users can monitor the status of all successfully connected terminals through the M2M platform, providing remote control, parameter configuration, and remote upgrade services.

This manual introduces 5500 series router to users, as well as how to install and configure the products, quickly guiding users to correctly install and configure basic parameters.

1.2. Model Description

5500 series router is equipped with single module/single SIM card, single module/dual SIM card, supporting multi band 5G, TDD/FDD-LTE and other mobile broadband networks. It is backward compatible with 5G, TDD/FDD-LTE and other mobile narrowband networks, and can optionally embed Wi Fi modules to build WLAN networks, which can adapt to different industry application needs and operator network environments.

This series of routers has multiple models to choose from, and the following are specific product model identifiers:

List of Industrial Router Series Products by WTIwireless 1-1

WTI	5500series		
Product model	Network standard	Wi-Fi network standard	Ethernet port
5500	5G: N2/N5/N7/N12/N13/N14/N25/N26/N30/N38/N41/N66/N70/N71/77/N78 LTE FDD: B2/B4/B5/B7/B12/B13/B14/B17/B25/B26/B30/B66/B70/B71 LTE TDD: B38/B41/B42/B43/B48		4*LAN 1*WAN

Table 1- 1

1.3. Equipment Configuration and Accessories

Table 1-3 describes the accessories

The name of the accessory	Quantity	Remark
5500 router host	1	According to the user's order situation, packing
4G/5G antennas	2	Antennas are assigned according to the network
WLAN antennas	2	Equipped with WLAN function

GPS antenna	1	When equipped with GPS function
Cable	1	Standard
Certificate	1	Standard
12V power adapter	1	Standard

Table 1- 2

1.4. Functional Features

- Supports multi band 5G/4G/FDD/TDD networks;
- Supports IEEE802.11a/b/g/n/ac Wi Fi AP functionality, with extended support for Wi Fi clients, WDS bridging, and multiple authentication and encryption methods such as WEP, WPA/WPA2 Persistent/Enterprise, TKIP/AES, etc;
- Support virtual data and private networks (APN/VPDN);
- Optional support for transparent transmission and protocol conversion of RS-232 interface data;
- Support multiple on-demand dialing options, including scheduled up and down calls, voice or SMS controlled up and down calls, data triggered online calls, and idle link offline calls;
- Supports TCP/IP protocol stack and comprehensive network protocols such as Telnet, HTTP, SNMP, PPP, PPPoE, etc;
- PPP:
 - Support VPDN/APN function, which can easily and quickly access the virtual dial-up private network provided by mobile operators to protect your data security.
 - Supports PPPoE (Point to Point Protocol over Ethernet) protocol, which is a technology for forwarding PPP frames on Ethernet, especially suitable for ADSL.
 - Support CE and CCC certification.
 - Support connection detection and automatic repair. After the device is disconnected, it can be automatically reconnected to ensure stable online operation.
- Provide user-friendly interface configuration management and support Telnet/SSH CLI configuration mode;
- Optional IPv6 protocol stack;
- Optional support for M2M terminal management platform;
- WDT watchdog design to maintain system stability;
- Customized development based on customer needs;
- Firewall function:
 - Support firewall packet filtering to filter out junk data for you, making the device more efficient.
 - Support Port Mapping, which enables access to specific port services from the Internet to machines within the local area network.
 - Support virtual address mapping, which can hide the real IP and facilitate your application.
 - Support DMZ (Demilitarized Zone), also known as "Isolation Zone" or "Demilitarized Zone" in Chinese.

- Effectively solving the problem of external network being unable to access internal network servers after installing a firewall, while also effectively protecting the internal network.
- Support MAC address binding, restrict access of internal network hosts, and provide more security guarantees.
- Management Platform:
 - Equipment remote management platform, which enables remote management of G92 devices, supports remote parameter configuration, remote upgrade, remote log management, remote alarm management, information statistics and display, batch configuration, batch upgrade and other remote operations through the management platform;
- Network tools:
 - Provide PING and traceroute to detect the connection status of the router;

1.5. Technical indicators and specifications

Router Interface Description

interface	describe	Note
USIM	Plug in SIM card slot	
4G/5G	4G/5G antenna, SMA connector, 50 Ω	
WiFi	Wi-Fi antenna, SMA connector, 50 Ω	optional
GPS	GPS antenna, SMA connector, 50 Ω	optional
LAN	Ethernet downlink service interface, 100Base TX, MDI/MDIX adaptive, Ethernet interface for connecting computers, switches, and hubs	Default: 5*LAN or 4*LAN+1*WAN
WAN	Ethernet uplink service interface, 100Base TX, MDI/MDIX adaptive, upstream switch or router	WAN/LAN reuse
RST	Reset button, used to restore factory default settings (press and hold the button for 15 seconds after powering on)	
PWR	power interface	7.5~32V DC

Table 1- 3

OTHERS:

Item	parameter
Casing	Sheet metal shell
weight	Approximately 530g
Ambient Temperature	-30~+75°C
Product appearance	150×103.5×24.6mm
Storage temperature	-40~+85°C
Relative humidity	<95% (no condensation)
Power consumption	When dialing 12V, the current is 850mA, and the standby current is 600mA

Table 1- 4

2. Hardware installation instructions

This section focuses on the cable connections of the device and the corresponding interfaces and indicators.

2.1. Installation Preparation

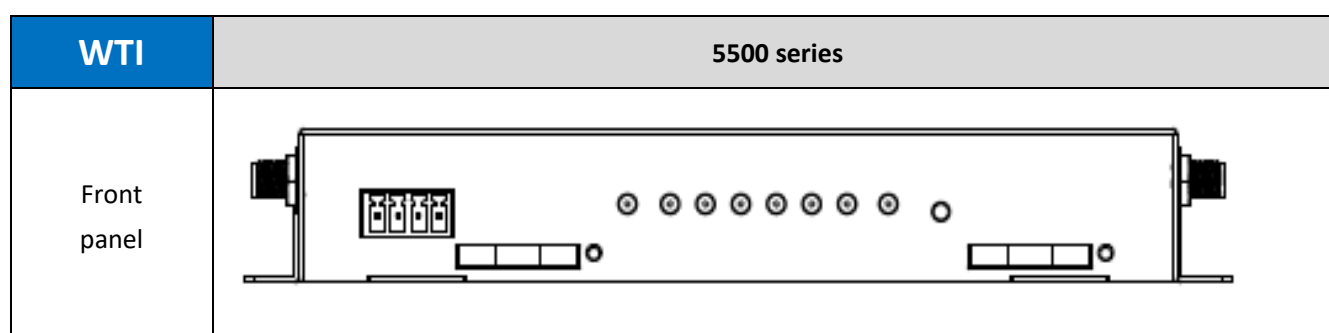
Please confirm that 5500 Router is within 3G/4G network coverage and there is no blocking on site.

Please provide the following conditions on site before installation:

- One PC
 - System: Windows XP/WIN7/WIN8/WIN10
 - CPU: PII 233 or higher
 - RAM: 32M or more
 - HDD: 6.4G or above
 - Ethernet port: : at least one (10M/100M)
 - IE version: 5.0 or later
 - Resolution: 640*480 or more
- A SIM card
 - Make sure that the card has data service enabled and is not down for arrears
- Power supply
 - 220V AC: Can be used with the DC power supply supplied with the product
 - 7.5~32V DC: ripple < 100 mV
- Fixed
 - Try to ensure that the router is placed on a horizontal plane and installed in an environment with low vibration frequency. When using industrial rails, the router can be attached to a chassis or rails equipped with rails (when installed on a moving vehicle or vibrating machine, it must be secured with an industrial rail).

2.2. Schematic representation of the product panel

5500 series products panel illustration



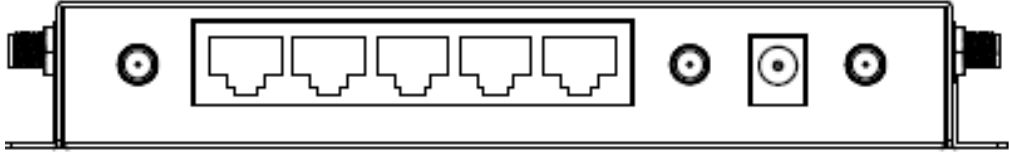
WTI	5500 series
Side panels	

Table 2-1 Panel diagram



The antenna interfaces of the extended Wi Fi and GPS function series products are different.



There is a difference in the indicator display of the extended single-mode dual-SIM product.

2.3. Dimensional specification drawing

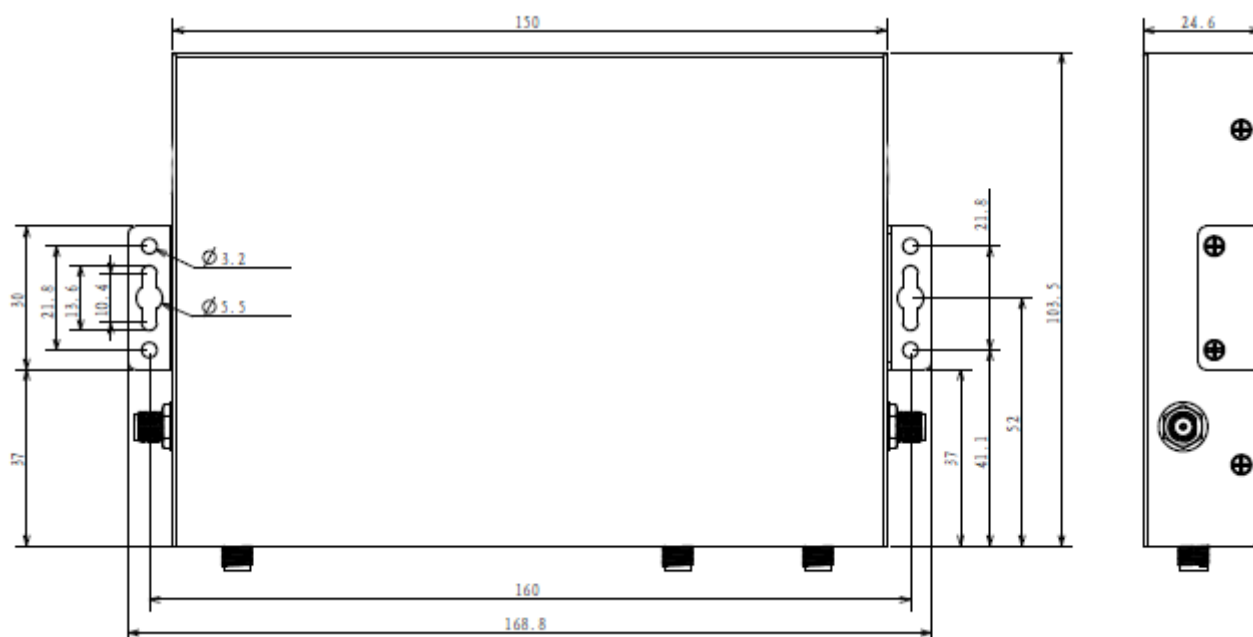


Figure 2-1 Dimensions of 5500 series routers



The device supports a variety of installation methods: embedded integration, desktop placement, wall mounting and rail installation.

2.4. SIM card installation

Step 1: Open the card cover with a screwdriver.

Step 2: Insert the SIM into the card holder correctly.

2.5. Cable connections

After installing and fixing the device, follow the steps below to connect the router series.

1. Connect the 3G/4G antenna to the 3G/4G interface of the router, connect the Wi-Fi antenna to the WI FI interface of the router, and adjust the best position or pointing of the antenna.
2. Use an Ethernet cable to connect the LAN interface of the converter with the network card interface of the computer or the uplink interface of the switch or the uplink interface of the terminal equipment. The WAN interface is connected in the same mode as the LAN interface.
3. Connect the PWR connector of the circuit driver (the input of the power adapter is 12V/2A DC) and the power socket with the power adapter (or battery backup unit).
4. Press the switch of the power outlet.



Before connecting the cables, please disconnect the power of the router.

2.6. Installation checks

Before installing and preparing to power on, check if the SIM card is installed correctly. Check the working status indicator light of the router after power on, and connect it to the lower level after power on. The LAN port of the machine will light up, and the PWR light will light up, indicating that the system has started working normally.



Be sure to connect the antenna before powering on to avoid partial impedance mismatch of the RF part, resulting in poor signal and inability to dial online.

Steps:

Step 1: Check if the antenna is installed correctly.

Step 2: Check if the SIM card is installed correctly and confirm that the SIM card is valid.

Step 3: 5500 power supply

- After power is supplied, if the LAN port of the lower computer is connected to the 5500, the Router has normal power supply.
- After a period of power, the router indicator lights up, indicating that the router system has been started.
- After the router indicator is on for a while, the .NET indicator lights up and flashes quickly, indicating that the router has found the module and started dialing. The router will have a .NET light on during dialing.



For different modules, the router finds the module at different times, and the dial-up time is different due to different networks. So for different modules, the router dial-up and the time to get the IP address may be inconsistent, but the router dial-up process is strictly as described above.

3. Prepare for the configuration

3.1. Local connection configuration

Prerequisites

- The 5500 Router has been powered.
- The 5500 Router port has been connected via an Ethernet cable.

Specify the IP address mode

Step 1 Click "Start> Control Panel" in the window that opens, double-click "Network Connections", double-click "Network Connections" to open the "Local Connection Status" window, click "Properties", double-click Internet The protocol (TCP/IP) is shown in Figure 3-1

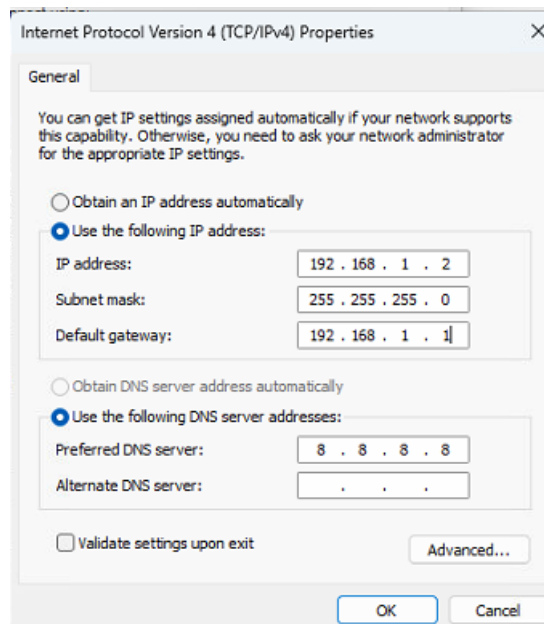


Figure 3-1 Internet Protocol (TCP/IP Properties Window).

Note: The IP address can be 192.168.1.x (where * represents any integer of 2~254).

Step 2: Click OK to complete the configuration.

DHCP automatically obtains IP addresses

The 5500 Router has a built-in DHCP service that automatically assigns IP addresses to terminals connected to it based on pre-set parameters.

Step 1: Click "Start> Control Panel" in the window that opens, double-click "Network Connections" to open the "Local Connection Status" window, click "Properties", double click Internet Protocol (TCP/IP) as shown in Figure 3-2:

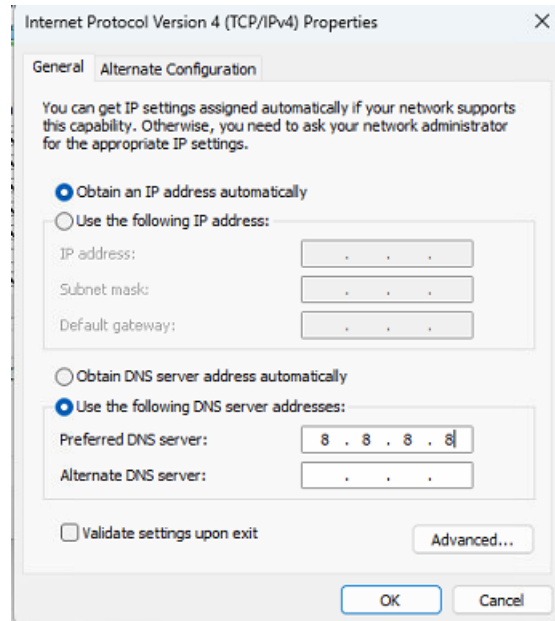


Figure 3-2 Internet Protocol (TCP/IP) Properties

Step 2: Click "OK" to complete the configuration.



The built-in DHCP service of the 5500 Router is enabled at the factory, and the DHCP service is enabled until this function is configured.

3.2. Configuration checks

Step 1: Click "Start > Run" on your computer, enter the "cmd" command in the input box and press Enter. Open the Run window.

Step 2: Enter the command "ipconfig" in the "Run" window to configure the above two connections for the method "ipconfig". The IP address displayed in the window is different: the IP address displayed in Figure 3-3 is the IP address in Figure 3-3, as shown in Figure 3-4 shown; The IP address displayed in the configuration method of automatic IP acquisition by DHCP of the router is displayed as "2~51".s random address.

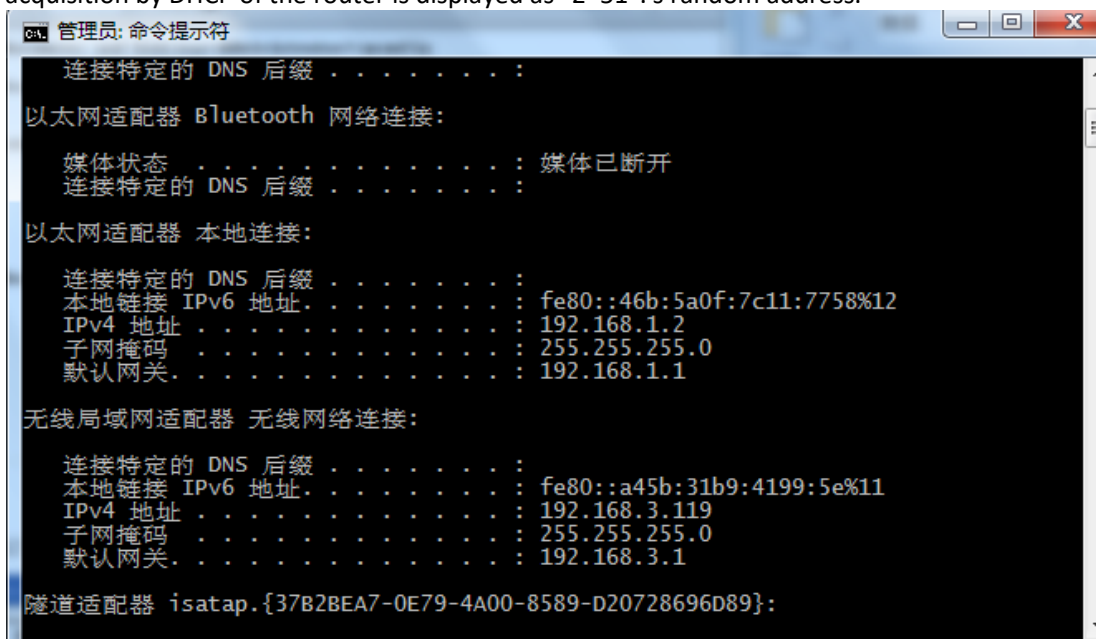


Figure 3-3 Specifies the result of 'ipconfigin' IP address



Figure 3-4 DHCP automatically obtains the result of 'ipconfig' IP address

Step 3: Enter the following command in the CLI window to check whether the connectivity is normal.

Ping 192.168.1.1

If the interface shown in Figure 3-5 is displayed, the local computer is properly connected to the 5500 router.

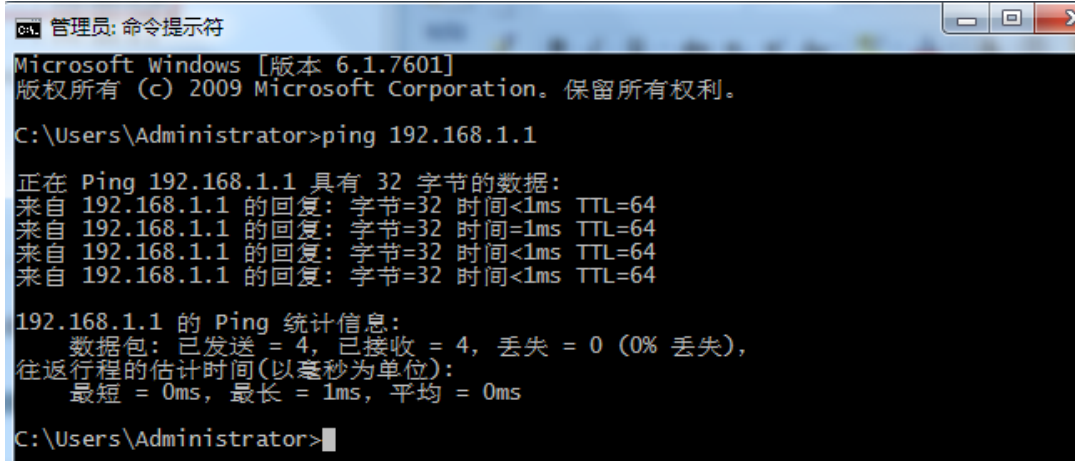


Figure 3-5 Connectivity Verification Results

4. Configuration introduction

This chapter describes the Router parameter configuration process, which can be configured through a web browser, and customers can use Internet Explorer, Firefox, Chrome and other browser software.

4.1. Establish a web configuration environment

The Router can be configured through a local Ethernet interface. The default IP address set for the local Ethernet interface is 192.168.1.1, the subnet mask is 255.255.255.0. Perform the following steps to set up a web configuration environment:

1. Connect the LAN interface of the Router and the Ethernet interface of the computer with an Ethernet cable, the default computer can automatically obtain the IP address, and the IP address of the computer can also be fixed The format is:192.168.1.xxx (where xxx represents any number between 2~254) and the subnet mask is 255.255.255.0.
2. Open the browser and enter "HTTP:192.168.1.1" in the address bar. In the login dialog box that appears, enter the username and password that you want to log in. The default username/password is admin/admin, as shown in Figure 4-1

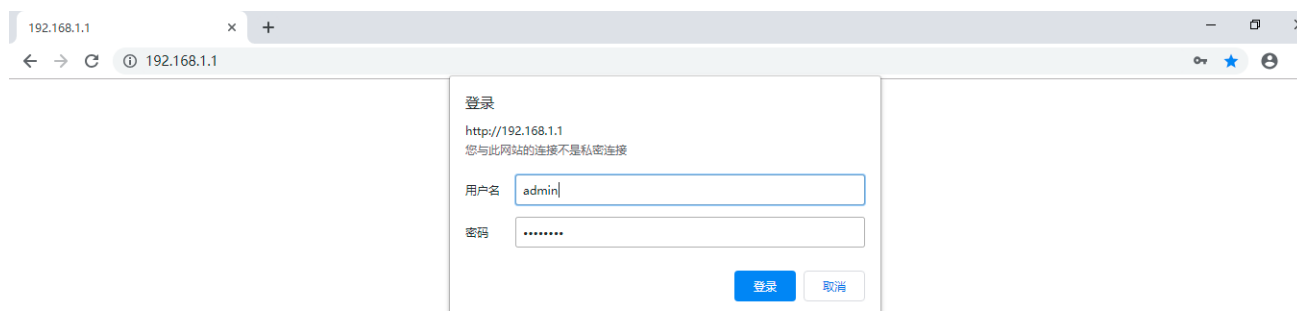


Figure 4-1 Web Configuration Management User Authentication Page

4.2. System status

You can query the status of the mobile network to learn about the "mobile network status" and "mobile network device information". In this way, the network and devices are healthy according to the relevant status. Log into the web configuration pave and click "Status=>Overview" as shown in figure 4-2

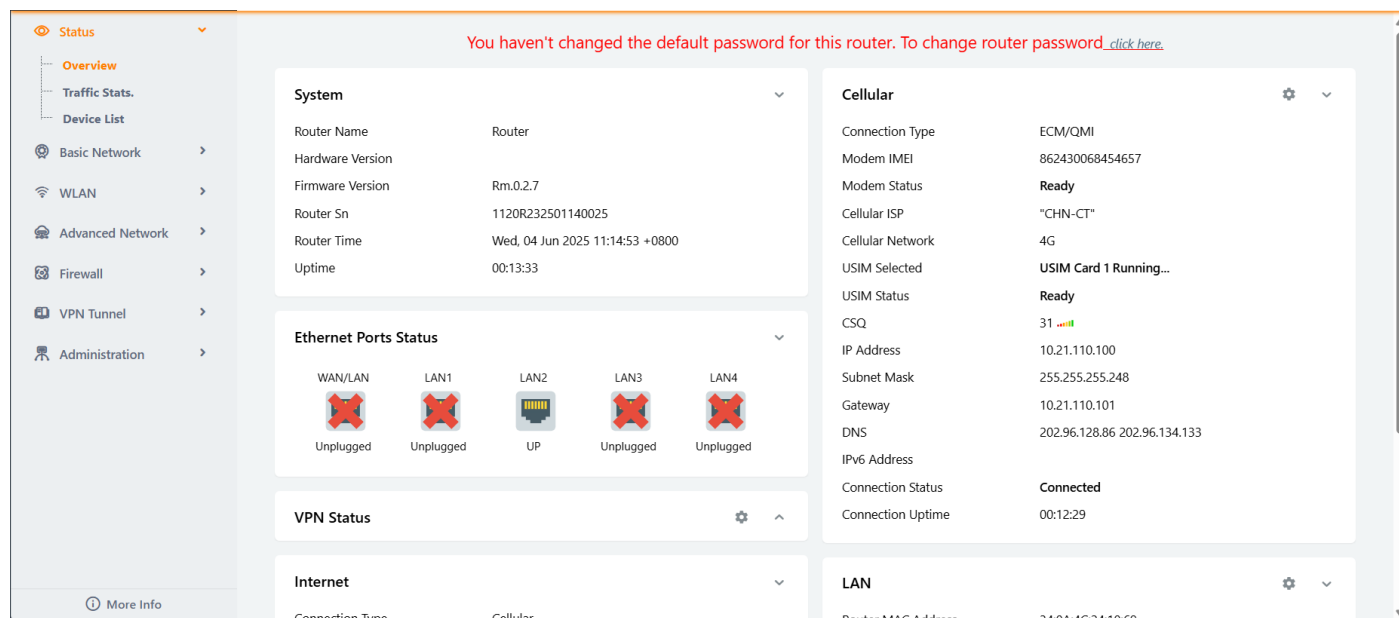


Figure 4-2 Screenshot of the Router status Table 4-1 of

Parameters on the Mobile Network Status page:

Parameter	meaning
Router Name	The current router name can be set in System Administration - System Identity

Hardware version	The current router hardware version
Firmware version	The version of the current router program
Router time	After networking, NTP actively aligns with the network time server, see Time Setting Parameters for details
Uptime	Displays the duration of the router when it is powered on
Total/Remaining Memory	The total memory of the router, and the remaining available memory
Connection Type	The name of the current mobile network dial-up rule
Connection Type	Mobile module model
IMEI	International Mobile Equipment Identification
Modem status	Check whether the module connection is normal
USIM status	Displays SIM card status
CSQ	The signal strength of the wireless network, the value range: 1~31, if there is no signal, it will not be able to dial successfully.
IP address	The IP address assigned by the carrier obtained when the Router dials up.
Subnet Mask	The carrier assignment that the Router gets when dialing up. 255.255.255.x
Gateway	The address of the carrier-assigned gateway obtained when the Router dials the number.
Connection status	There are two states: connected and disconnected
Connection Uptime	Displays the online duration of the Router after the dial-up is launched

Table 4-1

5. Basic network configuration



The web configuration interface is subject to change depending on the software version.

After entering the web configuration page, you can view the status of the router or change the router settings through the web configuration page. The following describes the common configurations.

5.1. WAN network configuration

In the navigation bar, select "Basic Configuration >WAN Network". On the page that opens, you can modify the parameters of configuring the WAN network. As shown in Figure 5-1:

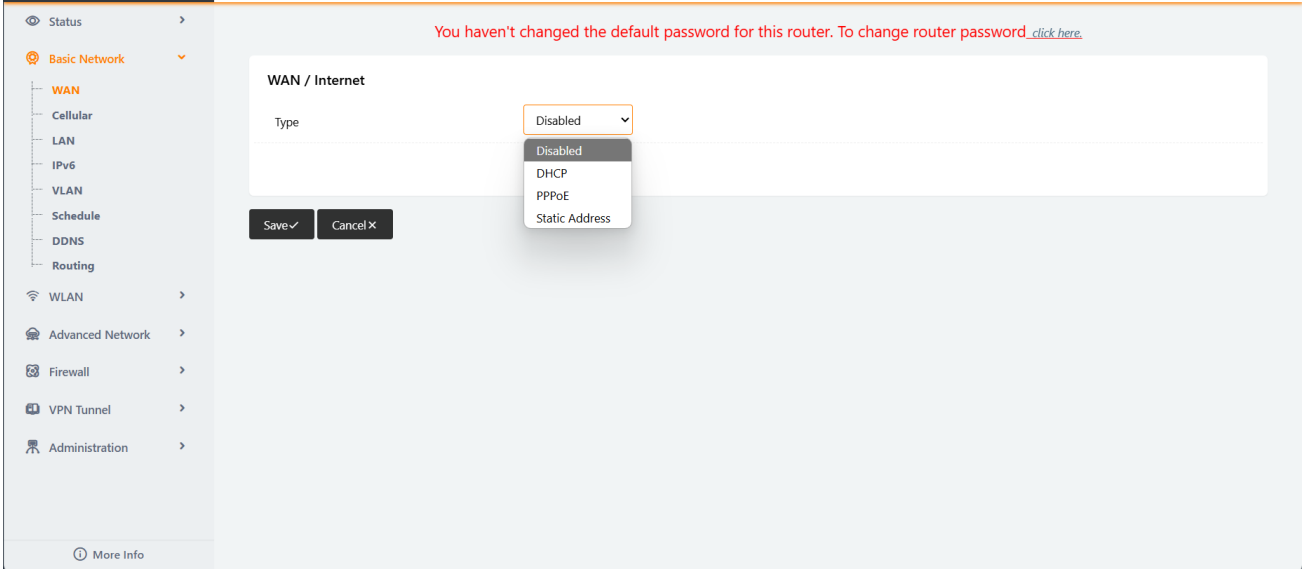


Figure 5-1 WAN connection type selection

According to the networking situation of the field application, select the Internet connection type provided by your ISP from the drop-down menu, including the following WAN connection types: PPPoE, static IP, dynamic address acquisition, and other WAN port access methods. As shown in Figure 5-2:

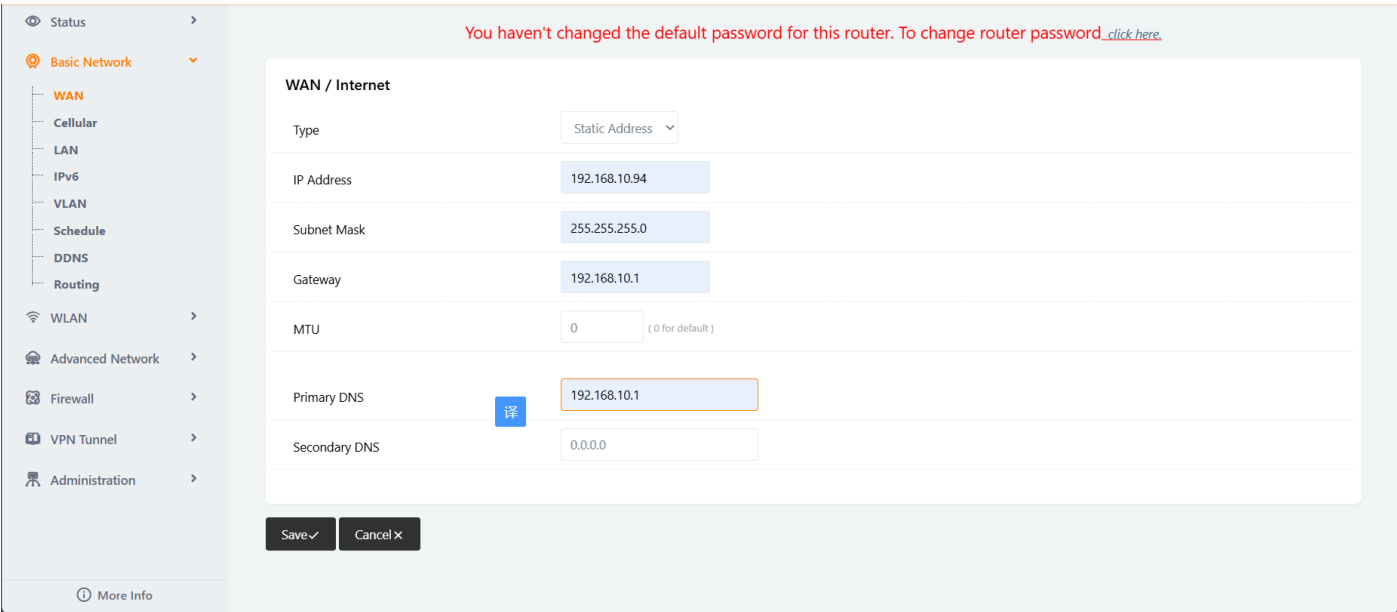


Figure 5-2 WAN Static Address Selection

Table 5-1 describes the WAN port connection type.

Parameter	meaning	How to configure
-----------	---------	------------------

Connection type	The type of connection for the WAN.	The drop-down box contains: Static IP address: Manually configure IP addresses, gateways, and DNS information. DHCP :D the HCP client automatically obtains an IP address and accesses the Internet through WA. PPPoE :PPPoE dial-up to obtain IP addresses (dial- up to the Internet through ADSL).
Displayed when Connection Type is set to Static IP		
IP	If Connection Type is set to Static IP, you need to set this parameter to Connection Type.	If Connection Type is set to Static IP, you need to set this parameter to Connection Type
Displayed when PPPoE is selected for Connection Type in the basic settings		
Service Name	The PPPoE service name is usually used for identification and judgment between the client and the server, and is usually provided by the server, and is provided by the ISP when dialing up the ADSL number.	The general WORD type, up to 64 bytes, cannot be empty
Username/password	The username/password used for PPPoE dial-up is usually provided by the server, and by the ISP when dialing up ADSL.	In general, the maximum length of each WORD type and CODE type is 64 bytes, and none of them are empty

After the configuration is complete, click the Save Settings button for the configuration to take effect.

Table 5-1

5.2. Mobile network configuration



WARNING

- 1.The card authentication mode of most domestic operators is PAP, so the custom dialing option is configured as (separated by spaces) refuse-chap refuse-mschap refuse- mschap-v2; If it is a CHAP or other certification, you can adjust the corresponding parameters.
- 2.VPDN private network APN access point, user name and password need to be provided by the operator
- 3.Note that some private networks have dedicated APN access points, while some private networks do not have APN access, only the user name and password are required
- 4.3G/4G LTE networks, whether TDD or FDD, the three major operators have a tendency to uniformly set APN as empty

In the navigation bar, select Basic Network > Cellular. You can modify the relevant parameters of the mobile network, as shown in the following figure:

You haven't changed the default password for this router. To change router password [click here](#).

Cellular Settings

Enable Modem ☒

Basic Settings	SIM 1	SIM 2
IMS	☐	
ICMP Check	☐	
Cellular Traffic Check	☐	詳
MTU	0 (0 for default)	
CIMI Send to		
SMS Code		
Operator Lock	ex:46001	
DualSim Mode	Fail Over	

Figure 5-3

You haven't changed the default password for this router. To change router password [click here](#).

Cellular Settings

Enable Modem ☒

Basic Settings	SIM 1	SIM 2
SIM 1 Mode	Auto	
SIM 1 5G Mode	SA & NSA	
SIM 1 Network Operator	Others	
SIM 1 PIN Code		
SIM 1 APN		
SIM 1 User		
SIM 1 Password		
SIM 1 Dial Number	*99#	

Figure 5-4

You haven't changed the default password for this router. To change router password [click here](#).

Cellular Settings

Enable Modem ☒

Basic Settings	SIM 1	SIM 2
SIM 2 Mode		Auto
SIM 2 5G Mode		SA & NSA
SIM 2 Network Operator		Others
SIM 2 PIN Code		
SIM 2 APN		
SIM 2 User		
SIM 2 Password		
SIM 2 Dial Number		*99#

Figure 5-5 Screenshot of mobile network configuration

For details about the mobile network configuration parameters, see Table 5-2:

parameter	illustrate
Enable Module	means enabling or deactivating a wireless module; It is enabled by default
IMS	refers to the way the core network is accessed; It is off by default
Use PPP	PPP dial-up mode is enabled and disabled by default
ICMP Check	The ICMP link detection mechanism is enabled and disabled by default
Detect IP addresses	Refers to the IP address that needs to be detected by the link, and checks whether the host is reachable and whether the route is available
interval	The interval between the time interval at which the IP address was detected
Retries	After the detection fails, the exception handling action is performed after the number of consecutive failures is reached
ICMP RTT Enabled	RTT (round-trip delay); It is off by default
RTT Threshold (Threshold)	The default value is 50ms, and exception handling operations are performed if the network delay exceeds 50ms. Range 50-2000ms
Fail Action	There are two actions that are performed when the number of retries is reached: reboot the system or redial
Cellular Traffic Check	Detect whether the Internet interface generates data traffic, if no traffic is generated within the detection time, perform exception handling and restart name redialing, which is disabled by default
Check Mode	Rx, Tx, and Rx&Tx, that is, upstream and downstream data detection methods
Check Interval	The detection interval is used to determine whether the traffic rate increases compared with the previous time
Fail Action	Detect traffic and perform exception handling if there are no two changes to the previous comparison: reboot the system or redial
CIMI sent to	The TCP client sends two parameters, CCID and IMEI, to the service address and port, which are empty by default
SMS Code	SMS verification code; For example, if the verification code is 1234, edit the SMS 1234 * reboot to send the routing SIM card, which is empty by default
Operator Lock	Lock your carrier's network number
Dual SIM Mode	There are four modes: automatic switching, card 1 only, card 2 only, backup mode Automatic switching: If card 1 fails to find the card, card 2 is switched, and card 2 fails to switch card 1 Automatic switching by default

parameter	illustrate
SIM 1 network mode	Auto, 5G NR, 4G LTE (FDD/TDD)
SIM 1 5G network standard SIM 2 5G network standard	SA&NSA, NSA, and SA are SA&NSA by default, and take effect only for 5G NR networks
SIM 1 network operator SIM 2 network operator	Others、Verizon; The default is Others, other carriers except Verizon
SIM 1 Enable the lock band function SIM 2 enables the lock band function	Forced 5G NR, forced 4G LTE (FDD/TDD) will enable this function, and will be disabled by default. If this function is enabled, you can lock the band function
SIM 1 SA Band/NSA/LTE Band SIM 2 SA Band/NSA/LTE	Force 5G NR, open SIM 1/SIM 2 SA lock band setting; Force 4G LTE (FDD/TDD), open SIM 1/ SIM 2 LTE lock band setting;
SIM 1 PIN	Set a PIN for your SIM card
SIM 1 dialing number	The carrier's network access number
SIM 1 APN Access Point	Parameters of the service type provided by the carrier
SIM 1 username	PPP authentication username
SIM 1 password	PPP Authentication Password
SIM 1 authentication method	Default Auto, PAP, CHAP, MS-CHAP, MS-CHAPV2
SIM 1 Local IP	To obtain an IP address, the SIM service must be bound to the specified IP address

Table 5-2 Mobile Network configuration parameters

5.3. ICMP Check

The 5500 Router not only supports this detection method, but also provides more reliable ICMP for abnormal phenomena such as false links in wireless networks, which are usually maintained by LCP and other methods Link detection function. ICMP detection mainly detects communication links through ping packet detection, and performs user-set actions when the link is abnormal to achieve rapid recovery of links and systems.

STEP 1: OPEN THE MOBILE NETWORK UNDER BASIC NETWORK ON THE WEB CONFIGURATION PAGE, AS SHOWN IN FIGURE 5-6.

You haven't changed the default password for this router. To change router password [click here](#).

Cellular Settings

Enable Modem ☒

Basic Settings SIM 1 SIM 2

IMS ☐

ICMP Check ☒

Check IP

Check IP (Optional)

Interval (seconds)

Retries (Times)

ICMP RTT Enable ☐

Fail Action

Figure 5-6 Mobile Network Configuration

Step 2: Configure ICMP detection service parameters

The name of the parameter	meaning	How to configure
Internet ICMP check	ICMP Detection Rule: Enabled or disabled	Default parameter: Disabled
Detect IP addresses	Two IP addresses are detected. First, IP1 is used to detect. If successful, the next detection will be conducted at equal intervals. If unsuccessful, if both IP addresses fail to ping alternately, an exception handling action will be taken.	Set valid IP addresses for PING communication. Default: 8.8.8.8
Detection interval	The detection interval and the maximum number of failures when the link is normal. When the maximum number of failures is reached, the ICMP rule executes the corresponding action tasks, such as modem redialing	Value range: 1~65535 (seconds). Default: 60 seconds
retry	Frequency setting	Value range: 1~1440 (times). Default: 3 (times)
ICMP RTT enabled	The RTT (Round-Trip Delay) feature is enabled	It is off by default
RTT Threshold (Threshold)	The highest value of network latency	The default value is 50ms, and exception handling operations are performed if the network delay exceeds 50ms. Range 50-2000ms
Fail Action	There are two ways to detect that the IP address is unreachable: reboot the system and redial	Default: Reboot the system

Table 5-3 ICMP detection parameters

Step 3: Click Save to complete the addition of ICMP detections.



If an ICMP packet is abnormal, the ICMP packet is sent continuously according to the ICMP detection system, and if the destination address is unreachable, the backup address is detected. If the number of times the backup address is unreachable also reaches the number of retries, the exception handling operation is executed.

5.4. LAN Configuration

In the navigation bar, select "Basic Configuration > Local Area Network". On the page that opens, you can modify the parameters of configuring the local area network, as shown in Figure 5-7

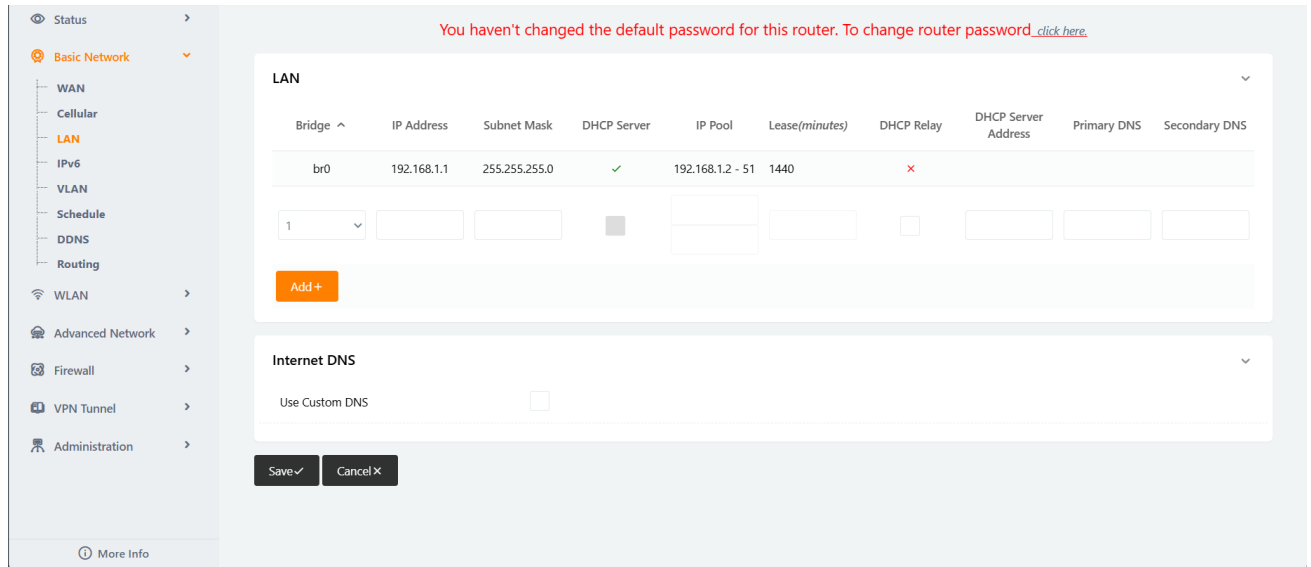


Figure 5-7 Screenshot of LAN configuration

Table 5-4 describes the parameters of LAN configuration

parameter	illustrate
Bridging	The default br0 parameter range of the interface is 0-4; LAN1-LAN4 network ports are used with VLANs
Router IP address	The IP address of the router, the default IP address is 192.168.1.1
Subnet Mask	The mask address of the router, the default mask is 255.255.255.0
DHCP services	Dynamically assign IP services. Once the DHCP service is selected, the IP address range and lease options will appear below.
IP Pool	IP addresses within the LAN range 2-254
Lease	By default, the IP address automatically assigned by DHCP is valid at 1440
Added BR1-BR3	For details about how to use a VLAN with a VLAN, see VLAN Description
DHCP Relay	Enabled or disabled, disabled by default;
DHCP Server Address	The default is empty, format: A.B.C.D

Table 5-4 "Local Area Network" Configuration Parameters

After the configuration is completed, click the "Save Settings" button. After saving the configuration, the device will

automatically restart for the corresponding configuration to take effect.

5.5. IPv6

IP is the abbreviation of Internet Protocol, while ipv6 is the sixth version of the Internet Protocol. It is a globally recognized next-generation Internet business application solution and the next-generation Internet protocol version formulated by the international standardization organization IETF to address the depletion of IPv4 addresses. It can provide massive network address resources and broad innovation space. Its number of addresses claims to be able to write an address for every grain of sand in the world.

The address length of IPv4 is 32 bits, and the number of addresses is 2^{32} , which is 4294967296;

The length of ipv6 addresses is 128 bits, the number of addresses is 2^{128} , and there are about 3.4×10^{38} addresses. Because the number of ipv6 addresses is huge, it also greatly solves the problem of insufficient number of ipv6 network address resources. With the development of the Internet, IPv6 is needed as a support in emerging fields such as 5G, the Internet of Things, cloud computing, and driver less driving. The popularization of ipv6 is a general trend.

Step 1: Configure as follows, enable IPv6 penetration (default not enabled, device cannot obtain IPv6 address):

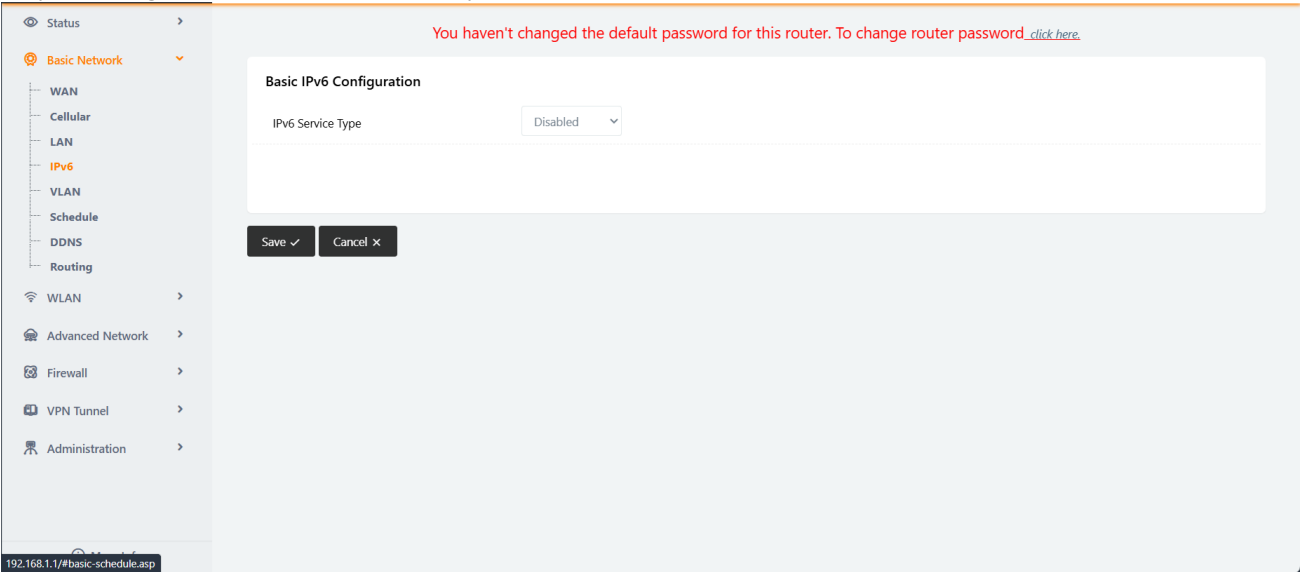


Figure 5-8

Step 2: After the module goes online, you can obtain the IPv4 and IPv6 addresses, and the LAN will assign a Router IPv6 address, through which you can access the router page locally, and the DNS and Router ipv6 automatically obtained by the local PC addresses are consistent:

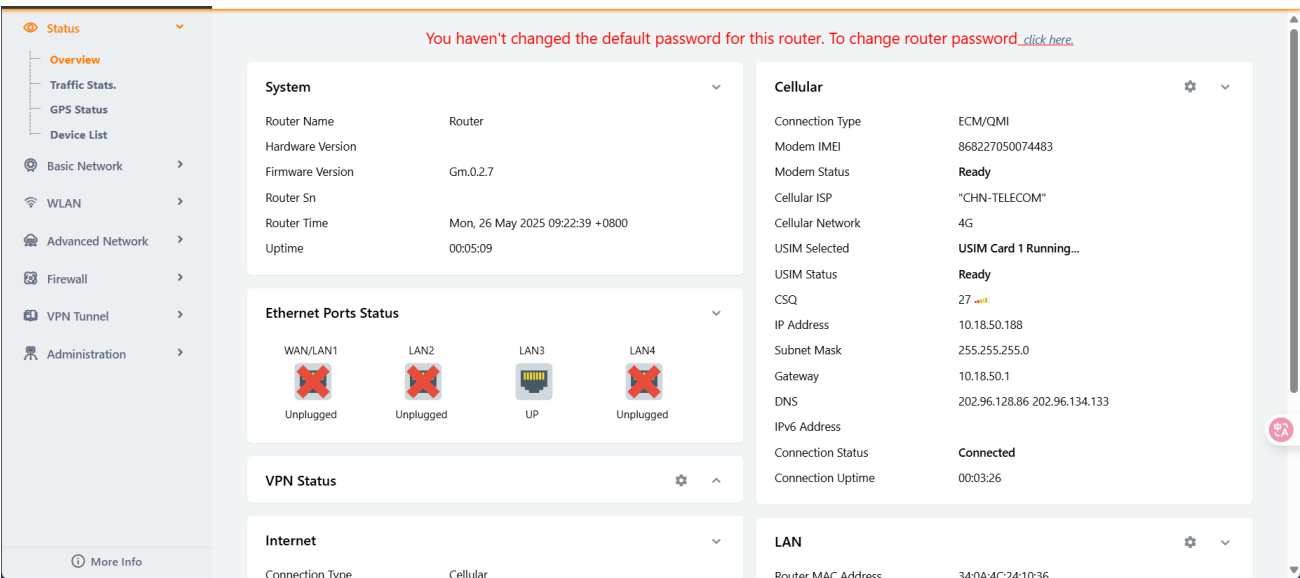


Figure 5-9

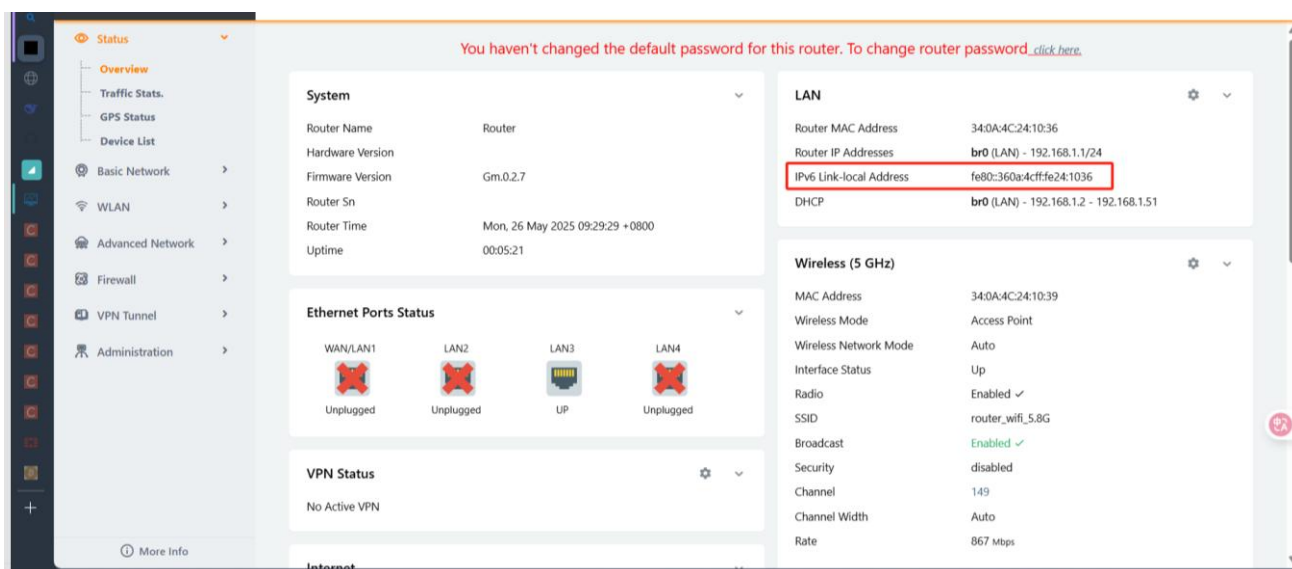


Figure 5-9

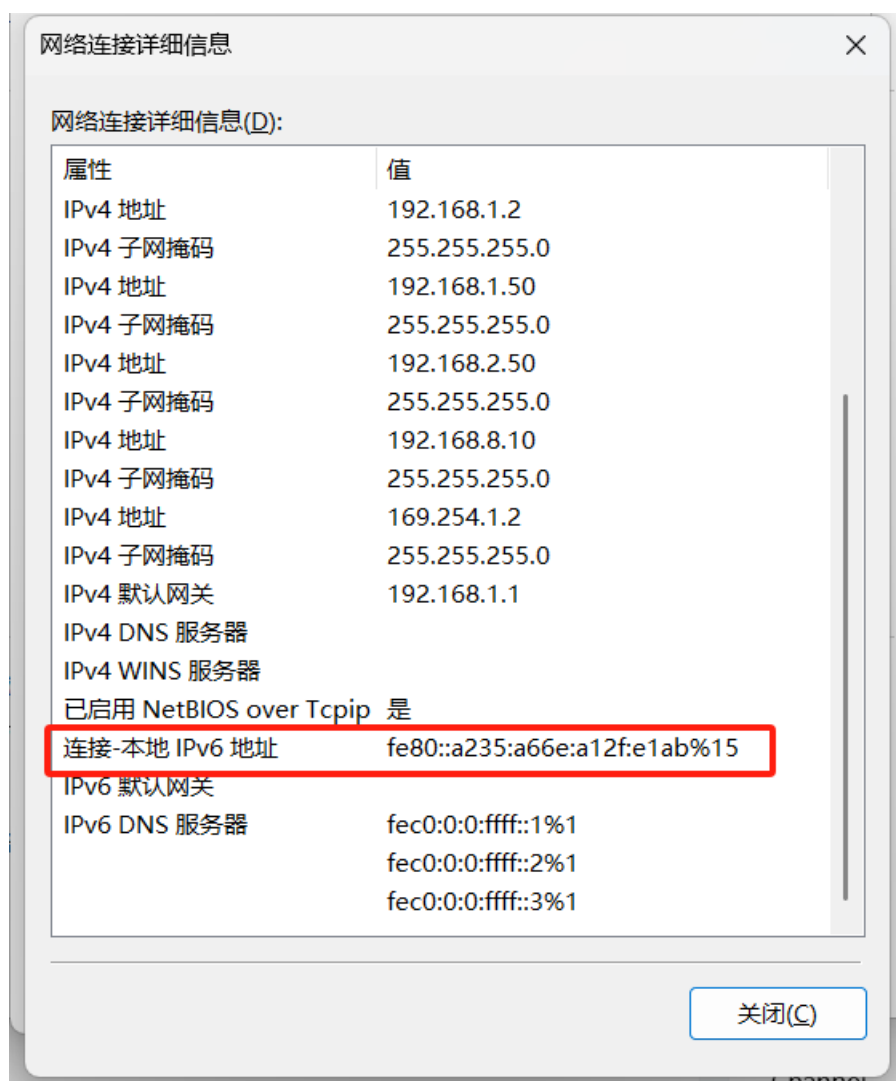


Figure 5-11

Step 3: Disconnect from other networks, use only the router to provide network to the PC, ping www.baidu.com and ping

baidu.com respectively, the result is as follows:

```

15/01/2024 10:11.44 /home/mobaxterm ping baidu.com

正在 Ping baidu.com [39.156.66.10] 具有 32 字节的数据:
来自 39.156.66.10 的回复: 字节=32 时间=56ms TTL=47
来自 39.156.66.10 的回复: 字节=32 时间=77ms TTL=47
来自 39.156.66.10 的回复: 字节=32 时间=91ms TTL=47
来自 39.156.66.10 的回复: 字节=32 时间=445ms TTL=47

39.156.66.10 的 Ping 统计信息:
    数据包: 已发送 = 4, 已接收 = 4, 丢失 = 0 (0% 丢失),
    往返行程的估计时间(以毫秒为单位):
        最短 = 56ms, 最长 = 445ms, 平均 = 167ms

15/01/2024 10:19.04 /home/mobaxterm ping www.baidu.com

正在 Ping www.a.shifen.com [240e:ff:e020:9ae:0:ff:b014:8e8b] 具有 32 字节的数据:
来自 240e:ff:e020:9ae:0:ff:b014:8e8b 的回复: 时间=48ms
来自 240e:ff:e020:9ae:0:ff:b014:8e8b 的回复: 时间=47ms
来自 240e:ff:e020:9ae:0:ff:b014:8e8b 的回复: 时间=50ms
来自 240e:ff:e020:9ae:0:ff:b014:8e8b 的回复: 时间=34ms

240e:ff:e020:9ae:0:ff:b014:8e8b 的 Ping 统计信息:
    数据包: 已发送 = 4, 已接收 = 4, 丢失 = 0 (0% 丢失),
    往返行程的估计时间(以毫秒为单位):
        最短 = 34ms, 最长 = 50ms, 平均 = 44ms
  
```

Figure 5-12

5.6. VLAN Configuration

Virtual Local Area Network (VLAN) is a communication technology that logically divides a physical LAN into multiple broadcast domains. Compared with traditional LAN technology, VLAN technology is more flexible, and it has the following advantages: Reduced management overhead for moving, adding, and modifying network devices; It is possible to control broadcasting activities; It can improve the security of the network.

In the navigation bar, select Basic Network > VLANs. On the page that opens, you can modify the parameters related to configuring a dynamic domain name. As shown in Fig

You haven't changed the default password for this router. To change router password [click here](#).

VID ^	WAN/LAN1	Tagged	LAN2	Tagged	LAN3	Tagged	LAN4	Tagged	Bridge
1	✓	✗	✓	✗	✓	✗	✓	✗	br0
2	✗	✗	✗	✗	✗	✗	✗	✗	WAN
	☐	☐	☐	☐	☐	☐	☐	☐	none

Figure 5-13

Table 5-5 describes the VLAN configuration parameters

parameter	illustrate
VID	Each VLAN switch port needs to be bound with a VID (VID range 0-15).
LAN1 、 LAN2 、 LAN3 、 LAN4 、 WAN	Corresponding to the physical interface of the routing device: 4 x LAN and 1 x WAN
Labeling	The data frames received from the trunk port (tagged and tagged) are tagged, and the data frames sent from the trunk port need to be tagged (regardless of the default VLAN).

Table 5-5

VLAN setting method

- Each VLAN switch port needs to be bound with a VID. (VID range 0-15).
- Each VLAN switch port falls into one of three categories: access , trunk
 - Access port (equal to unchecked tagged - marked unchecked): the data frames received from such ports are not tagged, and the data frames sent from such ports are not tagged;
 - trunk port (equivalent to checking tagged-marked): the data frames received from such ports are tagged, and the data frames sent from such ports need to be tagged (regardless of the default VLAN);
 - By default, the LAN port is br0 192.168.1.1, and three address segments can be added for different interfaces
- By default, the LAN port is br0 192.168.1.1, and three address segments can be added for different interfaces.

You haven't changed the default password for this router. To change router password [click here](#).

LAN

Bridge ^	IP Address	Subnet Mask	DHCP Server	IP Pool	Lease(minutes)	DHCP Relay	DHCP Server Address	Primary DNS	Secondary DNS
br0	192.168.1.1	255.255.255.0	✓	192.168.1.2 - 51	1440	✗			

1

Add +

Internet DNS

Use Custom DNS ☐

Save ✓

Cancel ✕

Figure 5-14

- Set up 4 LANs, one WAN is set as shown in the following figure, assign the WAN to VID 2, that is, bridge the WAN, and assign the other interfaces to the br0 interface

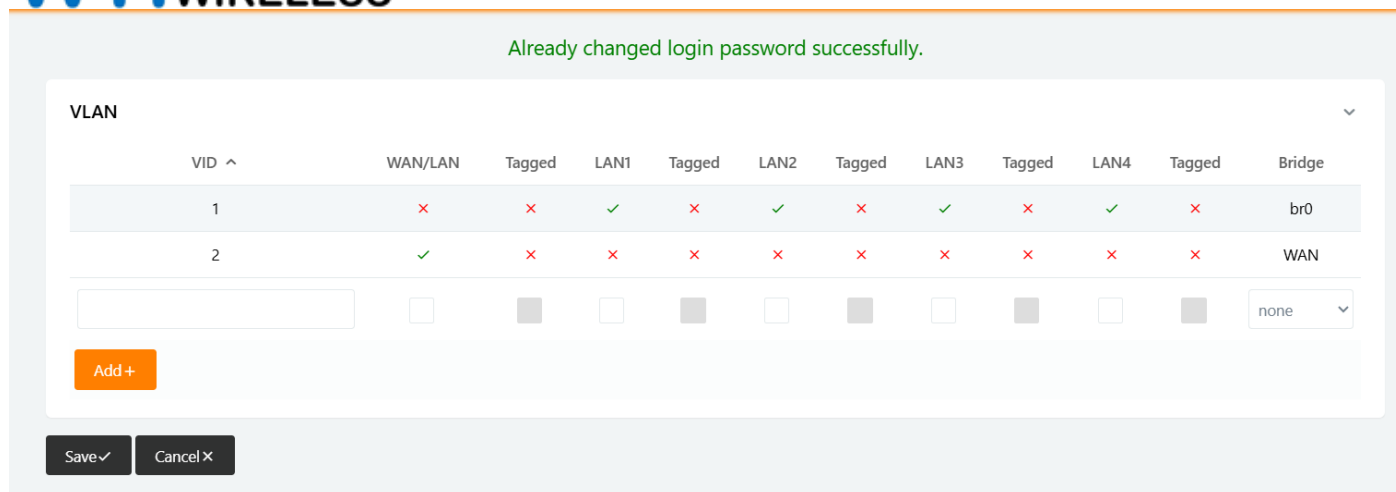


Figure 5-15

5. After br1, br2, and br3 are added to the LAN, 4 LAN ports can be connected to VLANs with different IP segments, and the WAN ports are used independently as WAN ports, as shown in the following figure.

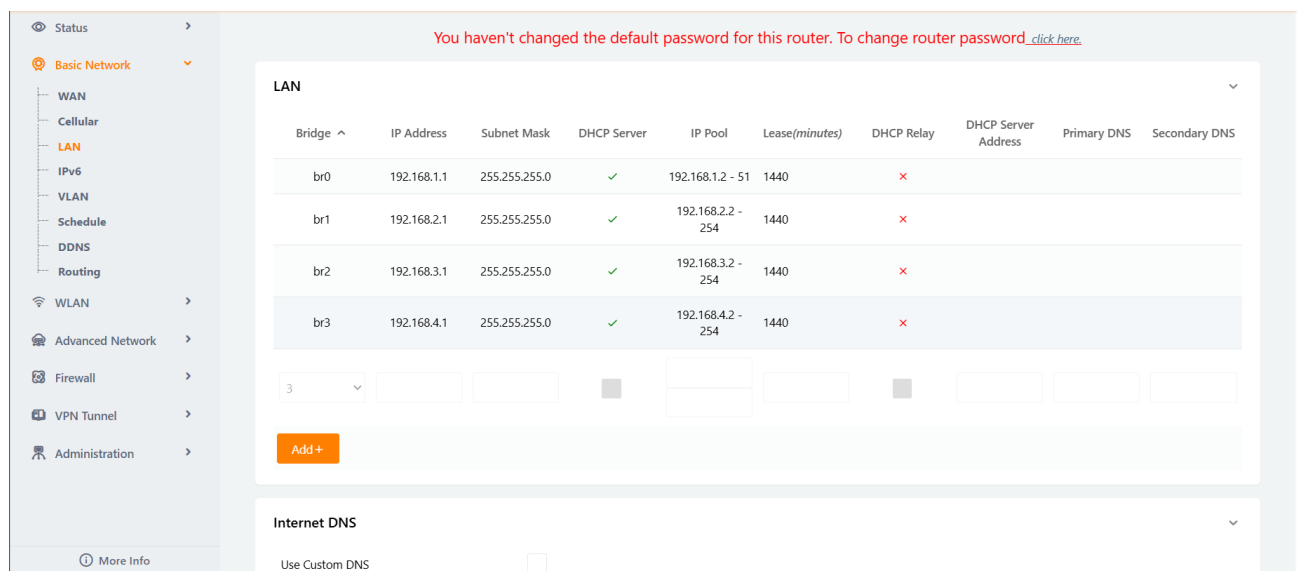


Figure 5-16

6. The 4 LAN ports and WAN ports are configured independently:

The settings changed, some settings will take effect after the router reboots. [Reboot Now](#)

VLAN ▼

VID ^	WAN/LAN	Tagged	LAN1	Tagged	LAN2	Tagged	LAN3	Tagged	LAN4	Tagged	Bridge
1	×	×	✓	×	×	×	×	×	×	×	br0
2	×	×	×	×	✓	×	×	×	×	×	br1
3	×	×	×	×	×	×	✓	×	×	×	br2
4	×	×	×	×	×	×	×	×	✓	×	br3
5	✓	×	×	×	×	×	×	×	×	×	WAN
	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	none ▼

Add +

Save ✓
Cancel ✕

Figure 5-17

7. WAN port and one group of LAN ports configured with the same IP segment:

The settings changed, some settings will take effect after the router reboots. [Reboot Now](#)

VLAN ▼

VID ^	WAN/LAN	Tagged	LAN1	Tagged	LAN2	Tagged	LAN3	Tagged	LAN4	Tagged	Bridge
1	✓	×	✓	×	×	×	×	×	×	×	br0
2	×	×	×	×	✓	×	×	×	×	×	br1
3	×	×	×	×	×	×	✓	×	×	×	br2
4	×	×	×	×	×	×	×	×	✓	×	br3
5	×	×	×	×	×	×	×	×	×	×	WAN
	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	none ▼

Add +

Save ✓
Cancel ✕

Figure 5-18

8. VLAN is divided into LAN1 and LAN2 groups, LAN3 and LAN4 groups, and independent WAN ports are used as shown in the following figure.
 LAN1 and LAN2 have one IP segment, LAN3 and LAN4 have one IP segment, and the WAN port is configured independently:

VLAN

VID ^

WAN/LAN

Tagged

LAN1

Tagged

LAN2

Tagged

LAN3

Tagged

LAN4

Tagged

Bridge

1	×	×	✓	×	✓	×	×	×	×	×	br0
3	×	×	×	×	×	×	✓	×	✓	×	br1
4	✓	×	×	×	×	×	×	×	×	×	WAN
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	none

Add +

Save ✓

Cancel ×

Figure 5-19

9. WAN port and one group of LAN ports configured with the same IP segment:

VLAN

VID ^

WAN/LAN

Tagged

LAN1

Tagged

LAN2

Tagged

LAN3

Tagged

LAN4

Tagged

Bridge

1	✓	×	✓	×	✓	×	×	×	×	×	br0
3	×	×	×	×	×	×	✓	×	✓	×	br1
4	×	×	×	×	×	×	×	×	×	×	WAN
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	none

Add +

Save ✓

Cancel ×

Figure 5-20

10. To label VLAN as trunk mode, the connected devices need to be set to the same VID of 1

VLAN

VID ^

WAN/LAN1

Tagged

LAN2

Tagged

LAN3

Tagged

LAN4

Tagged

Bridge

1	×	×	✓	×	✓	×	✓	×	br0
2	✓	×	×	×	×	×	×	×	WAN
	☐	☐	☐	☐	☐	☐	☐	☐	none

Add +

Save ✓

Cancel ×

Figure 5-21

5.7. Schedule configuration

In the navigation bar, choose Basic Network > Link Scheduling. On the page that opens, you can configure the link scheduling WAN and 3G/4G backup mode, or both.



Only the version of 3G/4G and wired network backup has this function, which is subject to the version of the actual product.

Features:

1. ICMP link detection determines whether the link exists normally by IP address, and triggers the switching mechanism if the IP is not available if the IP is not available in the PING check.
2. The link scheduling strategy can be selected in BACKUP mode: if "WAN" is in link 1, the WAN network is the mainstay, and "modem" in link 2 is in standby. In BACKUP mode, when link 1 is online, link 1 is the main for 3G/4G networks, and link 2 is set in "WAN" for standby, and in BACKUP mode, when link 1 is online, link 1 is primary; When Link 1 fails after ICMP detection, it switches to Link 2. When Link 1 is restored after ICMP detection, it switches back to Link 1
3. The link scheduling policy can be selected in FAILOVER mode, which means that link 1 and link 2 are backup mode for each other, and when link 1 is online, link 1 is the main link. After link 1 fails, it switches to link 2 after ICMP detection, and link 2 is the primary link. When link 1 takes effect again, link 2 remains the primary link and will not be switched back to link 1. After Link 2 fails, it switches to Link 1 after ICMP detection, and Link 1 is the primary link
4. The WAN port supports DHCP automatic acquisition, static address, and PPPoE fixed network access, and the WAN needs to be enabled by default.

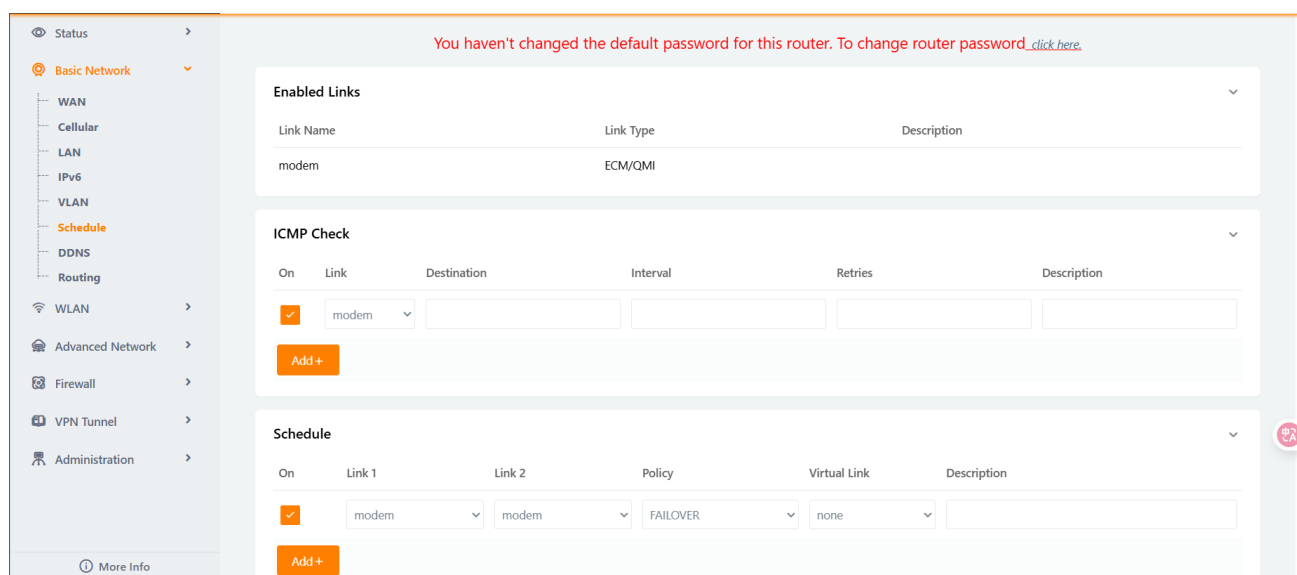


Figure 5-22

After the configuration is complete, click the Save Settings button for the configuration to take effect.

The name of the parameter	meaning
---------------------------	---------

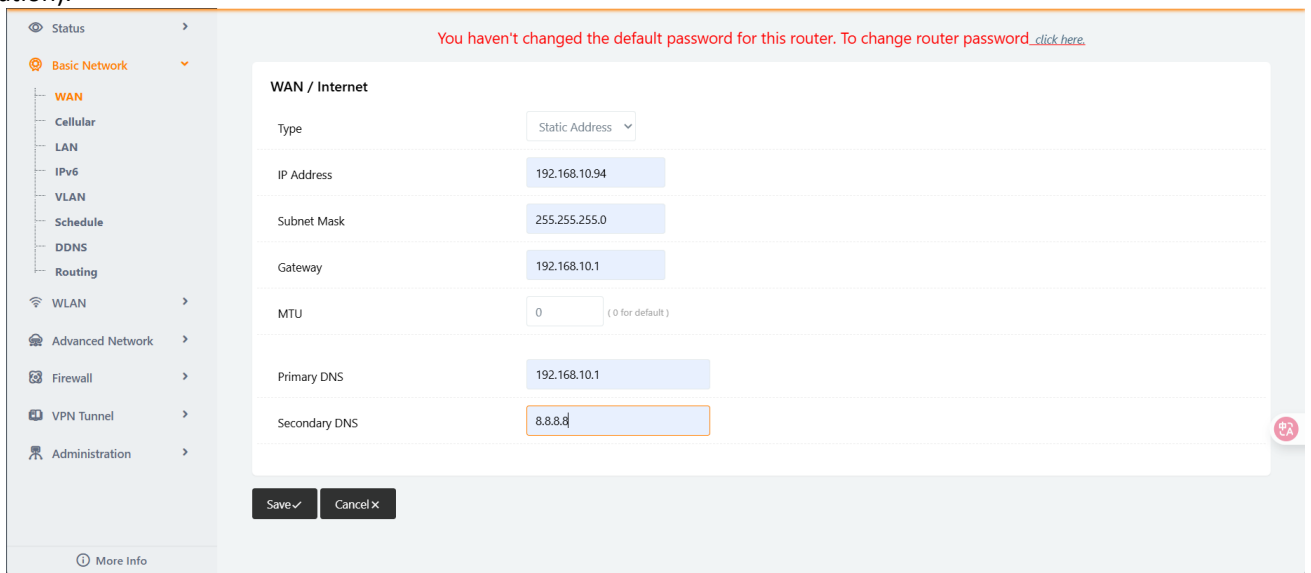
ICMP Check- Links	The default link name is modem, wan, sta, and sta2
ICMP Check - Destination Address	Refers to the IP address or domain name that needs to be detected by the link, and whether the host is reachable and whether the route is available
ICMP Check - Interval	The interval between the time interval at which the IP address was detected
ICMP Check - Retries	After the detection fails, the number of consecutive failures is toggled after the retry is reached
Schedule - Link 1	The default link name is modem, wan, sta, and sta2
Schedule - Link 2	The default link name is modem, wan, sta, and sta2
Schedule - Policy	The link scheduling policy can be selected in the BACKUP mode: link 1 is WAN primary, link 2 is 3G/4G standby, or link 1 is 3G/4G primary, and link 2 is WAN. In the FAILOVER mode, link 1 and link 2 are backed up to each other
Virtual Link	virtual links; If there are less than two links, the default value is none. If there are more than two links, you need to combine the two links into a virtual link, vlink1 and vlink2, and then select the policy of vlink 1 and vlink2 as one link and the third link

Table 5-6

Schedule configuration example:

Step 1:

In the navigation bar, select Basic Configuration > WAN Network. In the page that opens, select a static address from the drop-down box, set the parameters of the static address, and click Save Settings. As shown in the following figure (Note: The parameter configuration is an example, and the actual configuration needs to be configured according to the site situation):



The screenshot shows the 'WAN / Internet' configuration page. At the top, there is a red warning message: 'You haven't changed the default password for this router. To change router password, [click here](#).' The left sidebar contains navigation links: Status, Basic Network (selected), WAN, Cellular, LAN, IPv6, VLAN, Schedule, DDNS, Routing, WLAN, Advanced Network, Firewall, VPN Tunnel, and Administration. The main content area is titled 'WAN / Internet' and contains the following fields:

- Type: Static Address (dropdown menu)
- IP Address: 192.168.10.94
- Subnet Mask: 255.255.255.0
- Gateway: 192.168.10.1
- MTU: 0 (0 for default)
- Primary DNS: 192.168.10.1
- Secondary DNS: 8.8.8.8

At the bottom of the form, there are 'Save' and 'Cancel' buttons.

Figure 5-23 Static address settings

Step 2:

① In the navigation bar, select VLAN > Basic Configuration. On the page that opens, remove the WAN with VID1 checked, and click OK, as shown in the following figure:

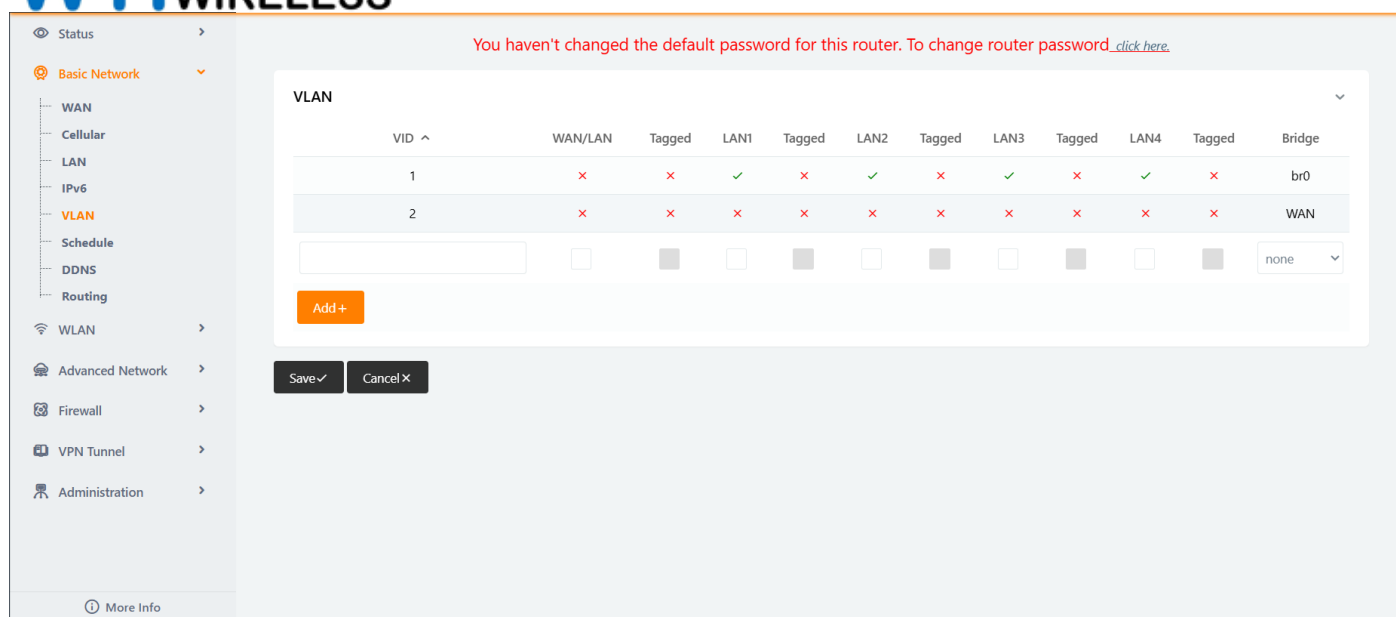


Figure 5-24

② In the VLAN page, add VID2, check WAN, click OK, and click Save Settings after the settings are complete, as shown in the following figure

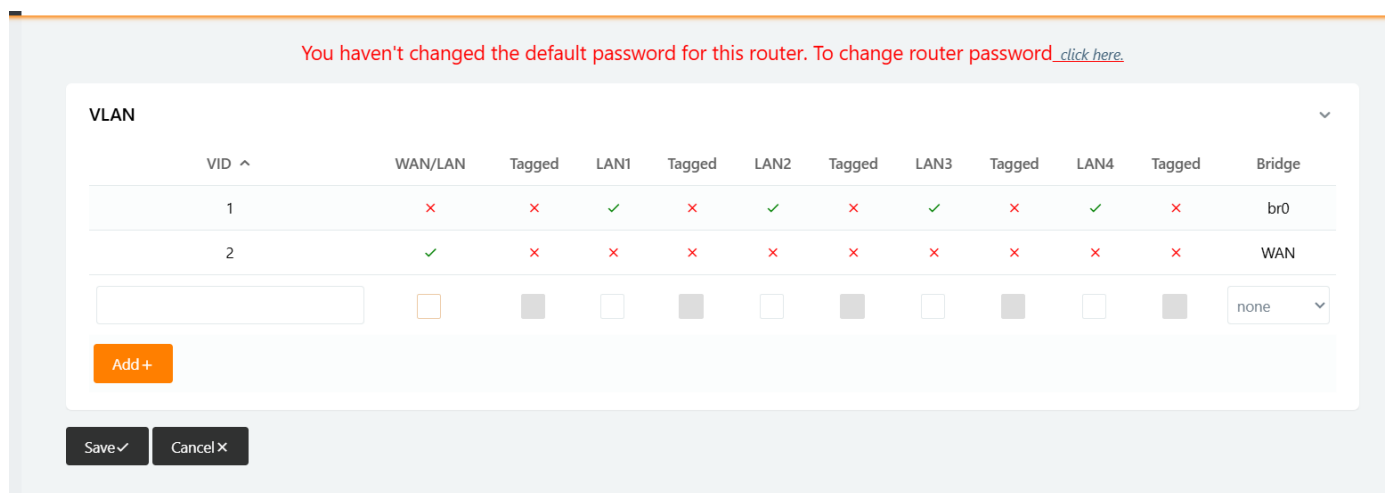


Figure 5-25 VLAN Settings

Step 3:

In the navigation bar, select System Status > System Information. On the page that opens, view the WAN network status and access the Internet, as shown in the following figure:

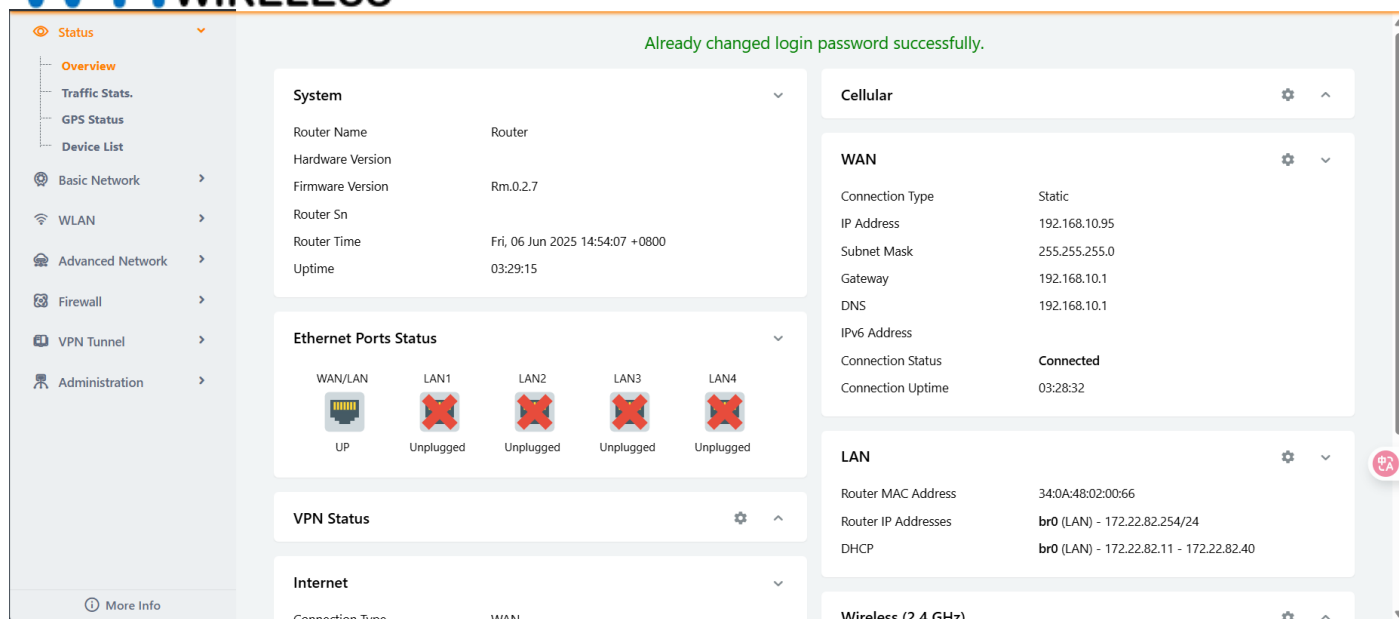


Figure 5-26 WAN network status

Step 4:

Turn on link scheduling in the basic network and configure ICMP link detection and link scheduling (Note: Link 1 is WAN; link 2 is modem), and the policy is backup; After the configuration is complete, click Save and wait for the device to restart.

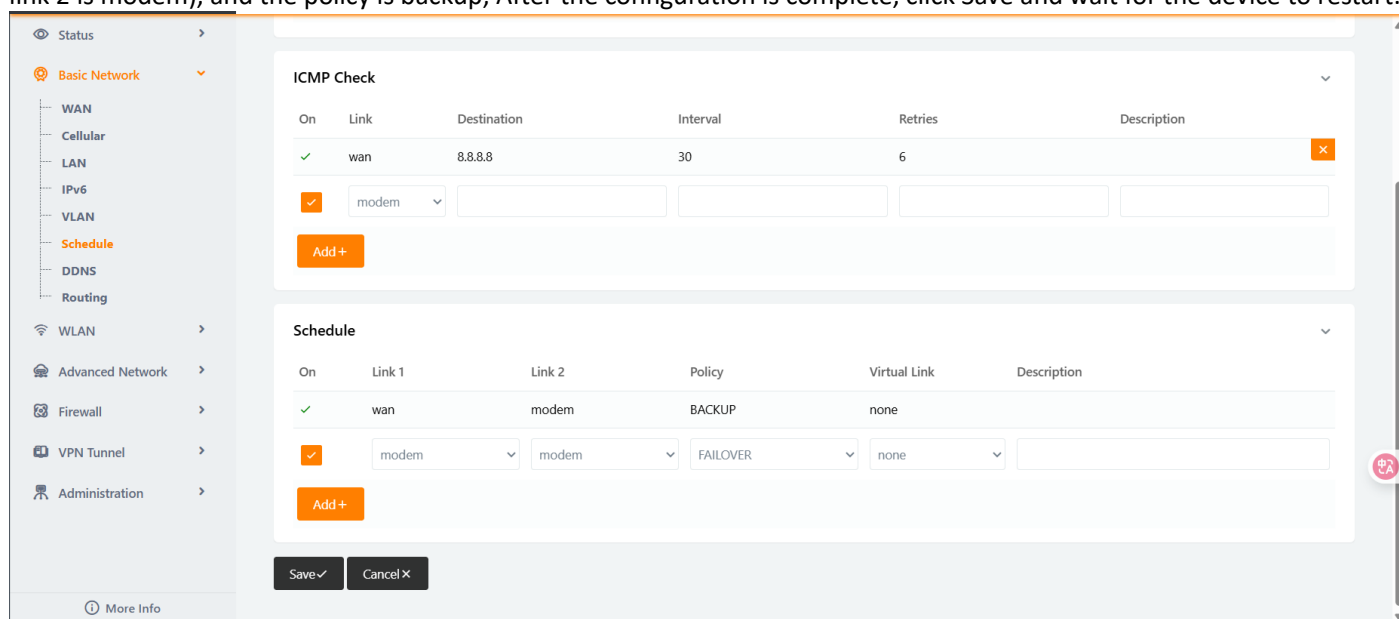


Figure 5-27 Link scheduling settings

Step 5:

Click System Information in System Status to view the WAN connection status (static Internet access is displayed if WAN is the main), as shown in the following figure:

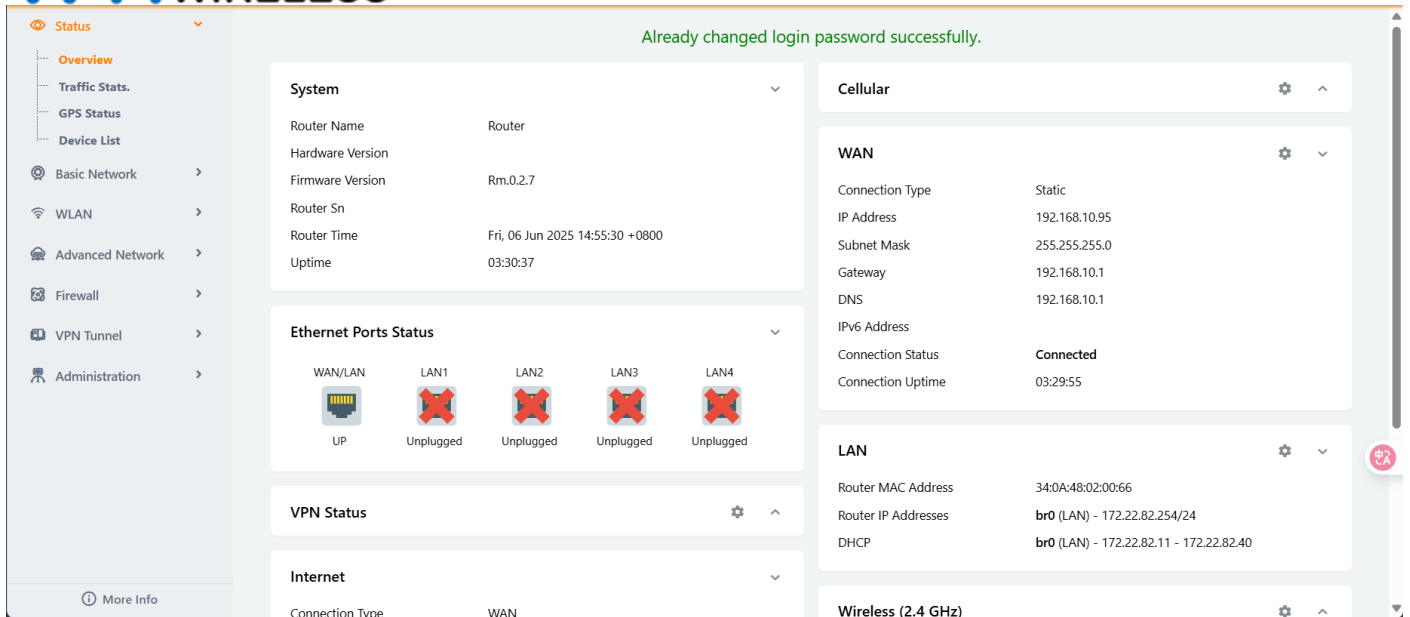


Figure 5-28 WAN Network Status

Step 6:

Disconnect the network cable of the WAN port and check the connection status of the WAN again (the card is online), as shown in the following figure:

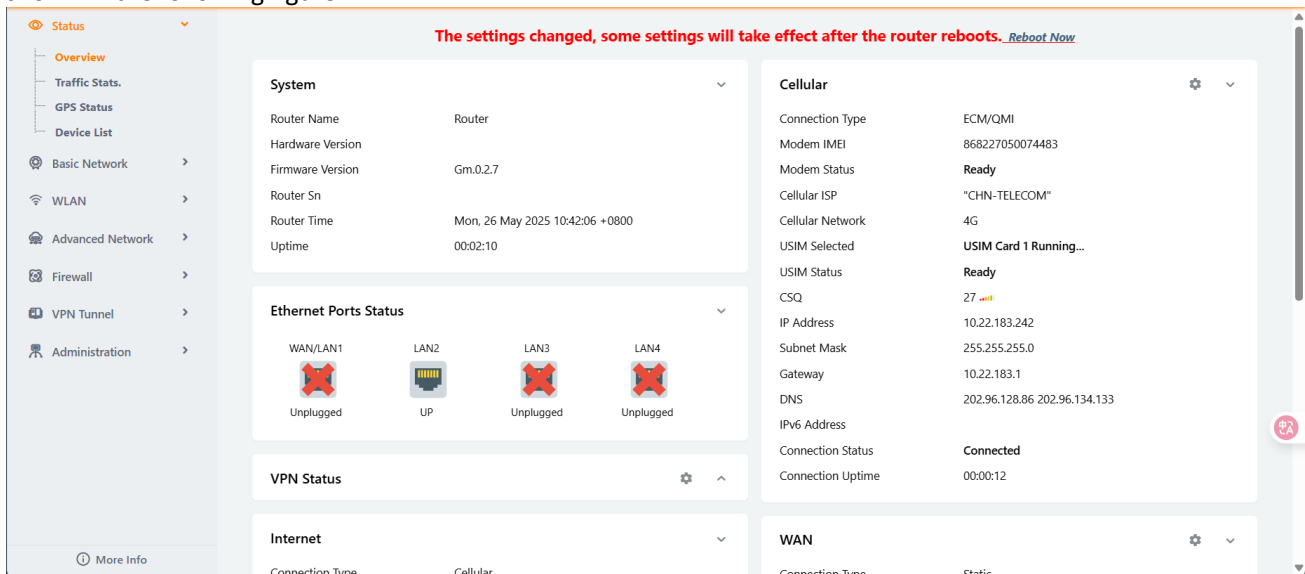


Figure 5-29 WAN network status

Step 7:

When you plug the network cable into the WAN port of the router again, check the WAN connection status (in this case, it is static Internet access), as shown in the following figure:

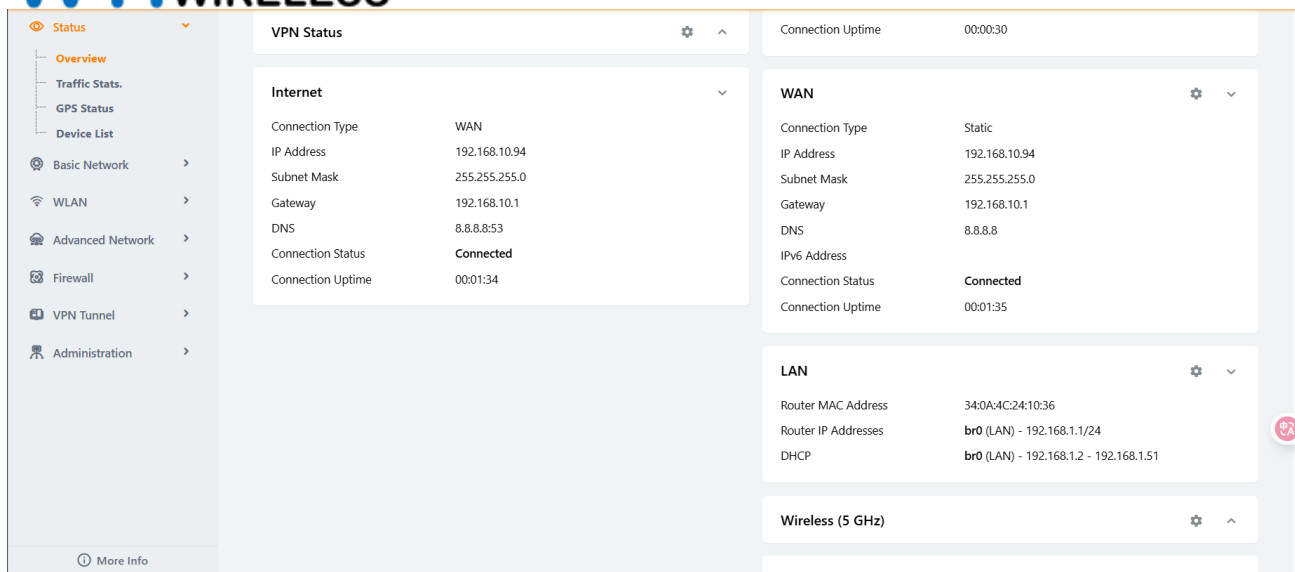


Figure 5-30 WAN networking

5.8. DDNS (Domain Name System)

DDNS dynamic domain name configuration

DDNS is the abbreviation of Dynamic Domain Name System, and the DDNS protocol provides the corresponding query function between dynamic IP addresses and domain names. DDNS allows users to access the router's page from any PC that can connect to the public network through a domain name. Of course, the network corresponding to the SIM card used by the router must be a public network accessible address, so as to ensure that you can access the router by entering the domain name.

In the navigation bar, choose Basic Configuration > Dynamic Domain Name. On the page, modify the parameters for configuring dynamic domain names. As shown in Figure 5-23, see Figure 5-23

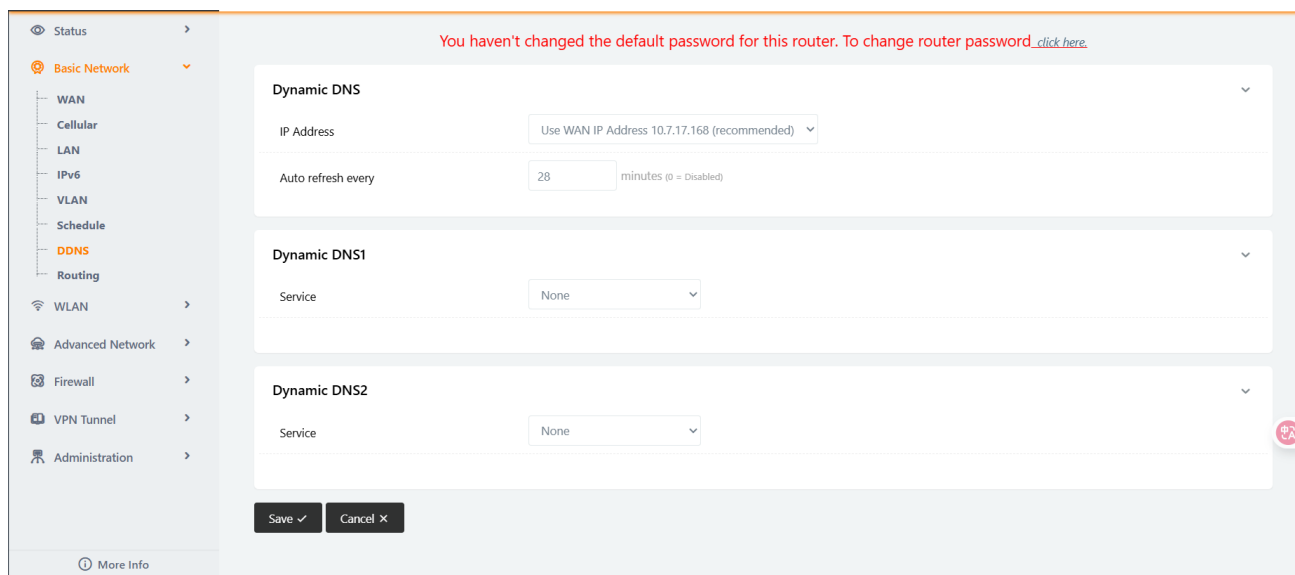


Figure 5-31 DDNS dynamic domain name configuration

Select the corresponding DDNS domain service provider from the drop-down list, such as 3322, and enter the state shown in Figure 5-27. Fill in the corresponding parameters and save.

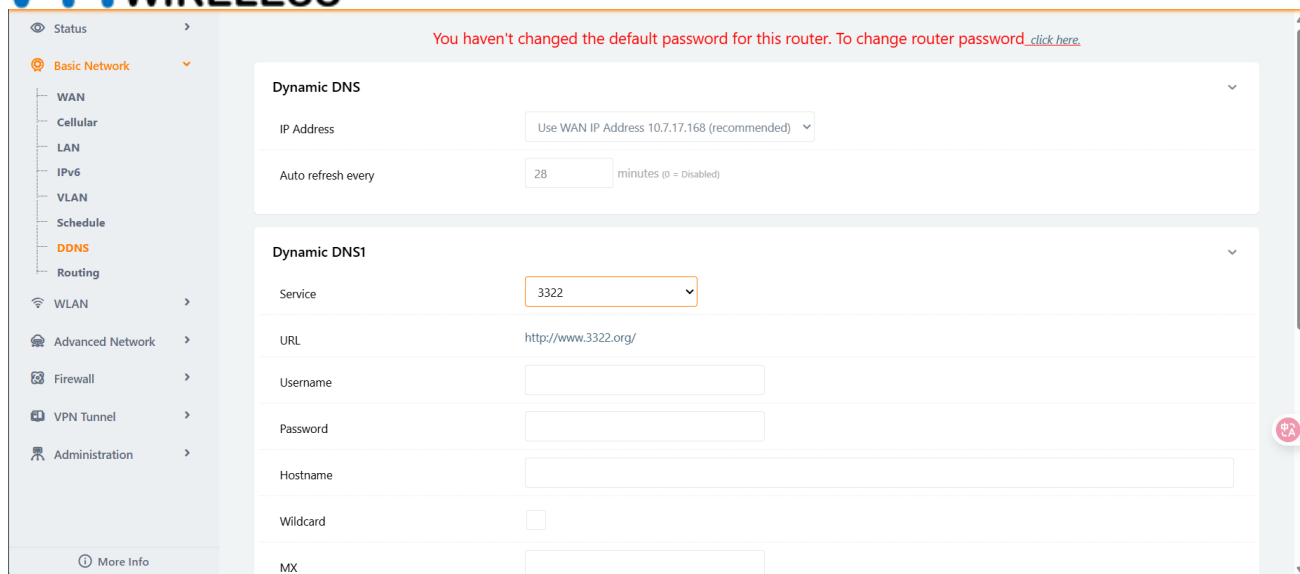


Figure 5-32 Screenshot of dynamic domain name configuration

Description of the parameters for dynamic domain names

parameter	illustrate	How to configure
IP address	The dynamic DNS service can pseudoname a dynamic IP address to any static hostname, making it easily accessible from different locations on the Internet	The default value is the current interface address
Service Providers	The domain name applied for corresponds to the domain name provider option, and our company does not currently support the DDNS service of domain name providers outside the list	Drop-down options: 3322, miniDNS, etc
Service URL	The address provided by the domain name service provider	Click on the URL to enter the web page
Username/password	The username and password used to register the DDNS service provider domain name	General WORD type/CODE type, up to 64 bytes
Hostname	A domain name provided by a DDNS service provider, which corresponds to the IP of the router and usually accesses the IP of the router by accessing the domain name	The domain name obtained by following the steps

Table 5-7 Parameters for Dynamic Domain Names

After the configuration is complete, click the Save Settings button for the configuration to take effect



Domestic DDNS service provider: NO-IP.com(<https://www.noip.com/>).

Foreign DDNS service providers: DNSEXIT (www.dnsexit.com), ZONEEDIT (www.zoneedit.com), DYNDNS (www.members.dyndns.org)

The IP address obtained from the SIM/UIM card service provider changes every time the router restarts. If you use the DDNS domain name you apply for when you remotely log in to the router, you can log in to the router page no matter how

the modemIP address of the router changes.

Dynamic domain name configuration example:

- Preparations: 1. The telecom card must have a public network card IP, otherwise it must use the WAN wired public network IP mode
2. Username: 5nre6hv@ddnskey.com Password: stone123
3. Host name: all.ddnskey.com.net

Two links: before and after the power failure

Step 1:

To force 3G, turn on the mobile network of the basic network, select 3G (CDMA 2000/CDMA 1x) as the network mode of SIM1, and then click Save Settings to wait for restart. As shown in Fig

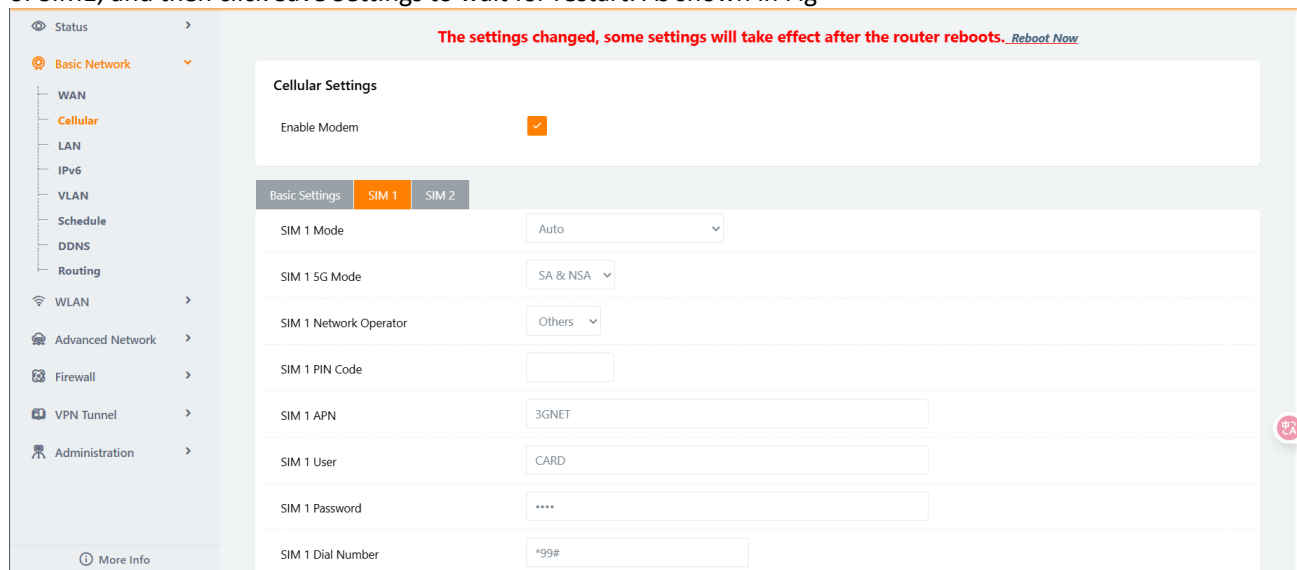


Figure 5-33 Mobile Network Configuration

Step 2:

Click the system information in the system status to view the status of the WAN network, at this time, China Telecom 3G is online, the public network address is obtained, and the Internet can be accessed, as shown in the following figure

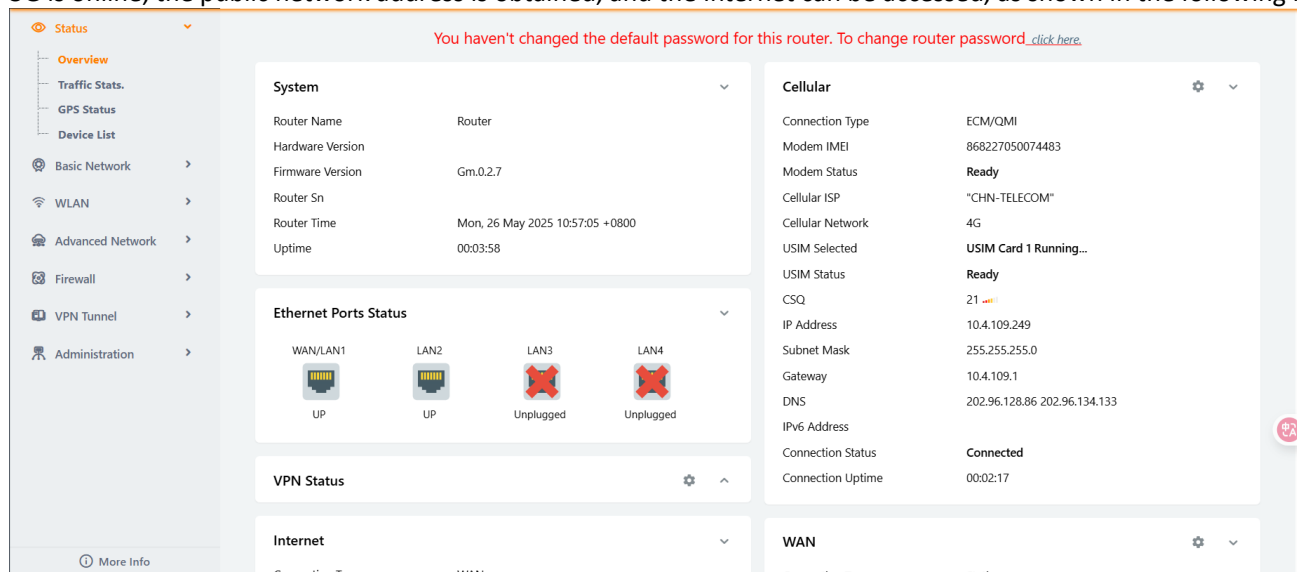


Figure 5-34 WAN network status

Step 3:

Click on the dynamic domain name in the basic network, and the automatic refresh setting will take 1 minute; Select dynamic domain name 1, select 3322 as service provider, username: 5nre6hv@ddnskey.com, password: stone123 host name: all.ddnskey.com.net, and click Save Settings after the settings are complete.

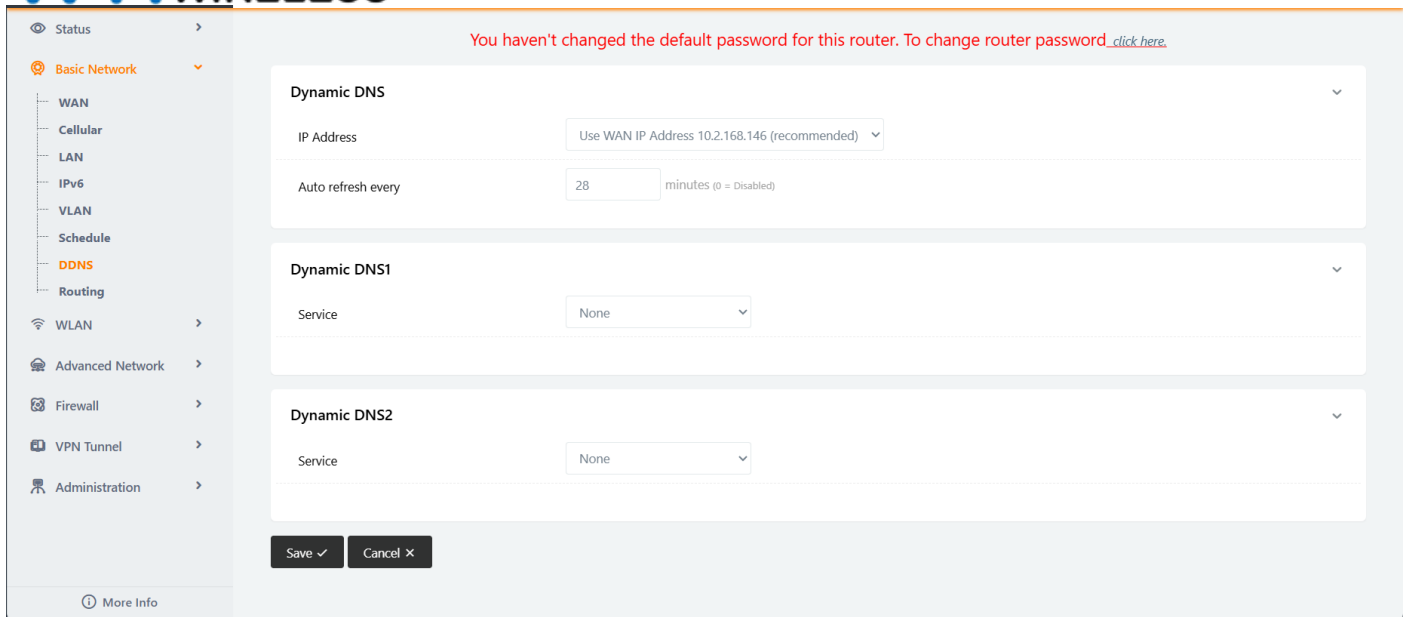


Figure 5-35 Dynamic domain name settings

Step 4:

Click the dynamic domain name in the basic network to view the latest IP update status and open the administrator page to ping the host domain name, as shown in the following figure

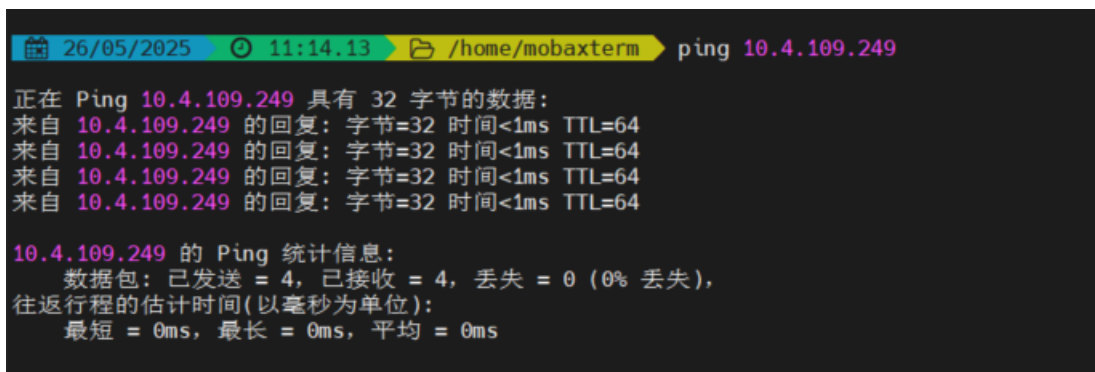
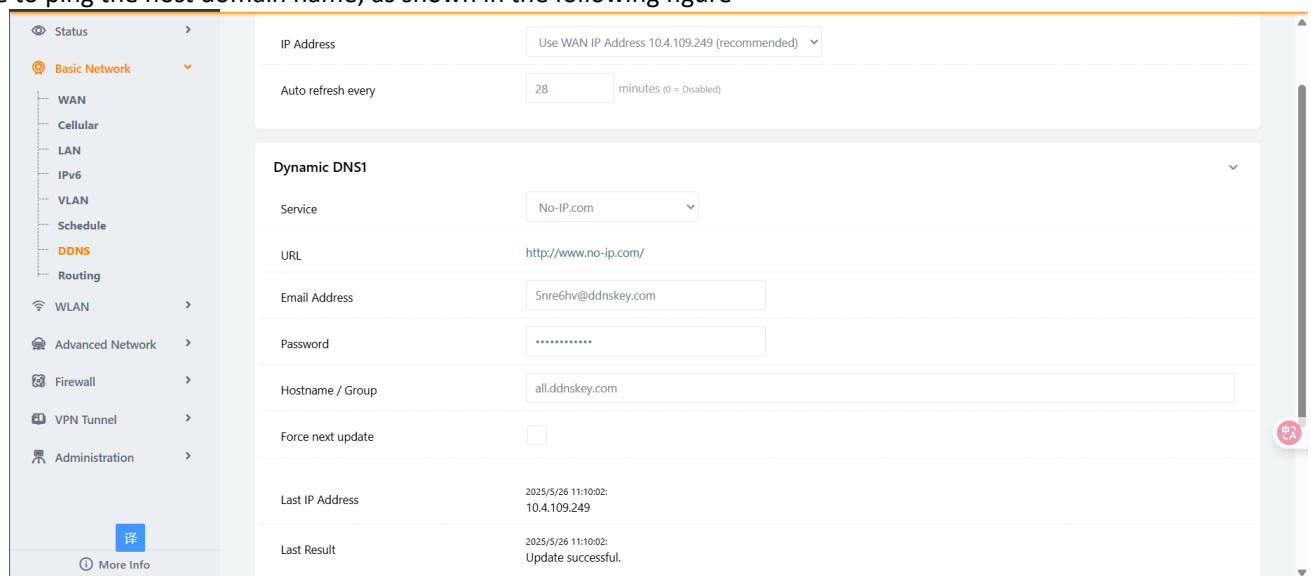


Figure 5-36 Ping the domain name

Step 5:

Result after power failure: The IP address resolved by the ping domain name will be automatically updated after each power failure

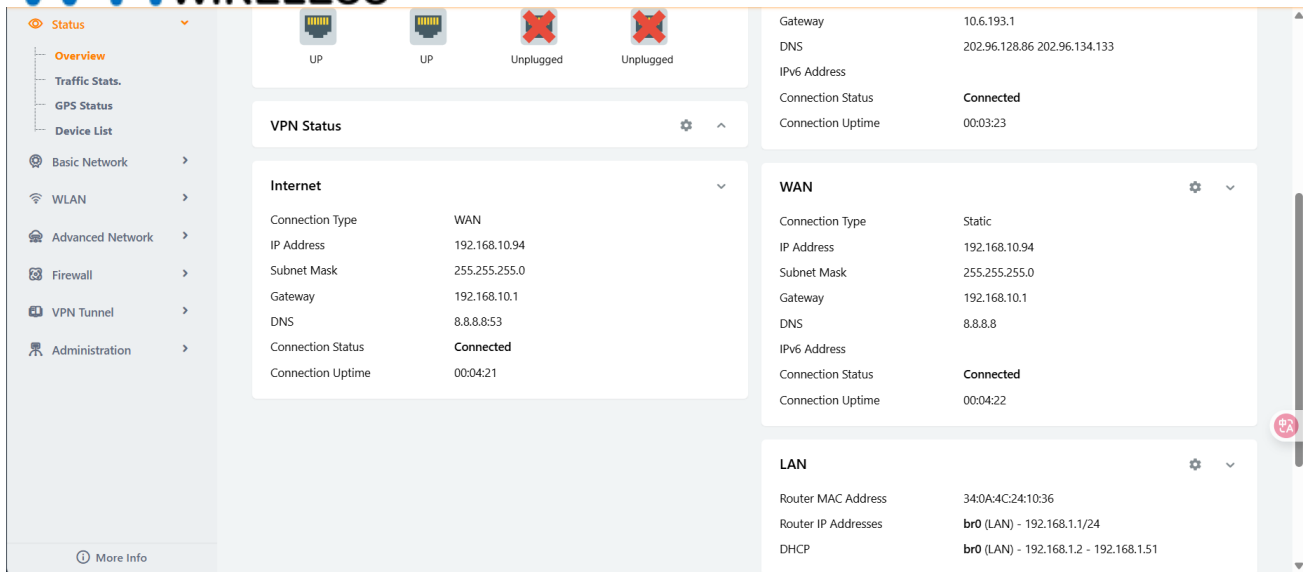


Figure 5-37 WAN Network Status

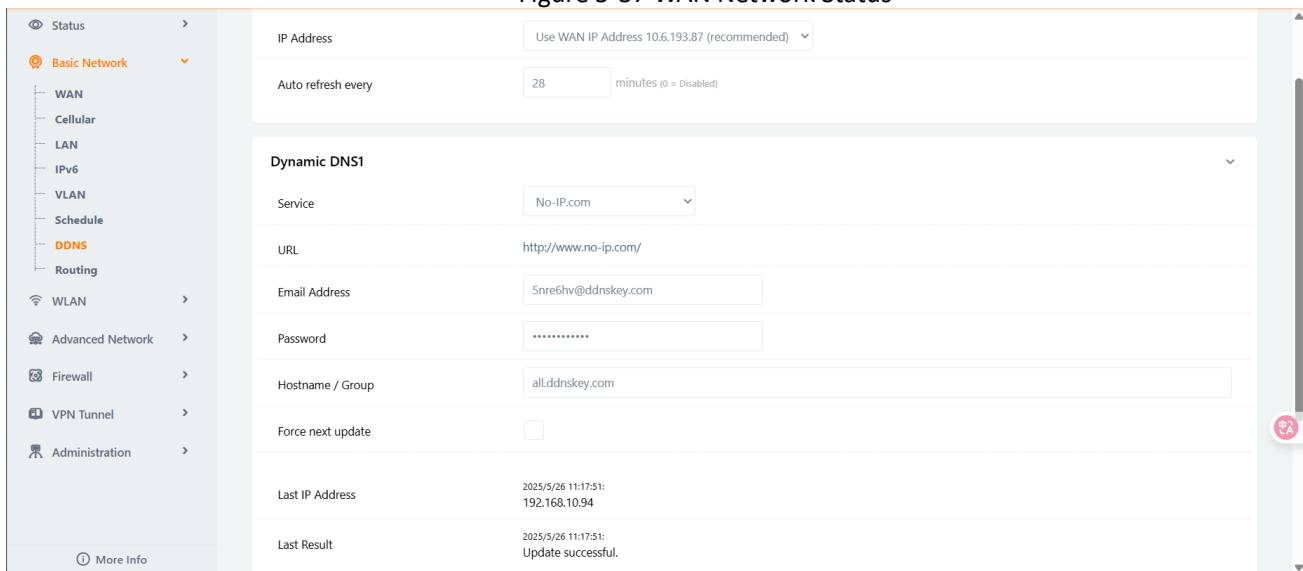


Figure 5-38 Domain name update status

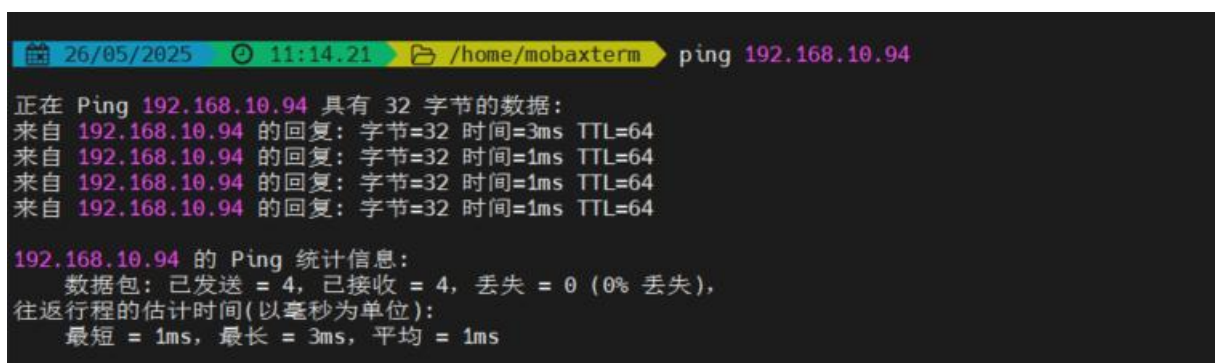


Figure 5-39 ping Domain

5.9. Route table settings

5.9.1. IPv4 static routing table configuration

The static route provides a specific forwarding path for the router to forward packets, which must be manually configured by the user. A static route is a route that uses the destination address as the basis for selection.

STEP 1: Log in to the WEB configuration interface of the router and open the routing table settings interface under the basic network:

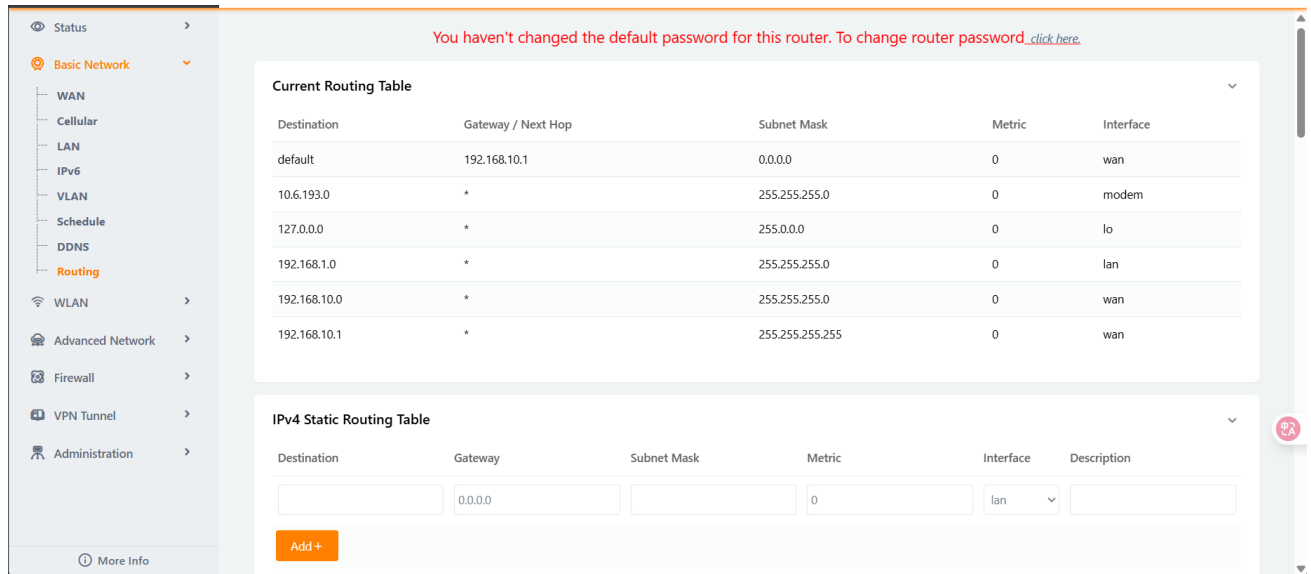


Figure 5-40 The Advanced Routing Configuration Interface

Step 2: Description of Static Routing Parameters

parameter	meaning	How to configure
Destination address	Set the destination address and the number of subnet mask digits for a static route	Enter the destination address and the number of bits of the subnet mask. Format: A.B.C.D/M
Gateway	Specify the next-hop IP address of a static route, that is, the port address of the neighboring router	Set it up as appropriate

Table 5-8 Static Route Parameter Configuration

Step 3: Click “Save” to complete the static route settings.

Example configuration of a static route table:

Step 1:

Click Route Table Configuration in Basic Network, configure the static route table settings, set the destination address to 192.168.10.0, set the subnet mask to 255.255.255.0, select LAN for the network interface, click Add, and click Save Settings after the configuration is complete.

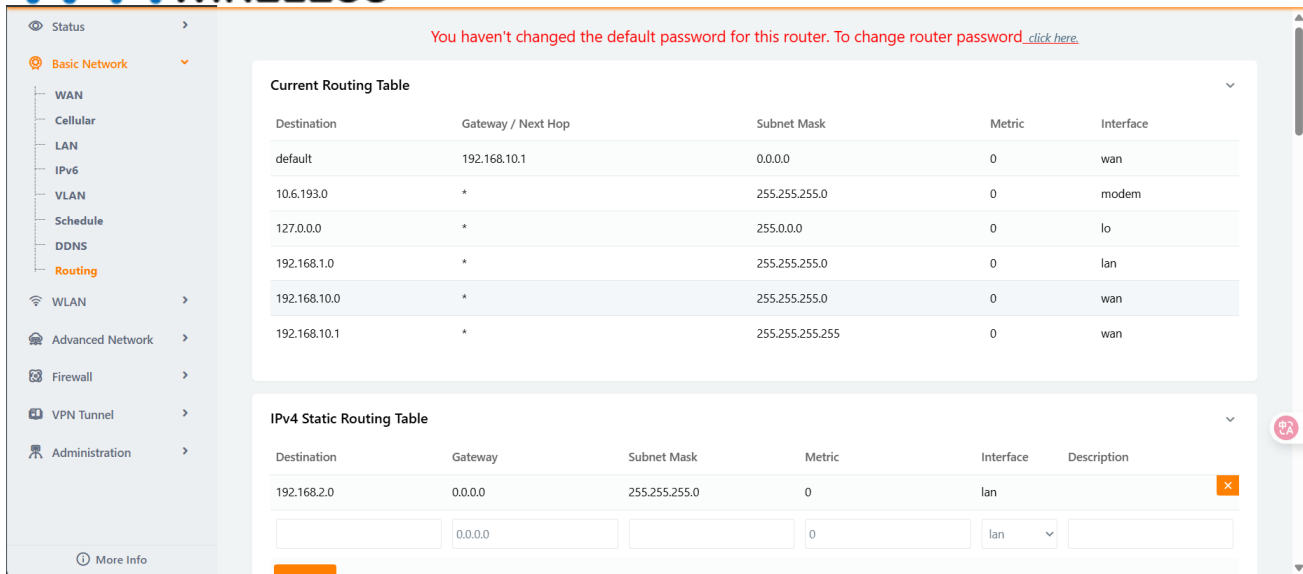


Figure 5-41 Static Route Configuration

Step 2:

After the save is complete, you can view the static route table in the current route table, and the static route table has taken effect.

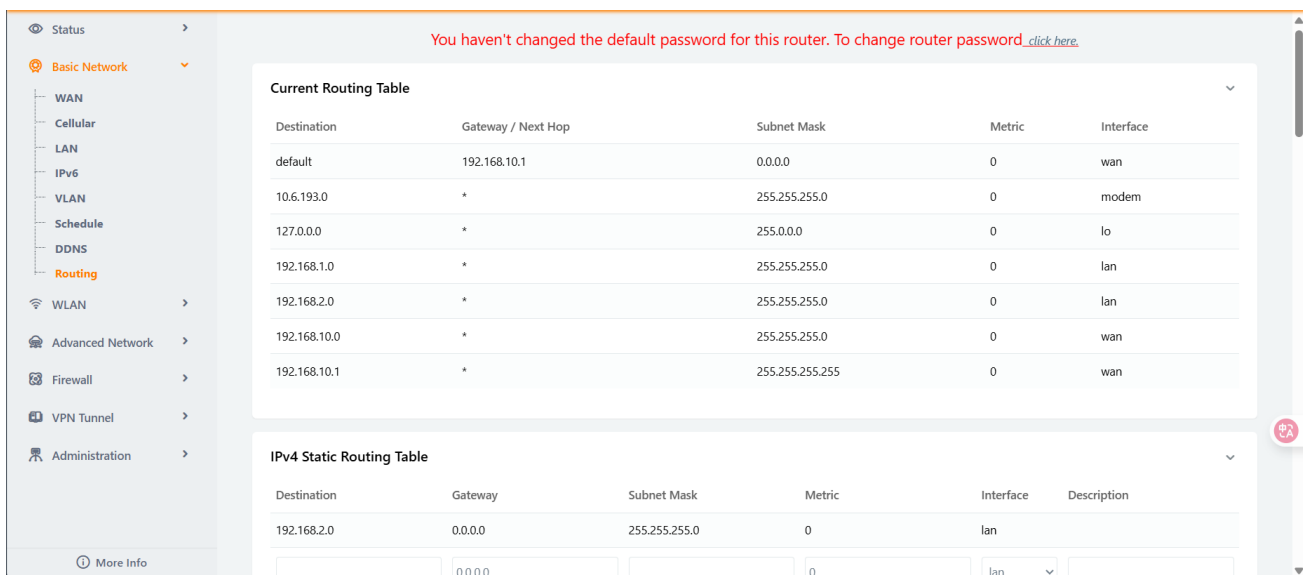
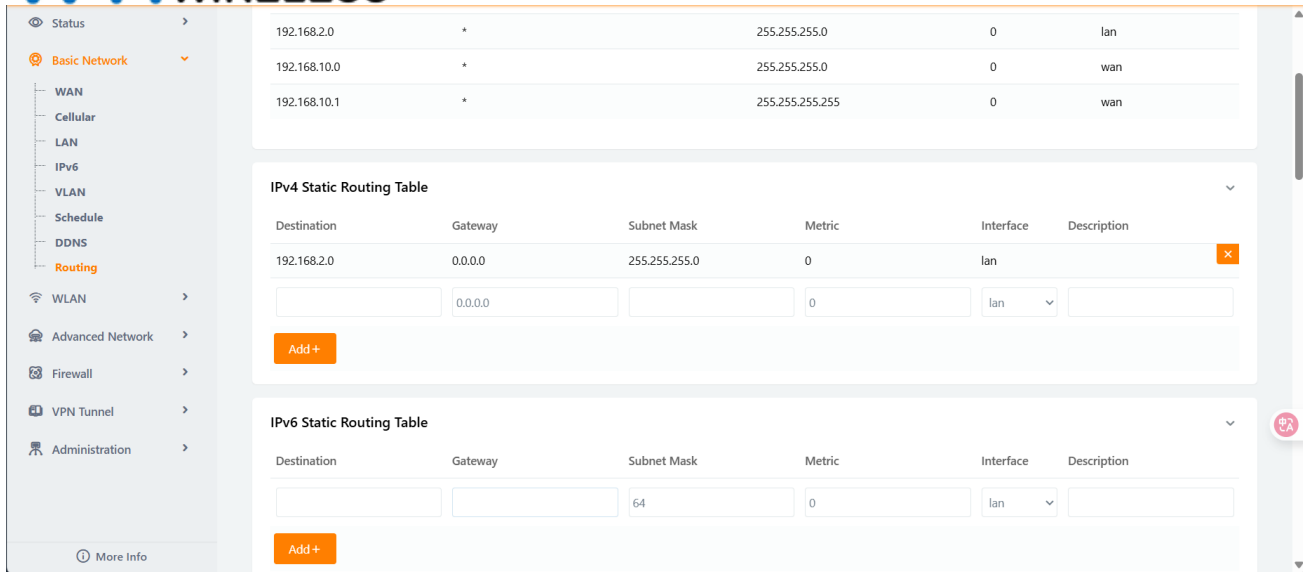


Figure 5-42 shows the static routing table

5.9.2. IPV6 static routing table configuration

static route provides a specific forwarding path for the router to forward packets, which must be manually configured by the user. A static route is a route that uses the destination address as the basis for selection.

STEP 1: Log in to the WEB configuration interface of the router and open the routing table settings interface under the basic network:



The screenshot shows the router's configuration page with a sidebar on the left containing options like Status, Basic Network, WAN, Cellular, LAN, IPv6, VLAN, Schedule, DDNS, Routing, WLAN, Advanced Network, Firewall, VPN Tunnel, and Administration. The main area displays two routing tables. The IPv4 Static Routing Table has columns for Destination, Gateway, Subnet Mask, Metric, Interface, and Description, with a table containing three entries and an 'Add +' button below. The IPv6 Static Routing Table has similar columns and an 'Add +' button.

Figure 5-40

Step 2: Description of IPv6 Static Routing Parameters

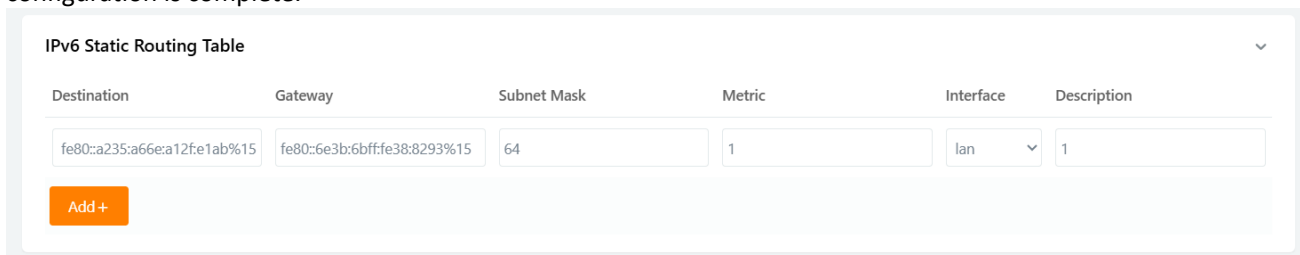
parameter	meaning	How to configure
Destination address	Set the destination address and the number of subnet mask digits for a static route	Enter the destination address and the number of bits of the subnet mask. Format: AAAA:BBBB:CCCC:DDDD:EEEE: FFFF:GGGG:HHHH/64
gateway	Specify the next-hop IP address of a static route, that is, the port address of the neighboring router	Set it up as appropriate. The format is as follows:

Table 5-9 IPv6 Static Route Table

Step 3: Click Save to complete the static route settings.

IPv6 Static Route Table Configuration Example:

Step 1: Click Route Table Configuration in the basic network, configure the static route table settings, fill in the destination address, fill in the subnet mask, select LAN for the network interface, click Add, and click Save Settings after the configuration is complete.



The screenshot shows the 'IPv6 Static Routing Table' configuration section. It contains a table with columns: Destination, Gateway, Subnet Mask, Metric, Interface, and Description. A single entry is shown with the following values: Destination: fe80::a235:a66e:a12f:e1ab%15, Gateway: fe80::6e3b:6bff:fe38:8293%15, Subnet Mask: 64, Metric: 1, Interface: lan, and Description: 1. An 'Add +' button is located below the table.

Figure 5-41

Step 2: After the IPV6 address is added, you need to restart the router for the configuration to take effect.

```

root@Router:/tmp/home/root#
root@Router:/tmp/home/root#
root@Router:/tmp/home/root#
root@Router:/tmp/home/root# ip -6 route show
fe80::/64 dev eth2 proto kernel metric 256
fe80::/64 dev vlan1 proto kernel metric 256
fe80::/64 dev br0 proto kernel metric 256
fe80::/64 dev ra0 proto kernel metric 256
fe80::/64 dev rai0 proto kernel metric 256
fe80::/64 dev vlan2 proto kernel metric 256
fe80::/64 dev usb0 proto kernel metric 256
root@Router:/tmp/home/root#

```

Figure 5-42

5.9.3. Policy Routing Table configuration

Policy-based routing (PBR) is a packet routing and forwarding mechanism that is more flexible than routing based on the destination network. The router will decide what to do with the packets that need to be routed through the route map, which determines the next- hop forwarding router for a packet.

STEP 1: Log in to the WEB configuration interface of the router and open the routing table settings interface under the basic network, as shown in Figure 5-38:

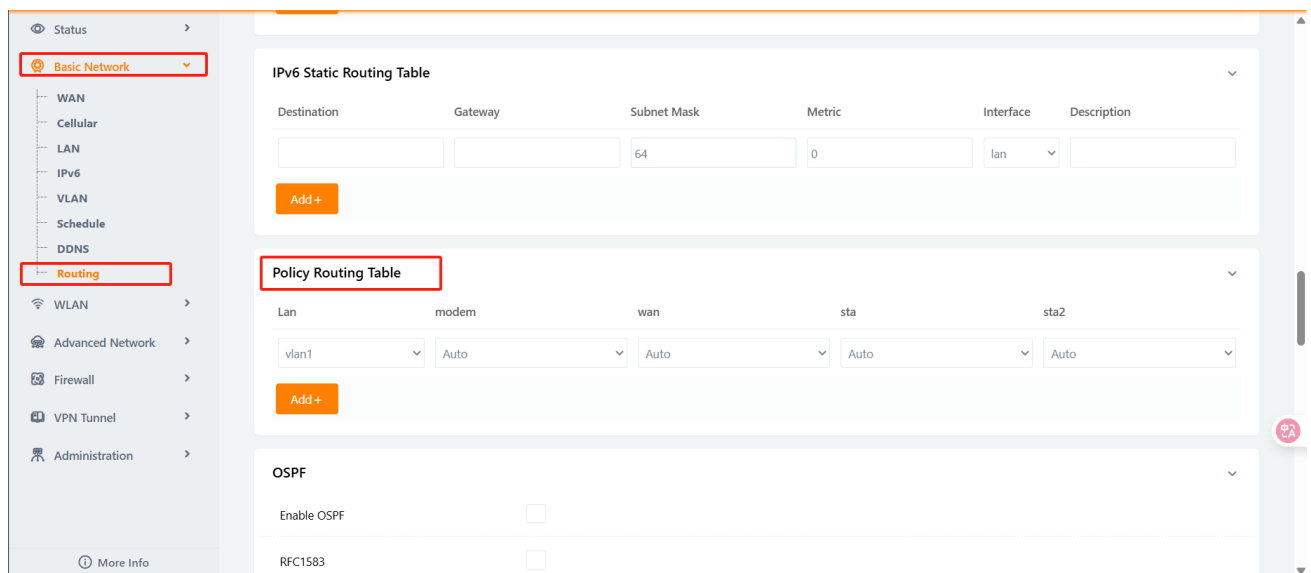


Figure 5-1 The strategy routing table page displays

Step 2: Detailed explanation of strategy routing table parameters

The name of the parameter	Feature description
Lan	Select the virtual network ports of PBR: VLAN1-VLAN16, AP, and AP2
modem	Module policy selection, such as Auto/Only/Primary/Secondary
wan	Select the policy of the WAN port, such as Auto/Only/Primary/Secondary
Sta	Sta (2.4GWiFi client) strategy selection, e.g. Auto/Only/Primary/Secondary

sta2	Sta2 (5.8GWiFi client) strategy selection, such as Auto/Only/Primary/Secondary
------	--

Table 5-10 Policy Routing Parameter Table

Note: Priority description of policy-based routing:

- ① Auto mode: the default value
- ② Priority size: Only>Primary>Secondary
- ③ When only mode is selected for one interface, only mode can be selected for other interfaces
- ④ When an interface selects the primary mode, other interfaces can only select the interface with a lower priority, and cannot select the primary mode at the same time
- ⑤ When an interface selects the secondary mode, one of the other interfaces can select the primary mode, while the others can only select the Auto mode

Step 3: Click Save Settings to save the PBR configuration

Example PBR configuration:

Step 1: Click the route table settings of the basic network, configure the information of the policy route table, select vlan1 for lan, select only mode for modem, click Add, and save the setting:

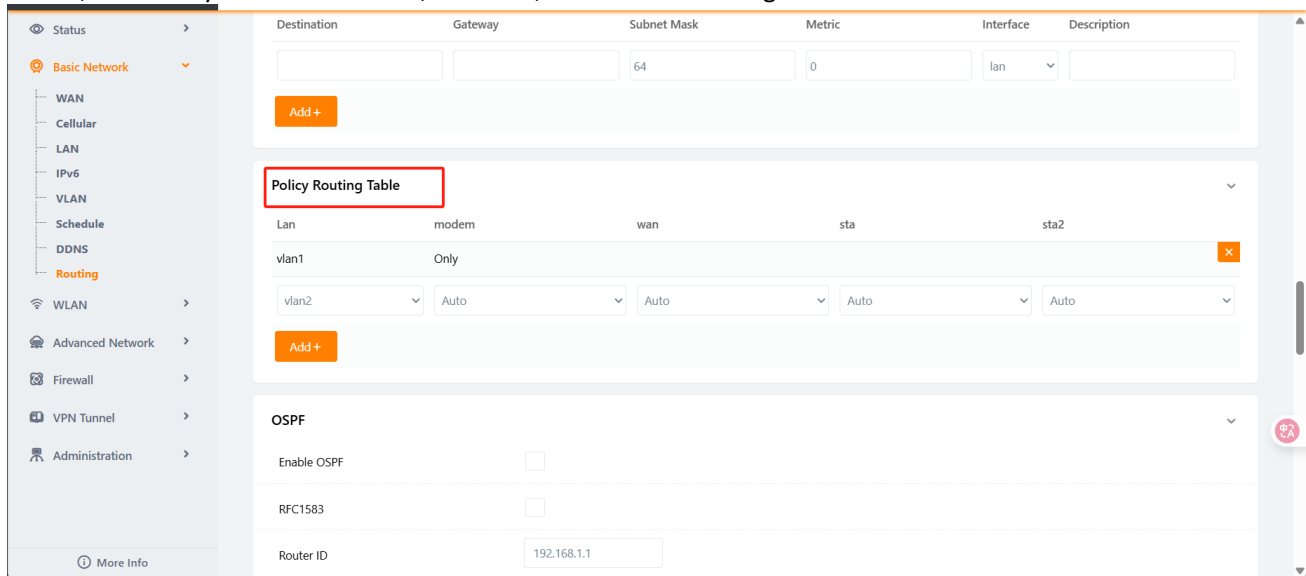


Figure 5-44 Policy Routing Table Parameter Configuration

Step 2: Enable modem and WAN online at the same time, and when the modem is switched to online modem, the routing device can access the public network normally. When switching to WAN online, the WAN cannot access the WAN because the PBR configuration only modem is used to access the Internet. Similarly, if STA and STA2 are also configured, you will not be able to access the Internet normally when switching to these two modes.

5.9.4. OSPF

OSPF (Open Shortest Path First): is an interior gateway protocol (IGP) used between routers in a single autonomous system (AS). OSPF uses link-state technology, where routers send each other directly connected link information and link information it has to other routers. Each OSPF router maintains a database with the same AS topology, from which the shortest path is constructed to calculate the routing table, and when the topology changes, the OSPF protocol can quickly recalculate the path and only generate a small amount of routing protocol traffic. In addition, all OSPF routing packet switching is validated.

Step 1: Open Basic Network and select Route Table Setting

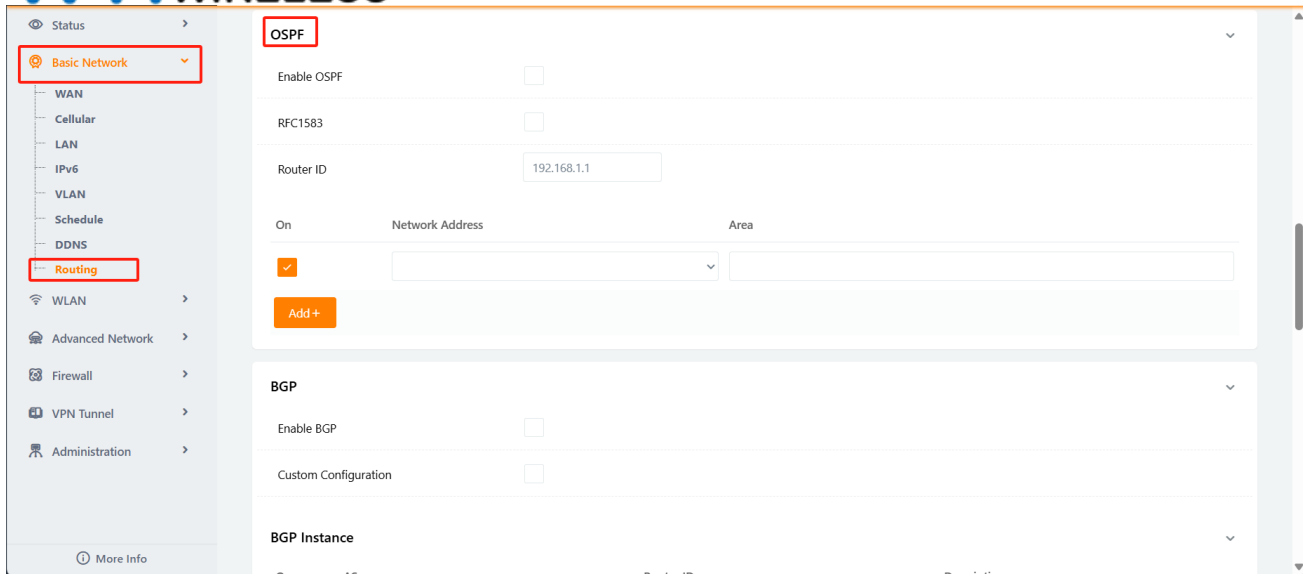


Figure 5-45 The OSPF page is displayed

Step 2: Parameters

The name of the parameter	Feature description	Parameter configuration
RFC1583	The preferred method of external routing	Enable or disable this feature
Router ID	The unique ID or ID of a route in a link	IP address or ID value
Network address	Choice of network port, such as LAN/WAN	
Area	Assign a zone to the LAN/WAN	The zone values for LAN and WAN are configured to be different values

Table 5-11 OSPF parameters

OSPF configuration example:

Step 1: Enable OSPF, set the router ID to 192.168.1.1, the network address LAN, region 1, the network address WAN, Area 0, and the wan port IP to 192.168.3.11, and save the settings

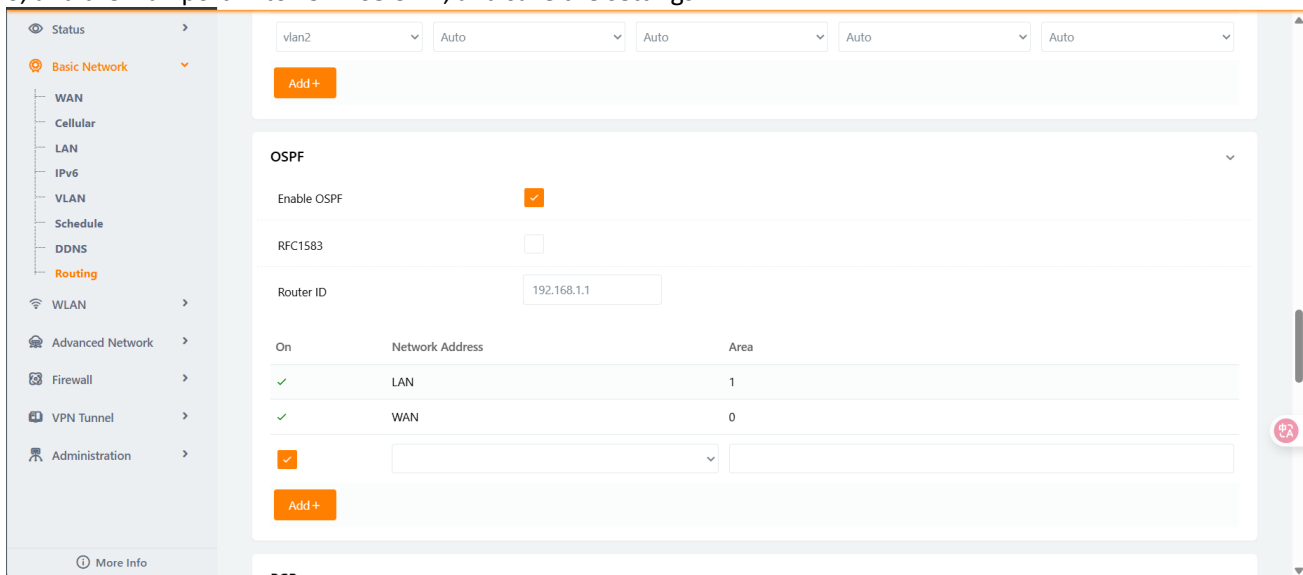
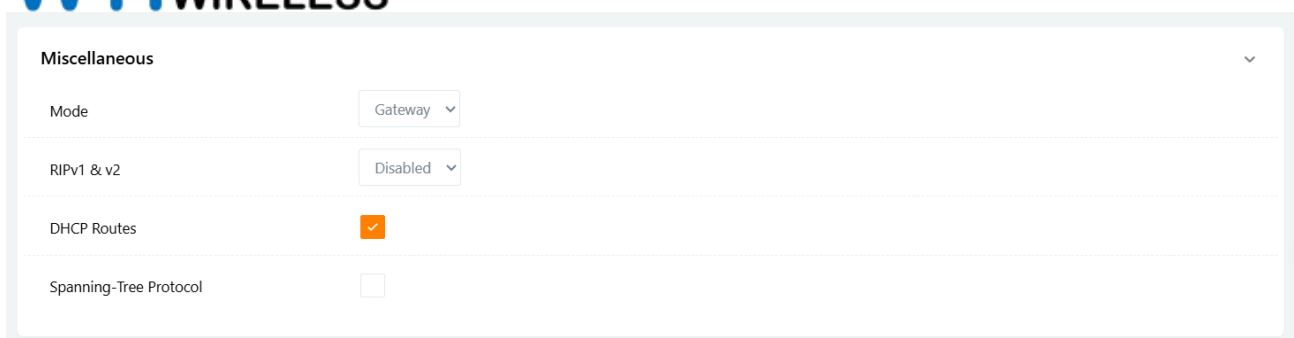


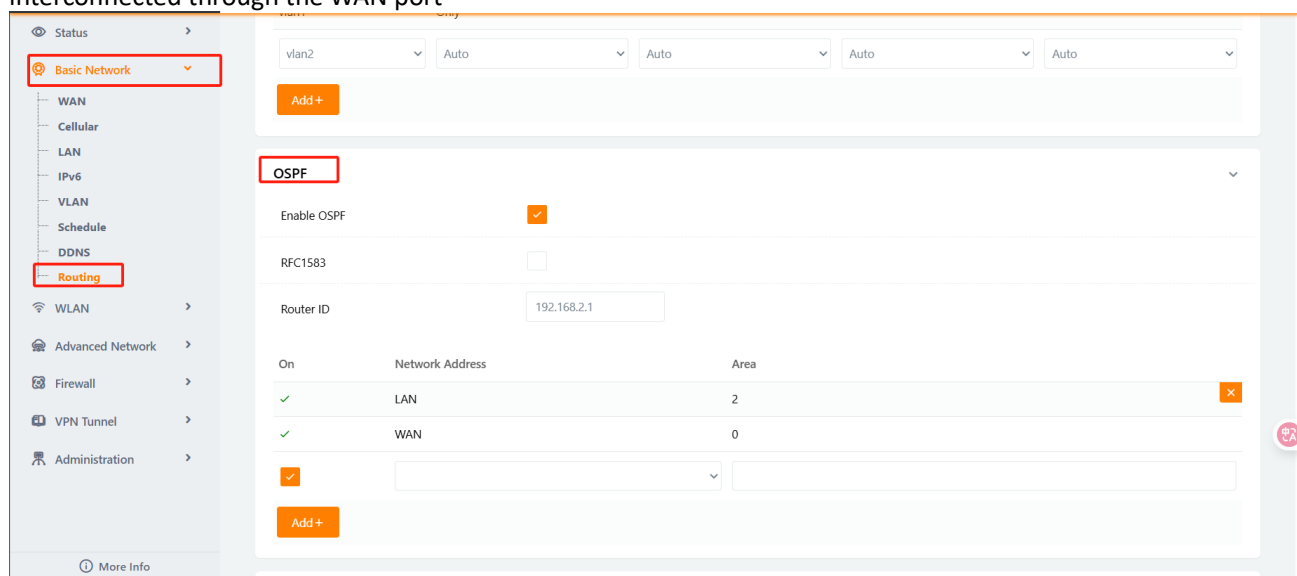
Figure 5-46 Screenshot of OSPF parameter configuration



Miscellaneous	
Mode	Gateway
RIPv1 & v2	Disabled
DHCP Routes	☒
Spanning-Tree Protocol	☐

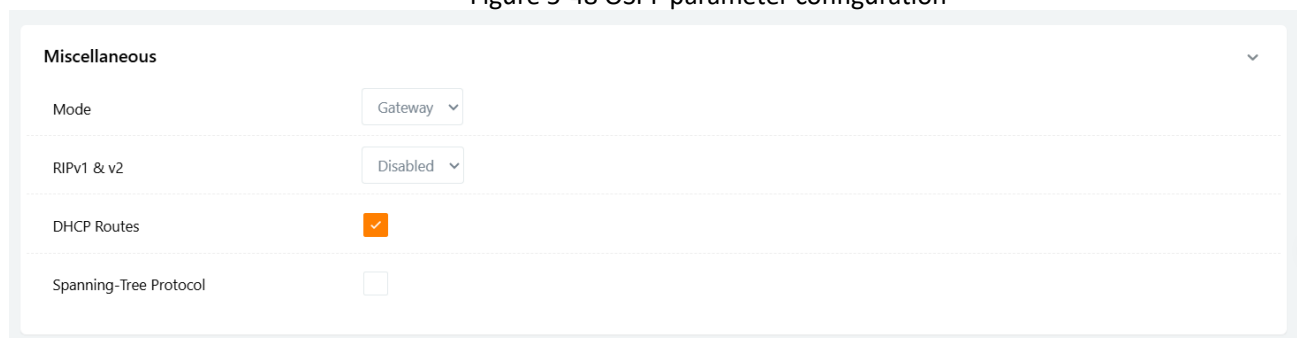
Figure 5-47 Other parameter configurations

Step 2: Configure the OSPF parameters of the other router, the router ID is 192.168.2.1, the network address is LAN, the region is 2, the network address is WAN, the region is 0, the WAN port IP is 192.168.3.12, and the two routers are interconnected through the WAN port



OSPF		
Enable OSPF	☒	
RFC1583	☐	
Router ID	192.168.2.1	
On	Network Address	Area
✓	LAN	2
✓	WAN	0

Figure 5-48 OSPF parameter configuration



Miscellaneous	
Mode	Gateway
RIPv1 & v2	Disabled
DHCP Routes	☒
Spanning-Tree Protocol	☐

Figure 5-49 Other parameter configurations

Step 3: Route topology diagram

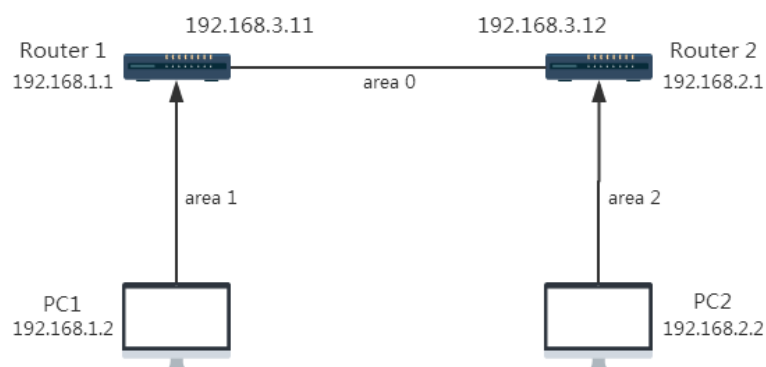


Figure 5-50 Routing topology diagram

Step 4: View the routing tables of the two devices and ping the IP addresses of the peer subnets

Route1: (LAN ip address 192.168.1.1)

Current Routing Table				
Destination	Gateway / Next Hop	Subnet Mask	Metric	Interface
192.168.3.1	*	255.255.255.255	0	WAN
192.168.3.0	*	255.255.255.0	0	WAN
192.168.2.0	192.168.3.12	255.255.255.0	20	WAN
192.168.1.0	*	255.255.255.0	0	LAN
127.0.0.0	*	255.0.0.0	0	lo
default	192.168.3.1	0.0.0.0	0	WAN

Figure 5-51 shows the routing table

```

C:\Users\Administrator>ping 192.168.2.2 -t
正在 Ping 192.168.2.2 具有 32 字节的数据:
来自 192.168.2.2 的回复: 字节=32 时间=6ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
来自 192.168.2.2 的回复: 字节=32 时间=1ms TTL=62
  
```

Figure 5-52 IP detection

Route2: (LAN ip address 192.168.2.1)

Destination	Gateway / Next Hop	Subnet Mask	Metric	Interface
192.168.3.1	*	255.255.255.255	0	WAN
192.168.3.0	*	255.255.255.0	0	WAN
192.168.2.0	*	255.255.255.0	0	LAN
192.168.1.0	192.168.3.11	255.255.255.0	20	WAN
127.0.0.0	*	255.0.0.0	0	lo
default	192.168.3.1	0.0.0.0	0	WAN

Figure 5-53 shows the routing table

```

C:\Users\Administrator>ping 192.168.1.2 -t
正在 Ping 192.168.1.2 具有 32 字节的数据:
来自 192.168.1.2 的回复: 字节=32 时间=2ms TTL=126
来自 192.168.1.2 的回复: 字节=32 时间=2ms TTL=126
来自 192.168.1.2 的回复: 字节=32 时间=2ms TTL=126
来自 192.168.1.2 的回复: 字节=32 时间=2ms TTL=126
来自 192.168.1.2 的回复: 字节=32 时间=2ms TTL=126
来自 192.168.1.2 的回复: 字节=32 时间=2ms TTL=126
来自 192.168.1.2 的回复: 字节=32 时间=2ms TTL=126
来自 192.168.1.2 的回复: 字节=32 时间=2ms TTL=126
来自 192.168.1.2 的回复: 字节=32 时间=2ms TTL=126
来自 192.168.1.2 的回复: 字节=32 时间=2ms TTL=126
来自 192.168.1.2 的回复: 字节=32 时间=2ms TTL=126
来自 192.168.1.2 的回复: 字节=32 时间=2ms TTL=126
来自 192.168.1.2 的回复: 字节=32 时间=2ms TTL=126
来自 192.168.1.2 的回复: 字节=32 时间=2ms TTL=126
来自 192.168.1.2 的回复: 字节=32 时间=2ms TTL=126

```

Figure 5-54 IP detection

5.9.5. BGP

Border Gateway Protocol (BGP) is an enhanced path vector routing protocol, and BGP is an external gateway protocol with rich policy control technologies, which mostly runs between AS. Dynamic routing protocols can be divided into IGP and Interior Gateway Protocol (EGP) according to the scope of work). IGP work within the same AS and are mainly used to discover and compute routes, and to exchange routing information within the AS. EGP works between AS and provides loop-free routing information exchange between AS, while BGP is a type of EGP. One of the main tasks of BGP is to publish the network reachability information of the AS to other ASP. The focus of BGP is not on the automatic discovery of network topology, but on selecting the best routes between AS and controlling the propagation of routes. BGP uses TCP as its transport layer protocol (listening port number 179), which improves the reliability of the protocol and does not require a special mechanism to ensure the controllability of the connection.

An AS is an IP network with the same routing policy under the jurisdiction of an entity, and each AS has a unique Autonomous System Number, which is assigned by IANA.

Step 1: Open the basic network, select Route Table Settings, and drop down the parameters to BGP Parameter Configuration

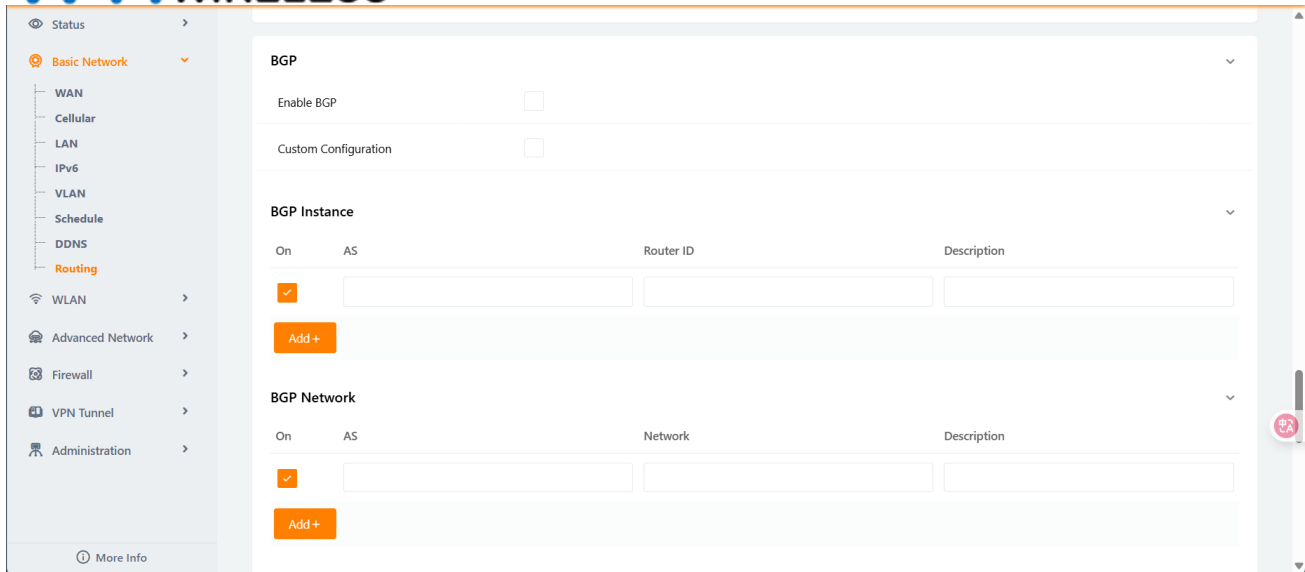


Figure 5-55

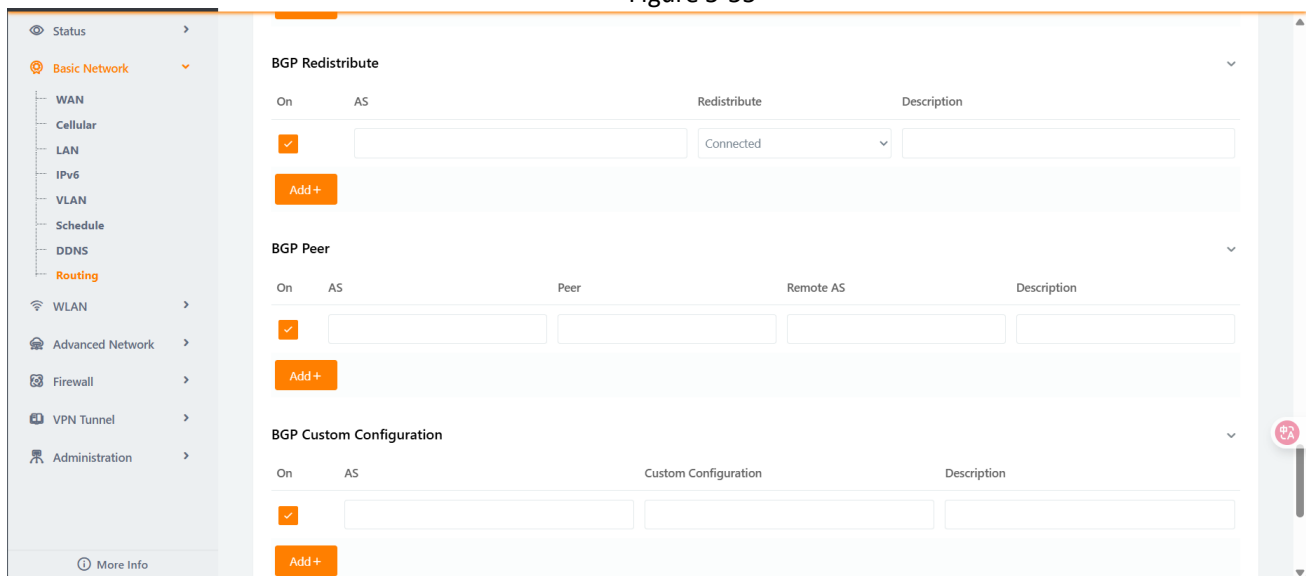


Figure 5-56

Step 2: Parameters

parameter	meaning	How to configure
Enable BGP	BGP enabled/disabled	Not enabled by default; Check to enable;
Custom Configuration	User-configurable	Disabled by default; After enabled, the configuration information can be customized;
AS	Autonomous system number, unique	Range: 1-65535
The router ID of the BGP instance	The router ID of a BGP device, which is unique, is usually in the form of an IPv4 address, which is the IP of the BGP gateway	Format: A. B.C.D
BGP network	The network address inside the BGP, which is distinguished from the router ID, is the network that will be broadcast by BGP	Format: A. B.C.D
BGP Redistribute	BGP redistribution	The default value is Connected; Optional Connected/Kernel/OSPF/RIP/Static

parameter	meaning	How to configure
BGP Peer	Peer/peer BGP router ID	Format: A. B.C.D
Remote AS	The autonomous system number of the peer router, which is unique	Range: 1-65535
BGP Custom Configuration	Custom options for the corresponding autonomous system number	Self-configurable

Table 5-12

The configuration is as follows:

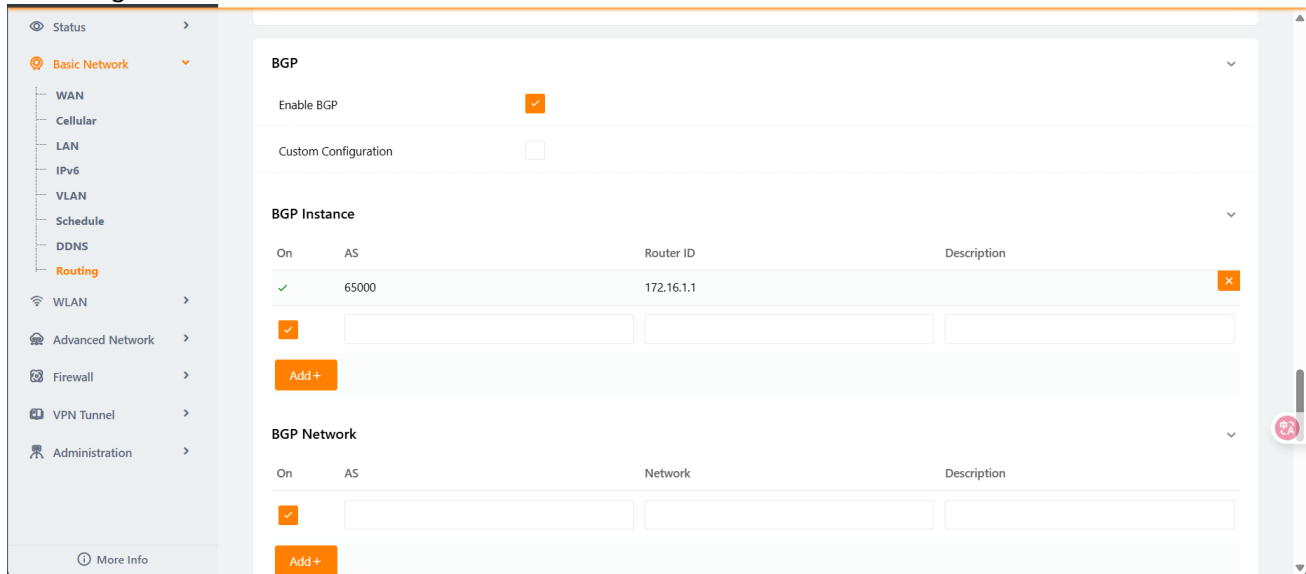


Figure 5-57

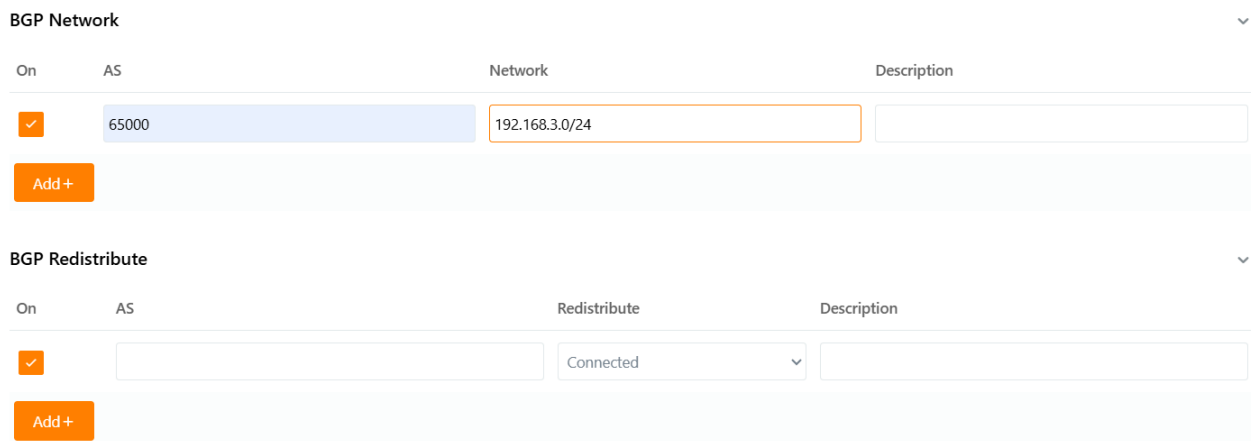


Figure 5-58

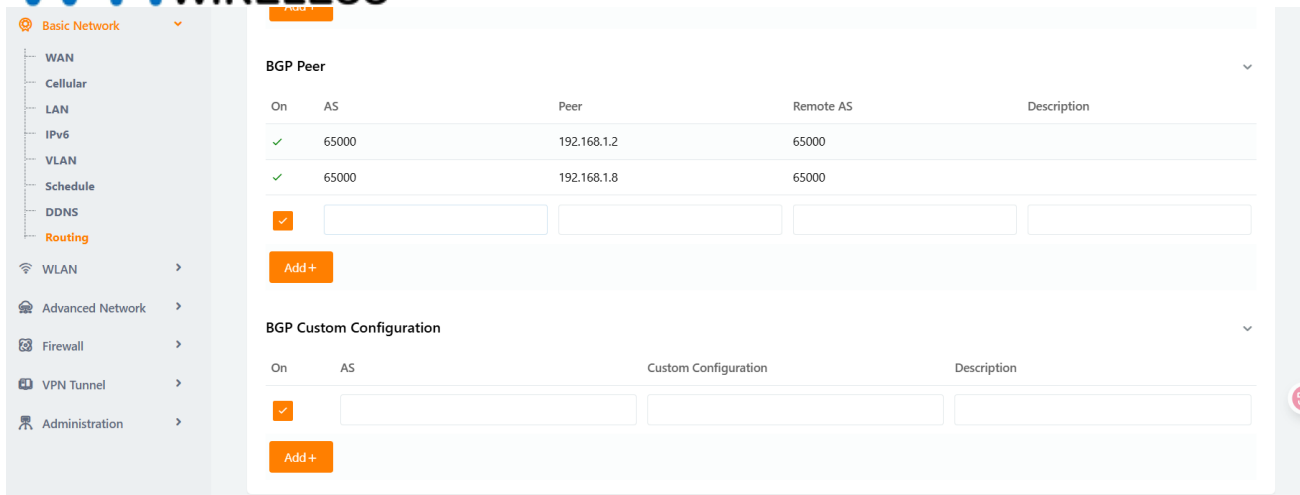


Figure 5-59

telnet enters the background and can ping the network address inside the peer BGP

```
Kernel IP routing table
Destination      Gateway         Genmask         Flags Metric Ref    Use Iface
0.0.0.0          192.168.10.1   0.0.0.0         UG        0      0          0 v1an2
10.36.84.32      0.0.0.0        255.255.255.252 U         0      0          0 usb0
127.0.0.0        0.0.0.0        255.0.0.0       U         0      0          0 lo
172.16.1.2       0.0.0.0        255.255.255.255 UH        20     0          0 dmvpn
172.16.1.3       172.16.1.2     255.255.255.255 UGH       20     0          0 dmvpn
172.16.1.8       0.0.0.0        255.255.255.255 UH        20     0          0 dmvpn
192.168.1.0      172.16.1.8     255.255.255.0   UG        20     0          0 dmvpn
192.168.2.0      172.16.1.2     255.255.255.0   UG        20     0          0 dmvpn
192.168.3.0      0.0.0.0        255.255.255.0   U         0      0          0 br0
192.168.10.0     0.0.0.0        255.255.255.0   U         0      0          0 v1an2
192.168.10.1     0.0.0.0        255.255.255.255 UH        0      0          0 v1an2
root@Router:/# ping 192.168.1.1
PING 192.168.1.1 (192.168.1.1): 56 data bytes
64 bytes from 192.168.1.1: seq=0 ttl=64 time=1.365 ms
64 bytes from 192.168.1.1: seq=1 ttl=64 time=1.082 ms
64 bytes from 192.168.1.1: seq=2 ttl=64 time=1.285 ms
64 bytes from 192.168.1.1: seq=3 ttl=64 time=1.133 ms
64 bytes from 192.168.1.1: seq=4 ttl=64 time=1.229 ms
^C
--- 192.168.1.1 ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 1.082/1.218/1.365 ms
root@Router:/#
```

Figure 5-60

6. WLAN configuration (WIFI)

For Router series products that support WiFi, WLAN properties can be modified and configured through the web.

Below is an introduction to the commonly used configurations for WiFi.

6.1. Basic parameter configuration

Select "WLAN Configuration>Basic Parameter Settings" in the navigation bar. In the opened page, you can modify and configure the basic parameters of WiFi.



The default WiFi password is null, and users can set or not set the WiFi password according to their own needs. The way to set the WiFi password is the last item in the [Basic Parameter Settings] [Security Options] Select the required encryption method from the drop-down list, and fill in the custom WiFi password, and save it.

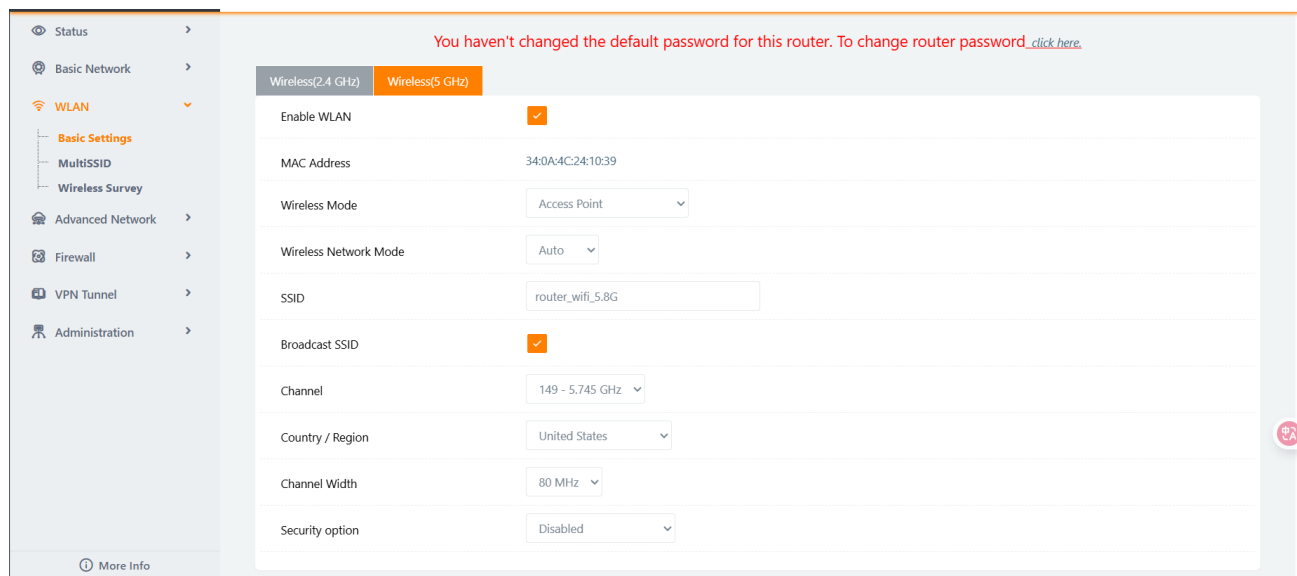


Figure 6-1 Screenshot of basic Wi-Fi parameters

Description of the basic parameter settings

parameter	meaning	How to configure
Enable wireless	Turn on the wireless mode and the relevant Wi-Fi parameters can be set	button selection Enable Disable
Wireless mode	Select the networking mode of the wireless network	The default AP working mode can also support clients
Wireless network protocols	The router supports multiple protocols such as 11b/g/n.	Default Auto Only; or manually modify only 802.11g; B/G mix
SSID	The ID of the wireless network service set, which is the Router by default	GENERAL WORD TYPE, UP TO 32 BYTES
channel	Channels used by Wi-Fi	It is recommended to use the default value
bandwidth	The bandwidth used by the wireless network	Support 20MHz, 40MHz, 80MHz
Security options	Configure the WLAN encryption mode so that it can be disable when encryption authentication is not required. WEP encryption is relatively easy to crack, so it is recommended to use WPA encryption	Drop-down box options: WEP、WPA、WPA-PSK、WPA2-PSK、WPA2、WPAPSK/WPA2PSK

Table 6-1 Basic Parameter Settings Configuration

6.1.1. Wireless client mode

Example of wireless client mode configuration:

Step 1: Open the WLAN settings, select the basic parameter settings, select the wireless client for wireless mode, the SSID name is consistent with the WiFi SSID name of the connected router, the security method and password must also be the same, then save the configuration and restart the router. The configuration is shown in the image:

You haven't changed the default password for this router. To change router password [click here](#).

- Status
- Basic Network
- WLAN**
 - Basic Settings
- MultiSSID
- Wireless Survey
- Advanced Network
- Firewall
- VPN Tunnel
- Administration

Wireless(2.4 GHz) Wireless(5 GHz)

Enable WLAN	☒
MAC Address	32:0A:4C:24:10:39
Wireless Mode	Wireless Client
Wireless Network Mode	Auto
SSID	DetranLtd
Country / Region	United States
Security option	WPA / WPA2 Personal
Encryption	AES
Shared Key	***** Random
Type	DHCP
MTU	0 (0 for default)

Figure 6-2 Wi-Fi Wireless Client Parameter Configuration

Step 2: Connect the WiFi antenna normally, and then check the connection status of the WiFi client on the status page, as shown in the figure:

- Status
- Overview
- Traffic Stats.
- GPS Status
- Device List
- Basic Network
- WLAN
- Advanced Network
- Firewall
- VPN Tunnel
- Administration

Uptime 00:04:25

Ethernet Ports Status

WAN/LAN1	LAN2	LAN3	LAN4
Unplugged	UP	Unplugged	Unplugged

VPN Status

Internet

Connection Type	STA
IP Address	192.168.31.194
Subnet Mask	255.255.255.0
Gateway	192.168.31.1
DNS	192.168.31.153
Connection Status	Connected
Connection Uptime	00:00:09

Wireless (5 GHz)

Wireless (2.4 GHz)

MAC Address	36:0A:4C:04:10:38
Wireless Mode	Wireless Client
Wireless Network Mode	Auto
Radio	Enabled
SSID	DetranLtd
Security	WPA / WPA2 Personal + AES
Channel	11
Channel Width	Auto
RSSI	-51 dBm
Connection Type	DHCP
IP Address	192.168.31.194
Subnet Mask	255.255.255.0
Gateway	192.168.31.1
DNS	192.168.31.1
Connection Status	Connected
Connection Uptime	00:00:09

Figure 6-3 Wi-Fi Wireless Client Connection

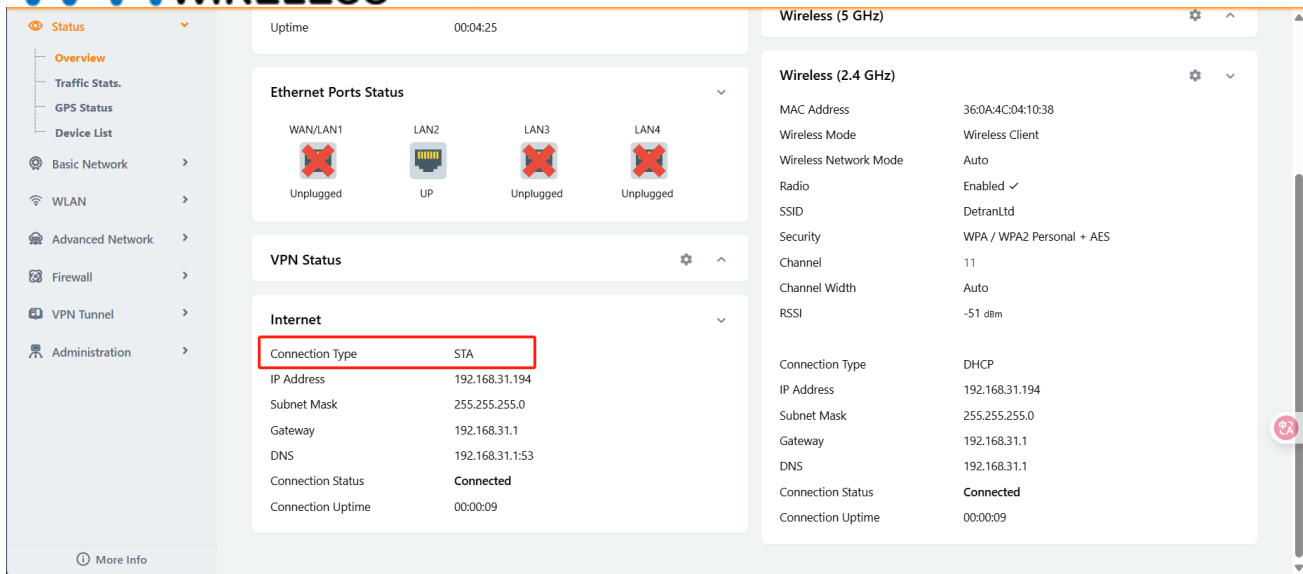


Figure 6-4 Wi-Fi Wireless Client Connection

Step 3: Check whether the device can access the Internet normally when the WiFi connected to the wireless client device can access the Internet normally

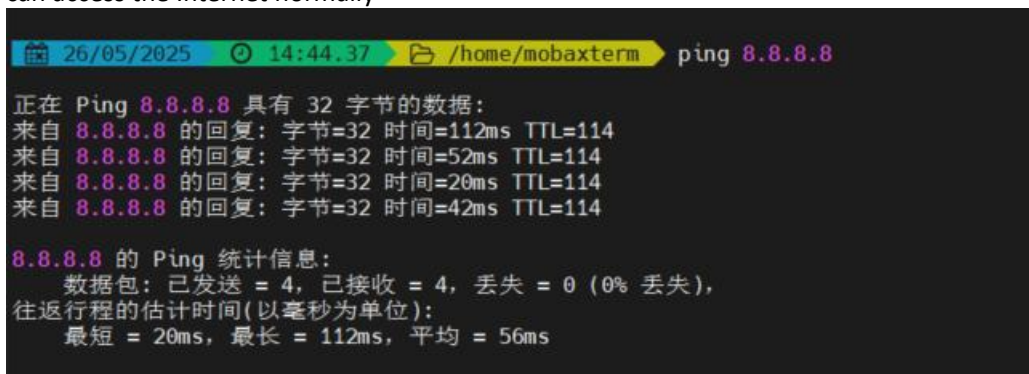


Figure 6-5 Internet access test

6.1.2. Wireless bridge mode

Wireless Bridging (WDS) Technology In the simplest network architecture, the Ethernet port of the bridge is connected to a hub or switch in the local area network, and the signal transmitting port is connected by a cable and antenna; In this way, the network system can be expanded.

Example wireless bridge mode configuration:

Step 1: Change the IP address of the LAN to 192.168.31.100 (which belongs to the same network segment as the bridged device), save the parameter configuration, and restart the router.

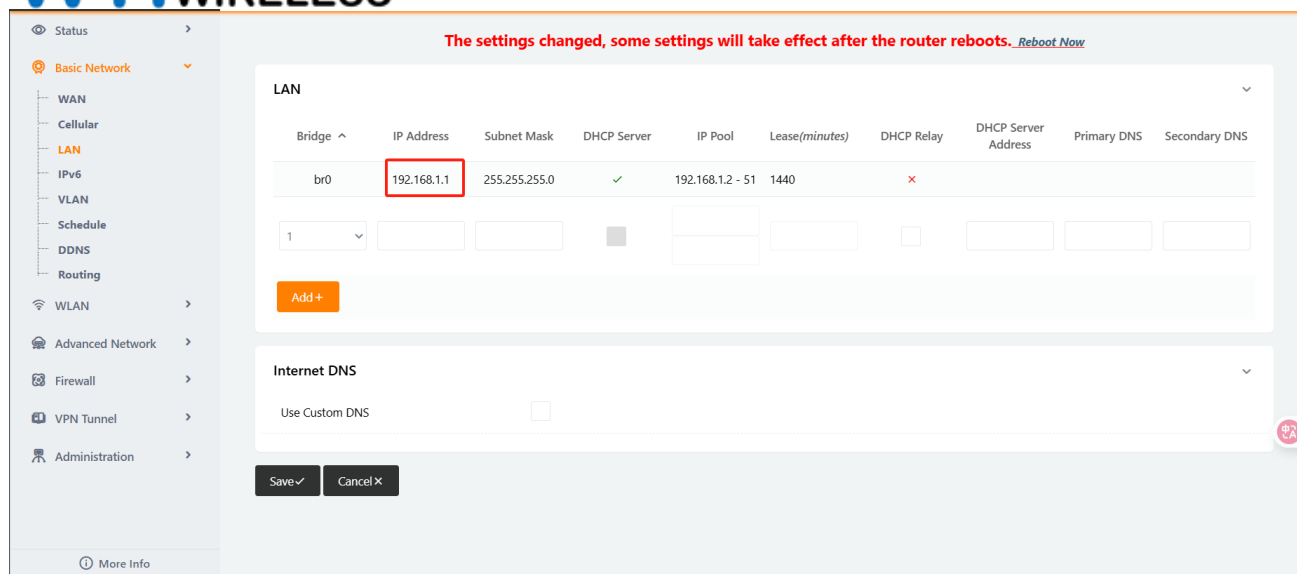


Figure 6-6 Screenshot of LAN parameter configuration

Step 2: Open the WLAN settings, configure the basic parameter settings, configure the wireless mode to the wireless bridge, the SSID and security mode and other configurations need to be consistent with the bridged device, and then save the parameters and restart the router

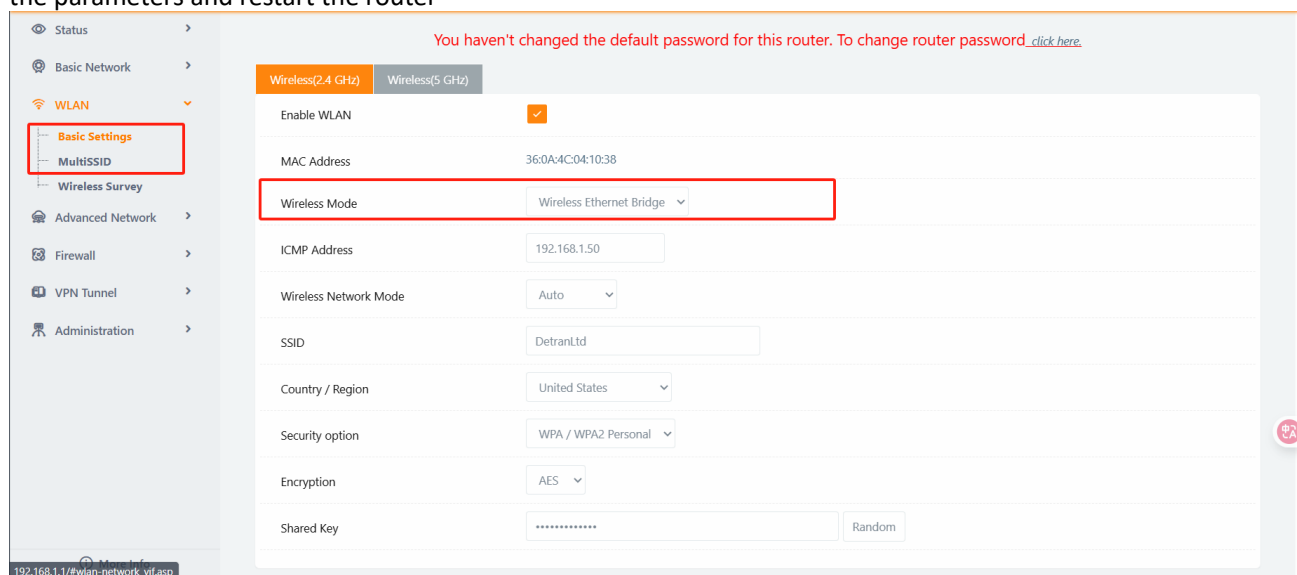


Figure 6-7 Screenshot of Wi-Fi wireless bridge parameter configuration

Step 3: Check the WLAN connection status on the web status home page of the router

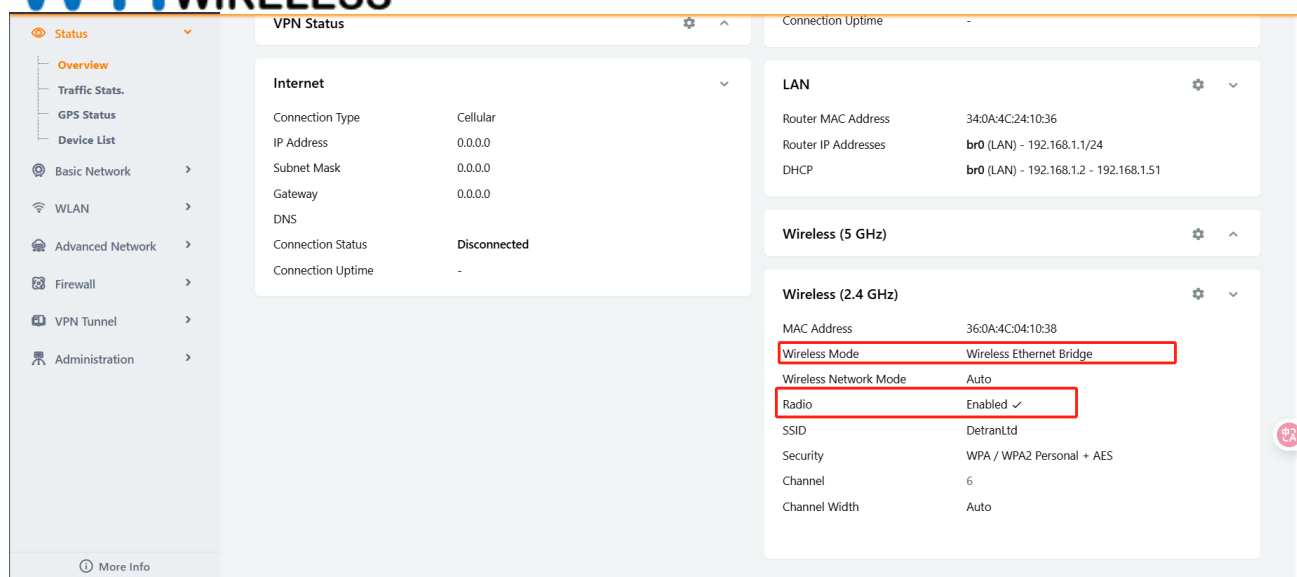


Figure 6-8 Wi-Fi wireless bridge connection

Step 4: Ping 192.168.31.1 (the gateway of the bridge device) and 8.8.8.8 (the accessible address of the Internet) respectively to check whether they can be pinged normally.

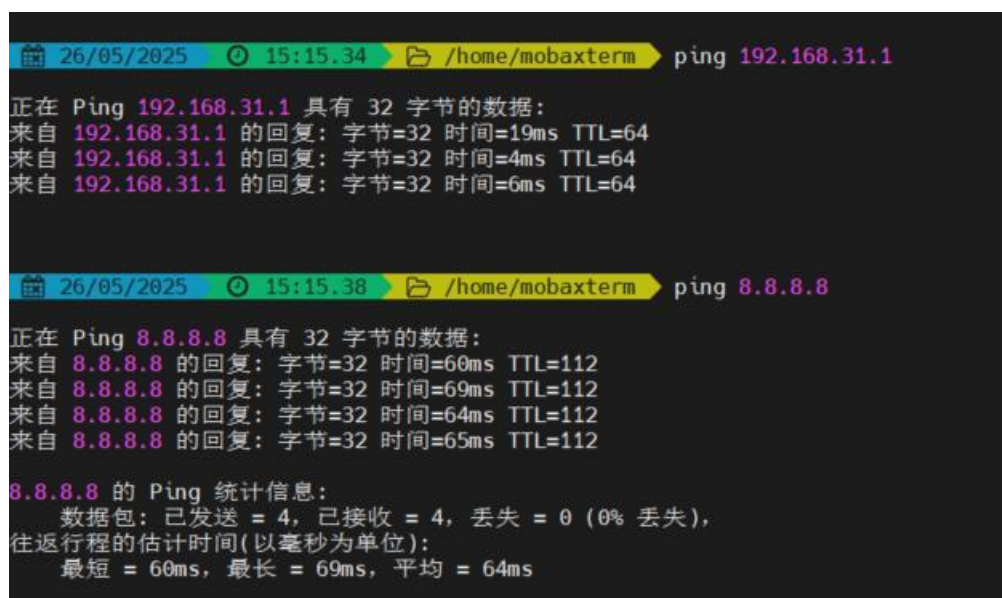


Figure 6-9 Screenshot of the Internet test

6.2. Multiple SSID

Multi-SSID is mainly used to allocate multiple WLAN, not just 2 WLAN, providing more connectivity options

Example for configuring multiple SSID:

Step 1: Open the WLAN settings, configure the multi-SSID, save the parameter settings, and restart the router after the configuration is complete

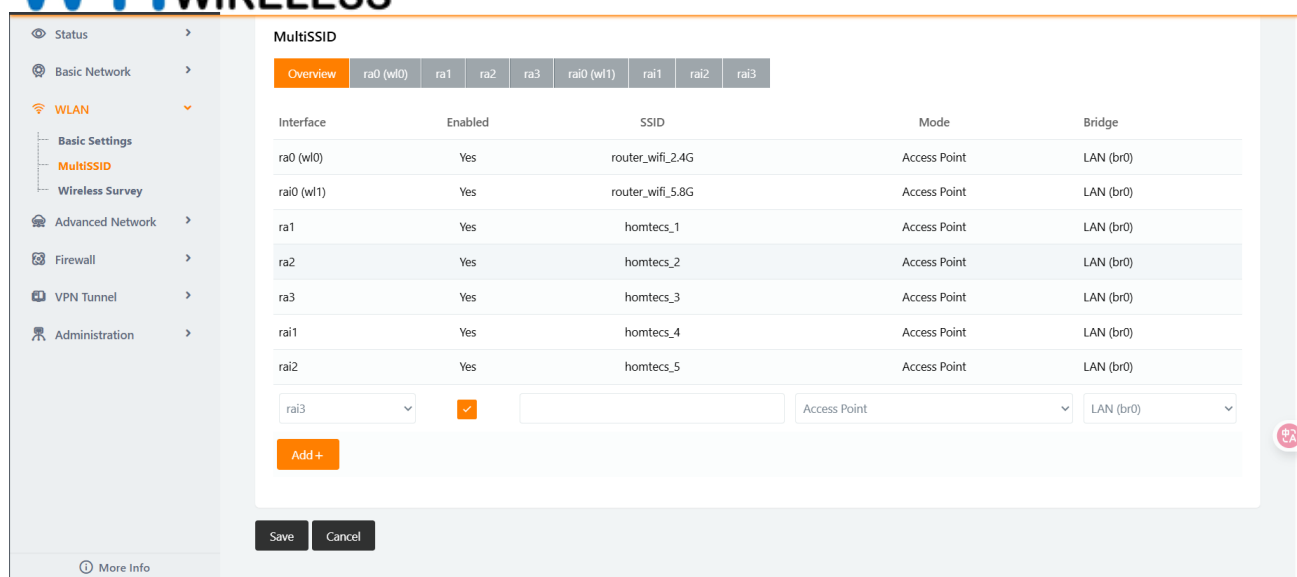


Figure 6-10 Configuring Wi-Fi parameters for multiple SSID is added

Step 2: Click on the web status home page of the router to check whether the information of the new Wi-Fi is normal (including the SSID name, MAC address, etc.), and other devices can be connected to WiFi normally.

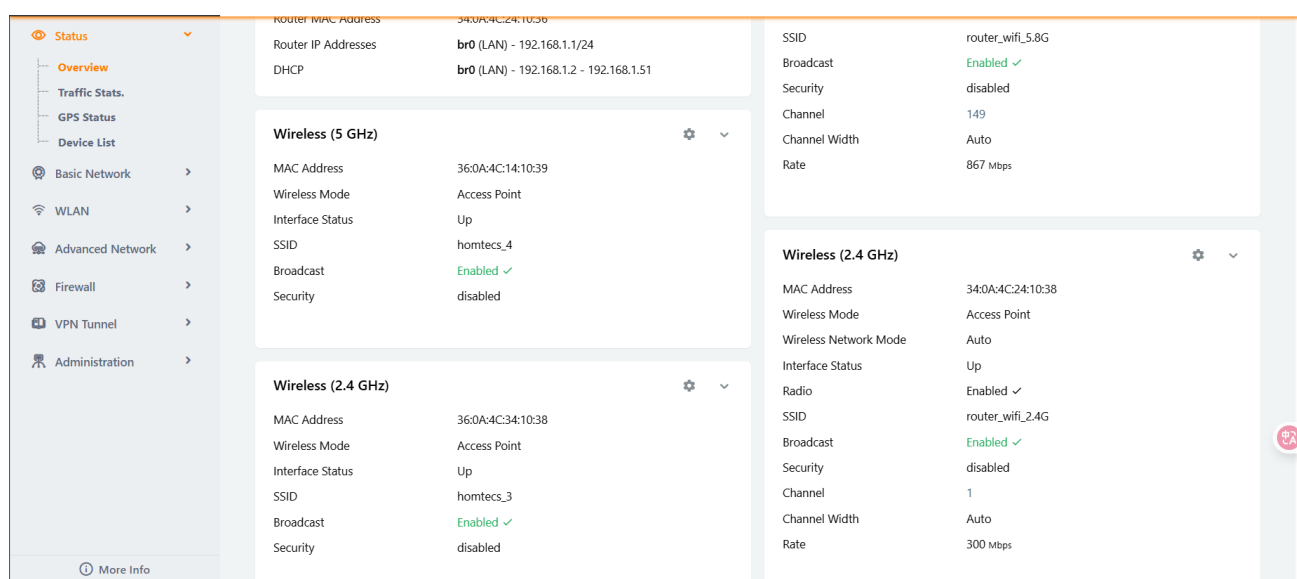


Figure 6-11 Screenshot of multiple SSID

6.3. Wireless Survey

In the navigation bar, select WLAN Configuration > Wireless Network Hunting. On the displayed page (Figure 6-13), you can search for information about the surrounding AP on a wireless network.

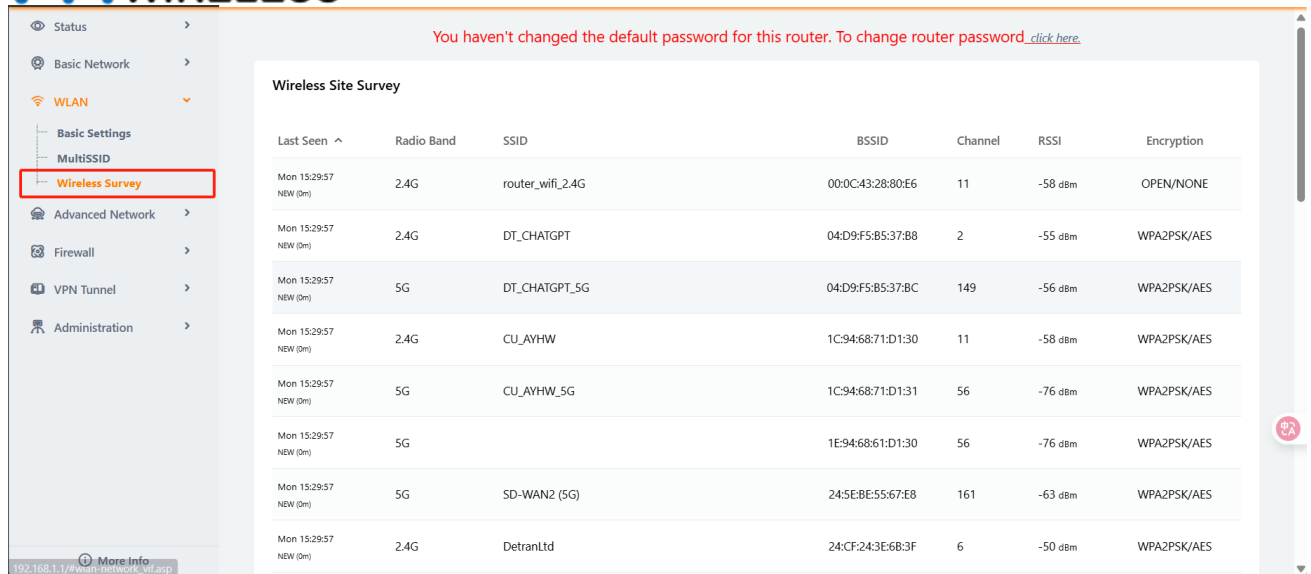


Figure 6-13 Wireless network search

7. Advanced network configuration

7.1. IPv4 port forwarding

Port forwarding is the act of forwarding a network port from one network node to another, allowing an external user to pass through an activated NAT router to a port at a private internal IP address (inside the LAN).

Source IP (optional): Only forwards data from a set IP range. Example: "1.2.3.4", "1.2.3.4 - 2.3.4.5", "1.2.3.0/24". "me.example.com".

External port : The port that should come in from WAN or 3G/4G VPN. Example: "2345", "200,300", "200-300,400"

Internal port (optional): If it is empty, it will automatically correspond to the external port. If the range of the inner port is different from the outer port, the internal port must be filled

Internal IP : Corresponding to the IP address in the local area network

In the navigation bar, select Advanced Network > IPv4 Port Forwarding. On the page that appears, you can modify the parameters for configuring port forwarding.

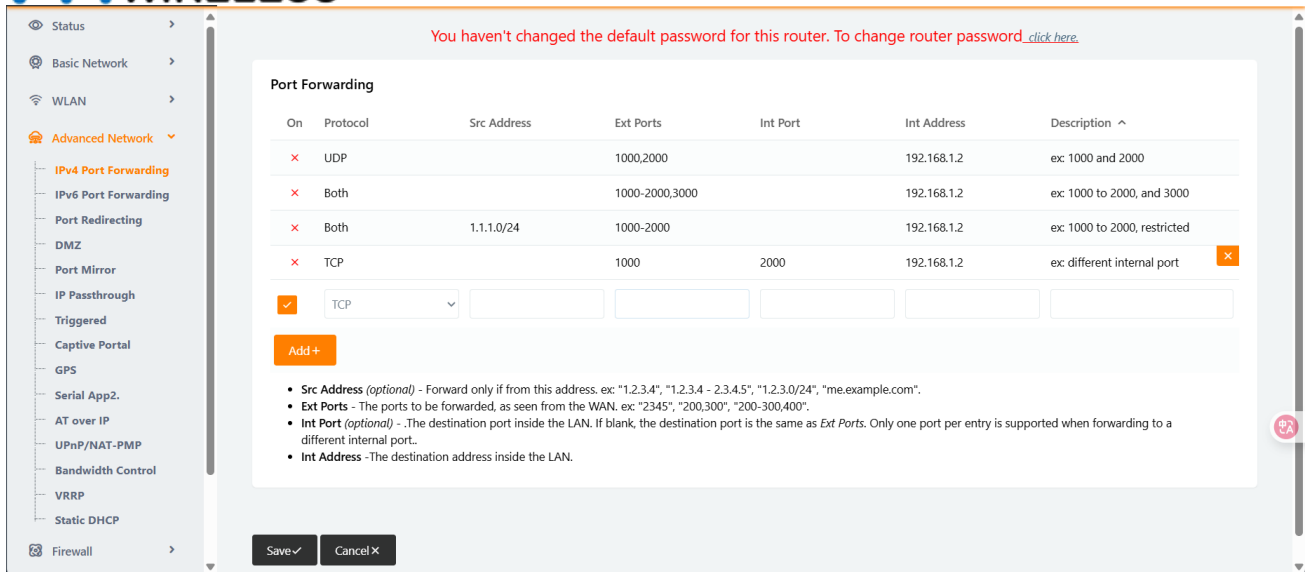


Figure 7-1 Port Forwarding

After the configuration is complete, click the Save Settings button for the configuration to take effect.

Port forwarding example:

Step 1:

Open the Routing web page, select Port Forwarding in Advanced Network, and configure port forwarding with 5000 ports on the external and internal ports. The internal IP address is 192.168.1.50, TCP protocol.

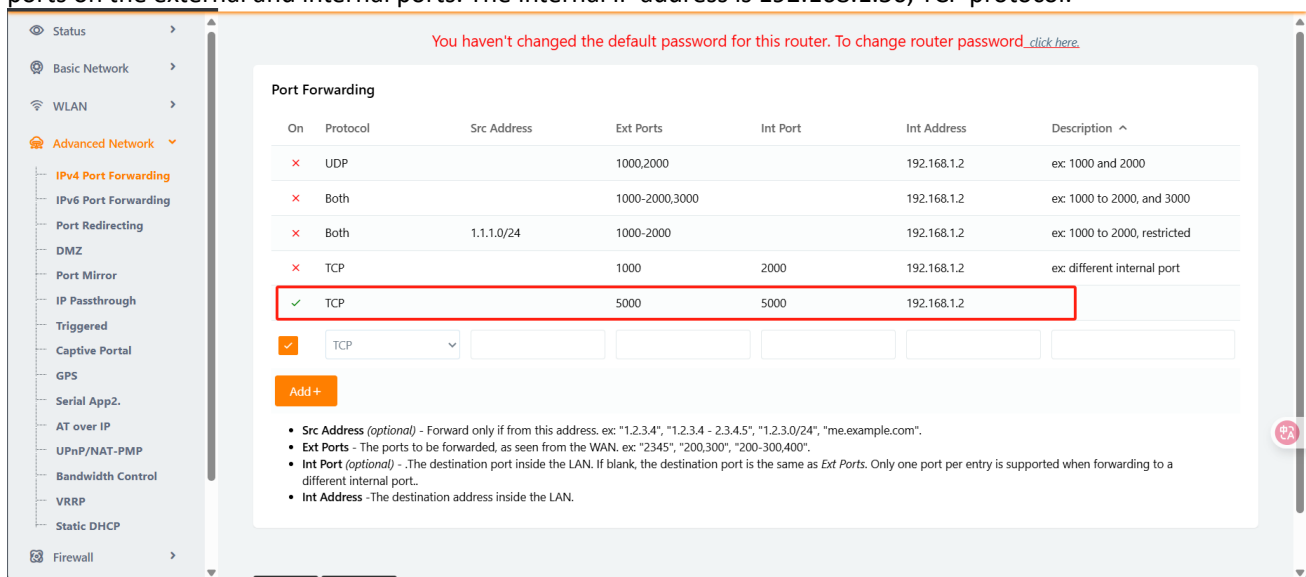


Figure 7-2 Port Forwarding Configuration

Step 2:

As the server, the local server uses the router to access the Internet and listens to the IP address and port 5000 of the local PC, and the client uses TCP to connect to the Internet IP address and port 5000 of the router.

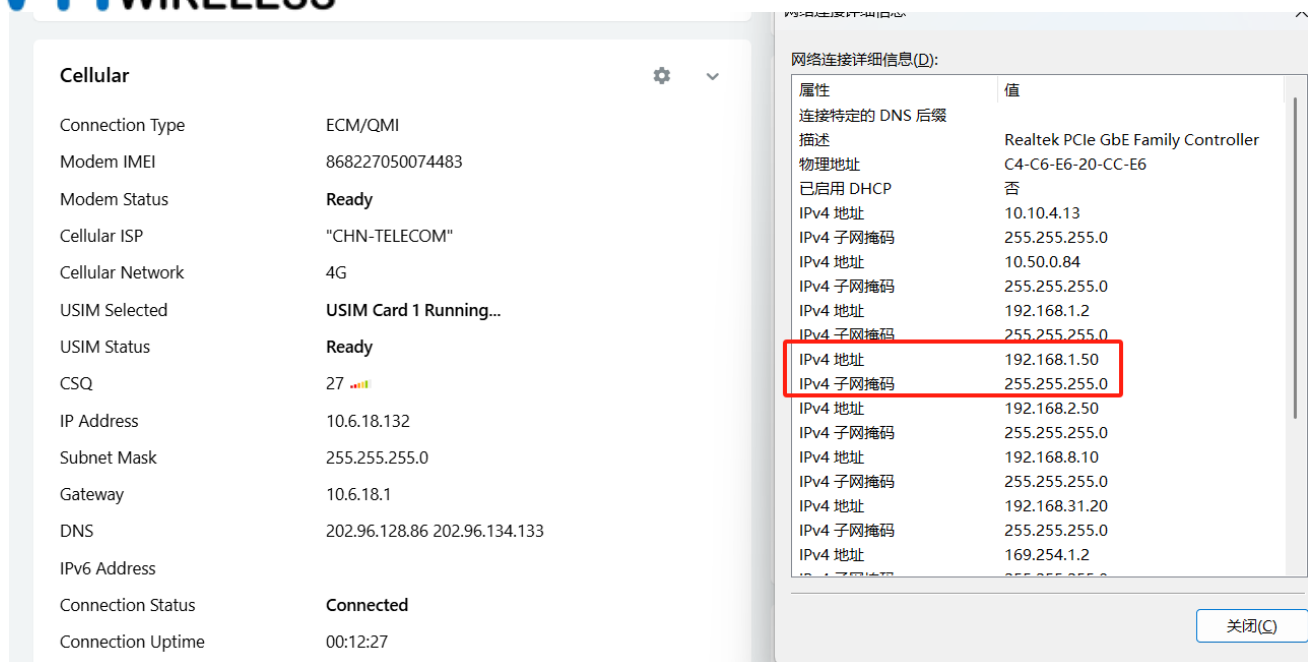


Figure 7-3 PC Setup

Step 3:

The server and the client can communicate with each other and send packets to each other

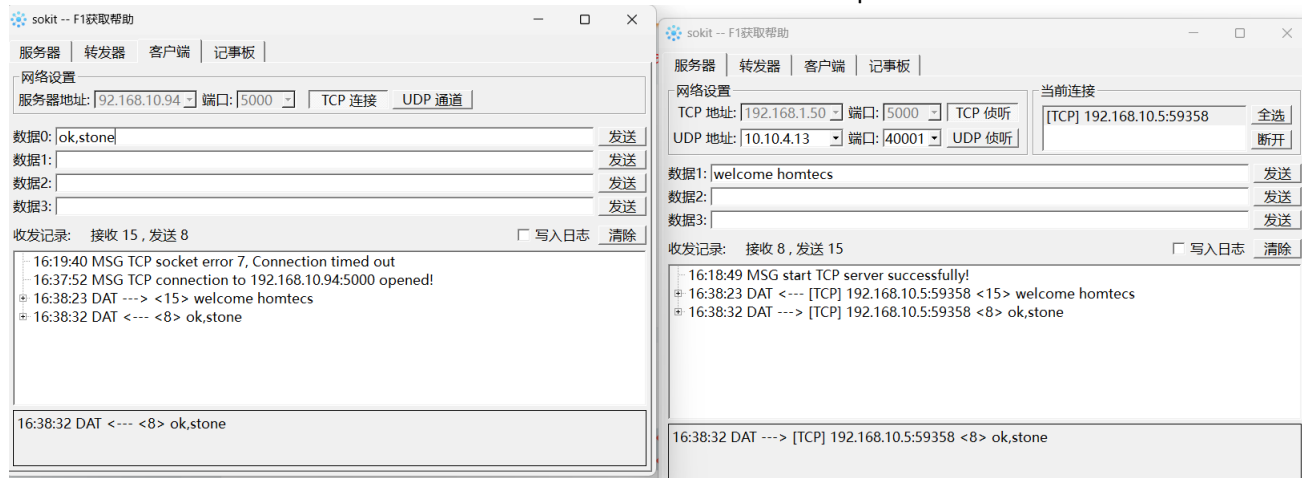


Figure 7-4 Data Transmission and Receiving

7.2. IPV6 port forwarding

Port forwarding is the act of forwarding a network port from one network node to another, allowing an external user to pass through an activated NAT router to a port at a private internal IP address (inside the LAN).

Protocols - Support TCP, UDP and TCP/UDP

Source IP (optional) - Only forwards data from the specified IP range. For example: "2001:4860:800b::/48", "me.example.com".

Destination IP - The IP address within the corresponding local area network

Destination Port - Open forwarding port For example: "2345", "200,300", "200-300,400"

In the navigation bar, select Advanced Network > IPv6 Port Forwarding. On the page that appears, you can modify the parameters for configuring port forwarding.

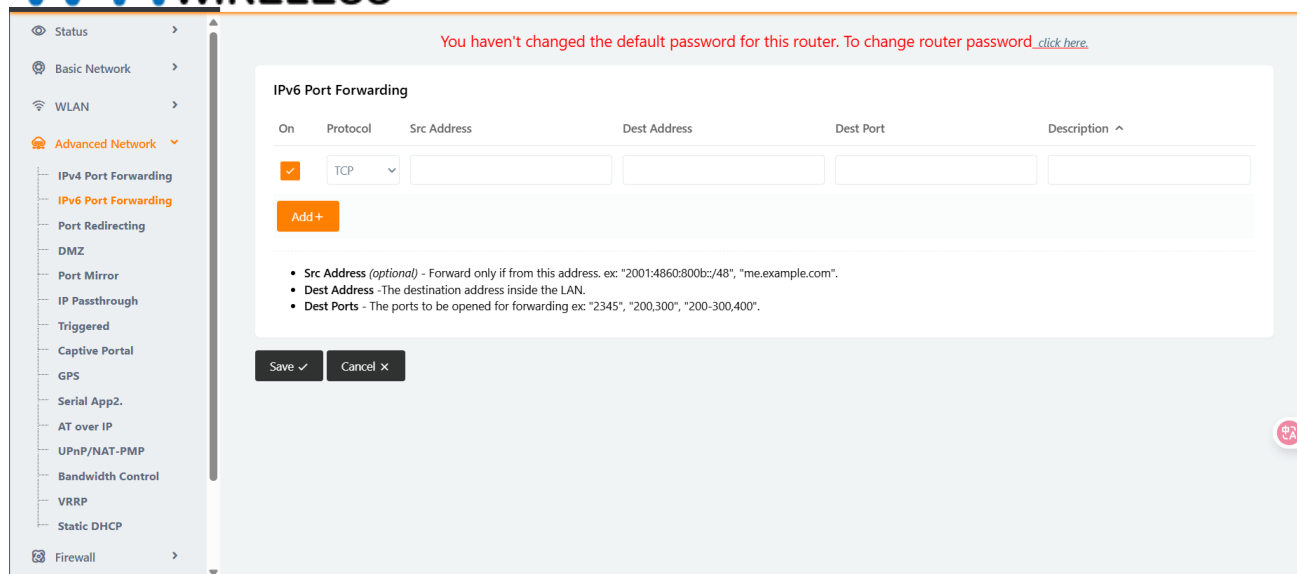


Figure 7-5

After the configuration is complete, click the Save Settings button for the configuration to take effect.

Port forwarding example:

Step 1: Router1 opens the routing web interface, selects port forwarding in the advanced network, sets Protocol to Both, sets the source IP address to empty by default, sets the destination IP address to a temporary ipv6 address automatically obtained by the local PC, and sets the destination port to 5 000 to save the parameter configuration. (using a telecom SIM card).

Mobile Network	
Connection Type	ECM/QMI
Modem IMEI	862430062451924
Modem State	Connected
Mobile Network	'CHN-CT'
USIM State	Ready
Signal Strength	31 dB
IP Address	10.29.55.189
IP Gateway	10.29.55.126
DNS Servers	106.38.128.68
IPv6 Address	240e:e107:ed0:0668::134.188 240e:e107:5::1
IPv6 Address	240e:e107:ed40:4668:: a109:f6b9:30f
Local Network	
Ethernet MAC Address	34.01.74:A8:C8 E0
LAN Interface	br0 (LAN) - 192.168.1.1/24
DHCP Lease	br0 (LAN) - 192.168.1.162 240e:e107:f602:aafe:rf82:e8: 2639

Figure 7-6