Ruijie Reyee RG-EG Series Router

Implementation Cookbook

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Preface

Intended Audience

This document is intended for:

- Network engineers
- Technical support and servicing engineers
- Network administrators

Technical Support

- Official website of Ruijie Reyee: https://www.ruijienetworks.com/products/reyee
- Technical Support Website: https://www.ruijienetworks.com/support
- Case Portal: https://caseportal.ruijienetworks.com
- Community: https://community.ruijienetworks.com
- Technical Support Email: service_rj@ruijienetworks.com

Conventions

1. GUI Symbols

Interface symbol	Description	Example
Boldface	1. Button names 2. Window names, tab name, field name and menu items 3. Link	1. Click **OK**. 2. Select **Config Wizard**. 3. Click the **Download File** link.
>	Multi-level menus items	Choose **System** > **Time**.

2. Signs

This document also uses signs to indicate some important points during the operation. The meanings of these signs are as follows.

Warning

An alert that calls attention to important rules and information that if not understood or followed can result in data loss or equipment damage.

Caution

An alert that calls attention to essential information that if not understood or followed can result in function failure or performance degradation.

Note

An alert that contains additional or supplementary information that if not understood or followed will not lead to serious consequences.

Specification

An alert that contains a description of product or version support.

3. Note

This manual is used to guide users to understand the product, install the product, and complete the configuration.

- The example of the port type may be different from the actual situation. Please proceed with configuration according to the port type supported by the product.
- The example of display information may contain the content of other product series (such as model and description). Please refer to the actual display information.
- The routers and router product icons involved in this manual represent common routers and layer-3 switches running routing protocols.

Contents

1 Product Introduction

Reyee RG-EG series router is a cloud managed router designed for villas and smart home, restaurants, small offices, and homestay hotels. It is affordable, small, and easy to use, providing 500–600 Mbit/s bandwidth and supporting up to 200 clients.

RG-EG series routers provide industry-leading auto-discovery and auto-networking for routers, switches, and wireless devices.

RG-EG series routers can perform per-port VLAN configuration to achieve port isolation, and integrate with smart flow control to achieve comprehensive network planning and perform local and remote network diagnosis.

1.1 Models

The RG-EG series routers come in five models.

Model	10/100/1000 Base-T Ethernet Port	Maximum Number of Concurrent Clients	Recommended Bandwidth	Management Capacity
RG-EG105G-P	5 (PoE supported)	100	500 Mbit/s asymmetric bandwidth (flow control disabled) 300 Mbit/s asymmetric bandwidth (flow control enabled)	AC mode: 300 Router mode: 32
RG-EG105G-P V2	5 (PoE supported)	100	500 Mbit/s asymmetric bandwidth (flow control disabled) 600 Mbit/s asymmetric bandwidth (flow control enabled)	AC mode: 300 Router mode: 32

Model	10/100/1000 Base-T Ethernet Port	Maximum Number of Concurrent Clients	Recommended Bandwidth	Management Capacity
RG-EG105G	5	100	500 Mbit/s asymmetric bandwidth (flow control disabled) 300 Mbit/s asymmetric bandwidth (flow control enabled)	AC mode: 300 Router mode: 32
RG-EG105G V2	5	100	600 Mbit/s asymmetric bandwidth (flow control disabled) 500 Mbit/s asymmetric bandwidth (flow control enabled)	AC mode: 300 Router mode: 32
RG-EG105GW	5	100 (recommended number of wireless terminals: 60)	500 Mbit/s asymmetric bandwidth (flow control disabled) 300 Mbit/s asymmetric bandwidth (flow control enabled)	Router mode: 32
RG-EG210G-E	10	200	1 Gbit/s asymmetric bandwidth (flow control disabled) 1 Gbit/s asymmetric bandwidth (flow control enabled)	AC mode: 500 Router mode: 150

Model	10/100/1000 Base-T Ethernet Port	Maximum Number of Concurrent Clients	Recommended Bandwidth	Management Capacity
RG-EG210G-P	10 (PoE supported)	200	600 Mbit/s asymmetric bandwidth (flow control disabled) 500 Mbit/s asymmetric bandwidth (flow control enabled)	AC mode: 500 Router mode: 150
RG-105GW(T)	5	100	600 Mbit/s (1500 bytes, NAT + flow audit) 400 Mbit/s (1500 bytes, NAT + authentication, application identification, flow audit, and flow control)	No. of Manageable Devices (AP + NBS Switches, Router Mode, including this device): 32 No. of Manageable Devices (AP + NBS Switches, Wired Repeater Mode, including this device): N/A No. of Manageable Devices (AP + NBS Switches, Wired Repeater Mode, including this device): 32 No. of Manageable Devices (ES Switches): 128

1.2 LED Indicators

LED Indicator	Status	Description
SYS	Flashing	Fast flashing (at 8 Hz): The router is starting up. Slow flashing (at 0.5 Hz): The network is unreachable. One long flash followed by three short flashes (at 0.8 Hz): The router is faulty. Flashing twice consecutively (at 0.8 Hz): ● The router is restoring factory settings. ● The router is upgrading the software. Note: Do not power off the router in this case.
	Solid on	The router is functioning properly.
	Off	The router is not powered on.
Port	Flashing	The port is connected and is sending/receiving traffic.
	Solid on	The port is connected and is not sending/receiving traffic.
	Off	No link is detected for this port.
Mesh	Off	● Mesh pairing is not implemented. ● Wireless relay is not set up.
	Flashing alternately	Mesh pairing is in progress.
	Three bars on	● The mesh signal strength is high. ● The wireless relay signal strength is high.
	Two bars on	● The mesh signal strength is medium. ● The wireless relay signal strength is medium.
	One bar on	● The mesh signal strength is low. ● The wireless relay signal strength is low.

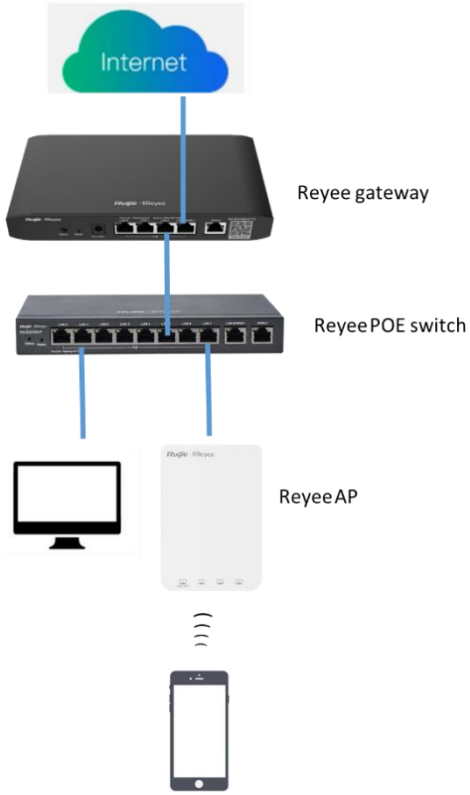
1.3 Button

Button	Description
Reset	Press the **Reset** button for less than 2 seconds to restart the device. Press the **Reset** button for over 5 seconds to restore the router to factory settings. (Release the button when the system status LED blinks). The default management IP address is http://192.168.110.1.
Mesh Button	Press the **Mesh** button for less than 2 seconds to perform mesh pairing.

2 Getting Started

2.1 Network Planning

The following figure shows a typical topology of a Reyee router.



The DHCP server has two address pools on the Reyee router: 192.168.110.0/24 in VLAN 1 for devices of this network and 192.168.10.0/24 in VLAN 10 for clients of this network.

The following ports are used for Ruijie Cloud management. To bring devices to go online on Ruijie Cloud, ensure that these ports are available and data flows are permitted on the network.

Domain name (Cloud-as)	DST.IP	Domain name (Cloud-eu，Cloud-me)	DST.IP	DST.TCP	DST.UDP
Device Online Related:		Device Online Related:			
devicereg.ruijienetworks.com	35.197.150.240	devicereg.ruijienetworks.com	35.190.10.141	80,443	
ryrc.ruijienetworks.com	35.197.150.240	ryrc.ruijienetworks.com	35.234.108.108	80,443	
stunrc.ruijienetworks.com	35.197.150.240	stunrc.ruijienetworks.com	35.234.108.108		34,783,479
stunsvr-as.ruijienetworks.com	34.126.80.150	stunsvr-eu.ruijienetworks.com	35.246.237.78		34,783,479
stunb-as.ruijienetworks.com	34.126.80.150	cwmpsvr-eu.ruijienetworks.com	34.159.112.239		34,783,479
stunc-as.ruijienetworks.com	34.87.169.209	cwmpcp-eu.ruijienetworks.com	34.120.73.71		34,783,479
cwmpsvr-as.ruijienetworks.com	35.197.136.171	cwmpb-eu.ruijienetworks.com	34.159.112.239	80, 443	
cwmpcp-as.ruijienetworks.com	34.160.143.162				
cwmpb-as.ruijienetworks.com	35.197.136.171				
Log Upload:		Log Upload:			
34.87.93.12	34.87.93.12	cloudlog-eu.ruijienetworks.com	35.246.247.49	80,443	
Advanced Service:		Advanced Service:			
firmware.ruijienetworks.com	34.87.32.36	firmware.ruijienetworks.com	34.89.153.55	80,443	
cloudweb.ruijienetworks.com	34.87.32.36	cloudweb.ruijienetworks.com	34.89.153.55	80,443	
fastonline.ruijienetworks.com	34.87.32.36	fastonline.ruijienetworks.com	34.89.153.55	80,443	
cloudapi.ruijienetworks.com	35.197.150.240	cloudapi.ruijienetworks.com	35.234.108.108	80,443	
cdn.ruijienetworks.com	35.201.94.110	cdn.ruijienetworks.com	35.190.93.193	80,443	
ES Series Switch		ES Series Switch			
iotrc.ruijienetworks.com	34.87.101.31	iotrc.ruijienetworks.com	34.107.106.56		7683
iotsvr-as.ruijienetworks.com	35.247.161.22	iotsvr-eu.ruijienetworks.com	35.242.228.40		5683
iotlog-as.ruijienetworks.com	35.240.167.168	iotlog-eu.ruijienetworks.com	35.198.144.180		6683
iotdl-as.ruijienetworks.com	34.87.141.45	iotdl-eu.ruijienetworks.com	35.234.118.145		8683
MQTT Devices with P206 version		MQTT Devices with P206 version			
ryrcmq.ruijienetworks.com	34.120.84.165	ryrcmq.ruijienetworks.com	34.149.186.87	25857	
ehrrcmq.ruijienetworks.com	34.120.84.165	ehrrcmq.ruijienetworks.com	34.149.186.87	25857	
mqclt001-as.rj.link	34.160.191.165	mqclt001-eu.rj.link	34.120.138.185	25857	

2.2 Installing the Router

2.2.1 Safety Suggestions

To avoid personal injury and equipment damage, read safety suggestions carefully before you install each device. The following safety suggestions do not cover all possible dangers

1. Installation

- Keep the chassis clean and free from any dust.
- Do not place devices in a walking area.
- Do not wear loose clothes or accessories that may be hooked or caught by devices during installation and maintenance.

2. Movement

- Do not frequently move devices.
- When moving devices, keep the balance and avoid hurting legs and feet or straining the back.
- Before moving devices, turn off all power supplies and dismantle all power modules.

3. Electricity

- Observe local regulations and specifications when performing electric operations. The operators must be qualified.
- Before installing the device, carefully check any potential danger in the surroundings, such as ungrounded power supply, and damp or wet ground or floor.
- Before installing the device, find out the location of the emergency power supply switch in the room. First cut off the power supply in the case of an accident.
- Try to avoid maintaining the switch that is powered on alone.

- Make a careful check before you cut off the power supply.
- Do not place the equipment in a damp location. Do not let any liquid enter the chassis.

4. Static Discharge Damage Prevention

To prevent damage from static electricity, pay attention to the following points:

- Proper ground grounding screws on the back panel of the device; use a three-wire single-phase socket with the protective earth wire (PE) as the AC power socket.
- Prevent indoor dusts.
- Ensure proper humidity conditions.

5. Laser

Some devices support varying models of optical modules that are Class I laser products sold on the market. Improper use of optical modules may cause damage. Therefore, pay attention to the following points when you use them:

- When a fiber transceiver is working, ensure that the port has been connected to an optical fiber or is covered with a dust cap, to keep out dust and avoid burns.
- When the optical module is working, do not pull out the fiber cable or look directly into a transceiver. The transceiver emit laser light that can damage your eyes.

2.2.2 Installation Site Requirement

The installation site must meet the following requirement to ensure normal working and a prolonged durable life Reyee EG series routers.

1. Ventilation

For installing devices, reserve at least 10 cm distances from both sides and the back plane of the cabinet at ventilation openings to ensure good ventilation. After cables have been connected, bundle or place the cables on the cabling rack to prevent them from blocking the air inlets. It is recommended that the device be cleaned at regular intervals. In particular, avoid dusts from blocking the screen mesh on the back of the cabinet.

2. Temperature and Humidity

To ensure normal operation and prolong the service life of the router, keep proper temperature and humidity in the equipment room.

If the temperature and humidity in the equipment room do not meet the requirements for a long time, the router may be damaged.

In an environment with a high humidity, insulating materials may have bad insulation or even leaking electricity. Sometimes the materials may suffer from mechanical performance change and metallic parts may get rusted.

In an environment with a low humidity, insulating strips may dry and shrink. Static electricity may occur easily and endanger circuits on the device.

In an environment with a high temperature, the router is subject to more serious harm. Its performance may degrade significantly and various hardware faults may occur.

3. Cleanness

Dust poses a severe threat to the running of the router. The indoor dust falling on the equipment may be absorbed by the static electricity, causing bad contact of the metallic joint. Such electrostatic absorption may occur more easily when the relative humidity is low. This affects the lifecycle of the AP and causes communication faults.

4. Grounding

A good grounding system is the basis for stable and reliable operation of the device, preventing lightning strokes and resisting interference. Carefully check the grounding conditions at the installation site according to the grounding requirements, and perform grounding operations properly as required.

- Lightning Grounding

  The lightning protection system of a facility is an independent system that consists of the lightning rod, down conductor, and connector to the grounding system, which usually shares the power reference ground and ground cable. The lightning discharge ground is targeted for the facility.

- EMC Grounding

  The grounding required for EMC design includes the shielding ground, filter ground, noise and interference suppression, and level reference. All the above constitute the comprehensive grounding requirements. The resistance of earth wires should be less than 1 Ω.

5. EMI

Electro-Magnetic Interference (EMI), from either outside or inside the device or application system, affects the system in the conductive ways such as capacitive coupling, inductive coupling, and electromagnetic radiation.

There are two types of electromagnetic interference: radiated interference and conducted interference, depending on the type of the transmission path.

When the energy, often RF energy, from a component arrives at a sensitive component through the space, the energy is known as radiated interference. The interference source can be either a part of the interfered system or a completely electrically isolated unit. Conducted interference results from an electromagnetic wire or signal cable connection between the source and the sensitive component, along which cable the interference conducts from one unit to another. Conducted interference often affects the power supply of the device, but can be controlled by a filter. Radiated interference may affect any signal path in the device and is difficult to shield.

- For the TN AC power supply system, the single-phase three-core power socket with protective earthing conductors (PE) should be adopted to effectively filter out interference from the power grid through filtering circuits.
- Do not use the grounding device for an electrical device or anti-lightning grounding device. In addition, the grounding device of the device must be deployed far away from the grounding device of the electrical device and anti-lightning grounding device.
- Keep the device away from the high-power radio transmitter, radar transmitting station, and high-frequency large-current device.
- Take measures to shield static electricity.
- Lay interface cables inside the equipment room. Outdoor cabling is prohibited, avoiding damages to device

signal interfaces caused by over-voltage or over-current of lightning.

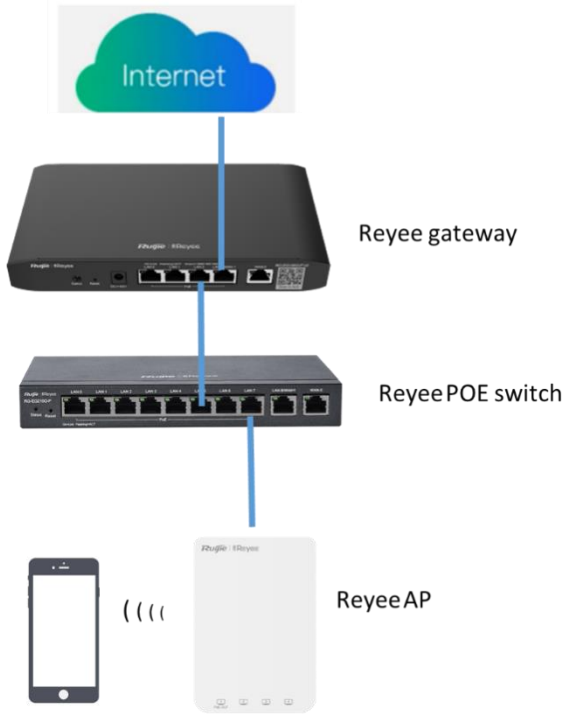
2.2.3 Installation Steps

For details about installation steps, *see Hardware Installation and Reference Guide*.

2.3 Quick Provisioning

2.3.1 Quick Provisioning Through Ruijie Cloud App

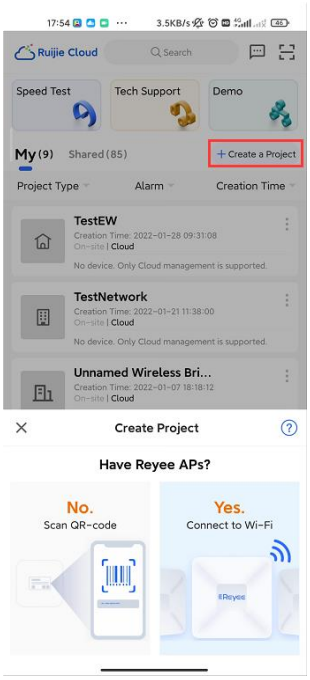
The Reyee router is often used with a Reyee PoE switch and a Reyee RAP.



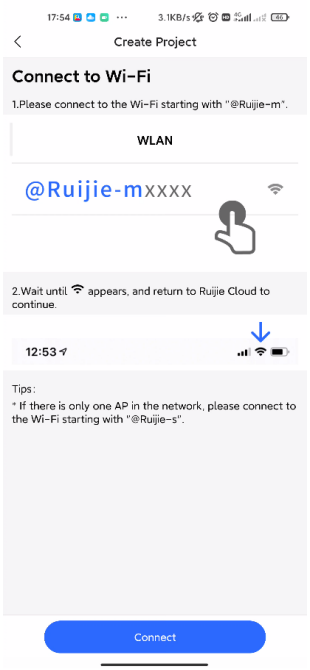
Connect the devices through Ruijie Cloud App for configuration and remote maintenance.

(1) Create a project.

a Open Ruijie Cloud App, click **Create a Project,** and select **Connect to Wi-Fi**.



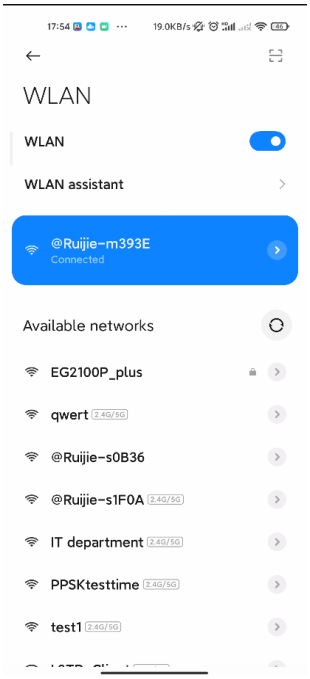
b After you click **Yes**, Ruijie Cloud App will ask you to connect SSID **@Ruijie-mxxxx**.



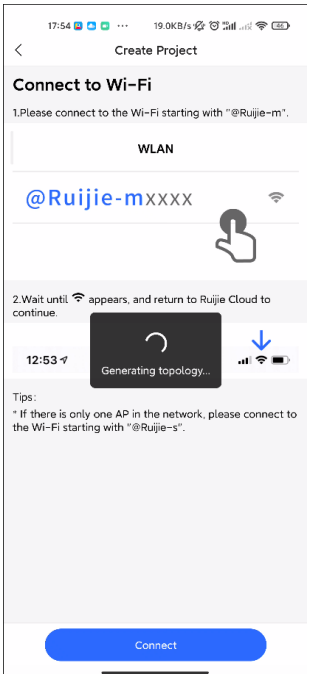
Note

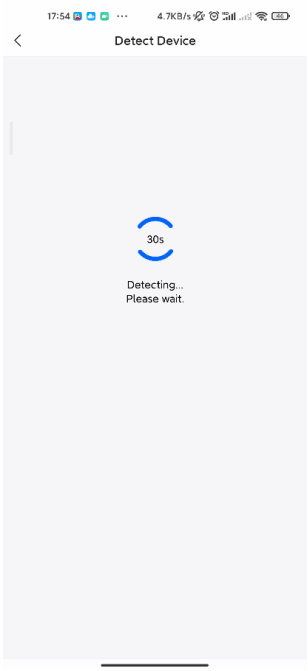
@Ruijie-m*xxxx* is generated after network self-organization established successfully, while **@Ruijie-s*xxxx*** is generated on a standalone device. ***xxxx*** is the last four digits of the MAC address of a device.

c Click **Connect** and access SSID **@Ruijie-mxxxx**.

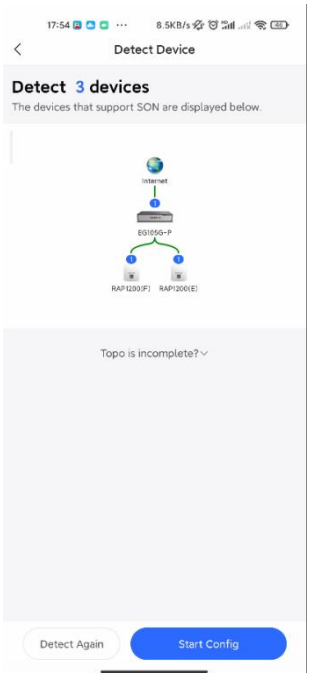


d After you access SSID **@Ruijie-mxxxx SSID**, Ruijie Cloud App will generate the topology and detect all devices on the SON.



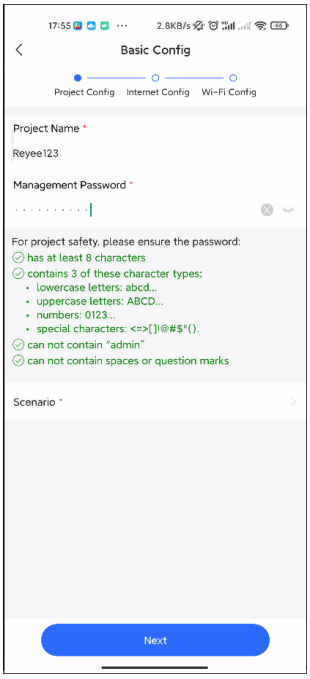


e After all devices are detected, Cloud App will display them and show the topology.

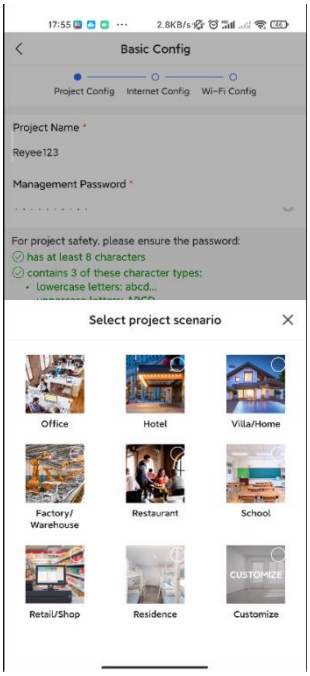


(2) Click **Start Config** to perform basic configuration of this project.

a Set **Project Name** and **Management Password**.

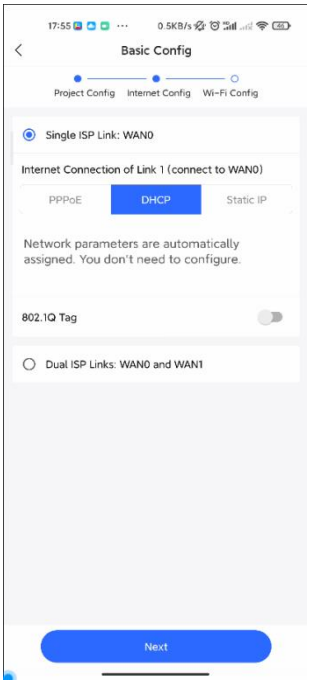


b Select the scenario of this project based on your requirement.



(3) Configure the Internet.

For WAN configuration, you can choose **PPPoE**, **DHCP**, or **Static IP**.



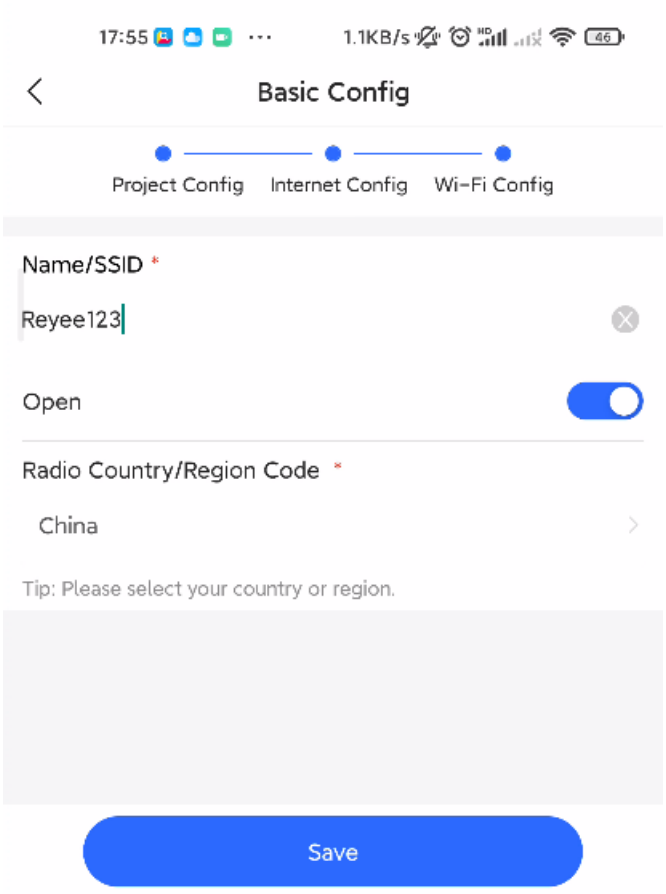
(4) Configure the SSID.

a Enter the name of the SSID.

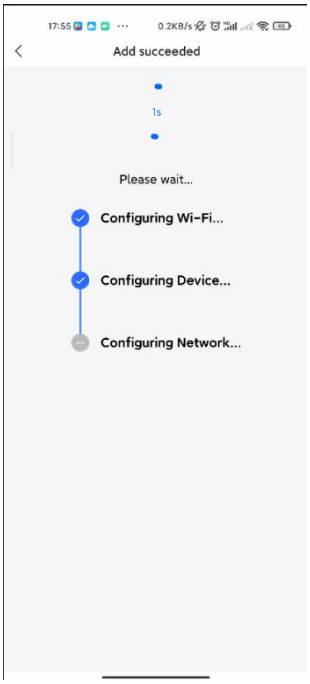
b Configure it as open to allow clients to access this SSID.

c Configure the password for this SSID.

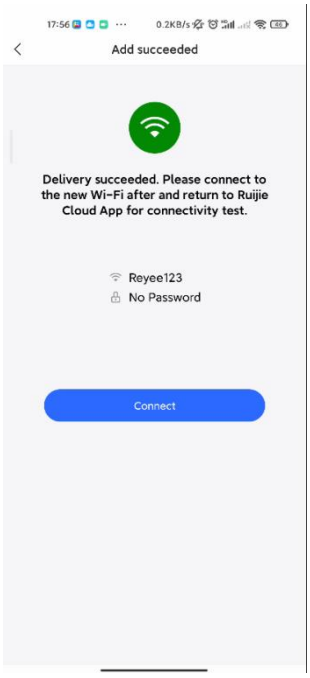
d Select the region code.



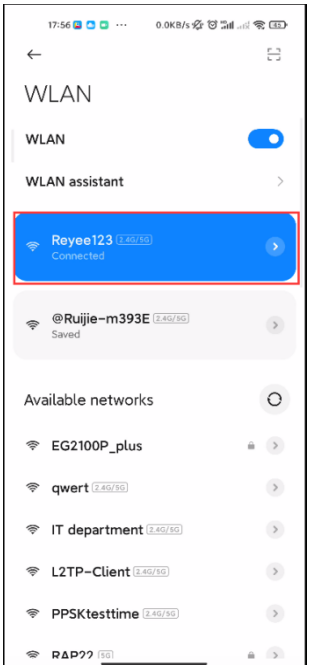
e The configuration will be synchronized to the network.



f After about 3s, Ruijie Cloud App will prompt that the configuration is delivery succeed.

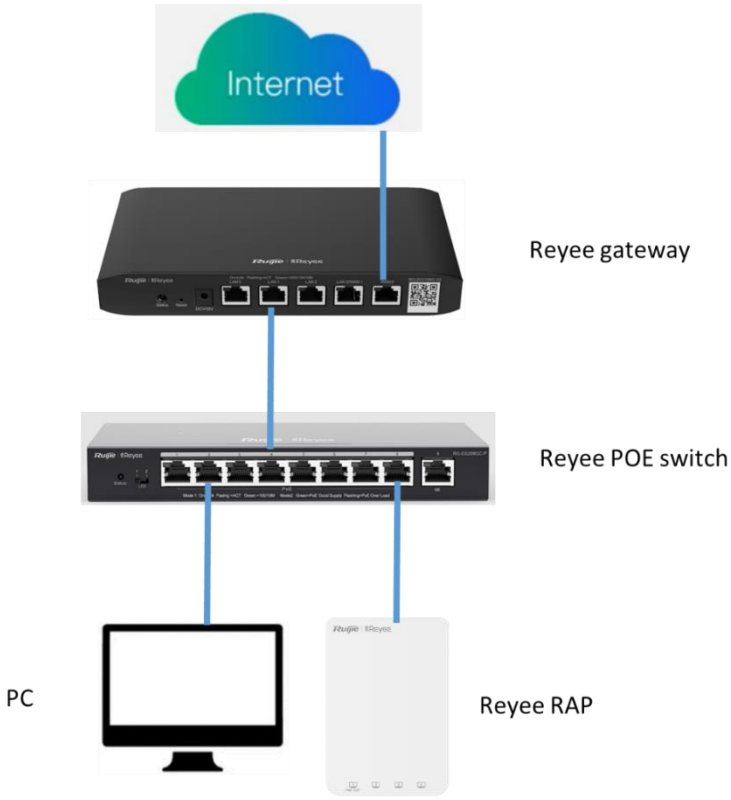


g Connect to the SSID created just now to manage the whole network on Cloud App.



2.3.2 Quick Provisioning Through Reyee Eweb

The Reyee router is often used with a Reyee PoE switch and a Reyee RAP.

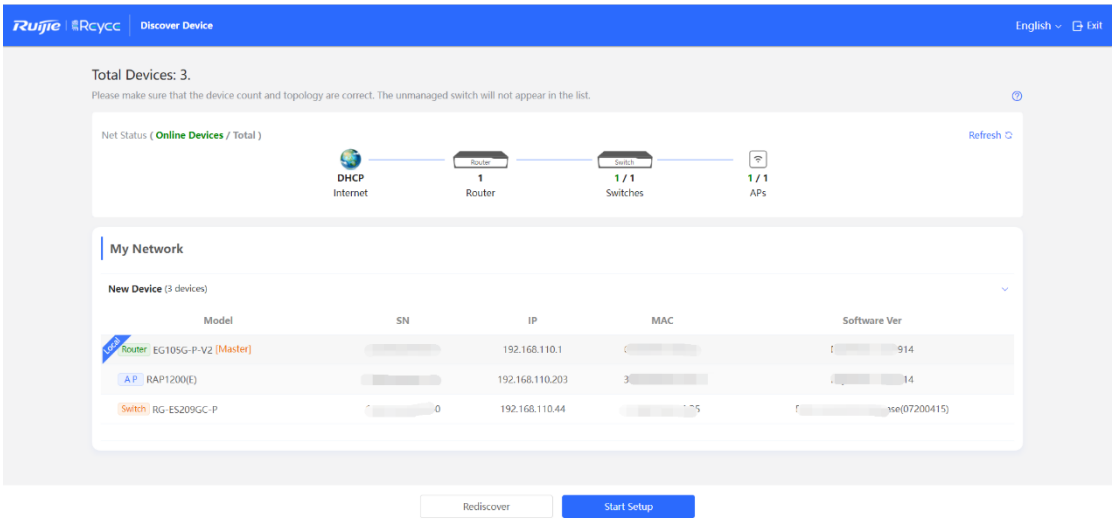


You can use a web management system to configure and maintain the Reyee router.

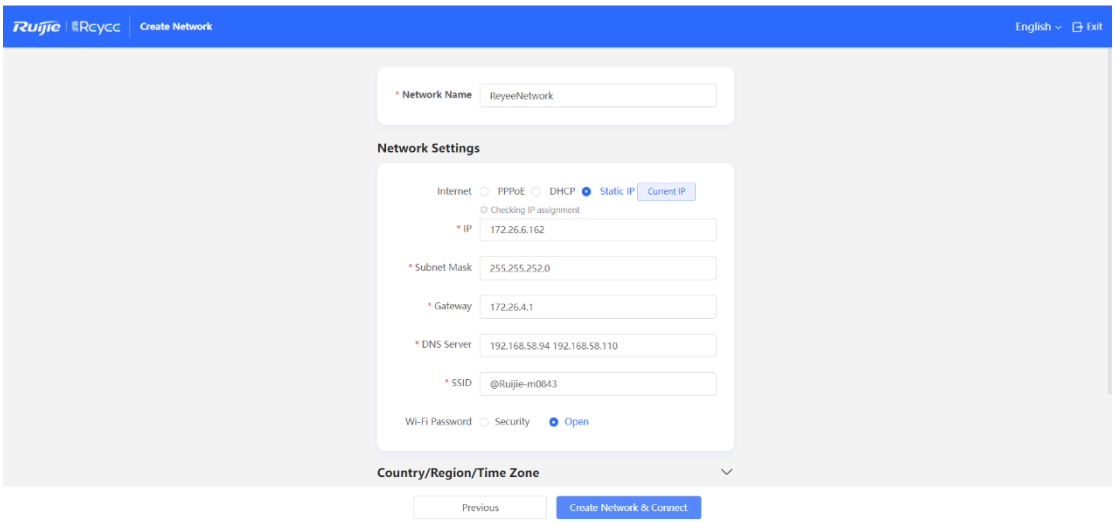
(1) Connect a PC to a PoE switch, set the IP address of PC to the static IP address 192.168.110.x.

(2) Enter 192.168.110.1 in the address bar of the browser to log in to the Eweb of the EG.

All devices on the network will be displayed in Eweb.



(3) Click **Start Setup** to perform quick start of the network.

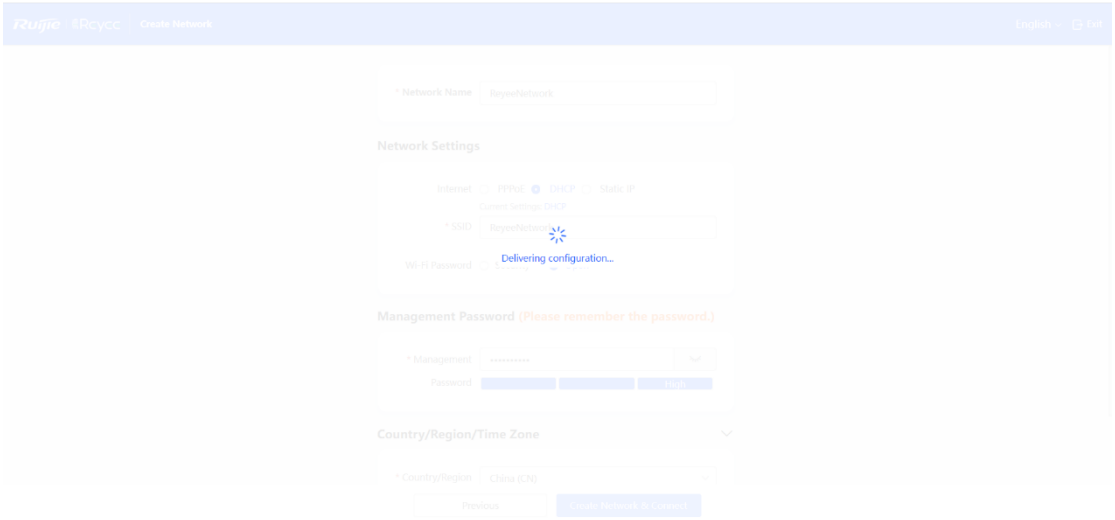


a Enter the network name, and configure the Internet access mode of this network.

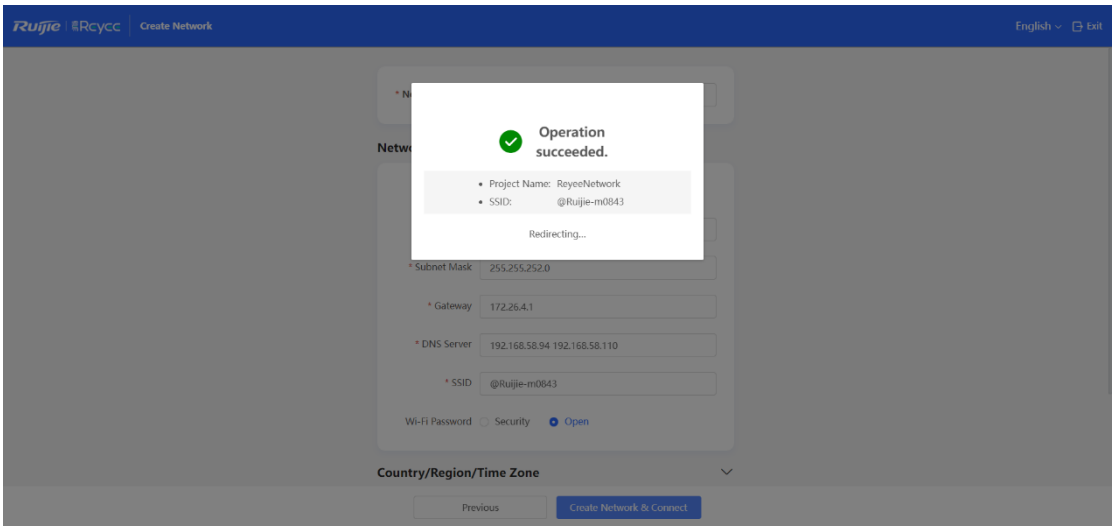
b Enter the password of the SSID or configure the SSID as open.

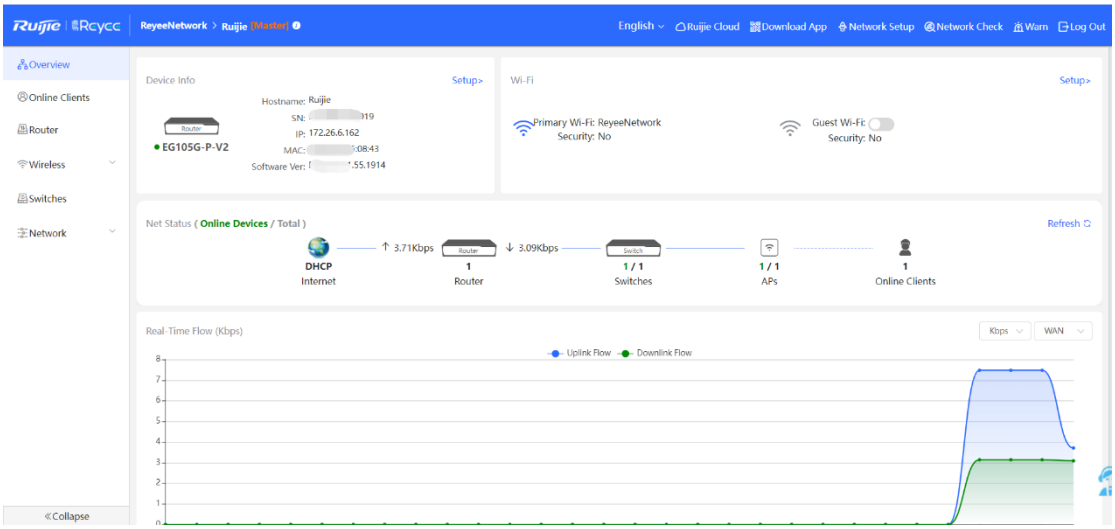
c Select the country/region.

(4) Click **Create Network & Connect**. The configuration will be delivered and activated.



After the configuration has been delivered and activated, you can access the **Overview** page to manage the SON of Reyee devices.





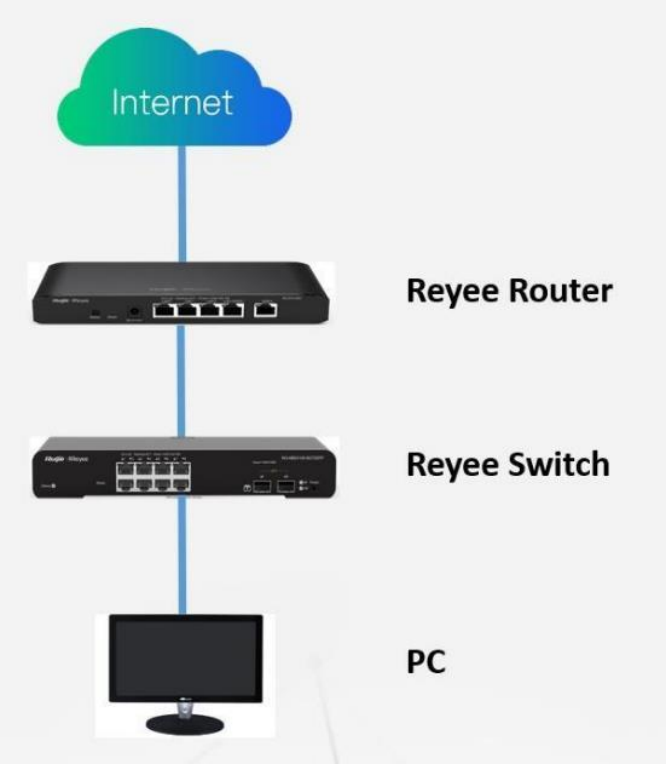
3 Device Management

3.1 Login

Eweb is a web-based network management system used to manage or configure devices. You can access Eweb through a browser such as Google Chrome. Web-based management involves a web server and a web client. The web server, which is integrated in a device, is used to receive and process requests from the client, and to return processing results to the web client. The web client usually refers to a browser, such as Google Chrome, IE, or Firefox.

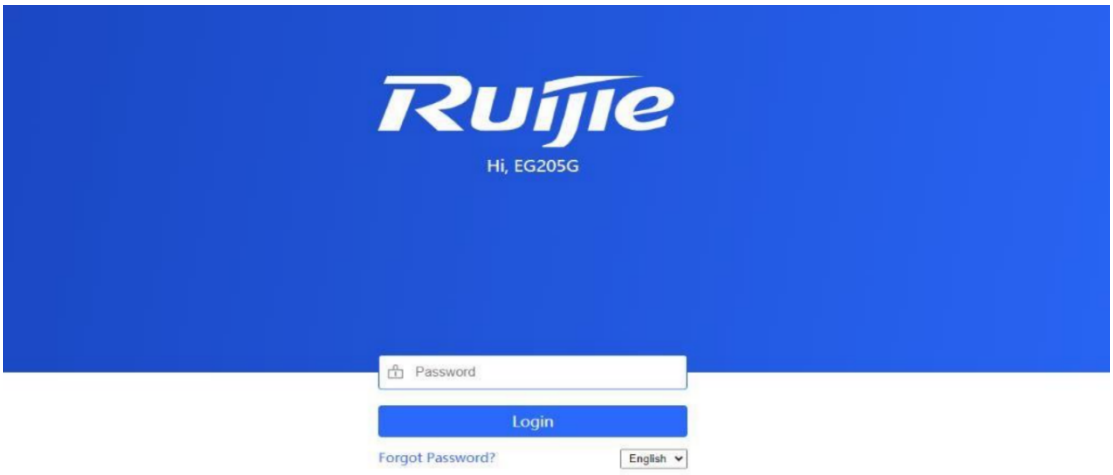
Reyee routers support both web interface management and remote management through life-time-free Ruijie Cloud App and Ruijie Cloud platform. You can view the network status, modify the configuration, and troubleshoot faults easily.

You can access the Eweb management system of an access or aggregation switch through a PC browser to manage and configure the device.



1. Set PC's IP assignment mode to obtain IP addresses automatically.
2. Visit http://192.168.110.1 through Microsoft Chrome.
3. Enter the password on the login page and click **Login**.

   The default password is **admin**.



For the Reyee EG device, you may use either 192.168.110.1 or 10.44.77.254 to access the device.

The default login password for all Reyee devices is **admin**.

You may visit https://10.44.77.253 to log in to the master device of the Reyee network.

3.2 Configuring the Login Password

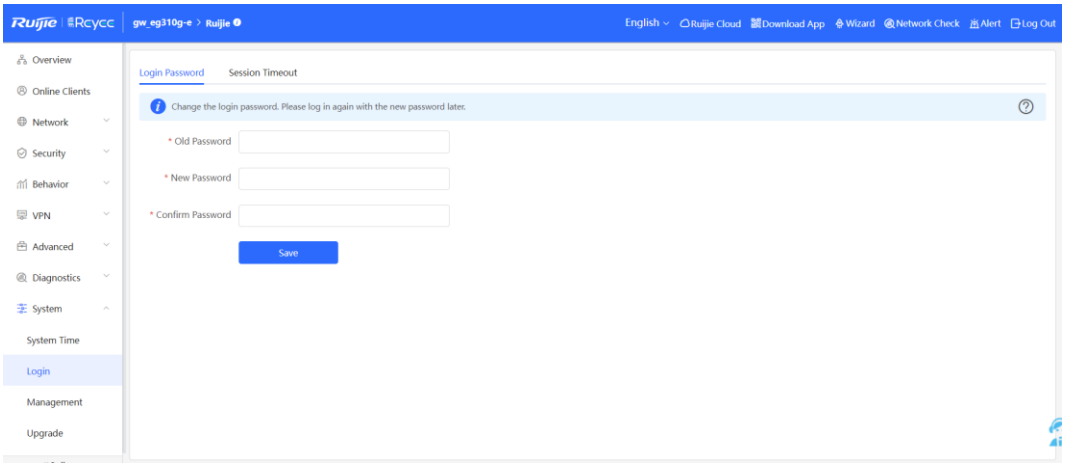
Change your password regularly to ensure account security.

(1) Log into the web management system by using the default IP address.

(2) Choose **System** > **Login > Login Password**.

(3) Enter the old password and new password.

(4) Click **Save**.



After saving the configuration, use the new password to log in.

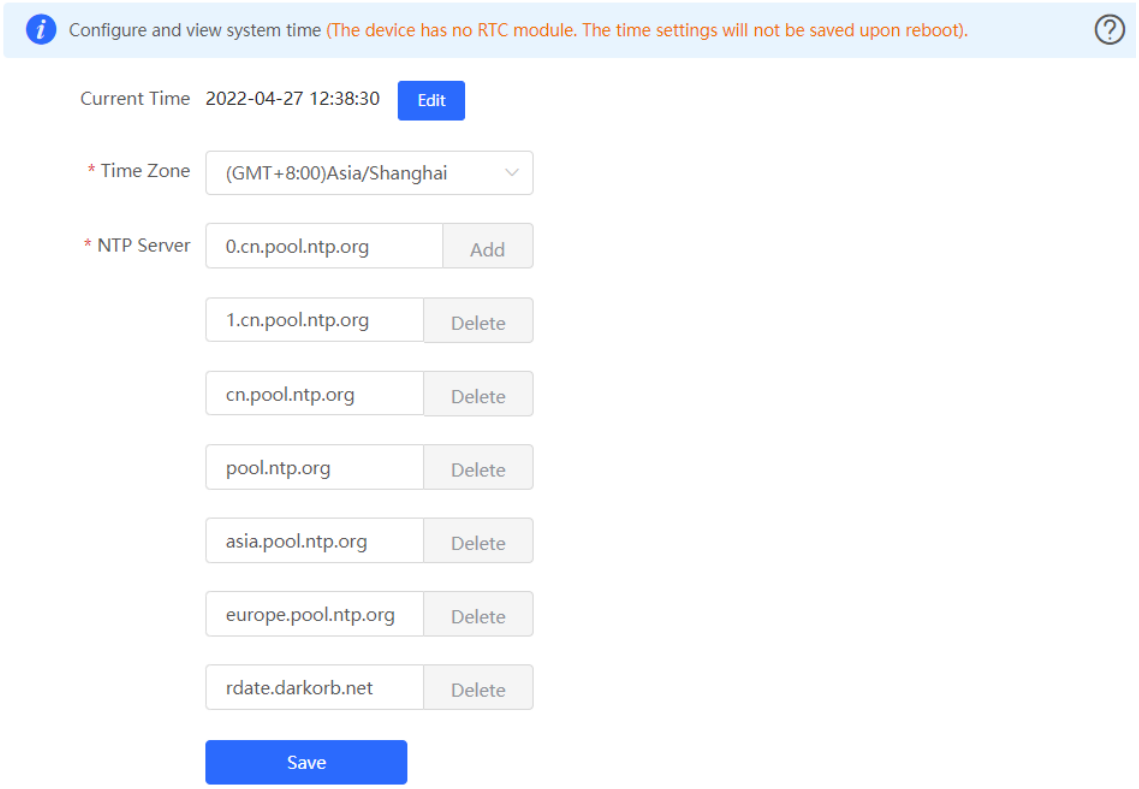
Caution

In SON network mode, the login password of all devices on the network will be changed synchronously.

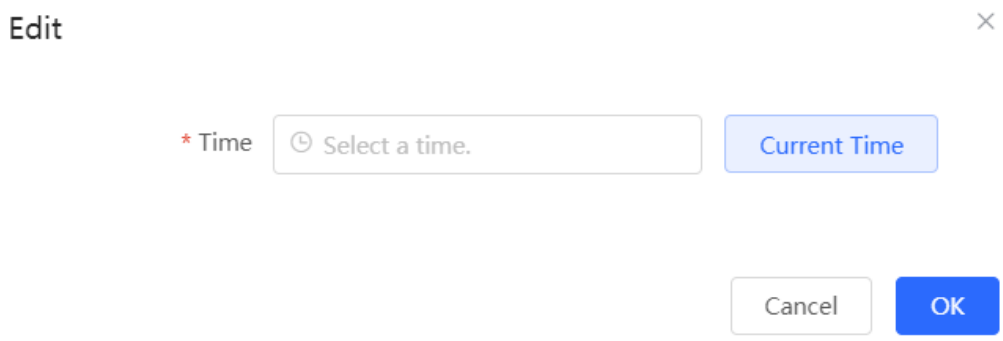
3.3 Configuring the System Time

Choose **System** > **System Time**.

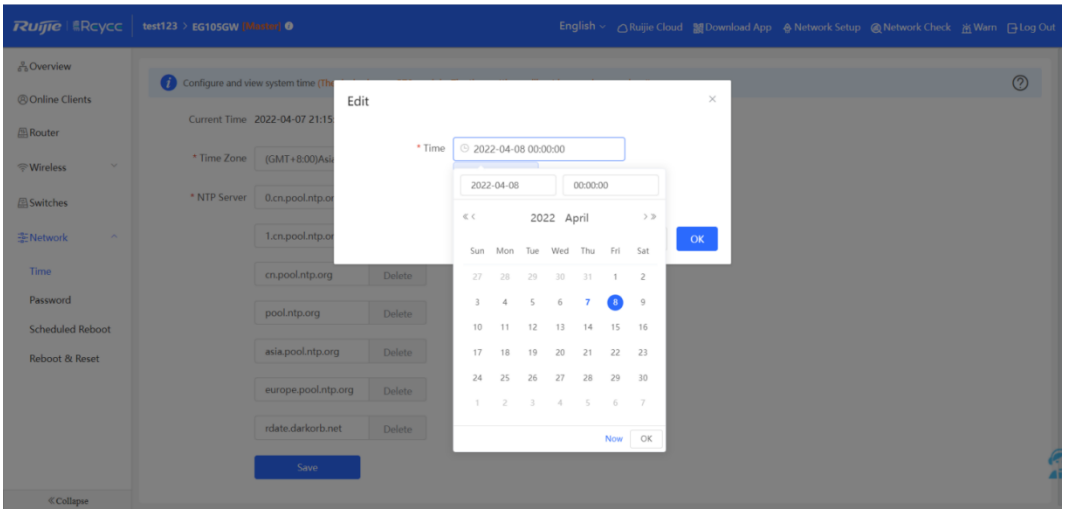
You can view the current system time. If the time is incorrect, check and select the local time zone. If the time zone is correct but the time is still incorrect, click **Edit** to manually set the time. In addition, the device supports Network Time Protocol (NTP) servers. By default, multiple servers serve as the backup of each other. You can add or delete the local server as required.

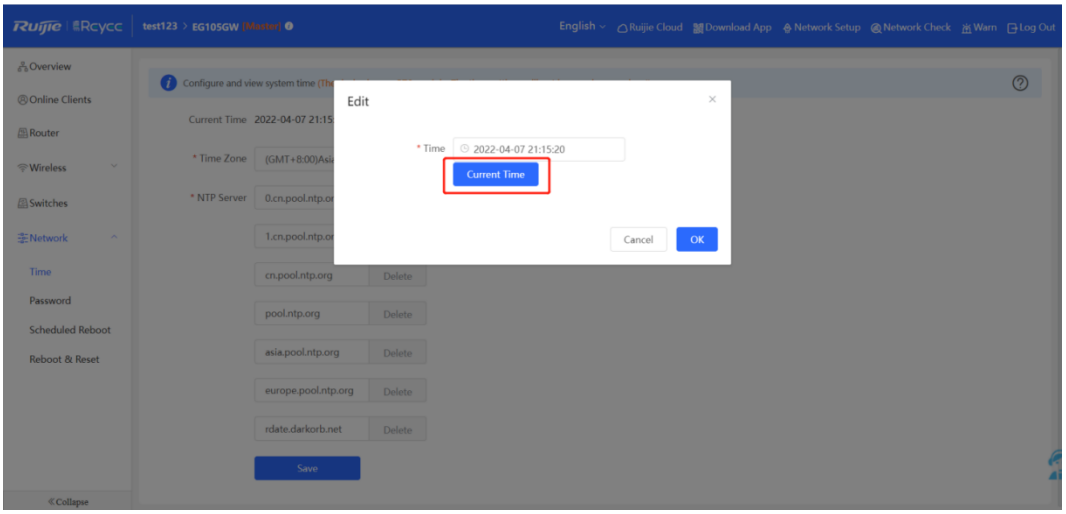


Choose **Current Time** > **Edit** > **Current Time**. The current system time will be filled in automatically.

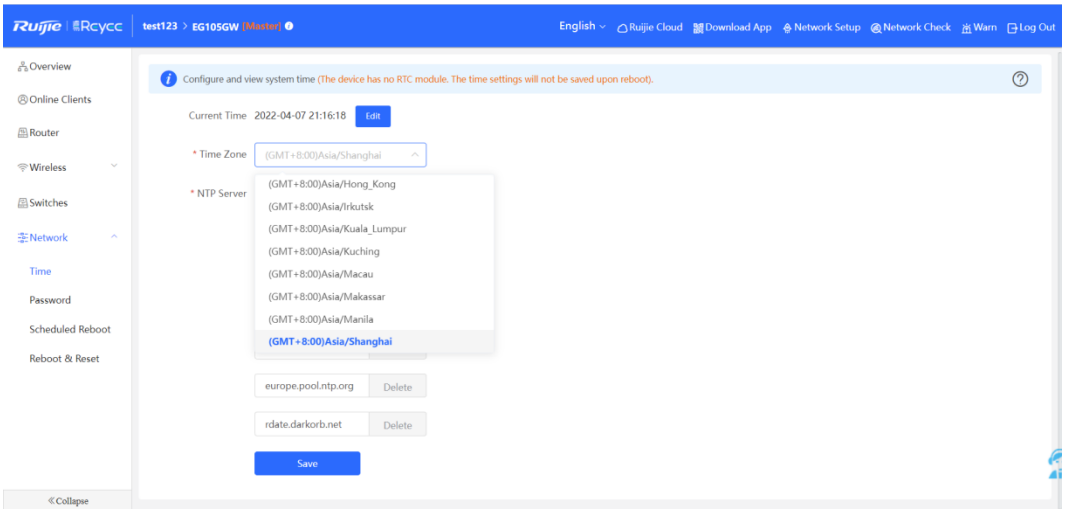


- Manually edit the current time or click **current time** to synchronize the current time automatically.

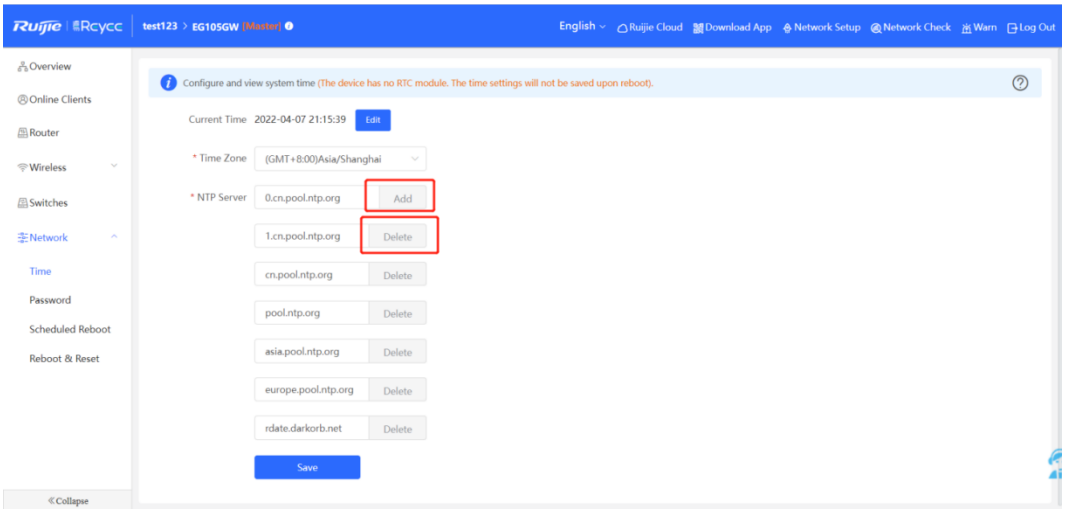




- Manually select a value from the **Time Zone** drop-down list box.



- Add or delete the NTP server.



3.4 Configuring Upgrade

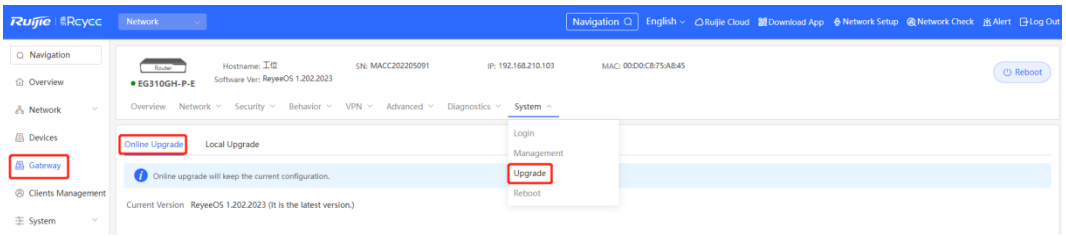
To use new features, upgrade the router to the latest version. There are two methods of upgrading routers: online upgrade and local upgrade.

3.4.1 Online Upgrade

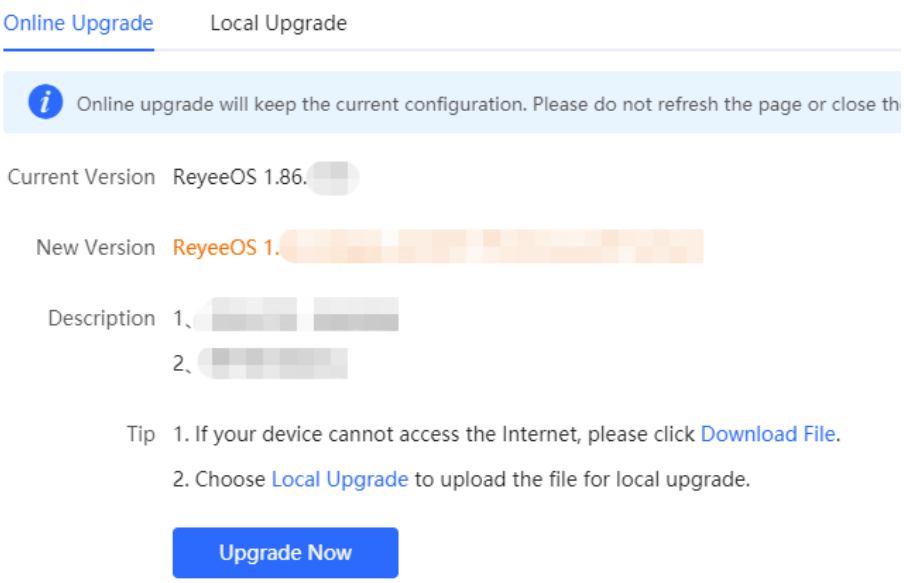
The router that is connected to the Internet can be upgraded online.

Log in to the Eweb of the device.

(1) Choose **Gateway** > **System** > **Upgrade** > **Online Upgrade**.



- If a prompt appears indicating the current version is the latest one, you do not need to upgrade the router.
- If a new version is available, you can click **Upgrade Now** to upgrade the router. The upgrade operation does not affect the current configuration, but the router will restart after being upgraded successfully. Do not refresh the page or close the browser during the upgrade. You are redirected to the login page automatically after the upgrade.



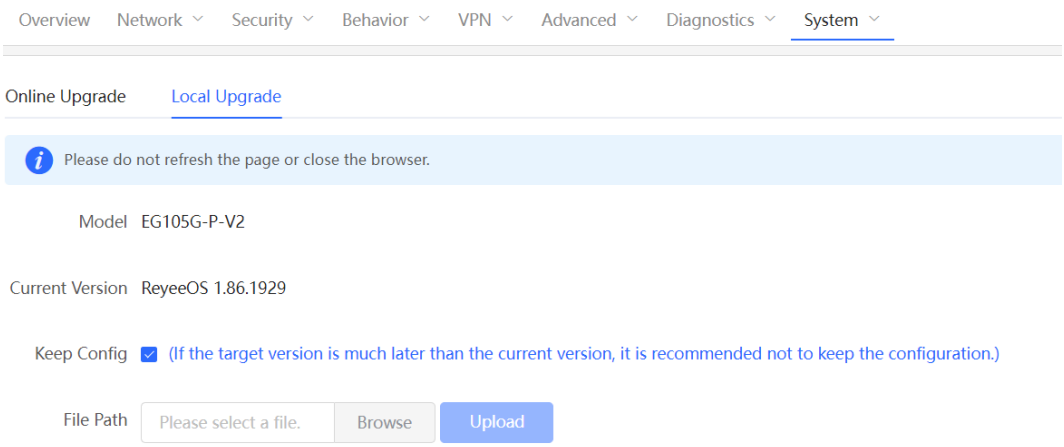
3.4.2 Local Upgrade

Upgrade the router by uploading a local upgrade package.

Confirm the target version and download the upgrade package from the official website.

(1) Log in to the Eweb of the router.

(2) Choose **Gateway** > **System** > **Upgrade** > **Local Upgrade**.



(3) Click **Browse**, select an upgrade package on the local PC, and click **Upload** to upload the file.

(4) After the file is uploaded successfully, the system displays upgrade package information and asks for the upgrade. Click **OK** to start the upgrade.

(5) After the upgrade is complete, choose **Gateway** > **Overview** and check whether the current version is consistent with the target version in the **Device Details** pane.

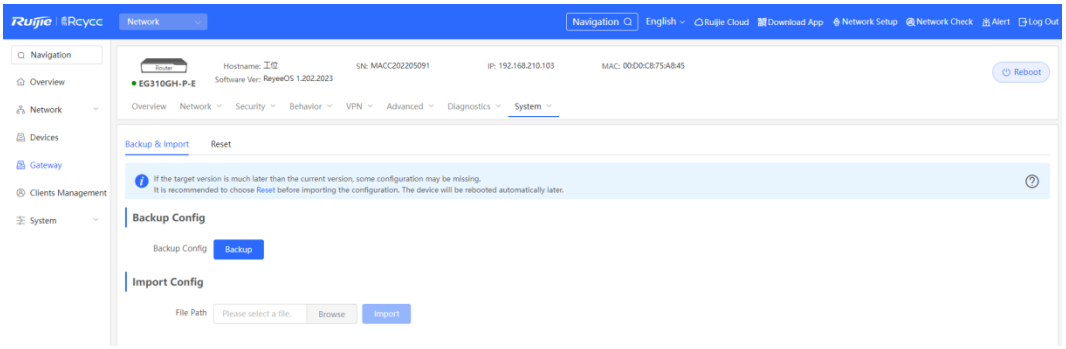
- If versions are consistent, the upgrade is successful.
- If versions are inconsistent, the upgrade fails. Try again or contact RITA.

3.5 Backing Up or Restoring the Configuration

Back up the configuration to restore the configuration quickly in the case of a failure.

(1) Log into the Eweb of the router.

(2) Choose **Gateway** > **System** > **Management**.



(3) Click **Backup** to download a configuration file locally.

(4) To restore the configuration, click **Browse**, select a backup file on the local PC, and click **Import** to import the configuration file. The router will restart.

If the target version is much later than the current version, some configuration may be missing.

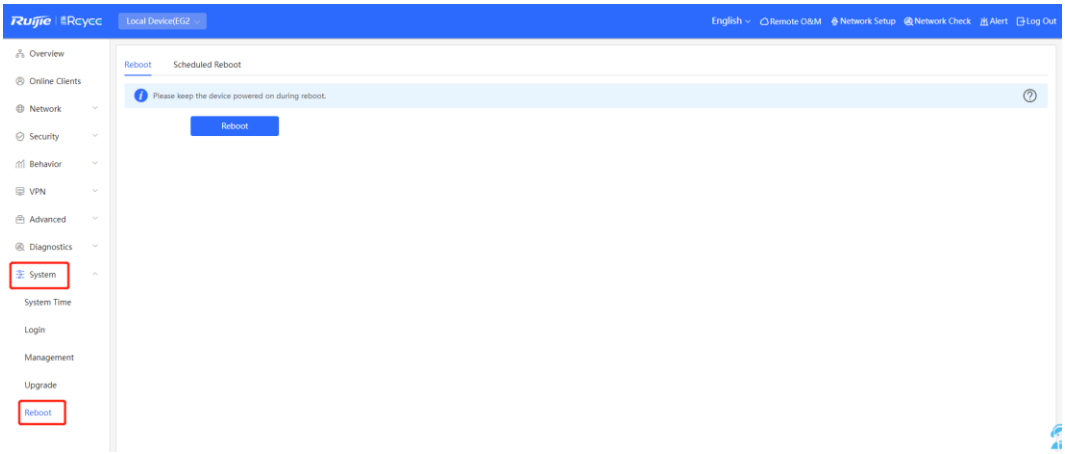
You are advised to restore the settings before importing the configuration. The router will restart automatically if you restore it.

3.6 Configuring Restart

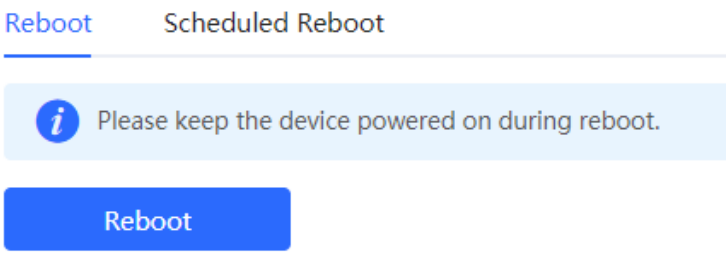
3.6.1 Restarting the Current Device

- Switch to the **Local Device** mode.

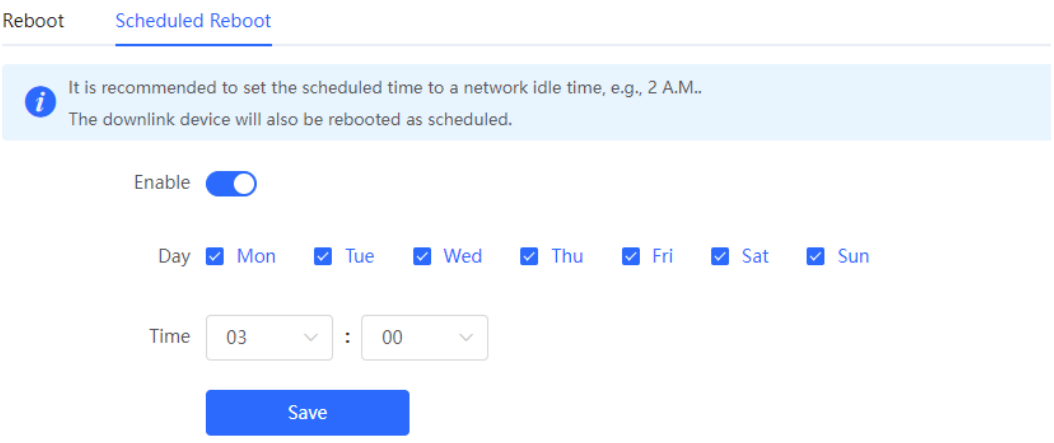
Choose **System** > **Reboot**.



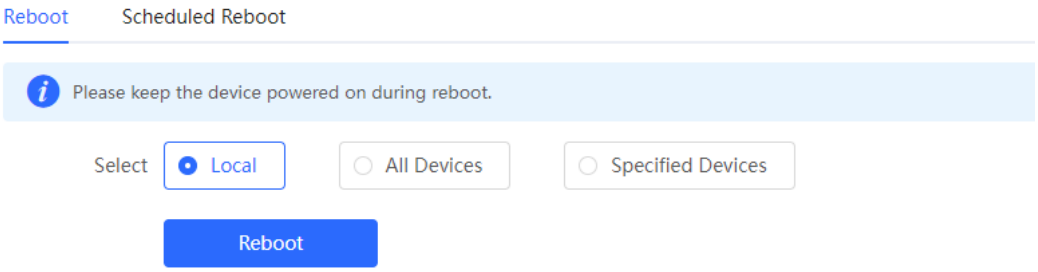
Click **Reboot**. The device will restart immediately. Do not refresh or close the page during restart. After the device restarts, you will be redirected to the login page.



Click **Scheduled Reboot**. Enable this feature and select the scheduled restart time. The device will restart as scheduled.

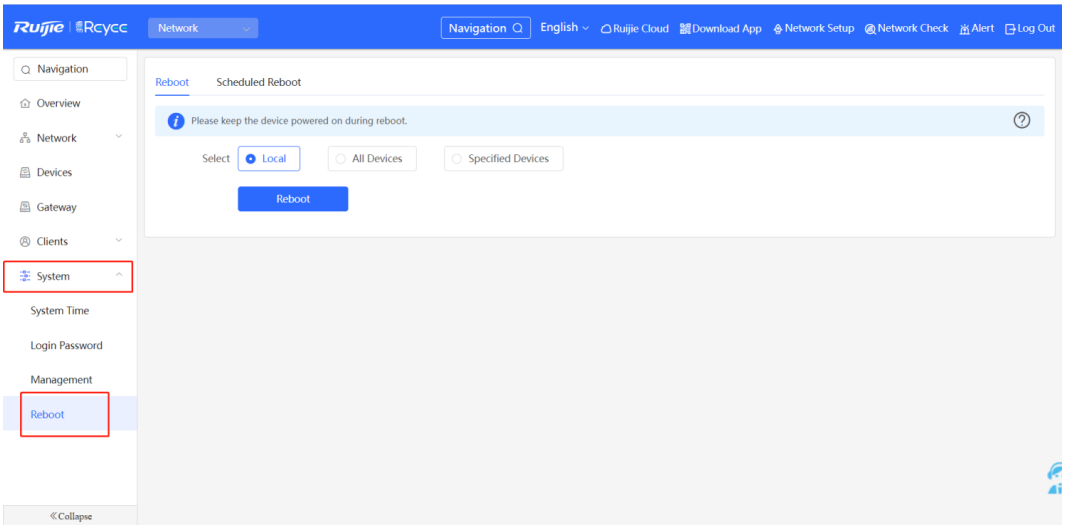


- Switch to the **Network** mode.
  - Choose **System** > **Reboot** > **Reboot**. Select **Local** to restart the current device.

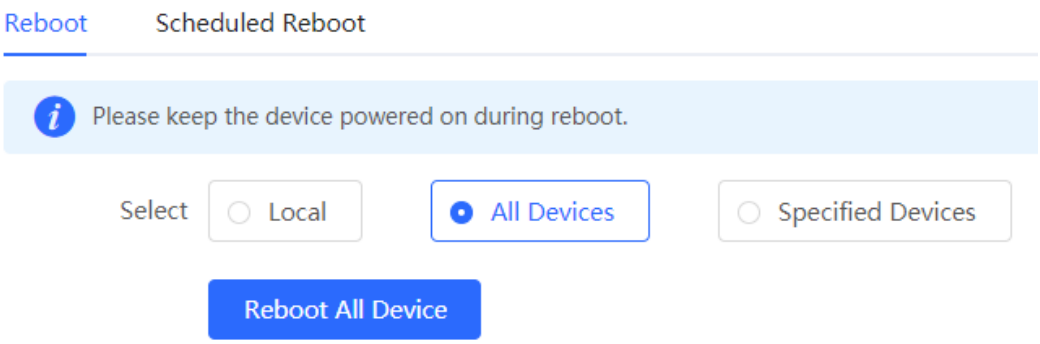


3.6.2 Restarting All Devices on the Network

Switch to the **Network** mode. Choose **System** > **Reboot** > **Reboot**.



Select **All Devices**, and click **Reboot All Device** to restart all devices on the network.



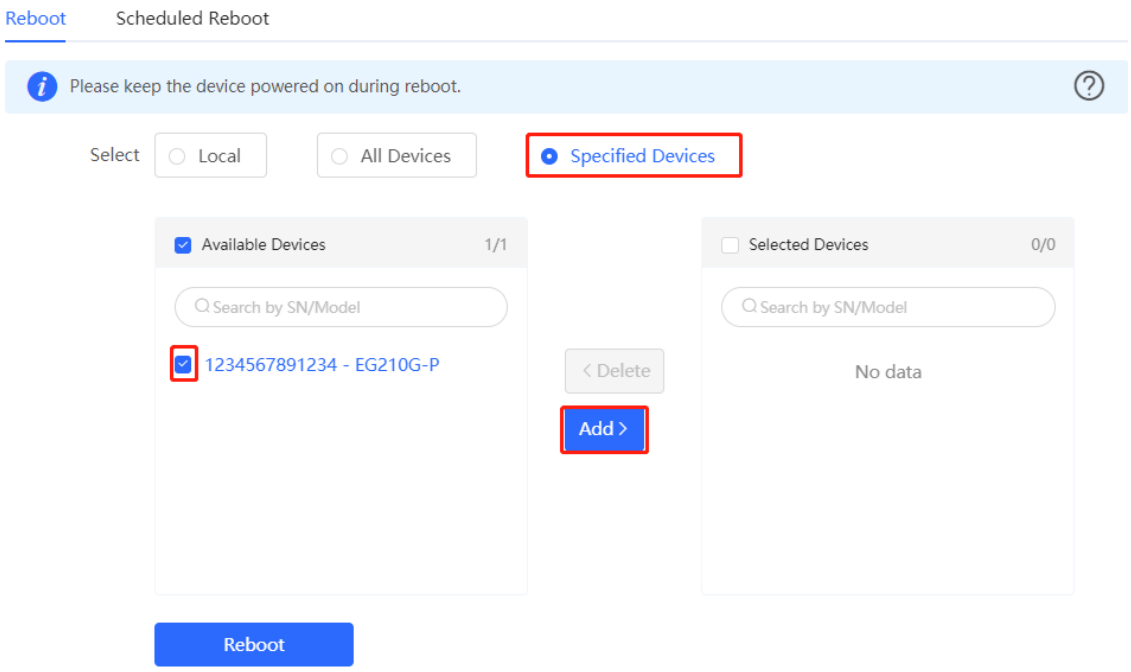
Caution

The operation takes some time and affects the entire network. Therefore, exercise caution when performing this operation.

3.6.3 Restarting Specified Devices

Switch to the **Network** mode. Choose **System** > **Reboot** > **Reboot**.

Click **Specified Devices**, select required devices from the **Available Devices** list, and click **Add** to add devices to the **Selected Devices** list on the right. Click **Reboot**. Specified devices in the **Selected Devices** list will restart.



3.6.4 Configuring Scheduled Restart

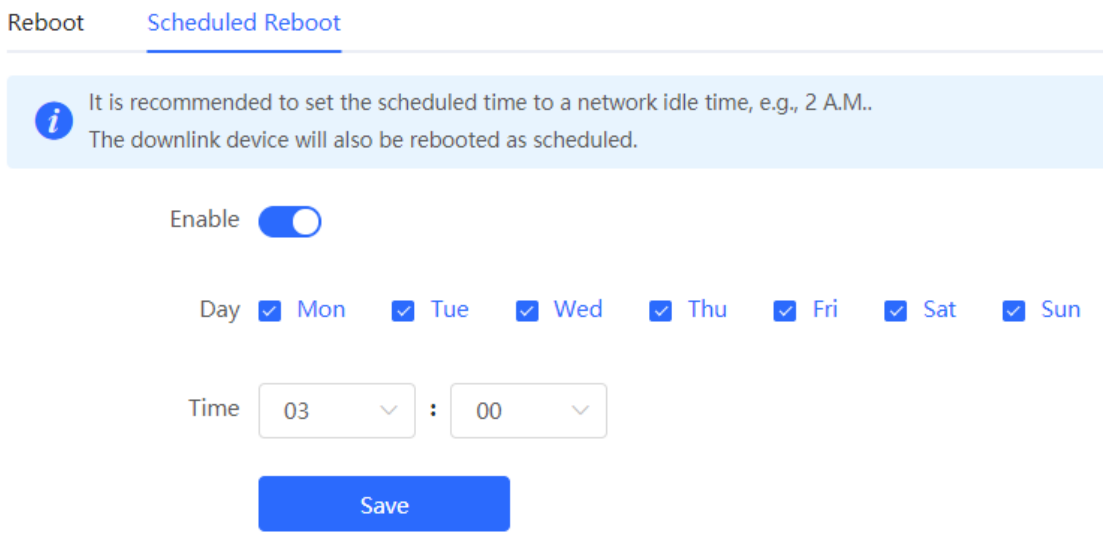
Confirm that the system time is accurate to avoid network interruption caused by device restart at an incorrect time point. For details about how to configure the system time, see section 3.3 Setting and Displaying System Time.

Choose **System** > **Reboot** > **Scheduled Reboot**.

Toggle the switch to **Enable**, and select the date and time of scheduled restart every week. Click **Save**. When the system time matches the scheduled restart time, the device will restart. You are advised to set scheduled restart time to off-peak hours.

Caution

The operation affects the entire network. Therefore, exercise caution when performing this operation.



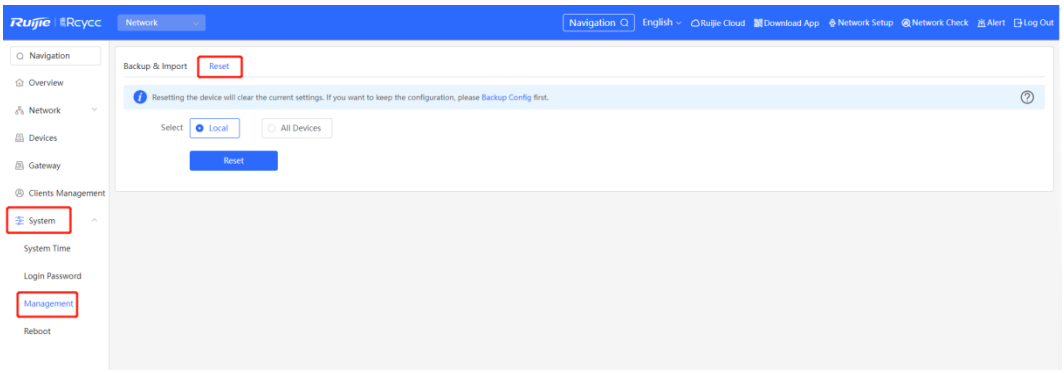
3.7 Restoring Factory Settings

Restore the device to factory settings and the default password.

The operation deletes all current configuration. You are advised to back up the configuration before restoring factory settings.

(1) Log in to the Eweb of the device.

(2) Choose **System** > **Management** > **Reset**.



(3) Select the target device.

- **Local**: Select **Local**. Only the local device is restored.
- **All Devices**: Select **All Devices**. All devices on the network are restored.

(4) Click **Reset** to restore the selected devices to factory settings.

4 Common Settings

4.1 Network Access Setting

Perform network configuration to connect the router to the Internet quickly.

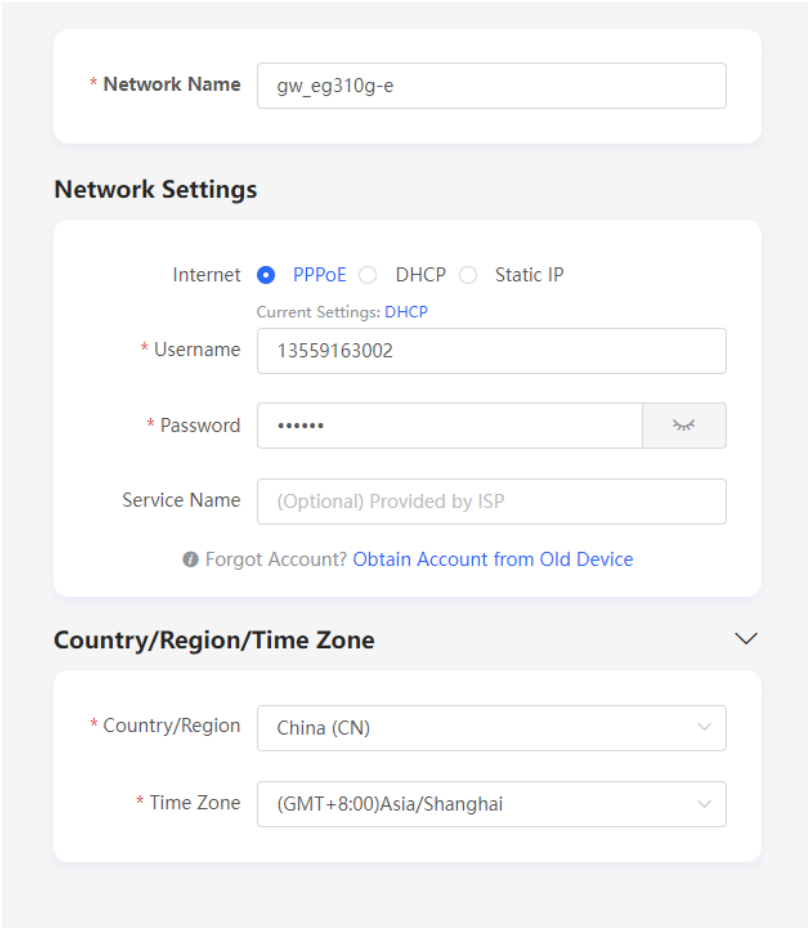
Three Internet access modes are available:

- PPPoE
- DHCP
- Static IP address

4.1.1 PPPoE Configuration Through a WAN Port

(1) Click **Wizard** to access the configuration wizard page.

Set **Internet** to **PPPoE** in the **Network Settings** pane.

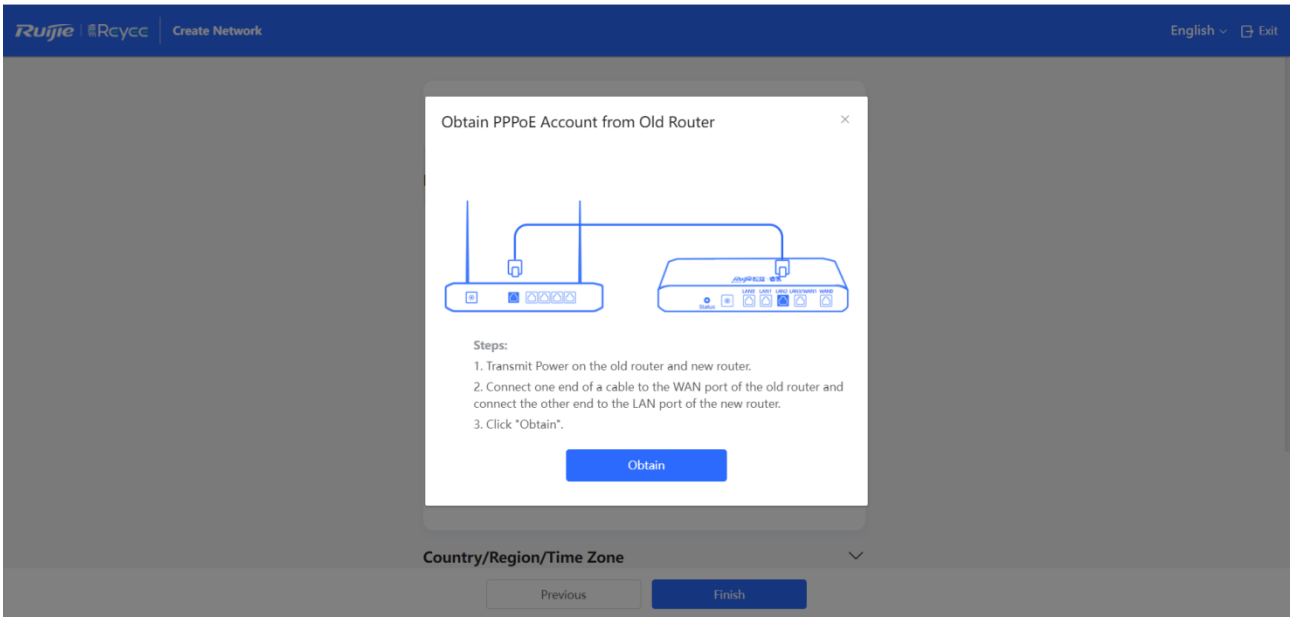


(2) Enter your **Username** and **Password** obtained from an ISP. **Service Name** is optional.

(3) If you forget the password from the ISP, click **Obtain Account from Old Device.**

(4) Click **Create Network & Connect**. The router initiates a connection with the Internet.

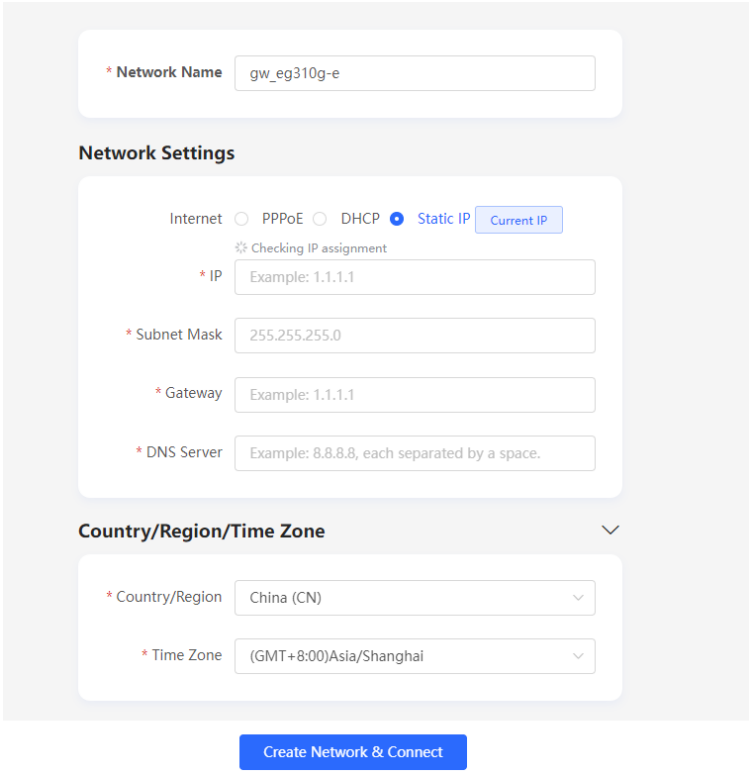
(5) After connecting the router to the Internet, you can manage the router on Ruijie Cloud or Eweb.



4.1.2 Static IP Address Configuration Through a WAN Port

(1) Click **Wizard** to access the configuration wizard page.

(2) Set **Internet** to **Static IP** in the **Network Settings** pane.



(3) Configure an IP address, a subnet mask, a gateway IP address, and a DNS server address.

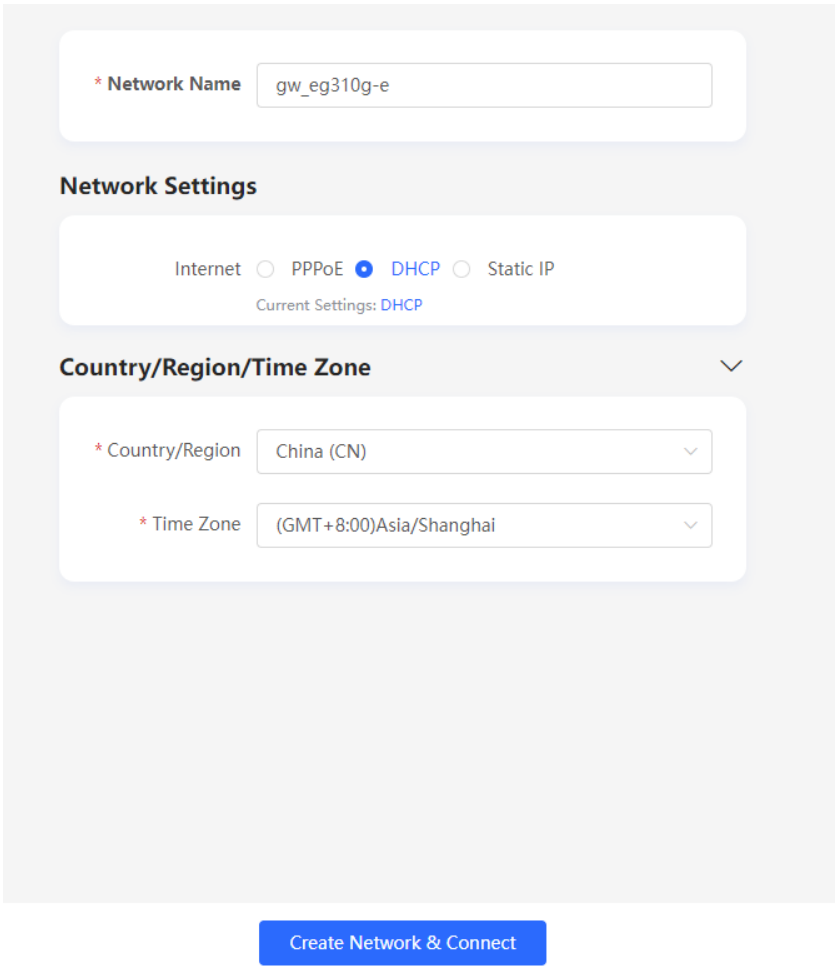
(4) Click **Create Network & Connect**. The router initiates a connection with the Internet.

(5) After connecting the router to the Internet, you can manage the router on Ruijie Cloud or Eweb.

4.1.3 DHCP Configuration Through a WAN Port

(1) Click **Wizard** to access the configuration wizard page.

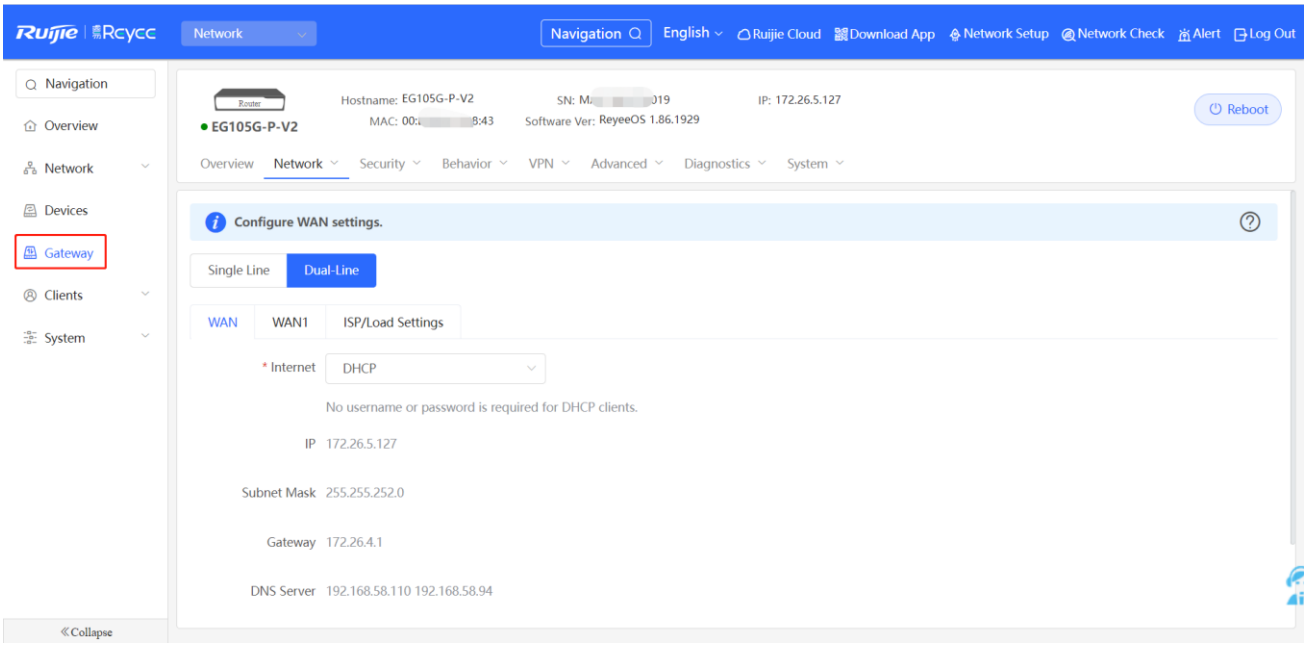
(2) Set **Internet** to **DHCP** in the **Network Settings** pane.



(3) Click **Create Network & Connect**. The router initiates a connection with the Internet.

After connecting the router to the Internet, you can manage the router on Ruijie Cloud or Eweb. You can perform WAN configuration through the following page.

Choose **Gateway** > **Network** > **WAN**.



4.2 AP Management

Note

- To manage the downlink AP, enable self-organizing network (SON) discovery (see section 错误!未找到引用源。错误!未找到引用源。). The wireless settings are synchronized to all wireless devices on the network by default. You can configure groups to limit the device scope under wireless management. For details, see section 4.2.2 Configuring AP Groups.
- Except the RG-EG105GW and RG-105GW(T), other Reyee routers do not send Wi-Fi signals. Wireless settings need to be delivered to make downlink APs take effect.

4.2.1 Switching the Working Mode

1. Working Mode

- Router mode

The device supports routing functions such as route-based forwarding and network address translation (NAT), VPN, and behavior management. It can allocate addresses to downlink devices, forward network data based on routes, and perform NAT operations.

In router mode, the device can access the network through Point-to-Point Protocol over Ethernet (PPPoE) dialing, dynamic IP address, and static IP address. It can also directly connect to a fiber-to-the-home (FTTH) network cable or an uplink device to provide network access and manage downlink devices.

- AC mode

The device supports Layer 2 forwarding only. The device does not provide routing and Dynamic Host Configuration Protocol (DHCP) server functions. By default, a WAN port obtains an IP address through DHCP. The AC mode is applicable to the scenario where the network is working normally. In AC mode, the device serves as the management controller to access the network in bypass mode and manage APs.

2. SON Discovery

When configuring a working mode, you can configure whether to enable the SON discovery function. This function is enabled by default.

After the SON discovery function is enabled, the device can be discovered on a network and discover other devices on the network. Devices interconnect with each other based on the device status and synchronize global configuration. You can log in to the web management page of any device on the network to check information about all devices on the network. After this function is enabled, clients can maintain and manage the current network more efficiently. You are advised to keep this function enabled.

If the SON discovery function is disabled, the device will not be discovered on the network and runs in standalone mode. After logging in to the web page, you can configure and manage only the current login device. If only one device is configured or global configuration does not need to be synchronized to the device, you can disable the SON discovery function.

Note

In AC mode, the SON discovery function is enabled by default.

After the SON discovery function is enabled, you can view the self-organizing role of the device on the **Device Details** page.

The menus on the web page vary depending on whether the SON discovery function is enabled. For details, see section 1.7 Switching Between Management Pages.

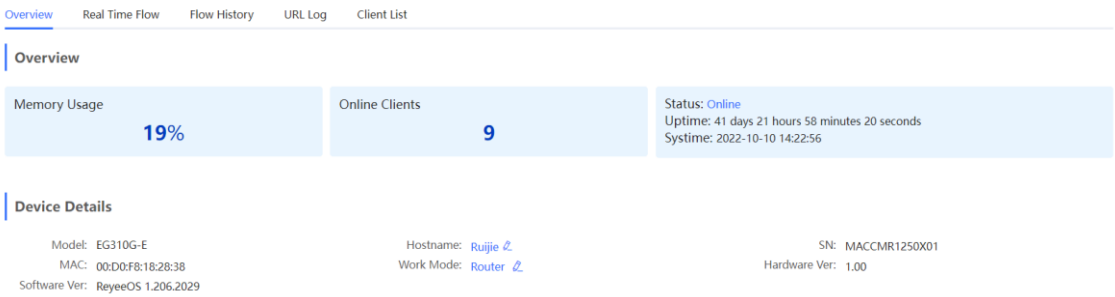
3. Configuration Steps

Choose Overview > Device Details.

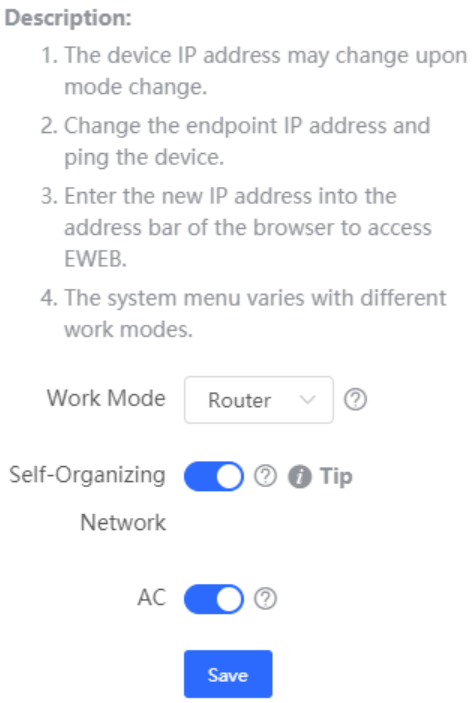
Click the current working mode to edit the working mode.

Caution

After you switch the working mode, the device will restore factory settings and restart. Proceed with caution.



AC function: If a device works in router mode and the SON discovery function is enabled, you can enable or disable the AC function. After the AC function is enabled, the device in router mode supports the virtual AC function and can manage downlink devices. If this function is disabled, the device needs to be elected as an AC in SON mode and then manages downlink devices.



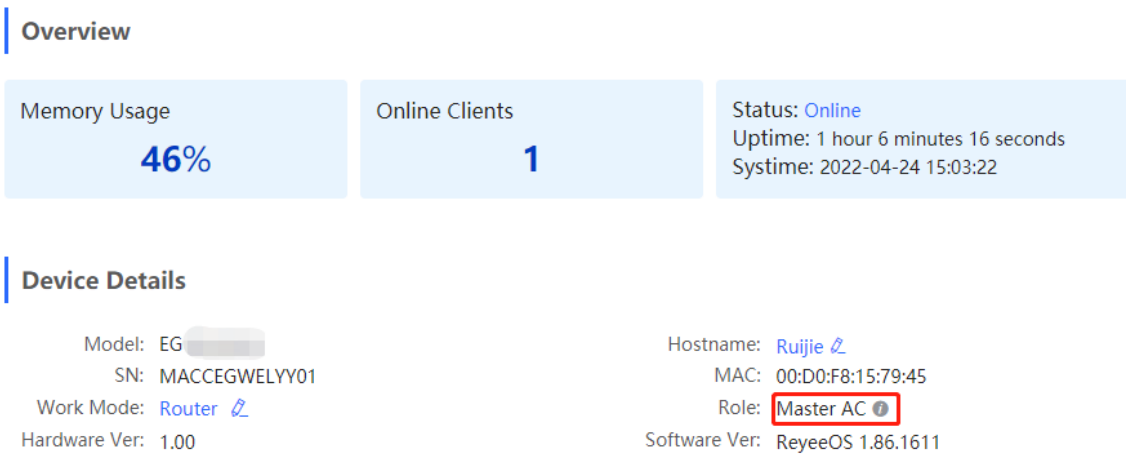
4. Viewing the Self-Organizing Role

Choose Local Device > Overview > Device Details.

After the SON discovery function is enabled, you can view the self-organizing role of the device on the Device Details page.

Master AP/AC: The device functions as an AC to manage downlink devices.

Slave AP: The device connects to the AC in self-organizing mode and is managed by the AC. Slave APs are uniformly managed by the master AP or AC. Some wireless network configurations cannot be modified separately in local mode, and must be delivered by the master AP or AC.



4.2.2 Configuring AP Groups

1. Overview

After SON network discovery is enabled, the device can work as the master AP or AC to batch configure and manage its downlink APs by group. Before you configure APs, assign them to different groups.

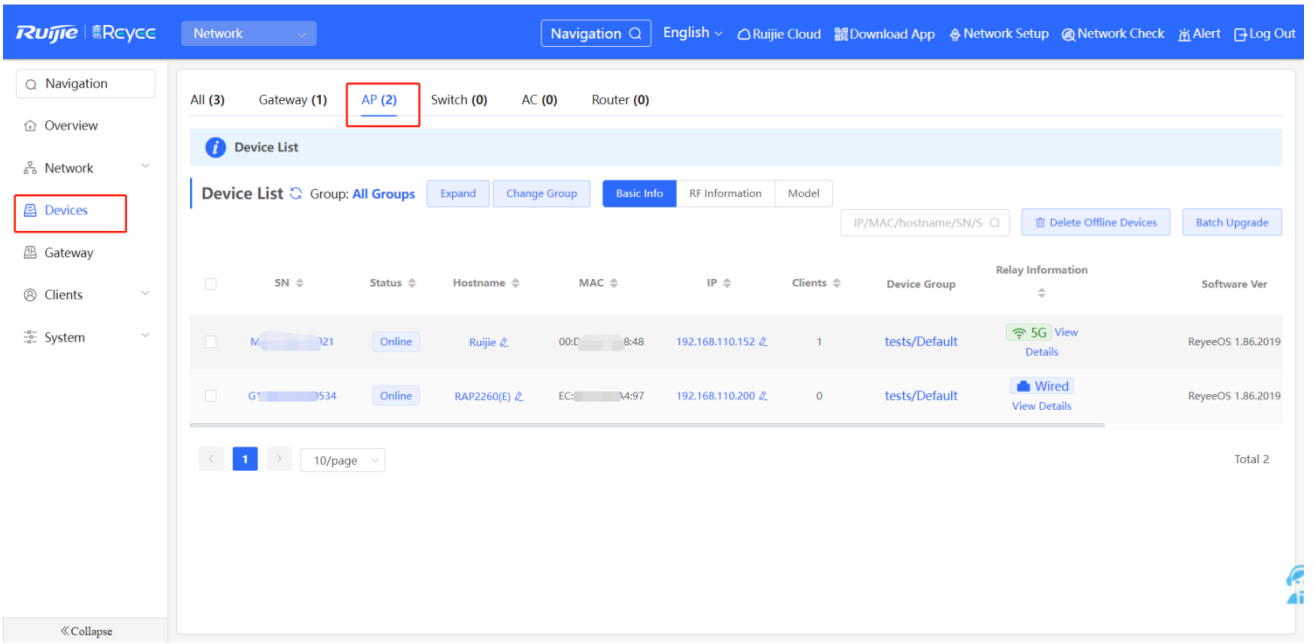
Note

If you specify groups when configuring the wireless network, the configuration takes effect on wireless devices in the specified groups.

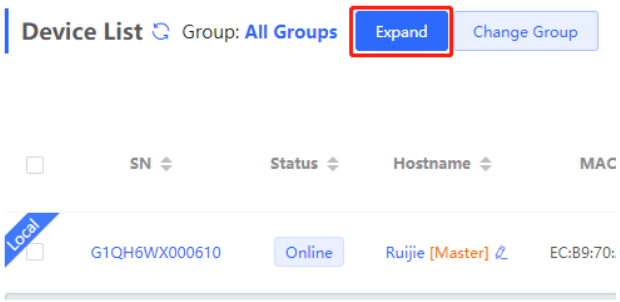
2. Configuration Steps

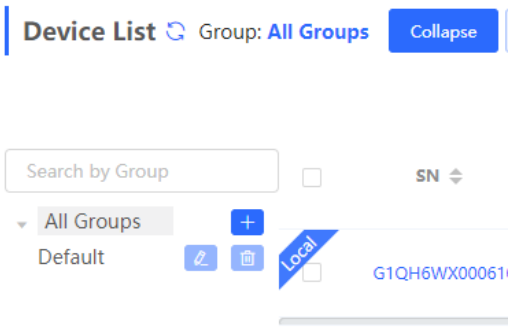
Switch to the **Network** mode. Choose **Devices** > **AP**.

(1) View the information of all APs on the current network, including basic information, RF information, and model. Click the SN of an AP to configure the AP separately.

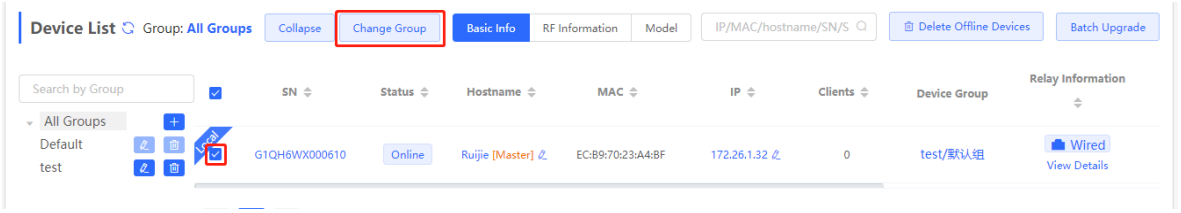


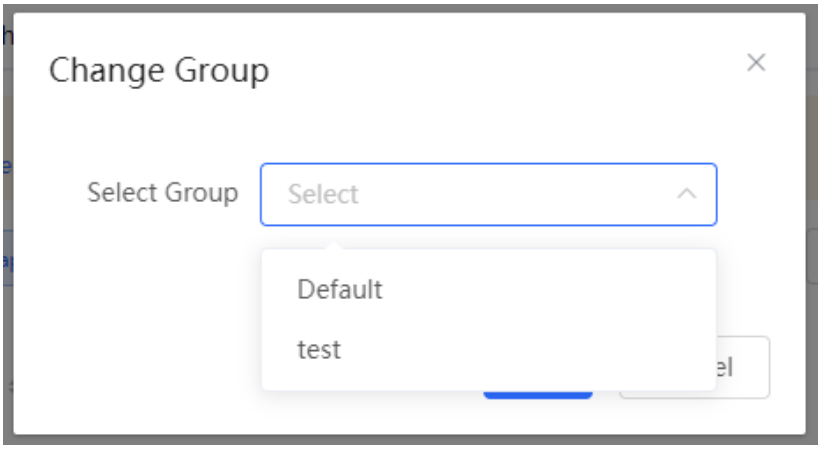
(2) Click **Expand**. Information about all the current groups is displayed on the left of the list. Click  to create a group. You can create a maximum of eight groups. Select the target group and click  to modify the group name or click  to delete the group. You cannot modify the name of the default group or delete the default group.





(3) Click a group name in the left. All devices in the group are displayed. One device can belong to only one group. By default, all devices belong to the default group. Select a device from the device list and click **Change Group** to migrate the selected device to the specified group. After a device is moved to the specified group, the device will use the configuration for the new group. Click **Delete Offline Devices** to remove offline devices from the list.





4.2.3 Configuring Wi-Fi

Switch to the **Network** mode. Choose **Network** > **Wi-Fi** > **Wi-Fi Settings**.

Enter the SSID and Wi-Fi password, select the frequency band used by the Wi-Fi signal, and click **Save**.

Click **Advanced Settings** to configure Wi-Fi parameters.

Caution

Configuration modification will cause the wireless configuration to be reset, resulting in logout of connected clients. Exercise caution when performing this operation.

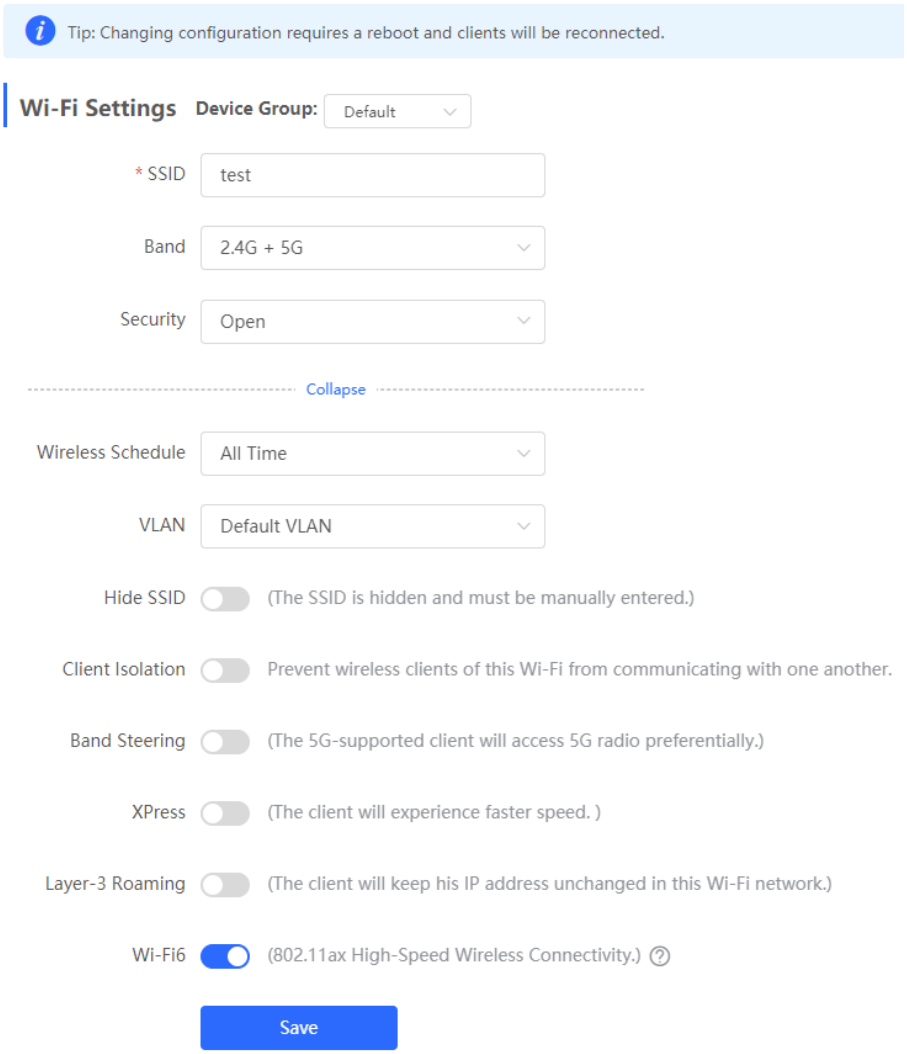


Table 4-1 Wireless Network Configuration

Parameter	Description
SSID	Enter the name displayed when a wireless client searches for a wireless network.
SSID Encoding	If the SSID does not contain Chinese, this item will be hidden. If the SSID contains Chinese, this item will be displayed. You can select UTF-8 or GBK.
Band	Set the band used by Wi-Fi signals. The options are 2.4 GHz and 5 GHz. The 5 GHz band provides faster network transmission rate and less interference than the 2.4 GHz band, but is inferior to the 2.4 GHz band in terms of signal coverage range and wall penetration performance. Select a proper band as needed. The default value is **2.4G + 5G**, indicating that the device provides signals at both 2.4 GHz and 5 GHz bands.

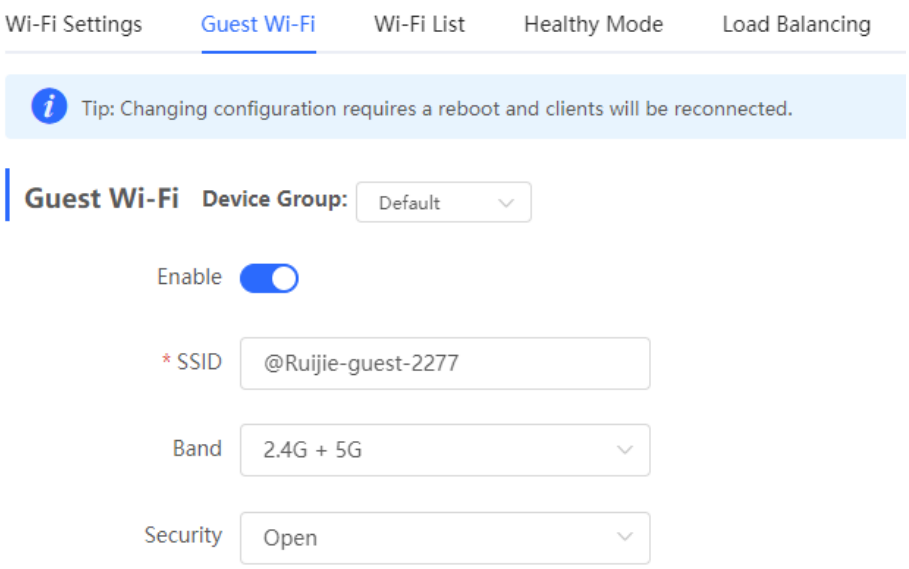
Parameter	Description
Security	Select an encryption mode for wireless network connections. The options are as follows: ● Open: The device can associate with Wi-Fi without a password. ● WPA-PSK/WPA2-PSK: Wi-Fi Protected Access (WPA) or WPA2 is used for encryption. ● WPA_WPA2-PSK (recommended): WPA2-PSK or WPA-PSK is used for encryption.
Wi-Fi Password	Specify the password for interconnection with the wireless network. The password is a string of 8 to 16 characters.
Wireless Schedule	Specify the period during which Wi-Fi is enabled. When this parameter is set, users can only connect to Wi-Fi during this period.
VLAN	Set the VLAN to which Wi-Fi signals belong. You can select a VLAN from the available VLANs, or click **Add New VLAN** and go to the **LAN Settings** page to add a VLAN.
Hide SSID	Enabling SSID hiding can prevent unauthorized users' access to Wi-Fi, improving security. However, mobile phones or computers cannot find the SSID after this function is enabled. You must manually enter the correct name and password to connect to Wi-Fi. Record the current SSID before you enable this function.
Client Isolation	With client isolation enabled, clients associated with Wi-Fi are isolated from one other, and end users connected to the same AP (in the same network segment) cannot access each other. This improves security.
Band Steering	Band steering allows 5G-capable clients to select 5 GHz Wi-Fi preferentially. You can enable this function only when **Band** is set to **2.4G + 5G**.
XPress	XPress enables the device to send game packets preferentially, providing more stable wireless network for games.
Layer-3 Roaming	Layer 3 roaming enables clients to keep their IP addresses unchanged when the clients are associated with the same Wi-Fi. This function improves the roaming experience of users in the cross-VLAN scenario.
Wi-Fi6	Wi-Fi 6 provides wireless users with faster network access speed and optimized network access experience. This function is valid only on 802.11ax-capable APs and routers. Clients must also support 802.11ax to experience high-speed network access empowered by Wi-Fi 6. If clients do not support Wi-Fi 6, disable this function.

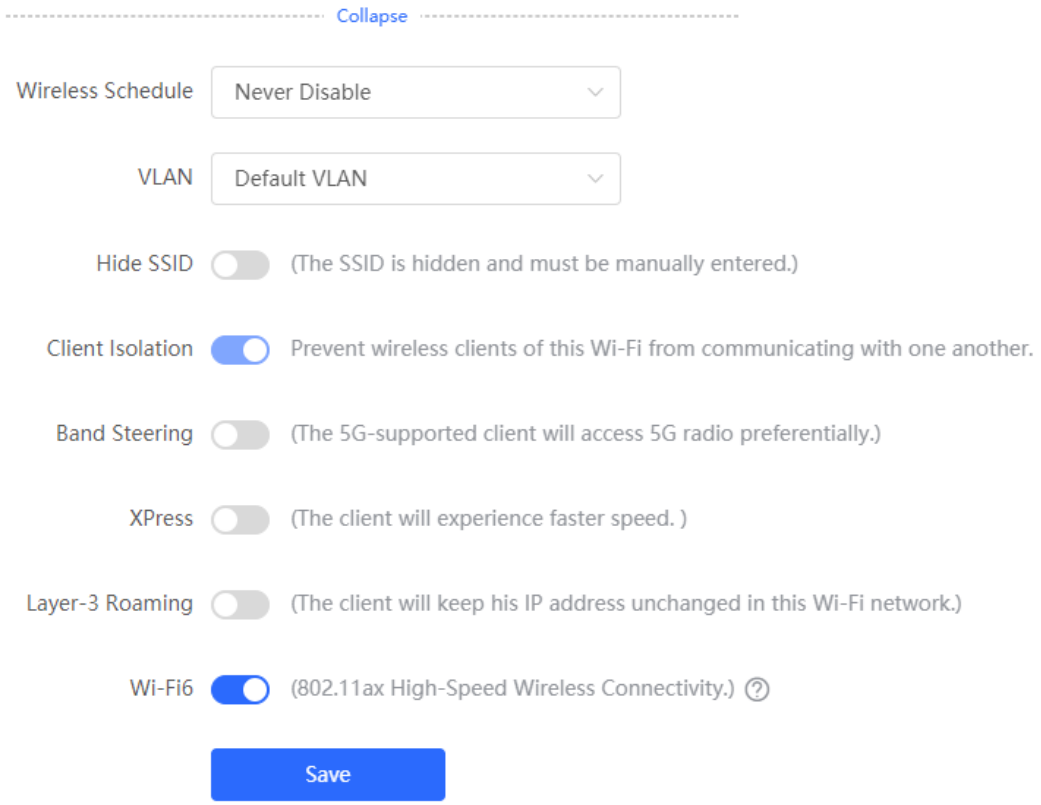
4.2.4 Configuring Guest Wi-Fi

Switch to the **Network** mode. Choose **Network** > **Wi-Fi** > **Guest Wi-Fi**.

Guest Wi-Fi is a wireless network provided for guests, and is disabled by default. Client isolation is enabled for guest Wi-Fi by default, and cannot be disabled. In this case, clients associating with guest Wi-Fi are mutually isolated, and they can only access the Internet through Wi-Fi. This improves network access security. You can configure a wireless schedule for the guest network. After the specified schedule expires, the guest network will become unreachable.

Enable guest Wi-Fi and set the guest SSID and password. Click **Advanced Settings** to configure the wireless schedule of guest Wi-Fi and more Wi-Fi parameters. For details, see section 4.2.2 Configuring Wi-Fi. Click **Save**. Guests can access the Internet through Wi-Fi after entering the SSID and password.

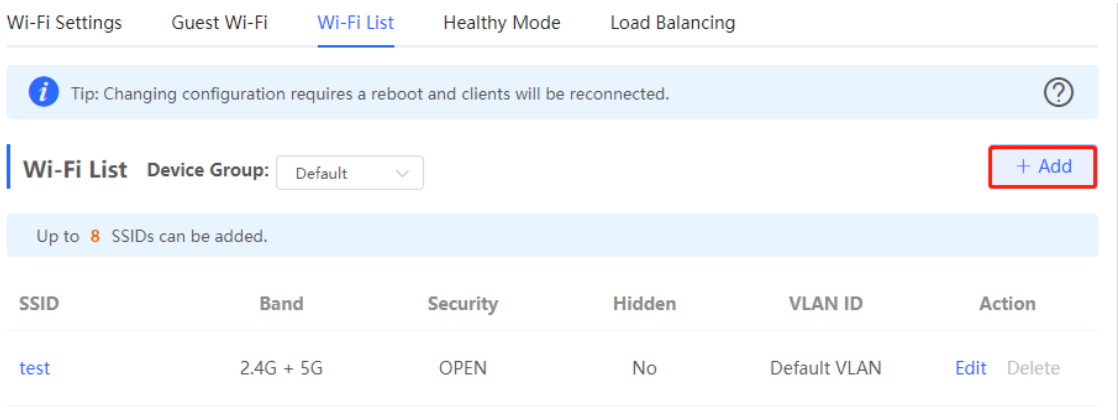


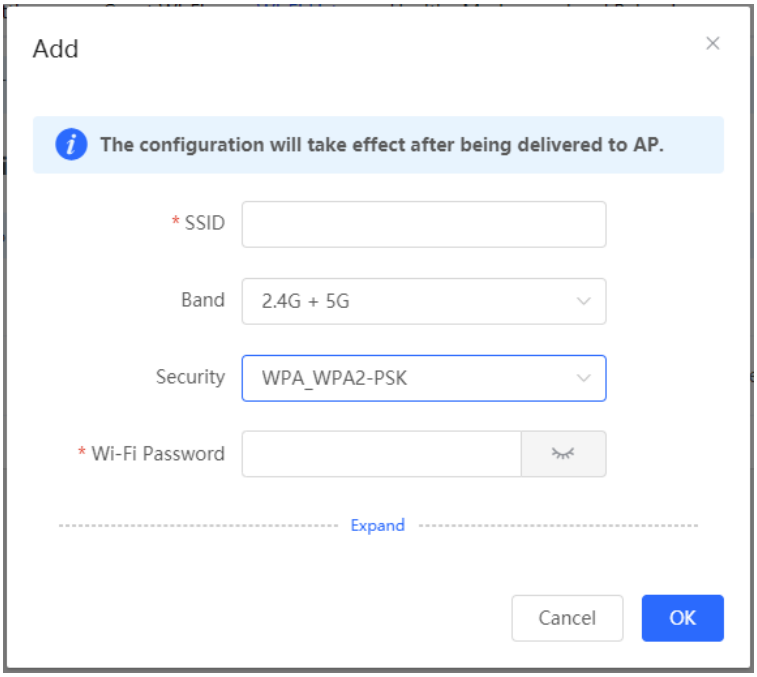


4.2.5 Adding More Wi-Fi Networks

Switch to the **Network** mode. Choose **Network** > **Wi-Fi** > **Wi-Fi List**, and select the device group which you want to add more Wi-Fi networks.

Click **Add**, enter the SSID and password, and click **OK** to create a Wi-Fi network. Click **Advanced Settings** to configure more Wi-Fi parameters. For details, see section 4.2.2 Configuring Wi-Fi. After a Wi-Fi network is added, clients can find this Wi-Fi network, and Wi-Fi information is displayed in the Wi-Fi list.



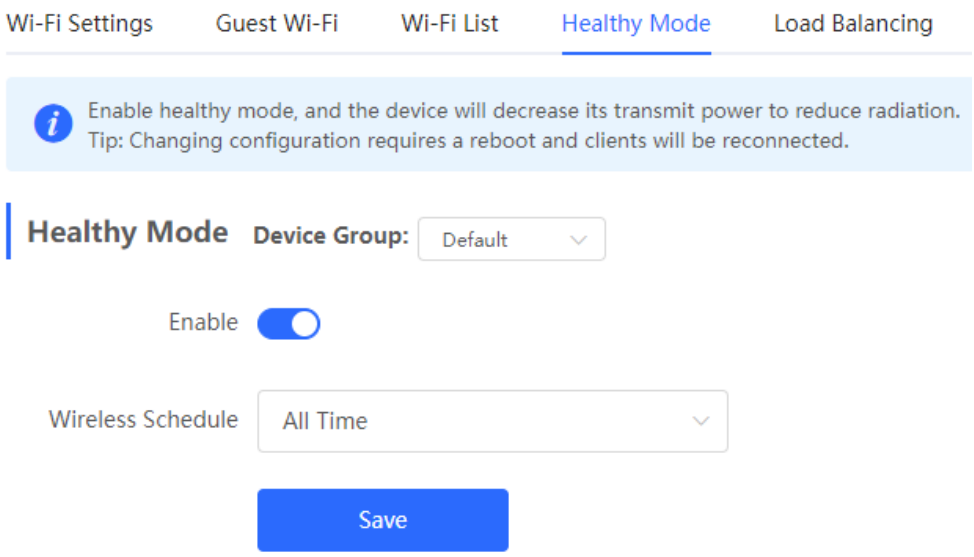


4.2.6 Healthy Mode

Switch to the **Network** mode. Choose **Network** > **Wi-Fi** > **Healthy Mode**.

Enable the healthy mode and select a wireless schedule for the mode.

After the healthy mode is enabled, the RF transmit power and Wi-Fi coverage range of the device are reduced in the schedule. This may lead to weak signals and network freezing. You are advised to disable the healthy mode or set the wireless schedule to an idle period.



4.2.7 RF Settings

Switch to the **Network** mode. Choose **Network** > **Radio Frequency**.

The device can detect the surrounding wireless environment upon power-on and select proper configuration. However, network freezing caused by wireless environment changes cannot be prevented. You can analyze the wireless environment around the APs and routers and manually select proper parameters.

Caution

Configuration modification will cause the wireless configuration to be reset, resulting in logout of connected clients. Exercise caution when performing this operation.

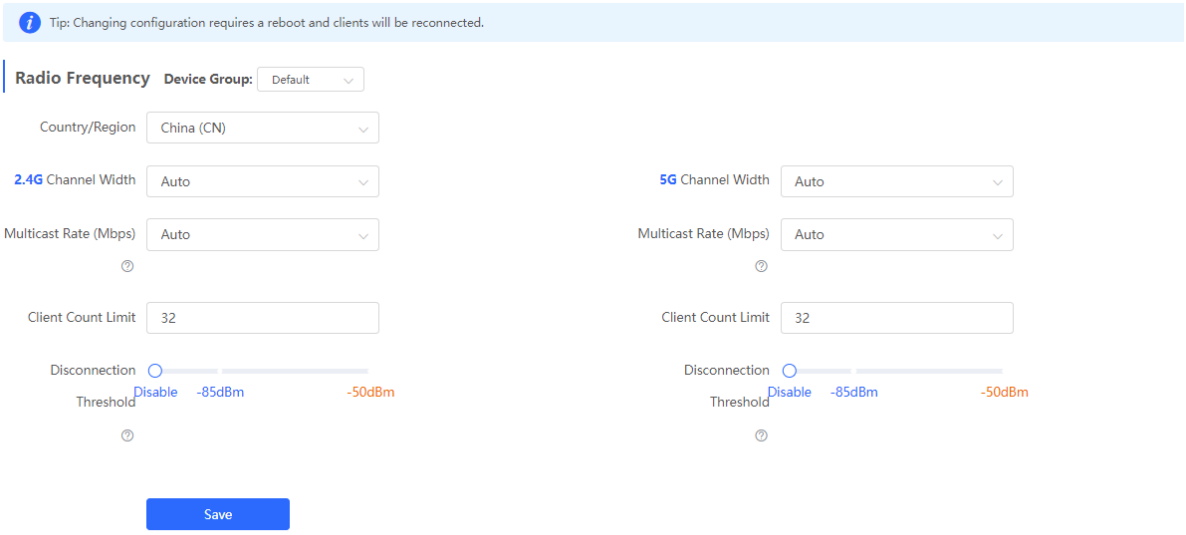


Table 4-2 RF Configuration

Parameter	Description
Country/Region	Wi-Fi channels stipulated by each country may be different. To ensure that clients can find Wi-Fi signals, select the country or region where the device is located.
2.4G/5G Channel Width	A lower bandwidth indicates a more stable network, and a higher bandwidth indicates less interference. In case of severe interference, select a low bandwidth to prevent network freezing to a certain extent. The 2.4 GHz band supports 20 MHz and 40 MHz bandwidths. The 5 GHz band supports 20 MHz, 40 MHz, and 80 MHz bandwidths. By default, the value is **Auto**, indicating that the bandwidth is selected automatically based on the environment.

Parameter	Description
Client Count Limit	If a large number of users are connected to an AP or a router, the wireless network performance of the AP or router may be degraded, affecting users' Internet access experience. When this parameter is set and the number of access users reaches the specified value, the AP or router rejects access of new users. If clients require high bandwidth, you can adjust this parameter to a smaller value. You are advised to keep the default value unless otherwise specified.
Disconnection Threshold	When multiple Wi-Fi signals are available, you can set this parameter to optimize the wireless signal quality. When a client is far away from the wireless device and the wireless signal strength of the end user is lower than this value, the Wi-Fi connection is ended. In this case, the client has to select a nearer wireless signal. The client is prone to be disconnected if this value is high. To ensure that the client can normally access the Internet, you are advised to set this parameter to **Disable** or a value smaller than -75 dBm.

Note

- Available wireless channels depend on the country or region code. Select the country or region code based on the country or region of your device.
- The channel, transmit power, and roaming sensitivity cannot be set globally. You must configure these parameters on devices separately.

4.2.8 Configuring a Wi-Fi Blacklist or Whitelist

1. Overview

You can configure the global or SSID-based blacklist and whitelist. MAC addresses can be exactly matched or based on the OUI.

Wi-Fi blacklist: Clients in the Wi-Fi blacklist are prevented from accessing the Internet. Clients that are not added to the Wi-Fi blacklist are free to access the Internet.

Wi-Fi whitelist: Only clients in the Wi-Fi whitelist can access the Internet. Clients that are not added to the Wi-Fi whitelist are prevented from accessing the Internet.

Caution

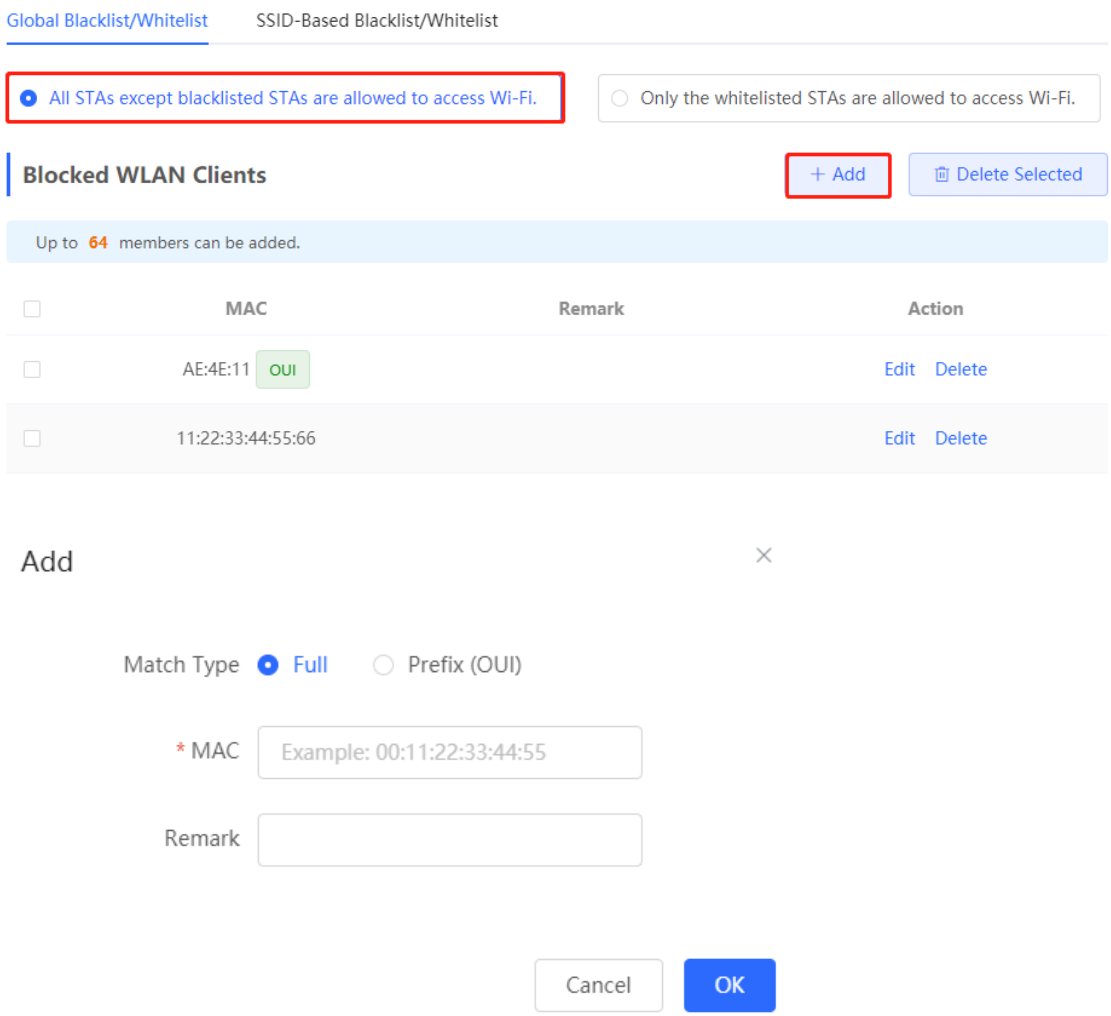
An empty whitelist does not take effect. In this case, all clients are allowed to access the Internet.

2. Configuring a Global Blacklist or Whitelist

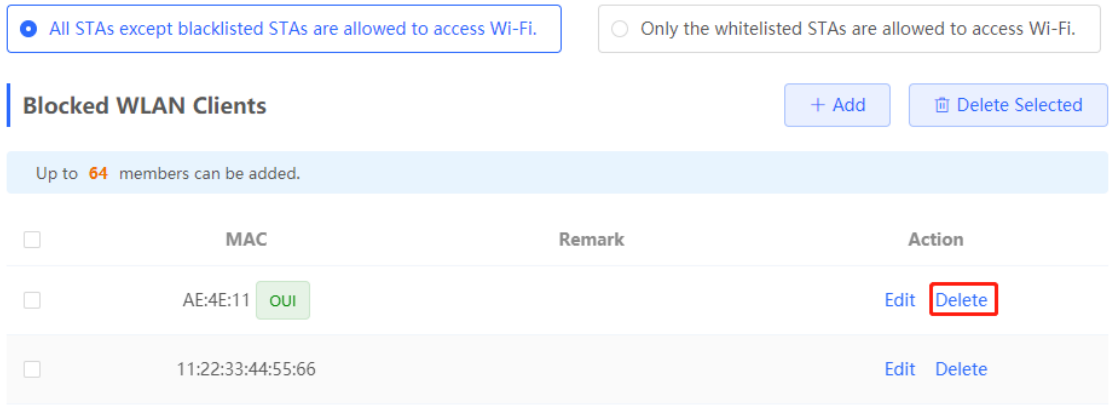
Switch to the Network mode. Choose Clients Management > Blacklist/Whitelist > Global Blacklist/Whitelist.

Select the blacklist or whitelist mode and click Add to add a client to the blacklist or whitelist. In the Add dialog box, enter the MAC address and remarks of the target client and click OK. If a client is already associated with the router, its MAC address appears automatically. Click the MAC address for automatic input. All clients

in the blacklist are forced offline and not allowed to access the Wi-Fi network. The global blacklist and whitelist settings take effect on all Wi-Fi networks of the router.



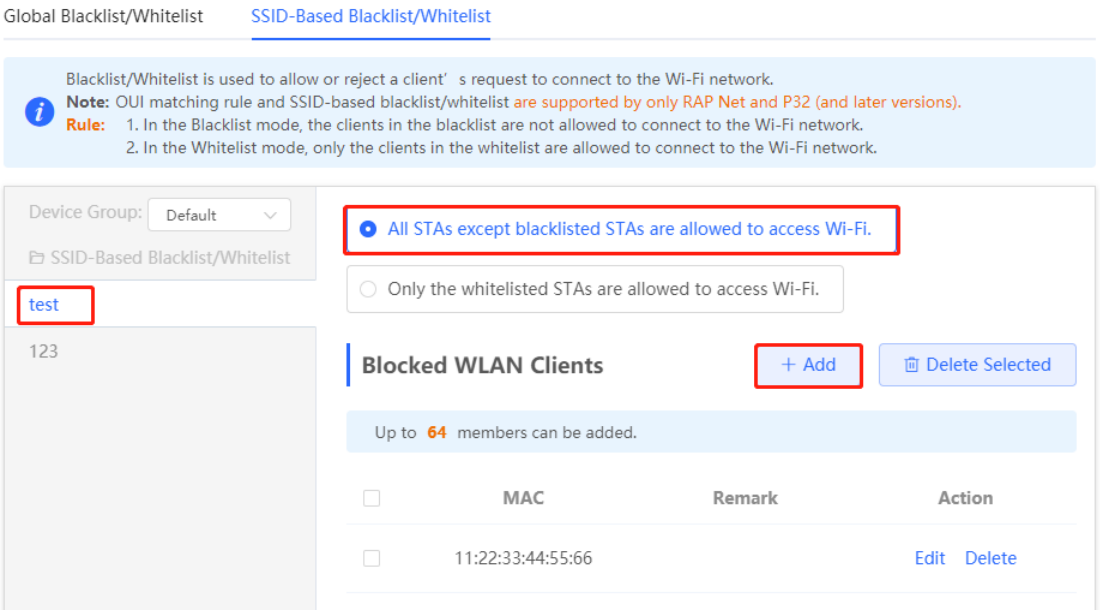
If you delete a client from the blacklist, the client is allowed to connect to the Wi-Fi network. If you delete a client from the whitelist, the client is forced offline and not allowed to access the Wi-Fi network.



3. Configuring an SSID-based Blacklist or Whitelist

Switch to the Network mode. Choose Clients Management > Blacklist/Whitelist > SSID-Based Blacklist/Whitelist.

Select a target Wi-Fi network from the left column, select the blacklist or whitelist mode, and click Add to add a client to the blacklist or whitelist. The SSID-based blacklist or whitelist restricts the client's access to the specified Wi-Fi network.



4.2.9 Configuring AP Load Balancing

1. Overview

The AP load balancing function is used to balance the load of APs on the wireless network. When APs that are added to a load balancing group are not load balanced, clients will automatically associate with the APs with light load. AP load balancing supports two modes:

- **Client Load Balancing**: The load is balanced according to the number of associated clients. When a large number of clients have been associated with an AP and the count difference of the AP with the lightest load has reached the specified value, the client can only associate with another AP in the group.
- **Traffic Load Balancing**: The load is balanced according to traffic on the APs. When the traffic on an AP is heavy and the traffic difference of the AP with the lightest load has reached the specified value, the client can only associate with another AP in the group.

Example: Add AP1 and AP2 into a group and select client load balancing. Set both the client count threshold and difference to 3. AP1 is associated with five clients and AP2 is associated with two clients, triggering load balancing. New clients' attempt to associate with AP1 will be denied, so they can associate only with AP2.

When a client request is denied by an AP and fails to associate with another AP in the group, the client will keep trying to associate with this AP. If the number of client attempts reaches the specified value, the AP will allow this client, ensuring that the client can normally access the Internet.

2. Configuring Client Load Balancing

Switch to the **Network** mode. Choose **Network** > **Wi-Fi** > **Load Balancing**.

Click **Add**. In the dialog box that appears, set **Type** to **Client Load Balancing**, and configure **Group Name**, **Members**, and **Rule**.

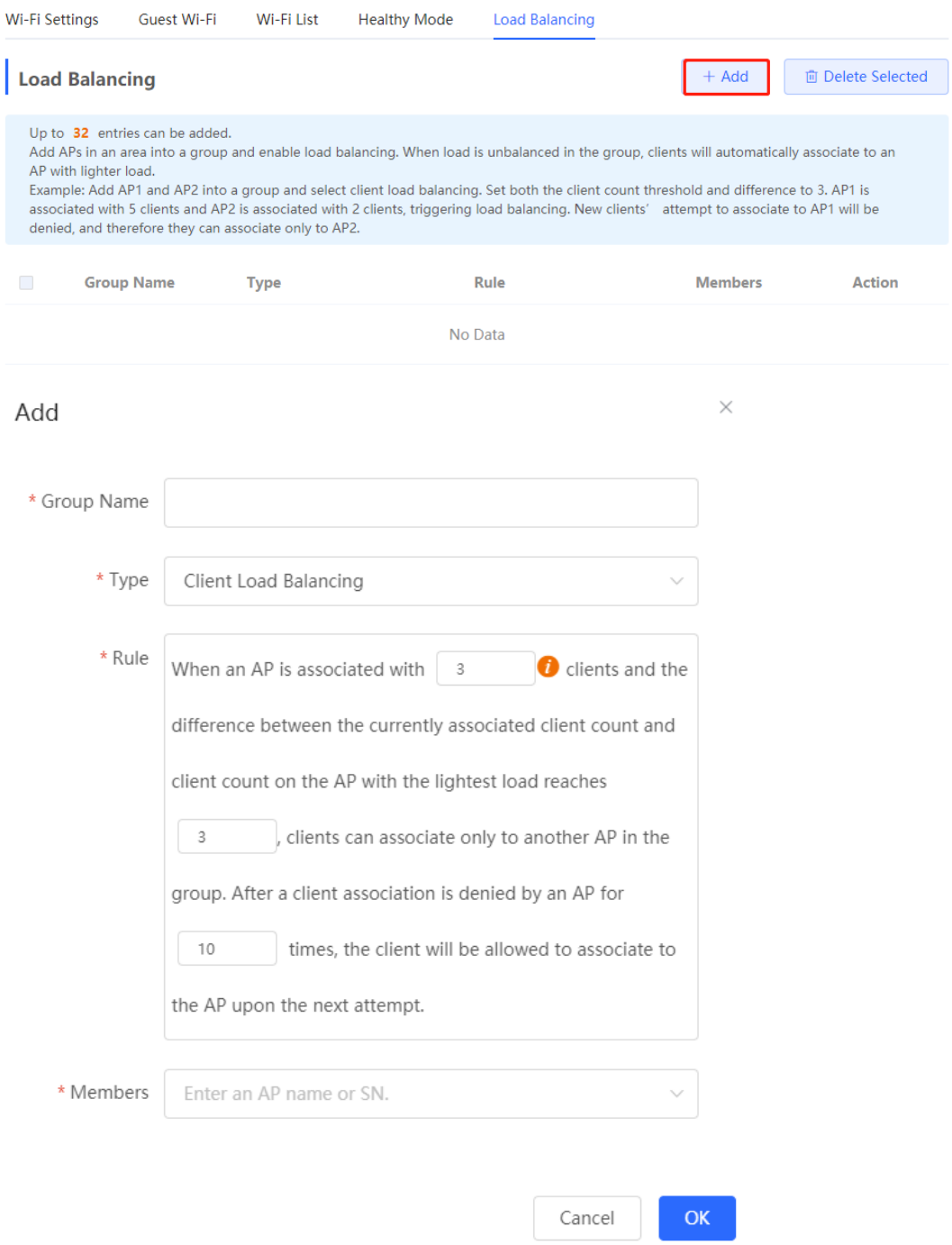


Table 4-3 Client Load Balancing Configuration

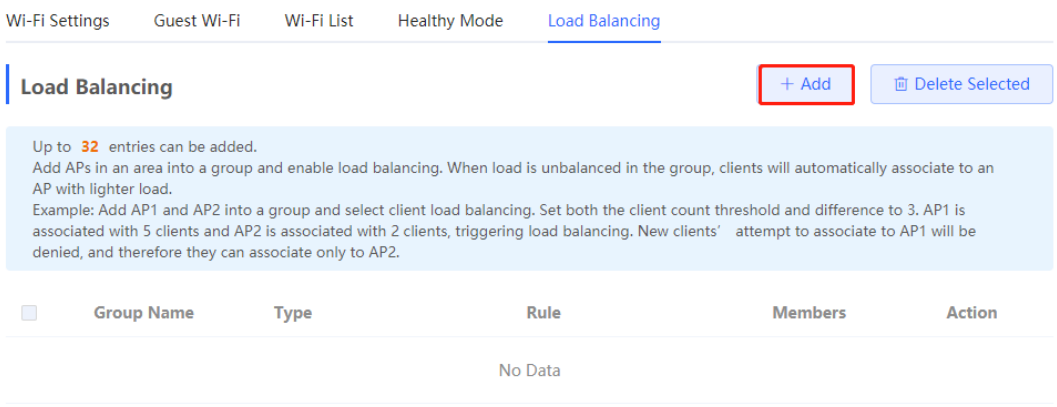
Parameter	Description
Group Name	Enter the name of the AP load balancing group.
Type	Select Client Load Balancing.

Parameter	Description
Rule	Configure a detailed load balancing rule, including the maximum number of clients allowed to associate with an AP, difference between the currently associated client count and client count on the AP with the lightest load, and number of attempts to access the AP with a full load. By default, when an AP is associated with three clients and the difference between the currently associated client count and client count on the AP with the lightest load reaches 3, clients can associate only to another AP in the group. After a client's association is denied by an AP for 10 times, the client will be allowed to associate with the AP upon the next attempt.
Members	Specify the APs to be added to the AP load balancing group.

3. Configuring Traffic Load Balancing

Switch to the **Network** mode. Choose **Network** > **Wi-Fi** > **Load Balancing**.

Click **Add**. In the dialog box that appears, set **Type** to **Traffic Load Balancing**, and configure **Group Name**, **Members**, and **Rule**.



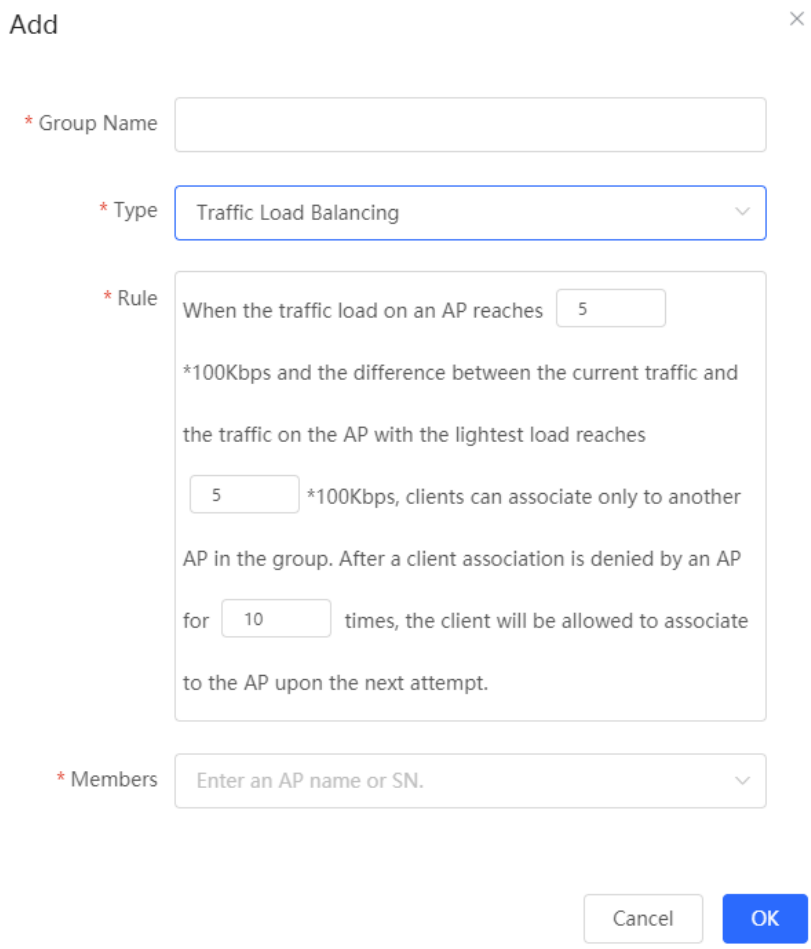


Table 4-4 Traffic Load Balancing Configuration

Parameter	Description
Group Name	Enter the name of the AP load balancing group.
Type	Select **Traffic Load Balancing**.
Rule	Configure a detailed load balancing rule, including the maximum traffic allowed on an AP, difference between the current traffic and the traffic on the AP with the lightest load, and number of attempts to access the AP with a full load. By default, when the traffic load on an AP reaches 500 kbit/s and the difference between the current traffic and the traffic on the AP with the lightest load reaches 500 kbit/s, clients can only associate with another AP in the group. After a client's association is denied by an AP for 10 times, the client will be allowed to associate with the AP upon the next attempt.
Members	Specify the APs to be added to the AP load balancing group.

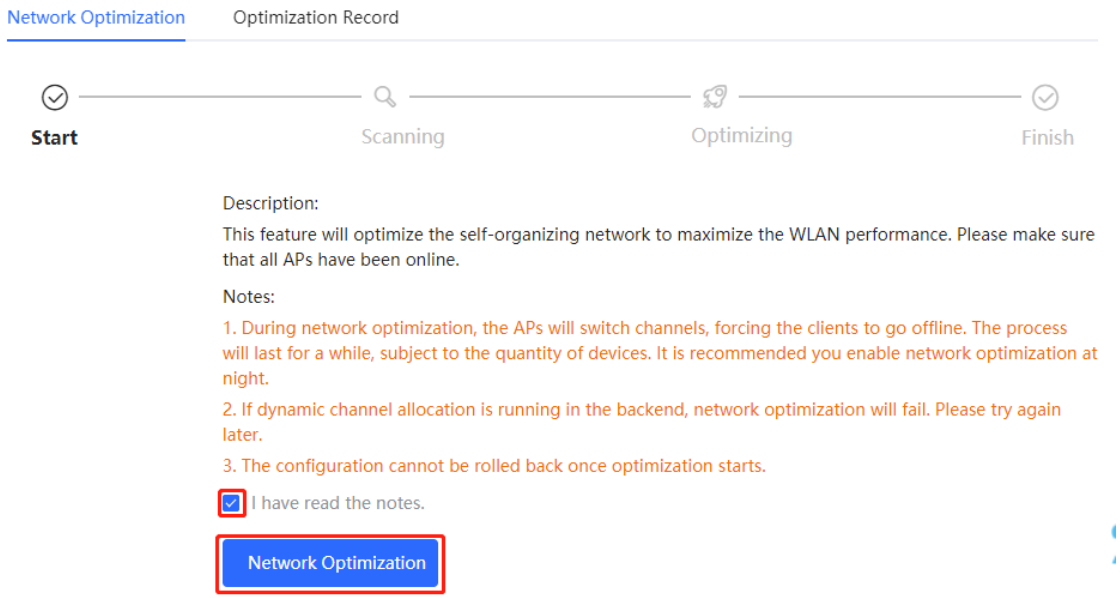
4.2.10 Wireless Network Optimization in One-Click Mode

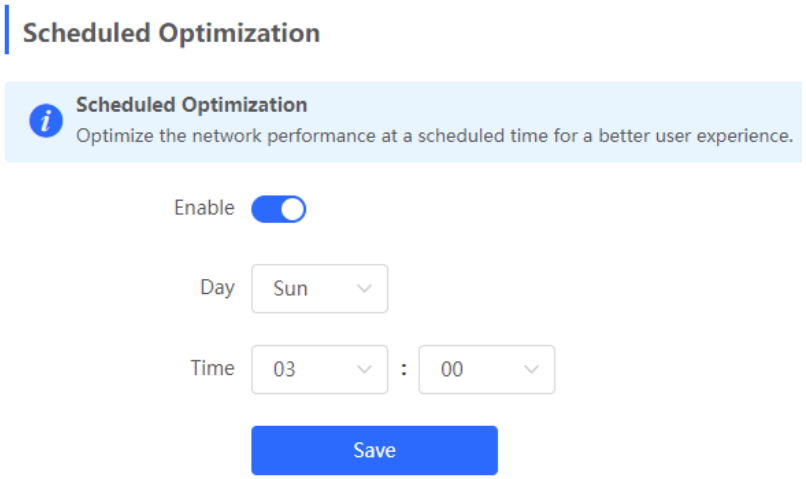
Switch to the **Network** mode. Choose **Network** > **WIO**.

On the **Network Optimization** tab, select **I have read the notes** and click **Network Optimization** to perform automatic wireless network optimization in the networking environment. You can configure scheduled optimization to optimize the network at the specified time. You are advised to set the scheduled optimization time to daybreak or an idle period.

Caution

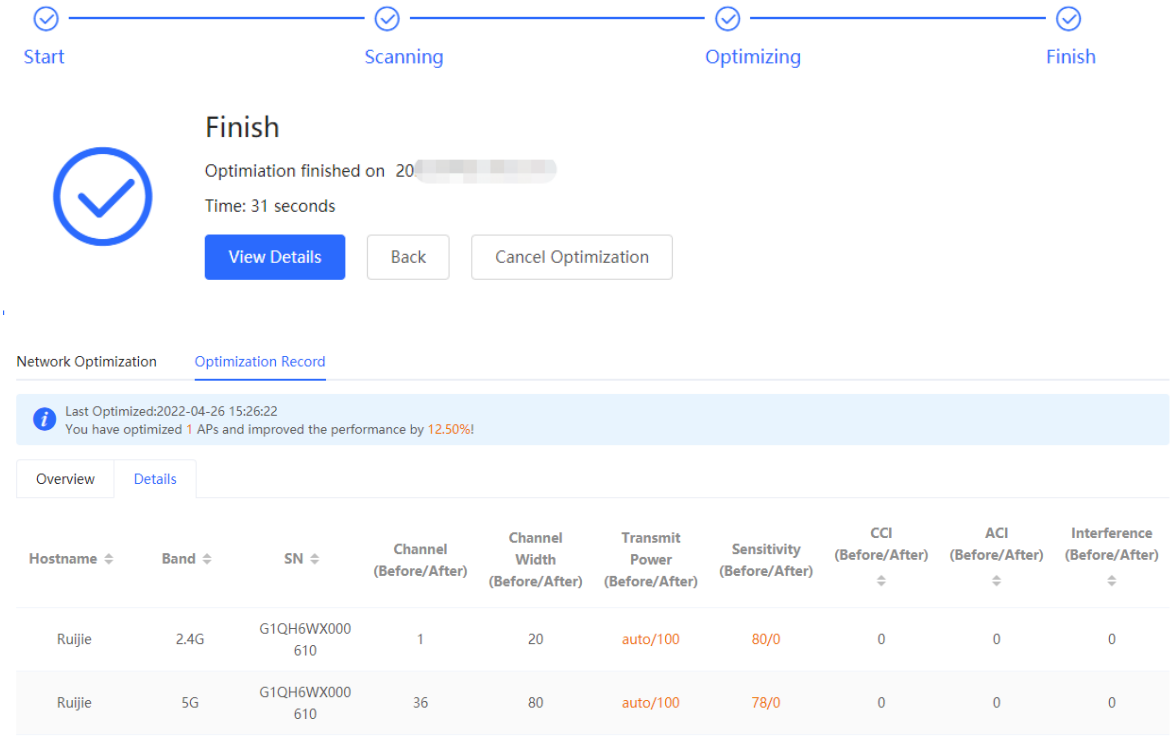
Clients may be disconnected during optimization and the configuration cannot be rolled back after optimization starts. Exercise caution when performing this operation.





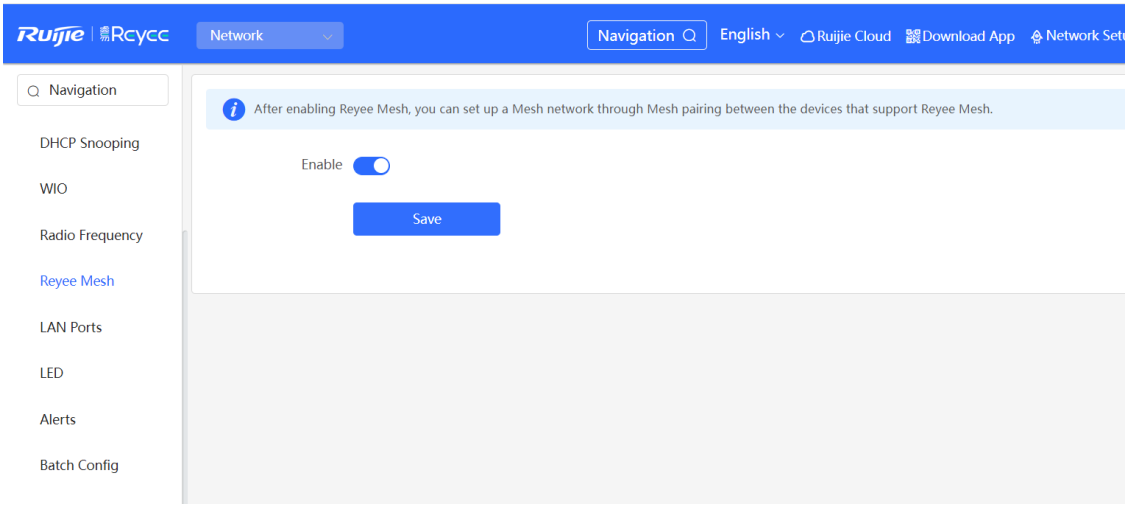
After optimization starts, wait for a while until optimization is complete. After optimization ends, click **Cancel Optimization** to restore optimized RF parameters to default values.

Click **View Details** or the **Optimization Record** tab to view the latest optimization record details.



4.2.11 Enabling Reyee Mesh

Switch to the **Network** mode. Choose **Network** > **Reyee Mesh**.



After Reyee mesh is enabled, you can set up a mesh network through mesh pairing between the devices that support Reyee mesh. You can press the **Mesh** button on the device to automatically discover a new device for mesh pairing or log in to the management page to select a new device for mesh pairing. Reyee mesh is enabled on the device by default with firmware ReyeeOS 1.86 or later.

Perform the following steps to set up a mesh network:

(1) Connect the first router to the network and configure it as the primary device.

(2) Place the second router 2 m (6.56 ft) away from the first router. Power on the second router.

(3) The system status LED of the second router blinks for 2 to 3 minutes. When the system status LED is solid on, the second router is started up.

(4) Press the **MESH** button on the first router to perform mesh pairing automatically.

The MESH LEDs on both routers are blinking for about 2 minutes. When the MESH LEDs stop blinking and turn solid white, mesh pairing succeeds.

(5) Place the second router where you want to have Wi-Fi coverage and then power on the router.

Wait for 3 to 5 minutes until the MESH LED turns solid on. Mesh networking succeeds and you can access the Internet by connecting to the new Wi-Fi network.

Note

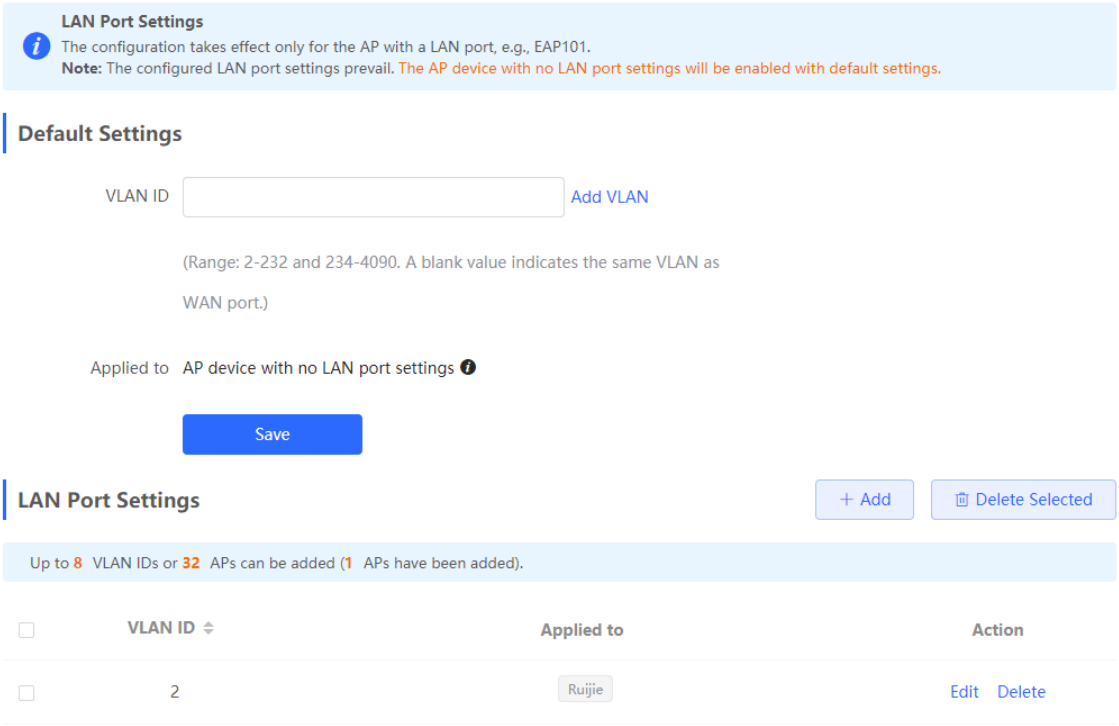
- Make sure that the new router is around the primary router and there are fewer obstacles between them.
- If three or more routers are added for mesh networking, repeat step 2 to 4. You can add eight devices in a batch at one time.

4.2.12 Configuring a LAN Port of a Downlink AP

Caution

The configuration takes effect only for a downlink AP with a wired LAN port.

Switch to the **Network** mode. Choose **Network** > **LAN Ports**.



In the **Default Settings** pane, enter the VLAN ID and click **Save** to configure the VLAN to which the AP's LAN port belongs. If the VLAN ID is empty, the LAN port and WAN port belong to the same VLAN.

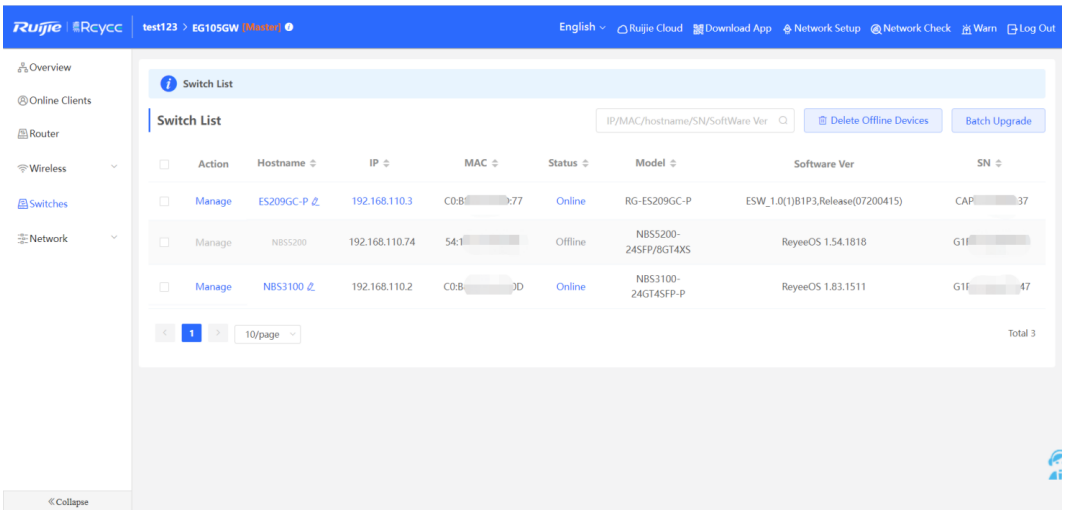
Click **Add** to add the AP's wired port. Enter a VLAN ID and select an AP.

In SON mode, the configuration of AP's wired port applies to all APs that have wired LAN ports on the current network. The configuration applied to APs in **LAN Port Settings** takes effect preferentially.

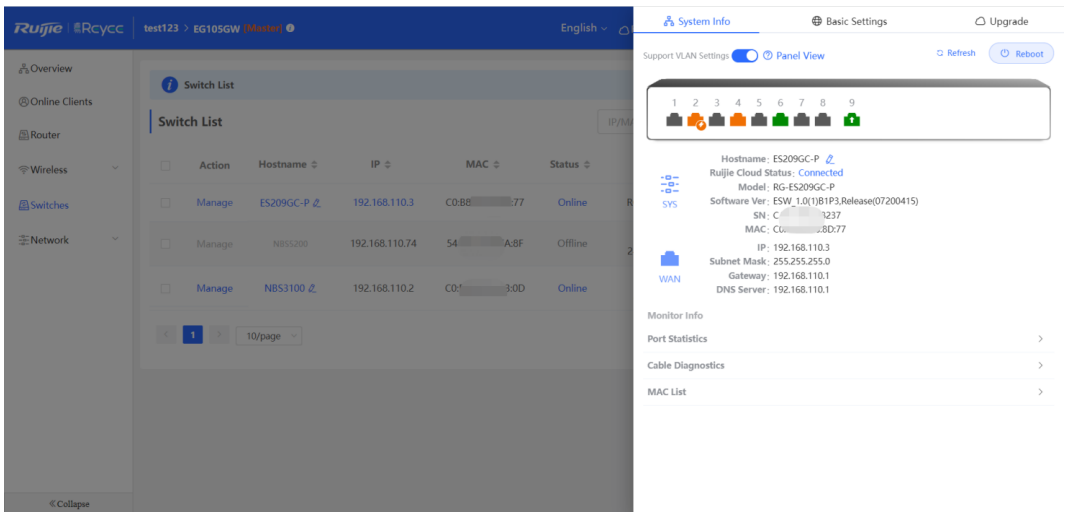
For APs, if no configuration is applied in **LAN Port Settings**, the default configuration of the AP's wired port will take effect.

4.3 Switch Settings

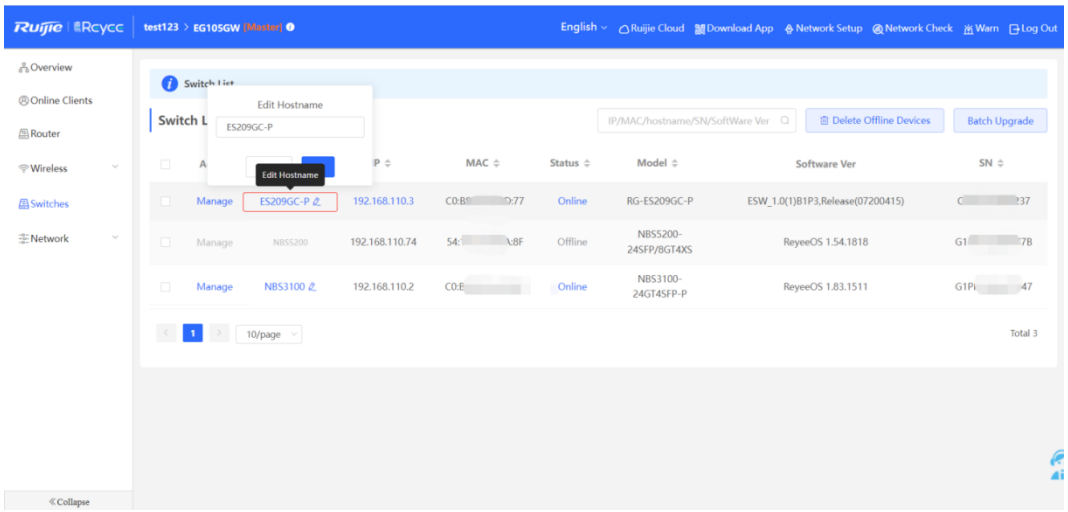
Switch List includes all switches that are managed by the router. The information includes the switch's host name, IP address, MAC address, status, model, software version, and SN. You can check AP categories by clicking .



- **Manage**: Go to the detailed configuration page of the switch.



- **Edit Hostname**: Modify the host name of switch.

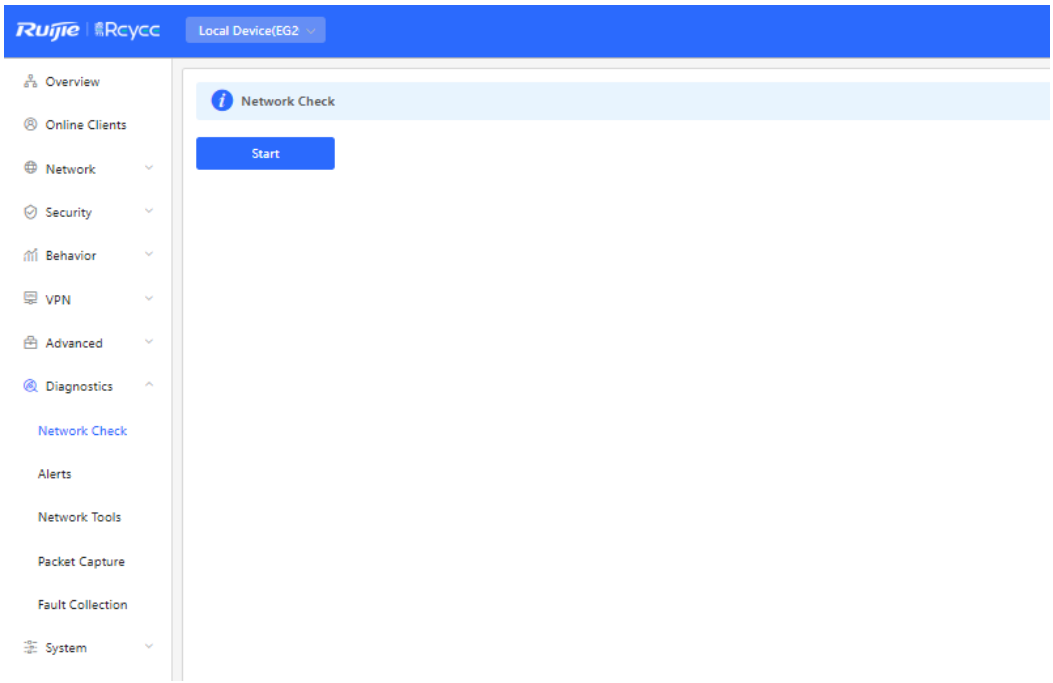


4.4 Diagnostics

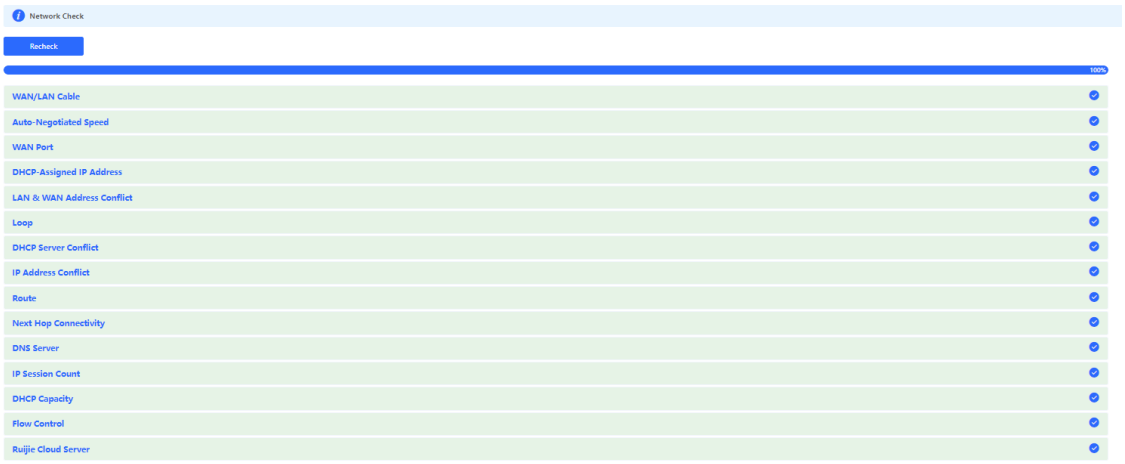
4.4.1 Network Check

You can check your network and resolve the problem on this page.

(1) Switch to the **Local** mode. Choose **Diagnostics** > **Network Check**. Click **Start** and click **OK** in the displayed dialog box to start checking the network status.



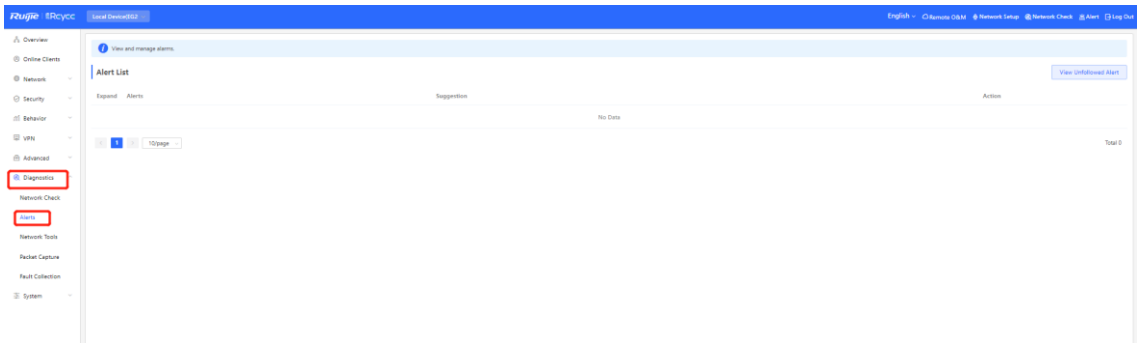
(2) The result is displayed after network check finishes.



4.4.2 Alarms

The **Alerts** page allows you to query and manage alarms.

(1) Switch to the **Local** mode. Choose **Diagnostics > Alert**.

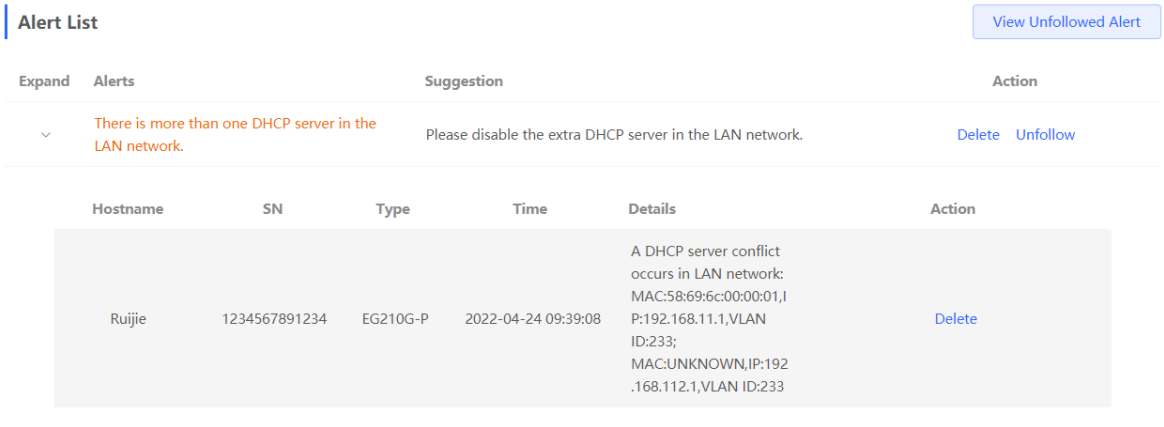


(2) The **Alert List** page displays possible problems on the network environment and device.

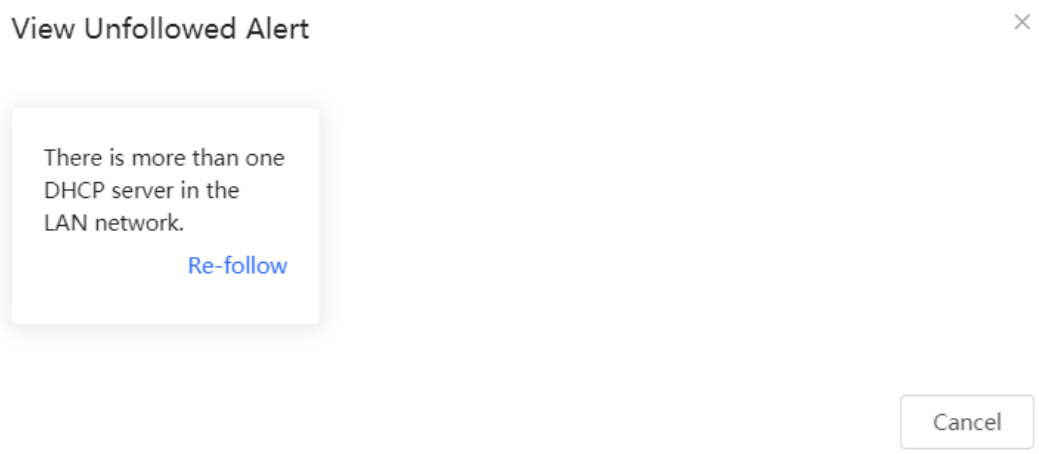
All types of alarms are followed by default. You can click **Unfollow** in the **Action** column to unfollow this type of alarms.

Caution

After unfollowing a specified alarm type, you will not discover and process all alarms of this type in a timely manner. Therefore, exercise caution when performing this operation.

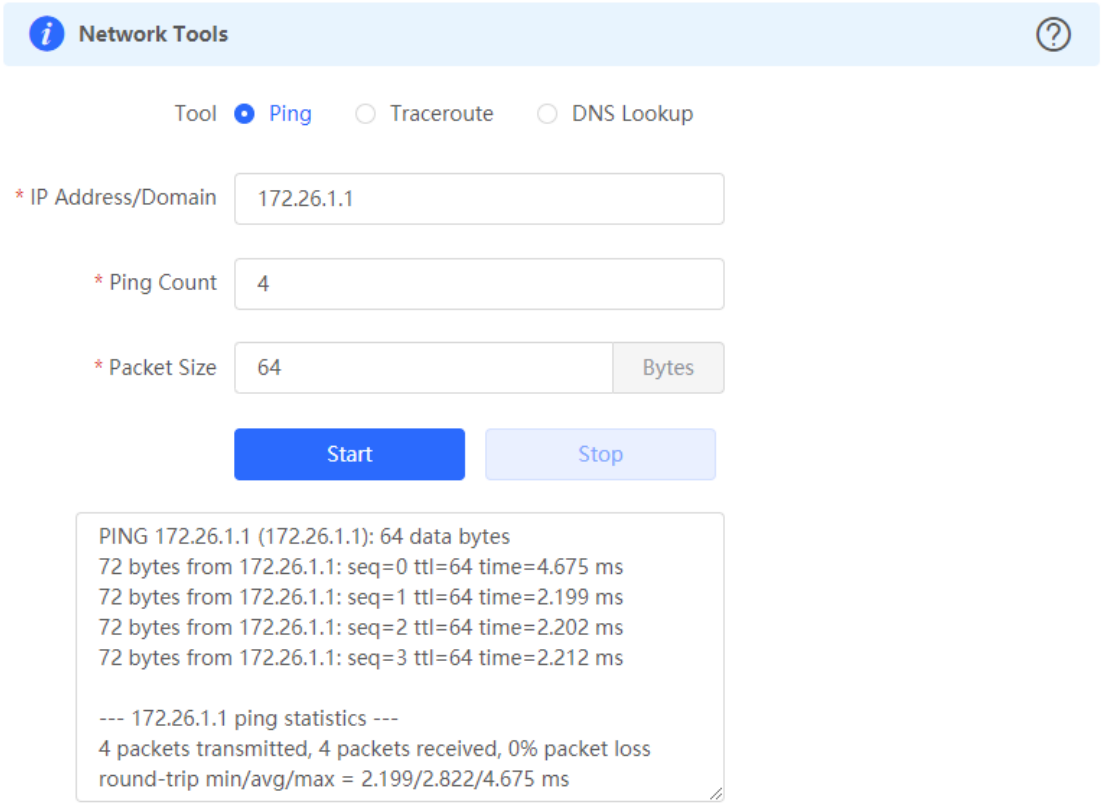


(3) Click **View Unfollowed Alert** to view the unfollowed alarm. You can follow the alarm again in the pop-up window.



4.4.3 Network Tools

Switch to the **Local** mode. Choose **Diagnostics** > **Network Tools**.

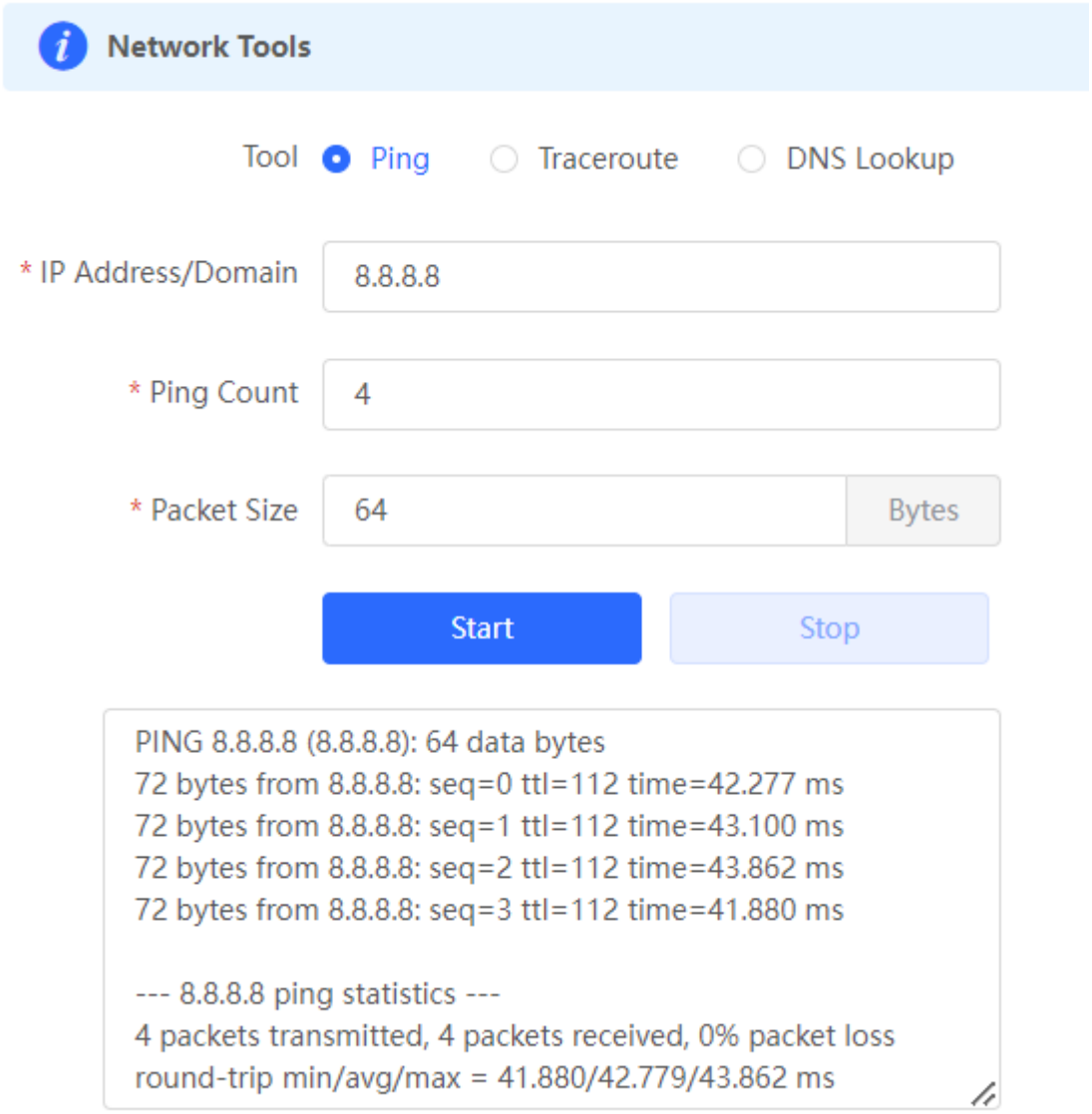


Select a diagnostic method, enter an IP address or URL, and click **Start**.

- The ping method is used to test the connectivity between the tested device and the specified IP address or URL. If the ping operation fails, the IP address or URL fails to be pinged from the device.
- The traceroute method is used to trace network paths to the specified IP address or URL.
- The DNS lookup method is used to check the DNS server address for URL parsing.

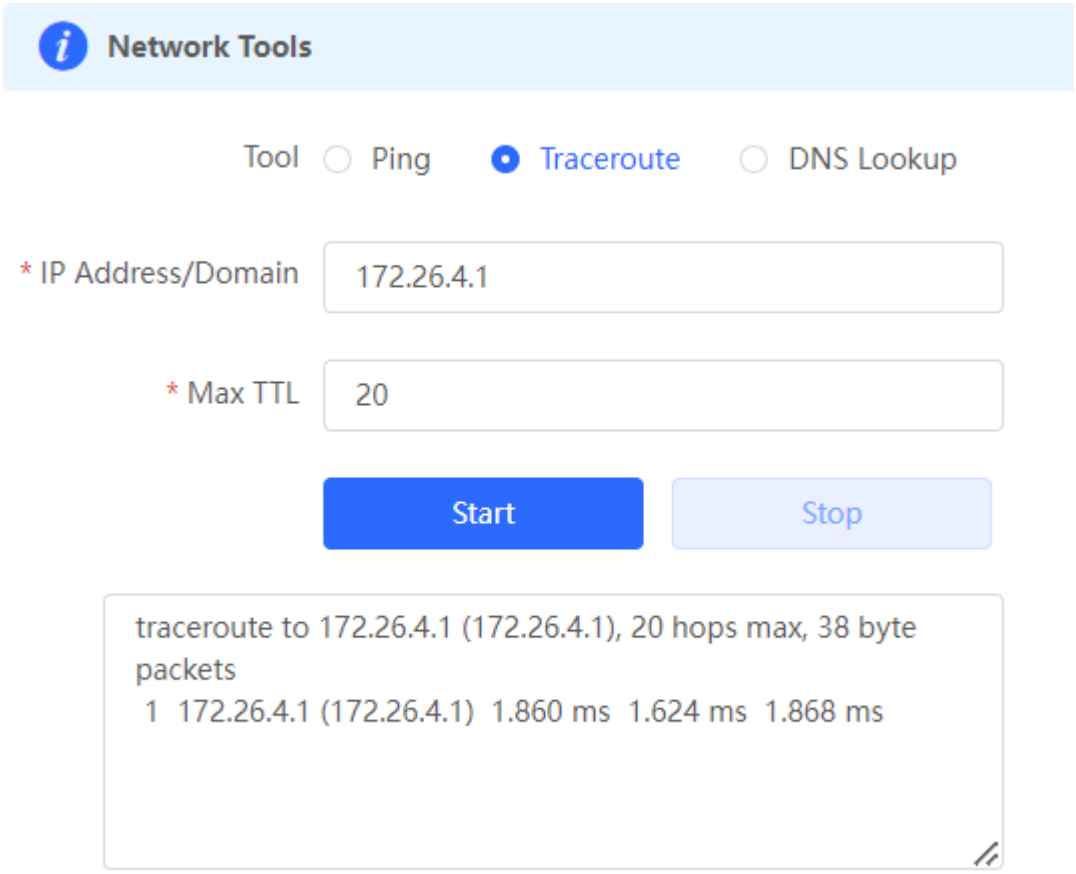
1. **Ping Tool**

Set **IP Address/Domain, Ping Count**, **and Packet Size** on this page, and click **Start**. The ping result will be displayed.



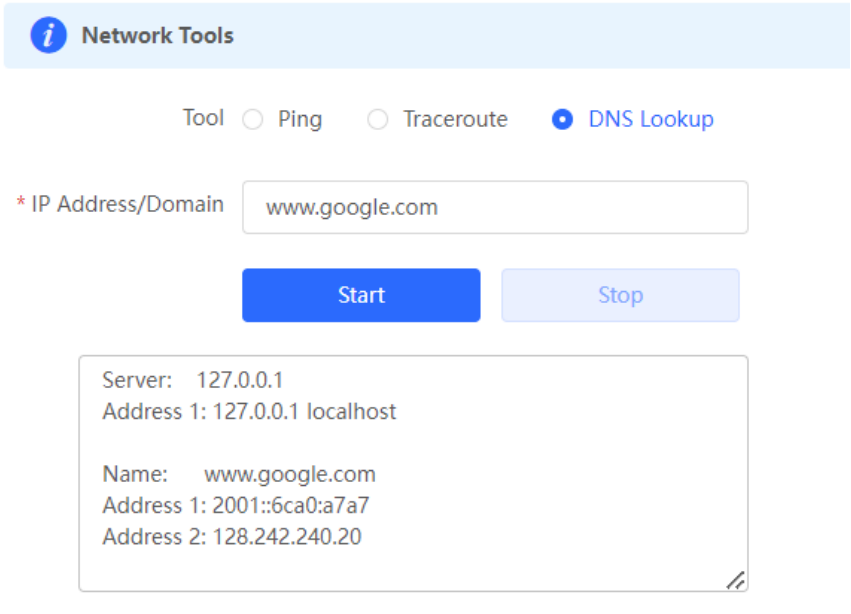
2. **Traceroute Tool**

Set **IP Address/Domain** and **Max TTL** on this page, and click **Start**. The traceroute result will be displayed.



3. **DNS Lookup Tool**

This tool is used to resolve the domain name to an IP address.



4.4.4 Packet Obtaining

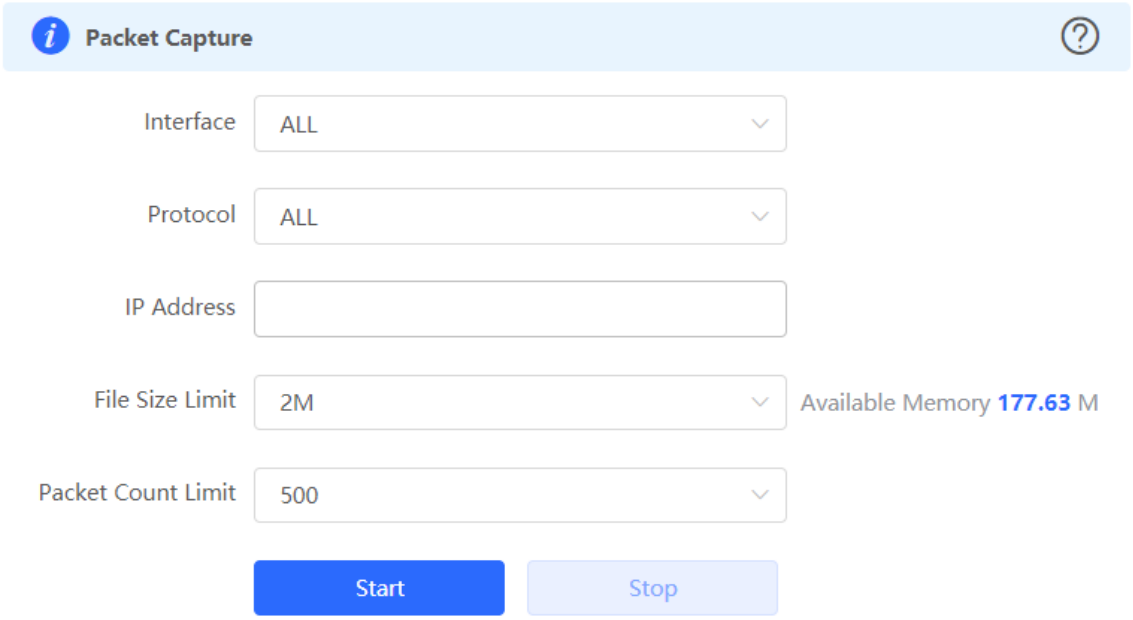
Switch to the **Local** mode. Choose **Diagnostics** > **Packet Capture**.

If the device fails and troubleshooting is required, the packet obtaining result can be analyzed to locate and rectify the fault.

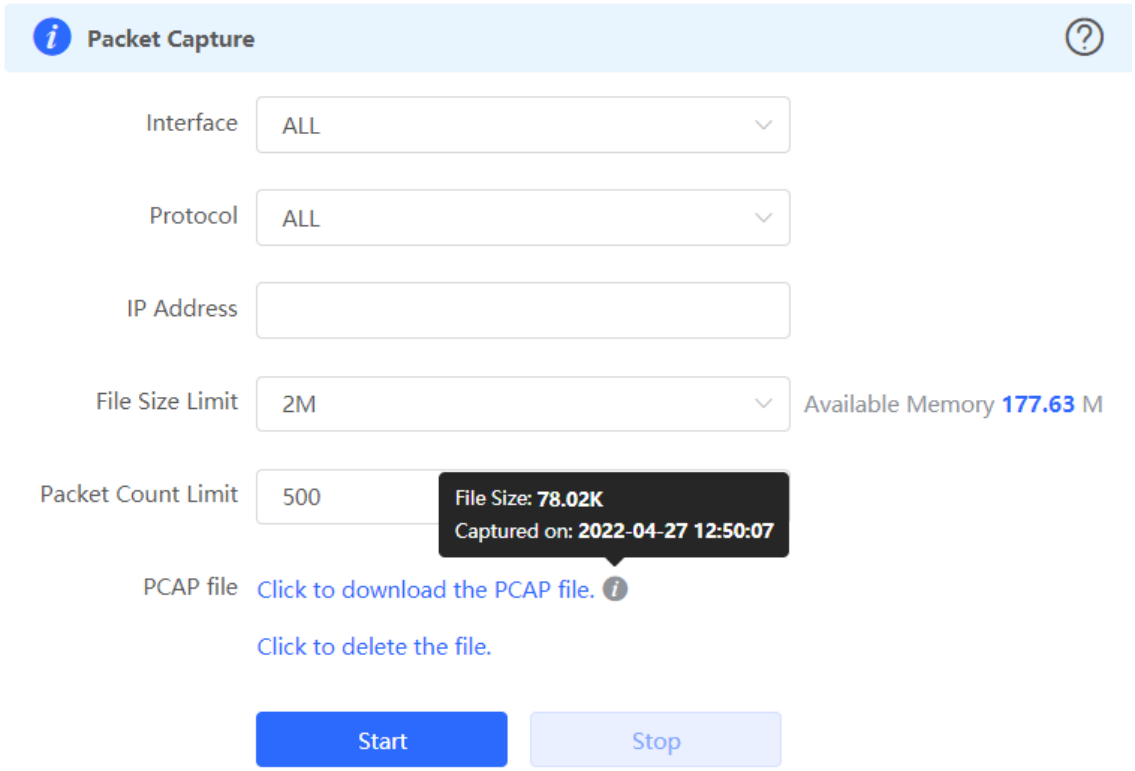
Configure an interface and a protocol, and specify the host IP address to obtain the content in data packets. Select the file size limit and packet count limit to determine the conditions for automatically stopping packet obtaining. If the file size or number of packets reaches the specified threshold, packet obtaining stops and a diagnostic package download link is generated. Click **Start** to execute the packet obtaining command.

Caution

The packet obtaining operation may occupy many system resources, causing network freezing. Therefore, exercise caution when performing this operation.



Packet obtaining can be stopped at any time. Then a download link is generated. Click this link to save the packet obtaining result in the PCAP format locally. Use analysis software such as Wireshark to view and analyze the result.

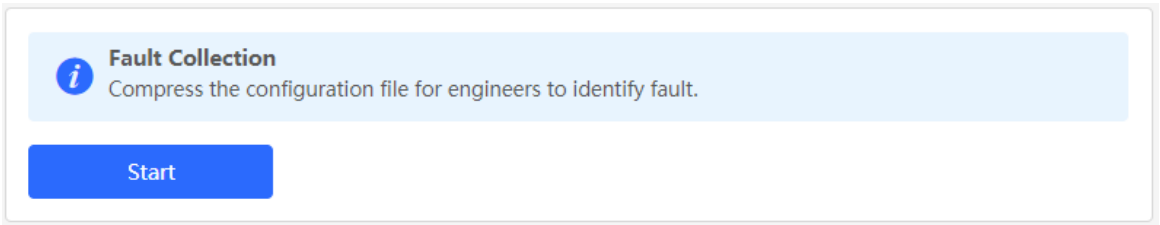


- **Interface:** Obtain packets passing through this interface.
- **Protocol:** Obtain packets of this protocol.
- **IP Address:** Obtain packets of this IP address
- **File Size Limit:** Limit the size of a packet.
- **Packet Count Limit:** Limit the packet count. When the packet count reaches the limit, packet obtaining will stop and a download link will be generated.

4.4.5 Fault Collection

Switch to the **Local** mode. Choose **Diagnostics** > **Fault Collection**.

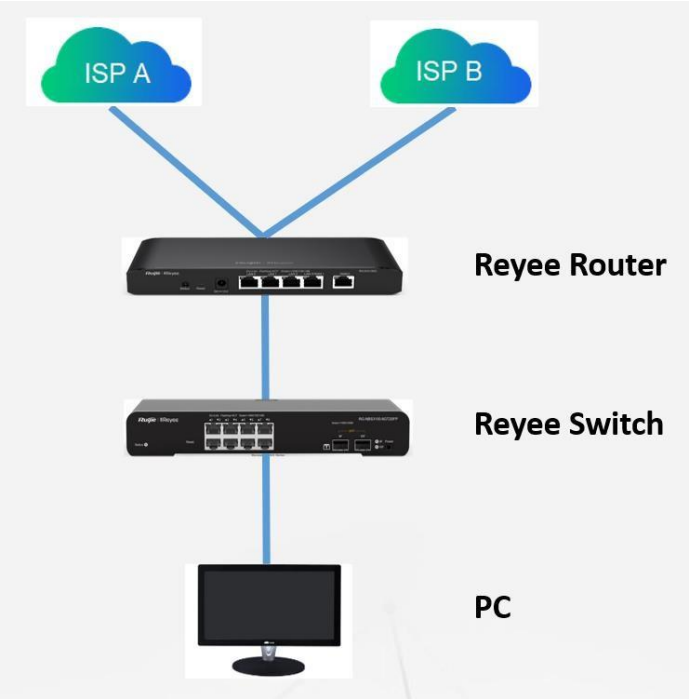
When the device fails, you need to collect fault information. Click **Start**. Configuration files of the device are packaged into a compressed file. Download the compressed file locally and provide it to R&D personnel for fault locating.



Compress the configuration file for engineers to identify faults.

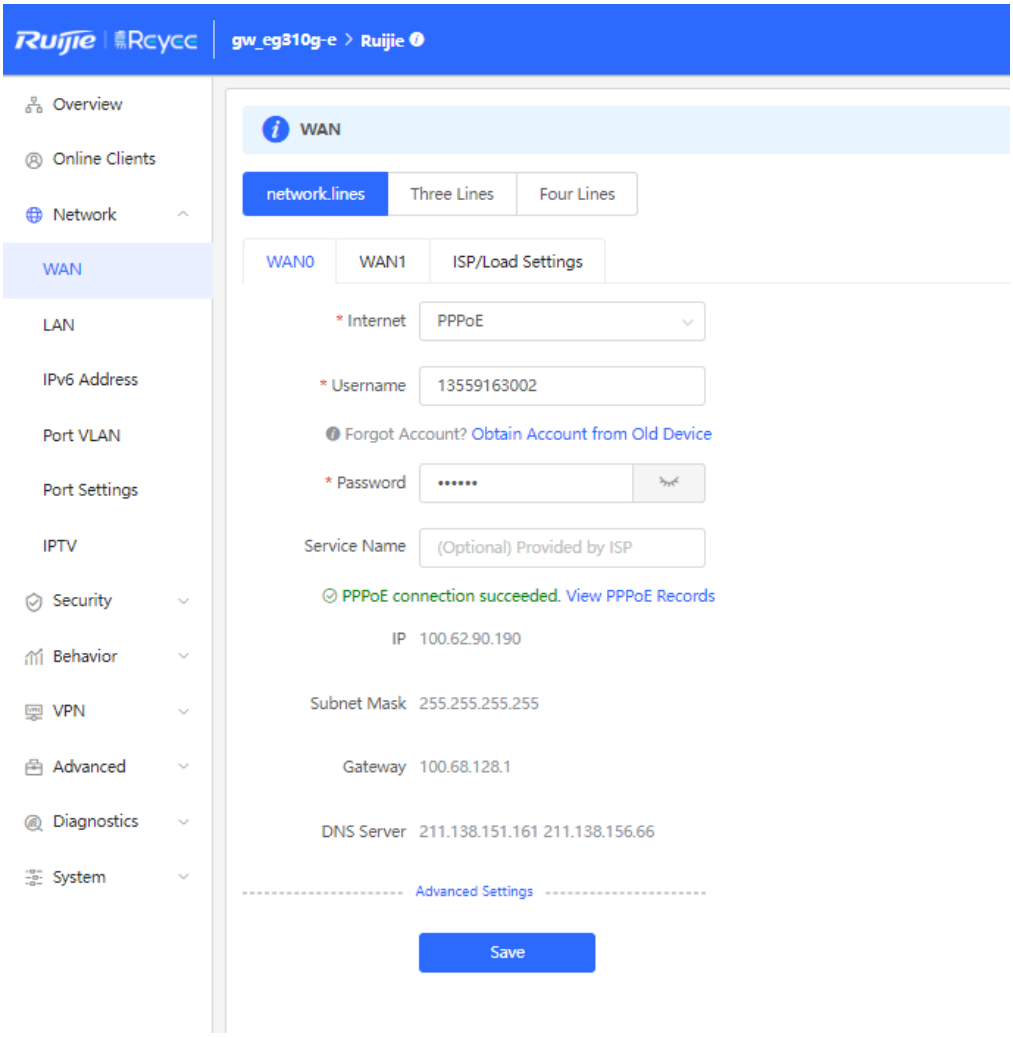
4.5 WAN Load Balancing

If there is more than one WAN port, some traffic is routed over the ISP route, and the remaining traffic is balanced according to the load mode.

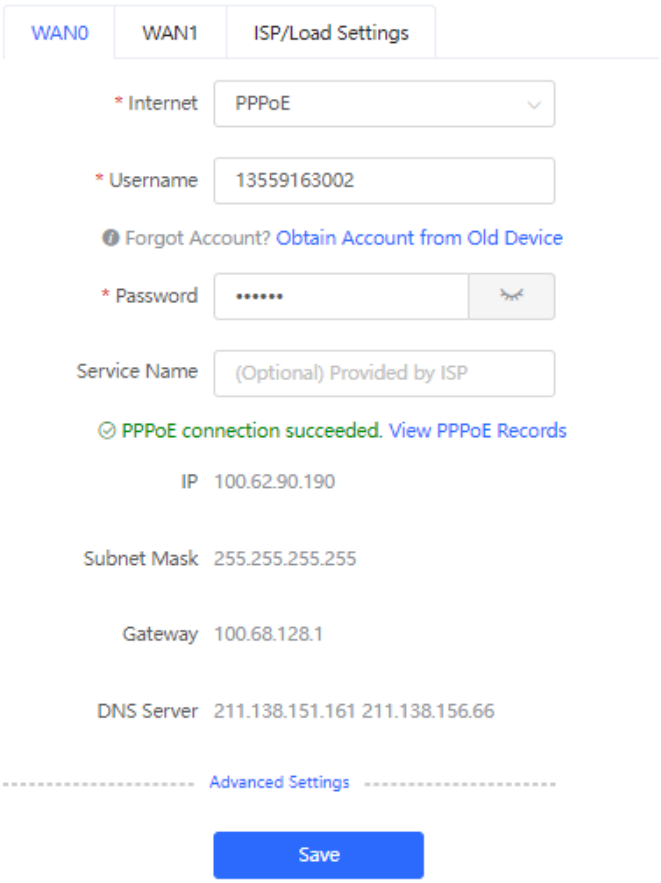


Prepare two uplink cables for Internet access before configuration.

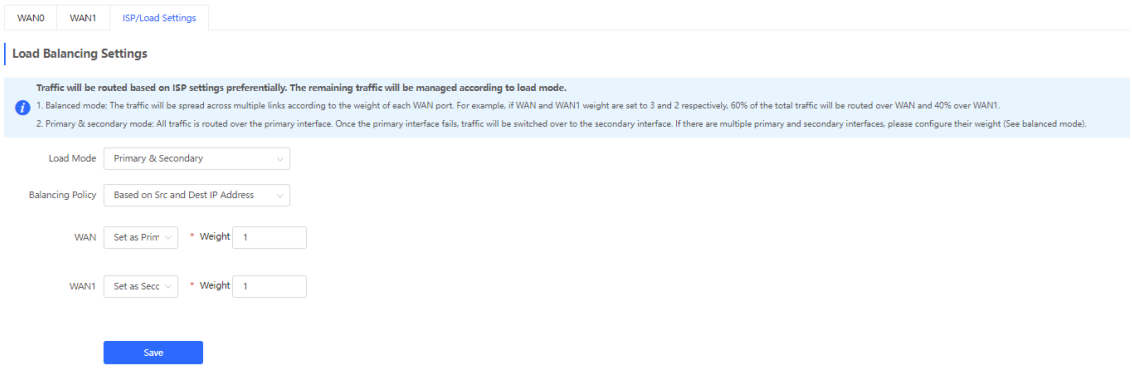
(1) Switch to the **Local** mode. Choose **Network** > **WAN**.



(2) Configure **WAN** accordingly.

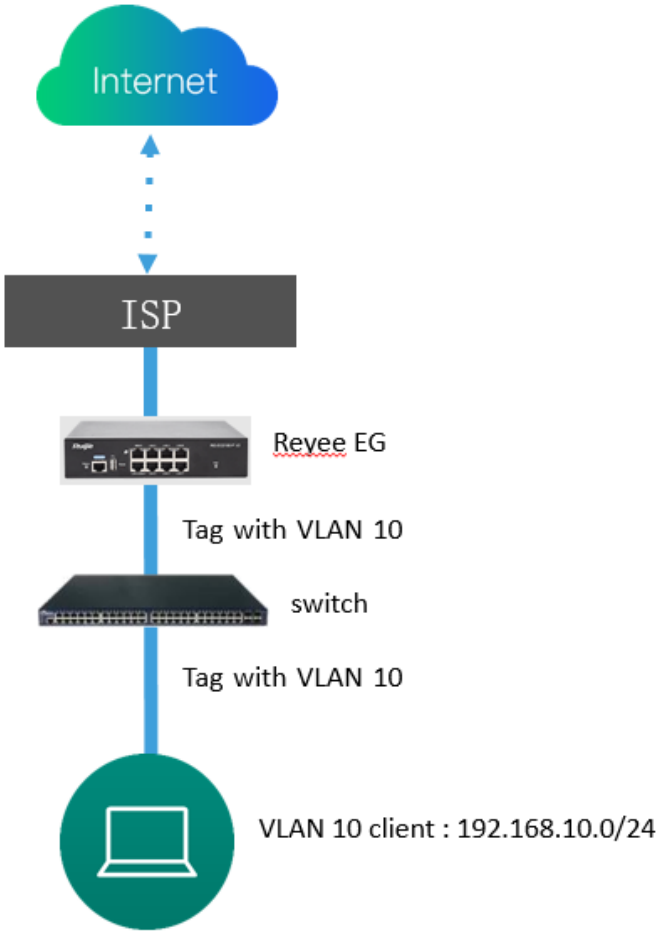


(3) Select **ISP/Load Settings**, and configure the load mode and interface weight.

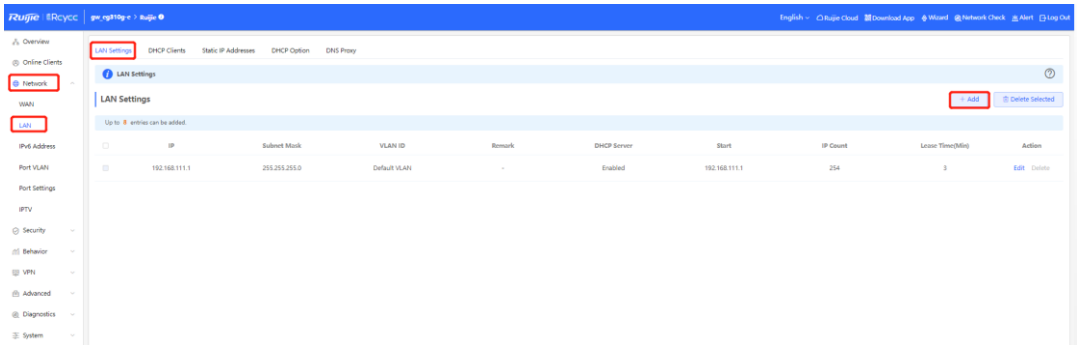


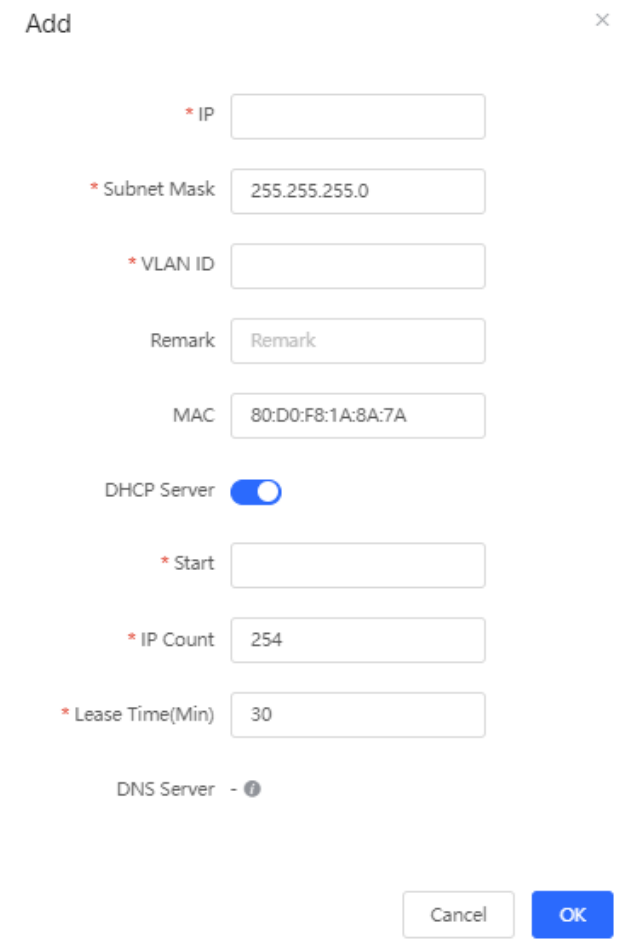
- **Balanced mode:** Traffic will be transmitted across multiple links according to the weight of each WAN port. For example, if weights of **WAN** and **WAN1** are set to 3 and 2 respectively, 60% of the total traffic will be routed over **WAN** and 40% over **WAN1**.
- **Primary & secondary mode:** All traffic is routed over the primary interface. Once the primary interface fails, traffic will be switched over to the secondary interface. If there are multiple primary and secondary interfaces, configure the weights.

4.6 Port VLAN



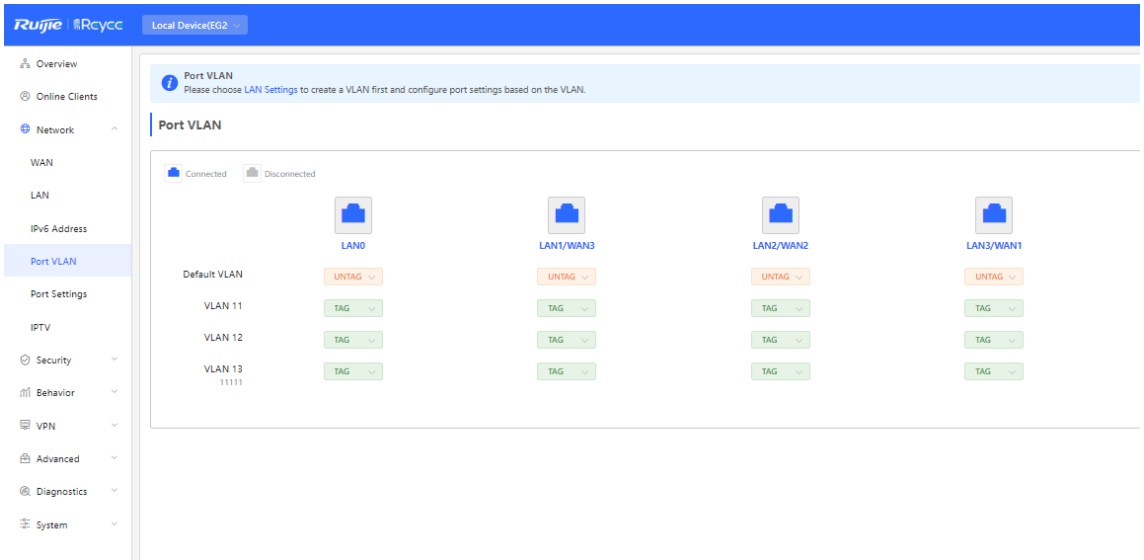
(1) Switch to the **Local** mode. Choose **Network > LAN** to create a VLAN first.





After you configure a LAN successfully, it is displayed in **LAN Settings**.

(2) Choose **Network** > **Port VLAN to tag VLAN**. By default, the tagged mode is used for VLANs.



- **UNTAG**: If VLAN 10 is set to **UNTAG** on port 2, VLAN 10 will be the native VLAN of port 2. Packets from VLAN 10 are forwarded through port 2 without being tagged with VLAN 10 and all untagged packets on

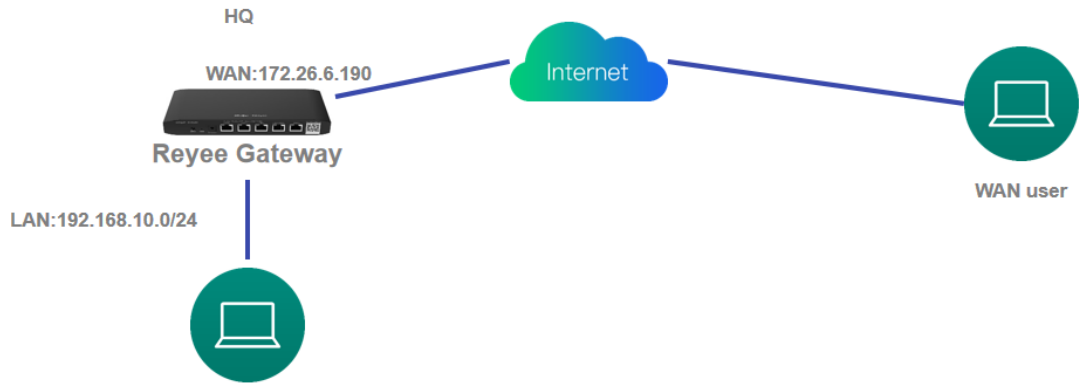
port 2 are considered as the packets from VLAN 10.

- Each port can be configured with only one untagged VLAN.
- The native VLAN of port 1 is the default VLAN and cannot be edited.
- **TAG**: If both VLAN 10 and VLAN 20 are set to **TAG** on port 2, packets from VLAN 10 and VLAN 20 are forwarded through port 2.
- **Not Join**: If both VLAN 10 and VLAN 20 are set to **Not Join** on port 2, port 2 will not receive or transmit packets from VLAN 10 or VLAN 20.

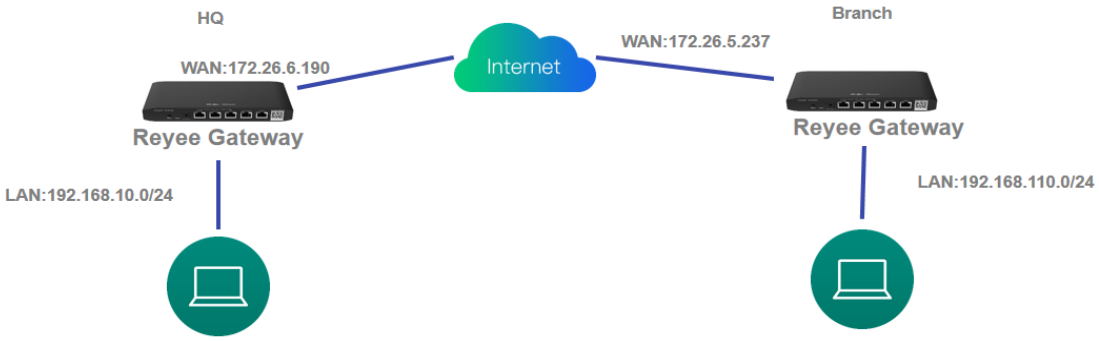
4.7 VPN

Application Scenario

- Client-to-Site Scenario



- Site-to-Site Scenario



4.7.1 PPTP VPN

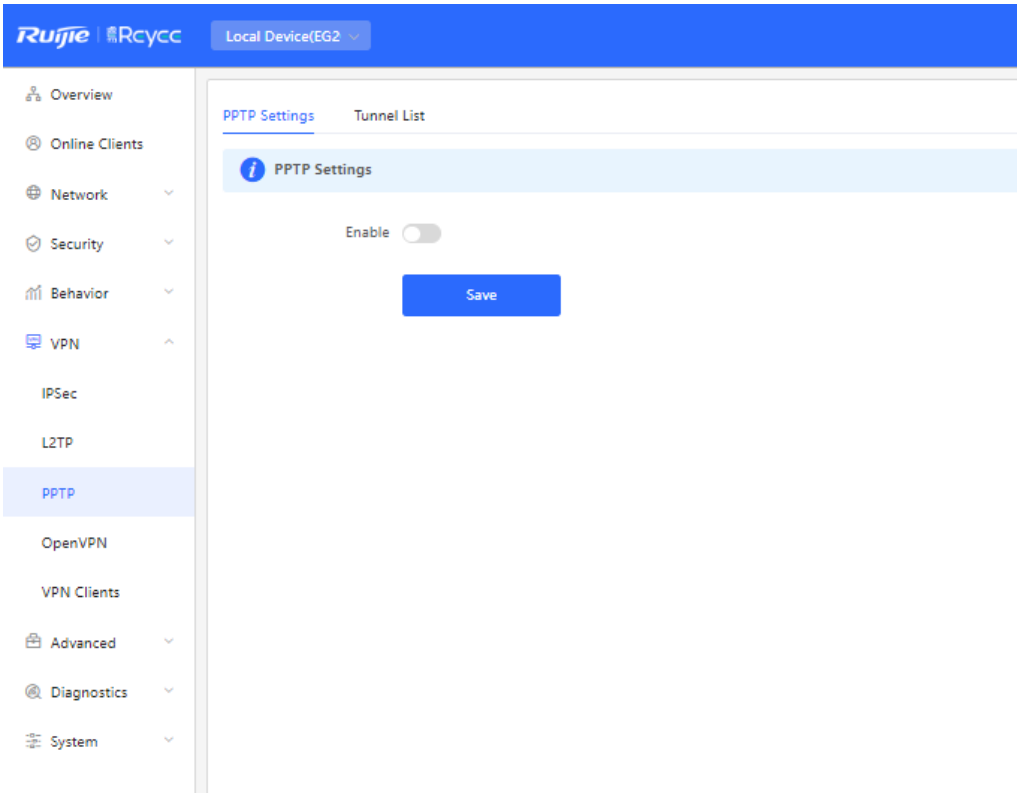
PPTP VPN is typically used in client-to-site and site-to-site scenarios. For example, clients work from home and need to access company servers through PPTP VPN tunnels; a company has three branches that are distributed in three different places, and each branch needs to establish a tunnel with each other through a router.

1. Client-to-Site Scenario Configuration

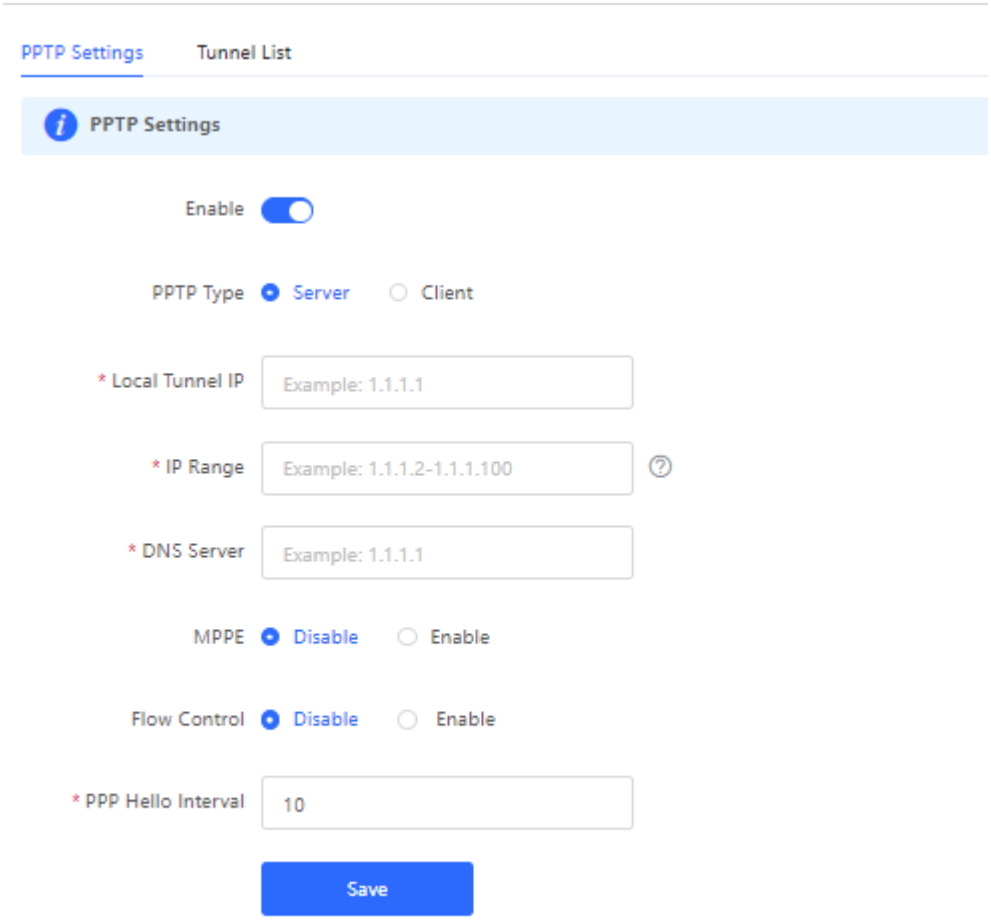
(1) Headquarters side:

a Log in to the Reyee EG with the default IP address of 192.168.110.1.

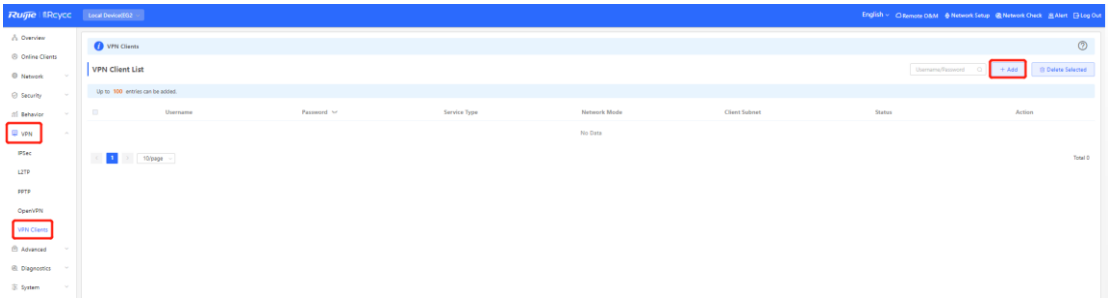
b Switch to the **Local** mode. Choose **VPN** > **PPTP** and enable PPTP.

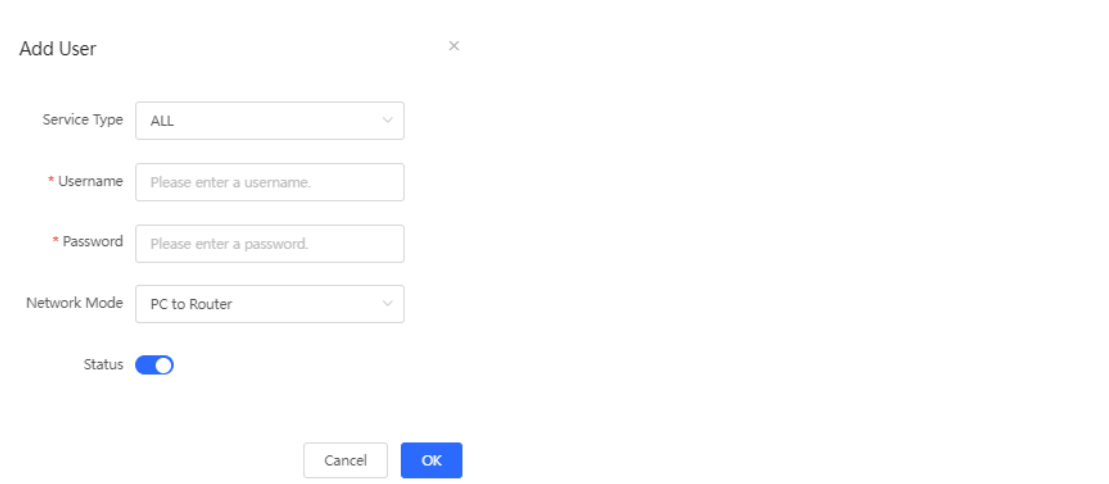


c Perform PPTP configuration and click **Save**.



d Choose **Network** > **VPN Clients** and configure VPN clients.



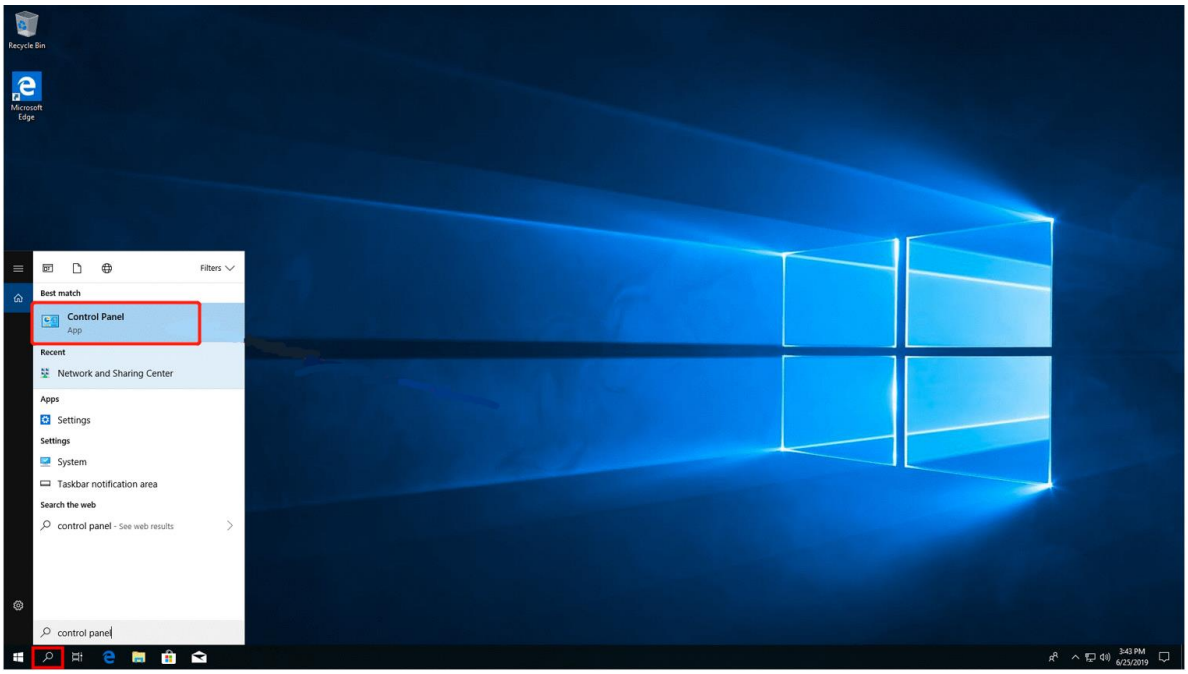


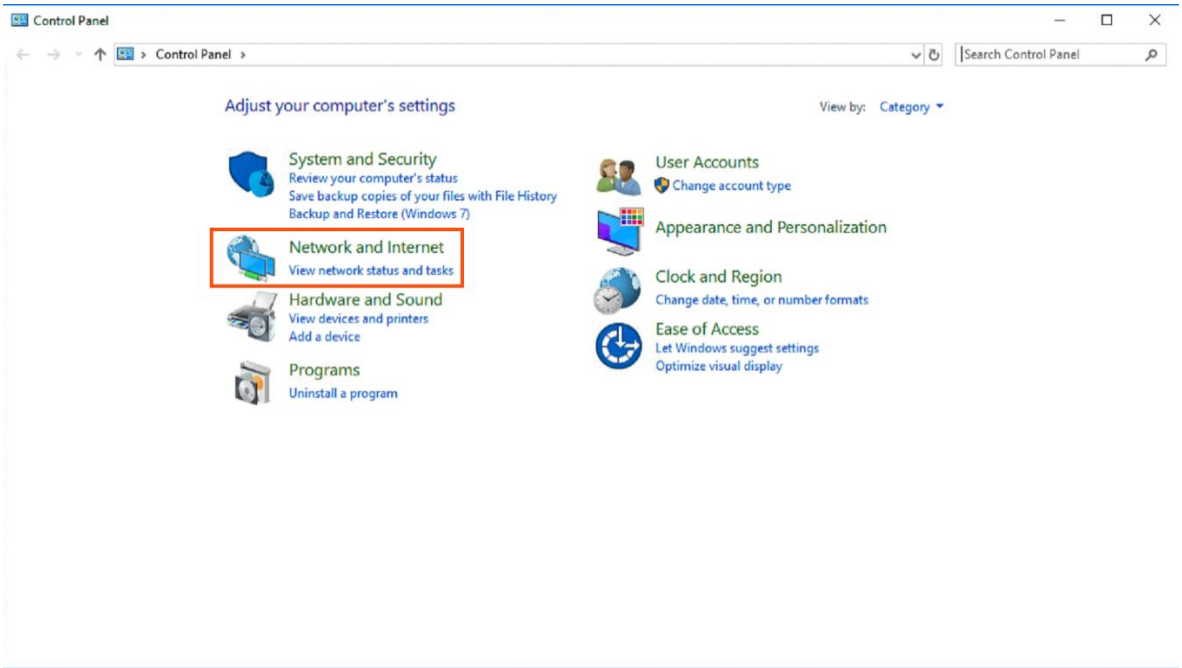
Note

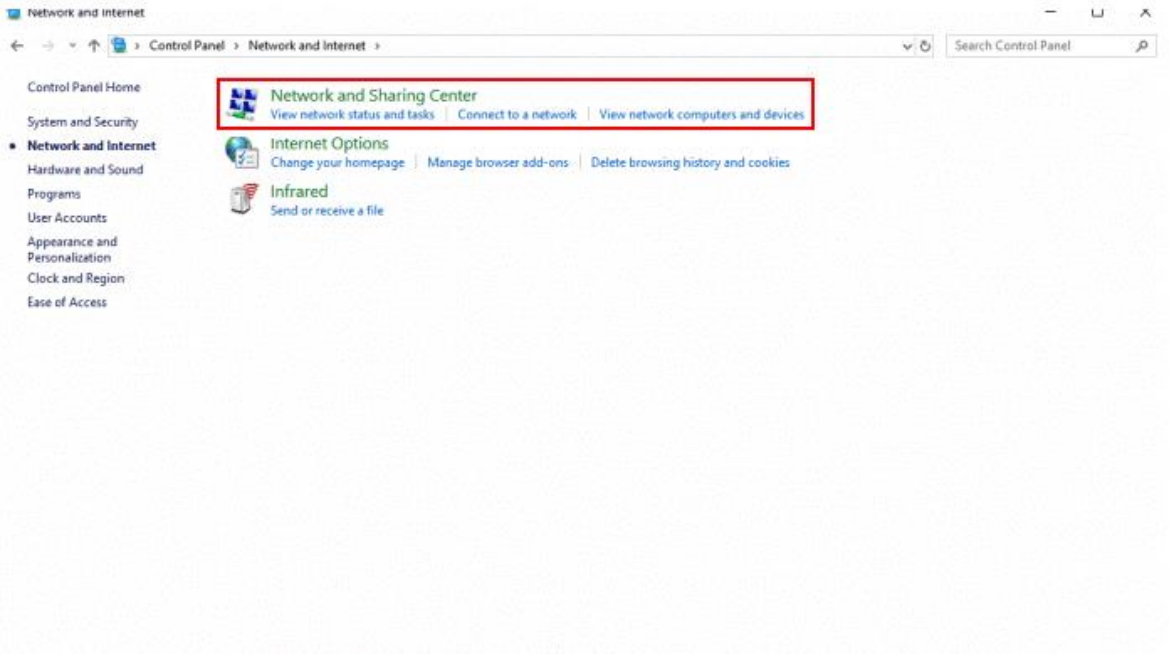
- **Service type**: Select **PPTP**.
- **Network Mode**: Select **Router to Router**.
- **Peer Subnet**: Fill in the internal network segment of the branch. The value and the internal network segment of the headquarters cannot overlap.

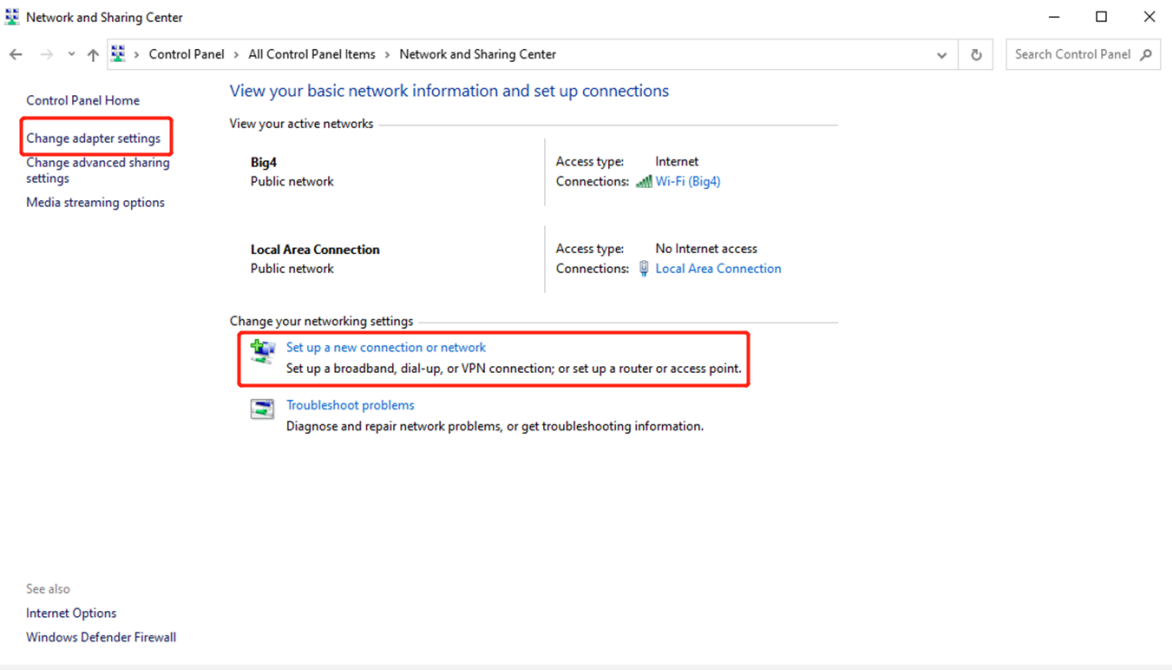
(2) Client side (Windows 10 is used as an example):

a Choose **Control Panel** > **Network and Internet** > **Network and Sharing Center**.

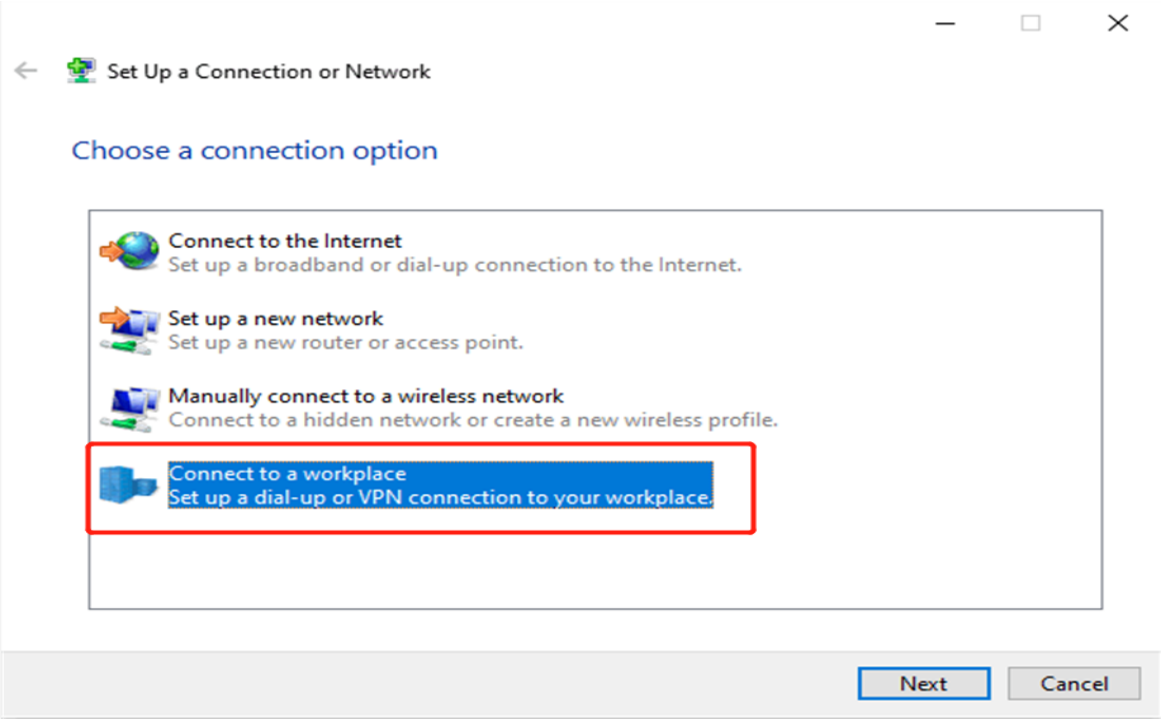


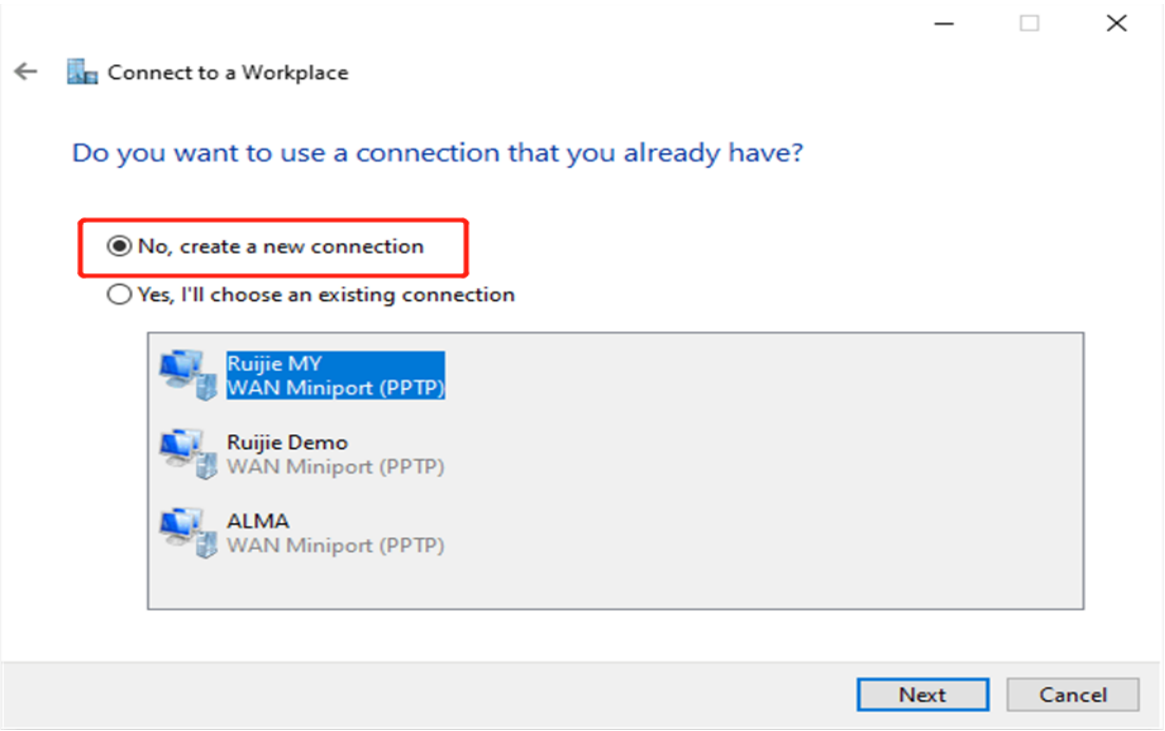


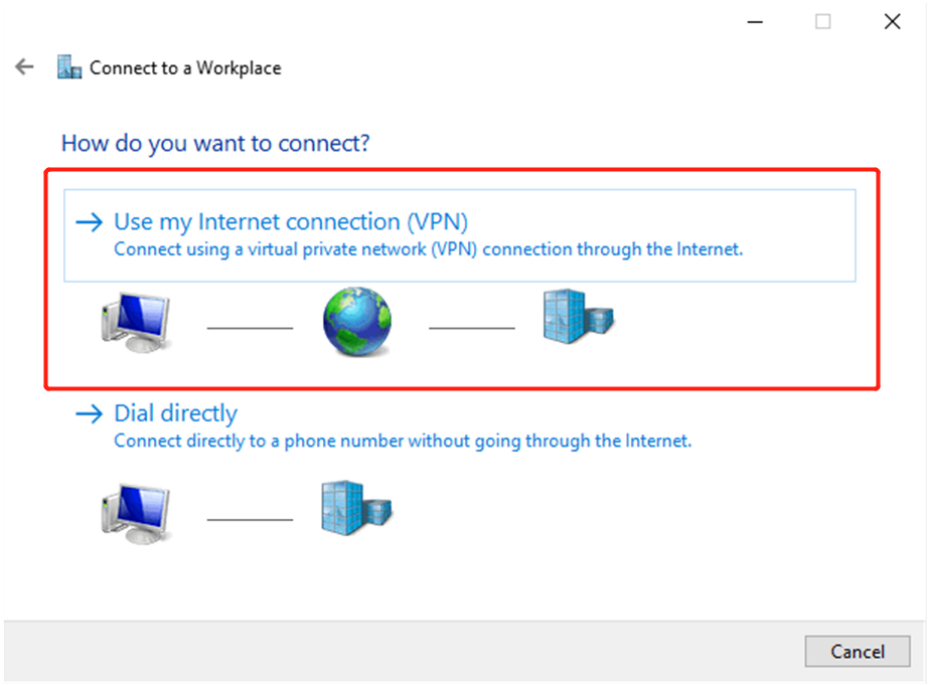


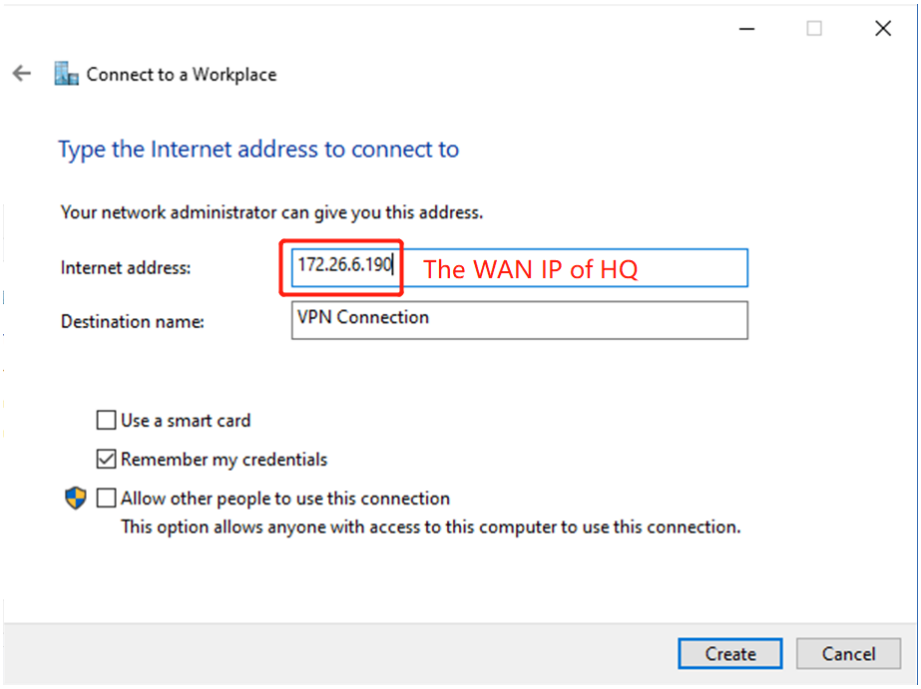


b Configure a VPN connection.

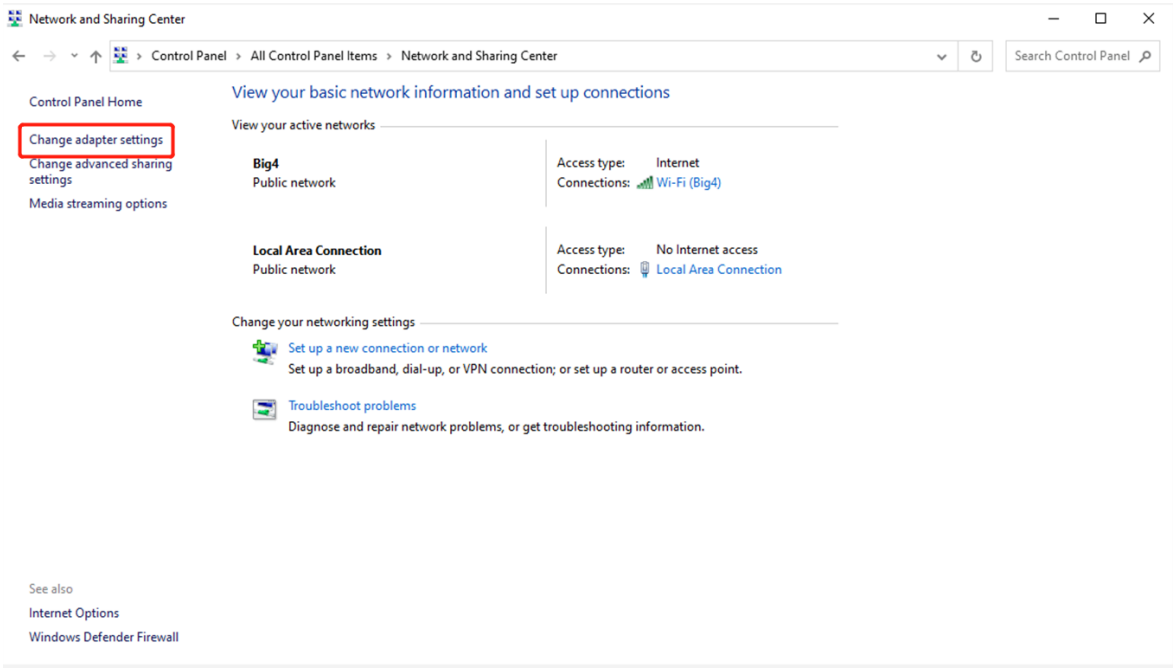

Set Up a Connection or Network
Choose a connection option
Connect to the Internet
Set up a broadband or dial-up connection to the Internet.
Set up a new network
Set up a new router or access point.
Manually connect to a wireless network
Connect to a hidden network or create a new wireless profile.
Connect to a workplace
Set up a dial-up or VPN connection to your workplace.
Next
Cancel

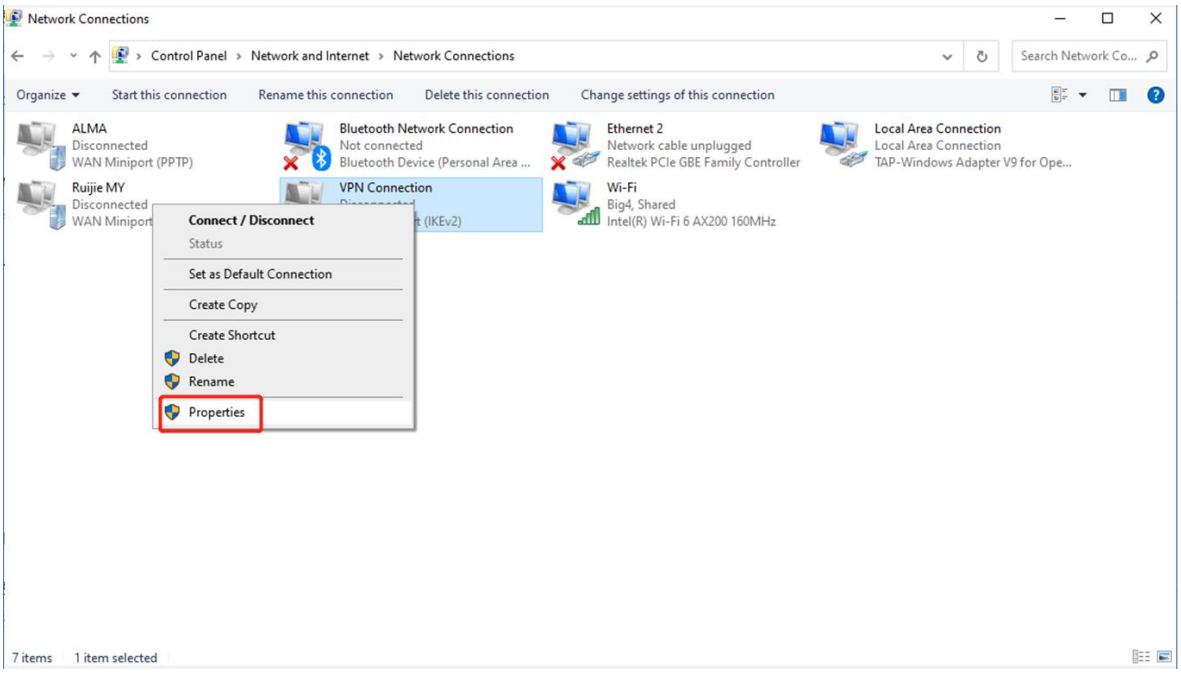

Connect to a Workplace
Do you want to use a connection that you already have?
No, create a new connection
Yes, I'll choose an existing connection
Ruijie MY
WAN Miniport (PPTP)
Ruijie Demo
WAN Miniport (PPTP)
ALMA
WAN Miniport (PPTP)
Next
Cancel

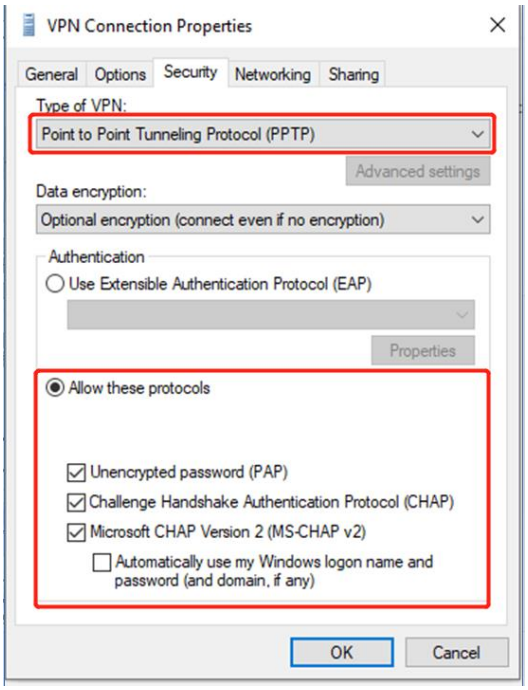




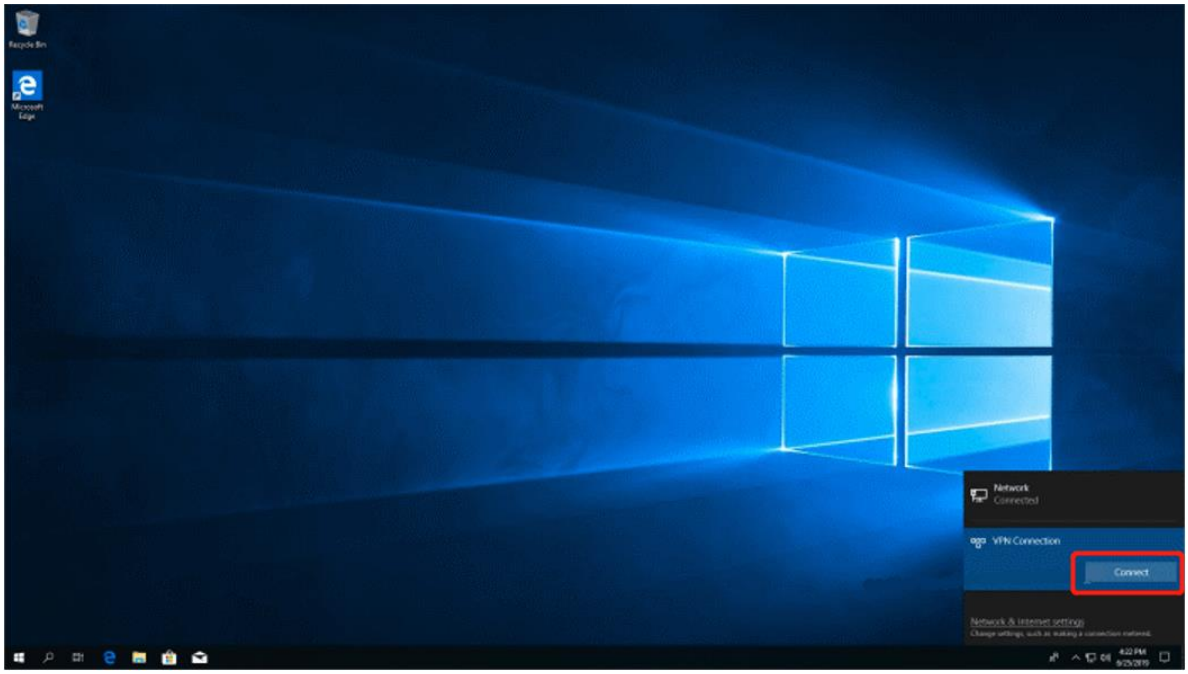
c Change settings of the adapter.

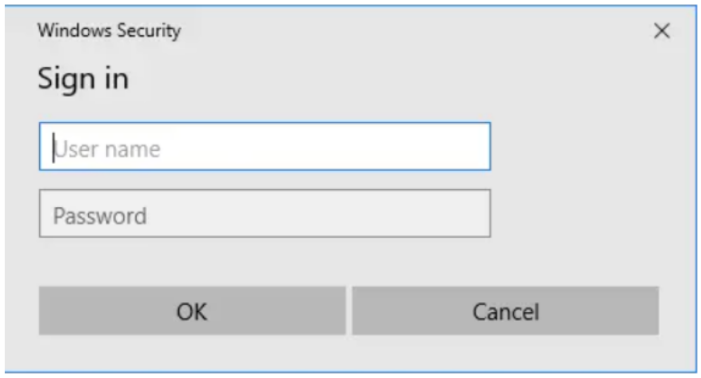

Network and Sharing Center
Control Panel › All Control Panel Items › Network and Sharing Center
Search Control Panel
Control Panel Home
Change adapter settings
Change advanced sharing settings
Media streaming options
View your basic network information and set up connections
View your active networks
Big4
Public network
Access type: Internet
Connections: Wi-Fi (Big4)
Local Area Connection
Public network
Access type: No Internet access
Connections: Local Area Connection
Change your networking settings
Set up a new connection or network
Set up a broadband, dial-up, or VPN connection; or set up a router or access point.
Troubleshoot problems
Diagnose and repair network problems, or get troubleshooting information.
See also
Internet Options
Windows Defender Firewall

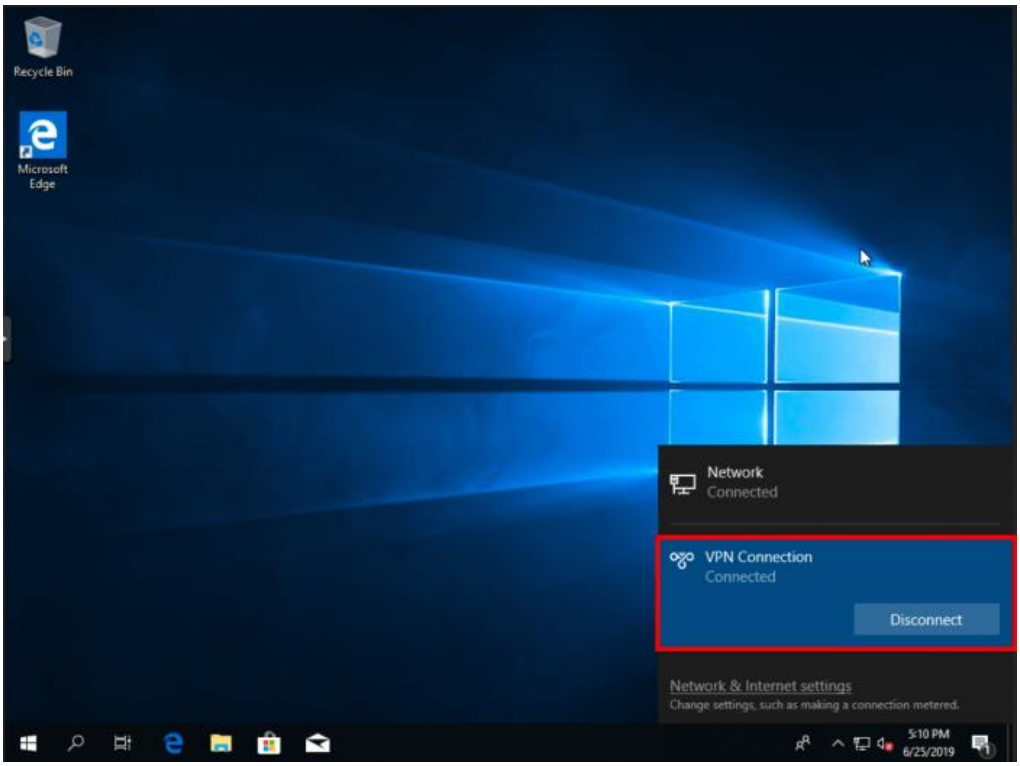

Network Connections
Control Panel › Network and Internet › Network Connections
Search Network Co...
Organize
Start this connection
Rename this connection
Delete this connection
Change settings of this connection
ALMA
Disconnected
WAN Miniport (PPTP)
Bluetooth Network Connection
Not connected
Bluetooth Device (Personal Area ...
Ethernet 2
Network cable unplugged
Realtek PCIe GBE Family Controller
Local Area Connection
Local Area Connection
TAP-Windows Adapter V9 for Ope...
Ruijie MY
Disconnected
VPN Connection
Wi-Fi
Big4, Shared
Intel(R) Wi-Fi 6 AX200 160MHz
Connect / Disconnect
Status
Set as Default Connection
Create Copy
Create Shortcut
Delete
Rename
Properties
7 items
1 item selected



d Check the VPN connection status.







e If your PC cannot access internal devices (192.168.10.0/24) of the headquarters after the VPN connection is set up, add the following static route on your PC. The IP address 192.168.100.2 is the PC's IP address obtained from the headquarters. Then the PC can access internal devices of the headquarters.

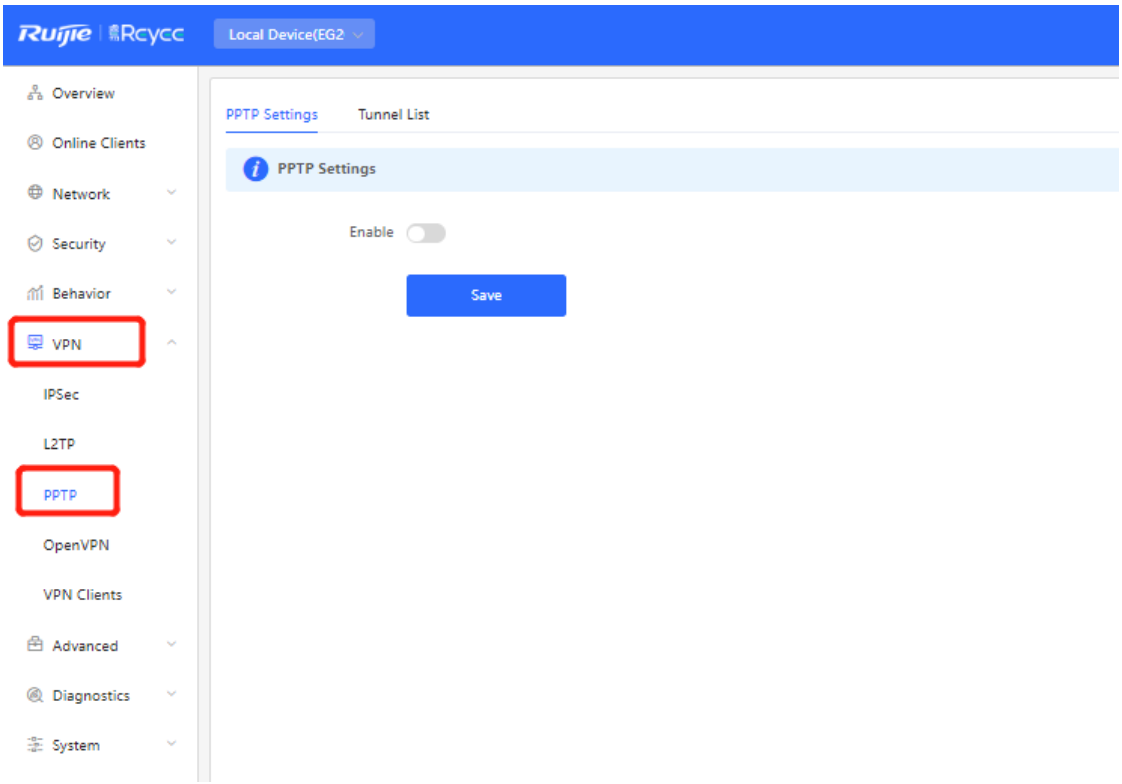
```
C:\Users\Daisy>route add 192.168.168.10.0 mask 255.255.255.0 192.168.100.2
```

2. Site-to-Site Scenario Configuration

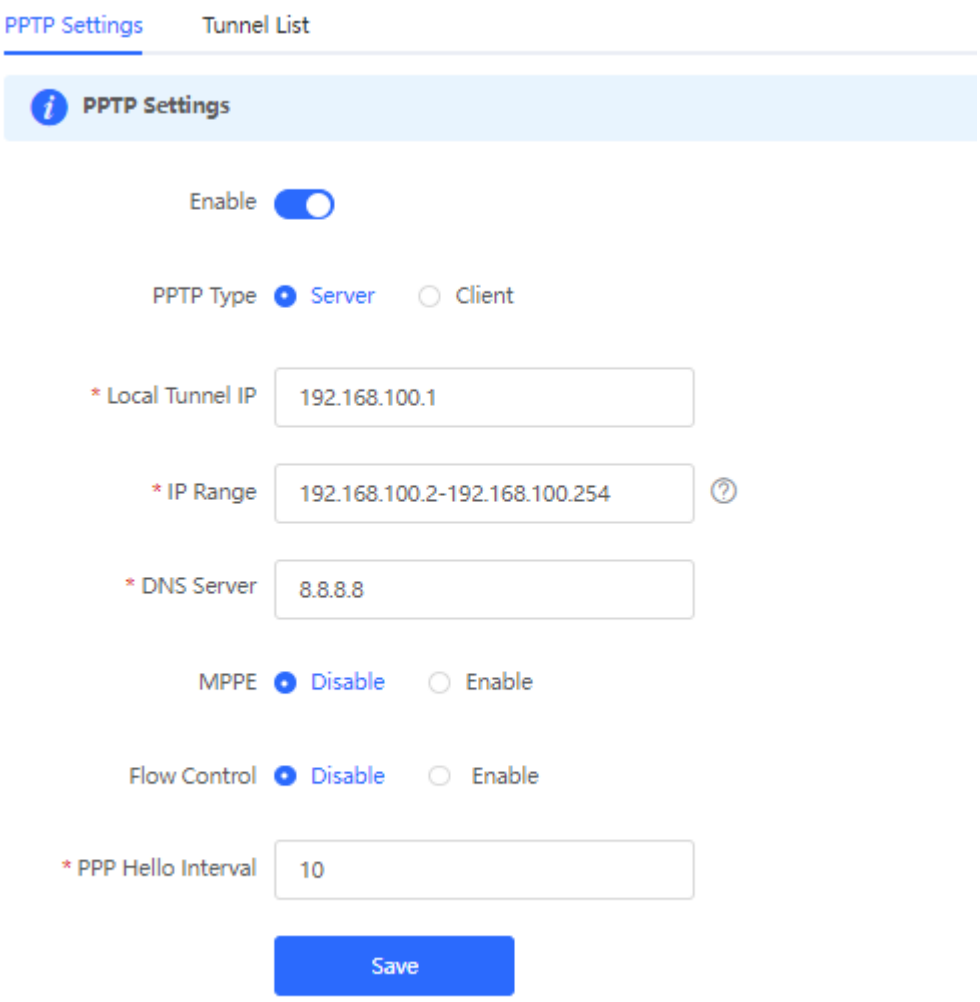
(1) Headquarters side:

a Log in to the Reyee EG with the default IP address of 192.168.110.1.

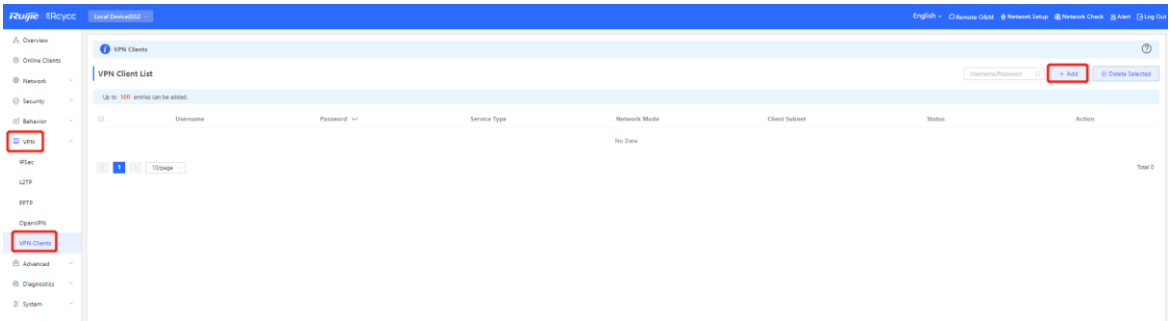
b Switch to the **Local** mode. Choose **VPN** > **PPTP**.

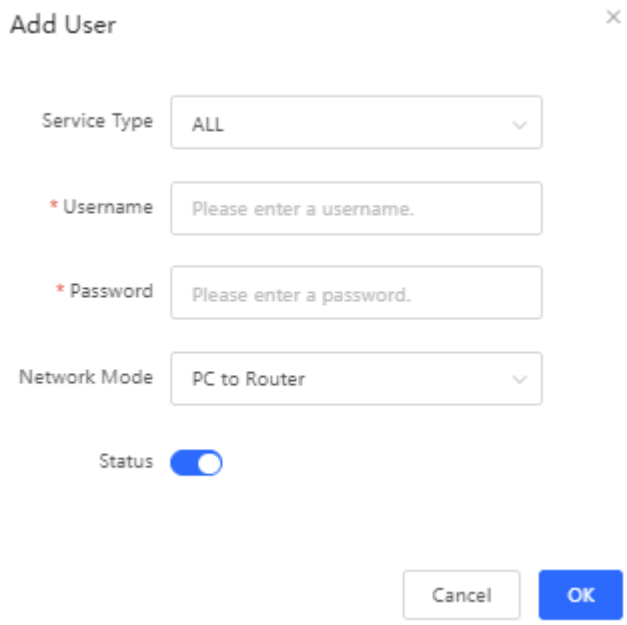


c Enable PPTP, set **PPTP Type** to **Server**, perform PPTP configuration, and click **Save**.



d Choose **Network** > **VPN Clients** and configure VPN clients.





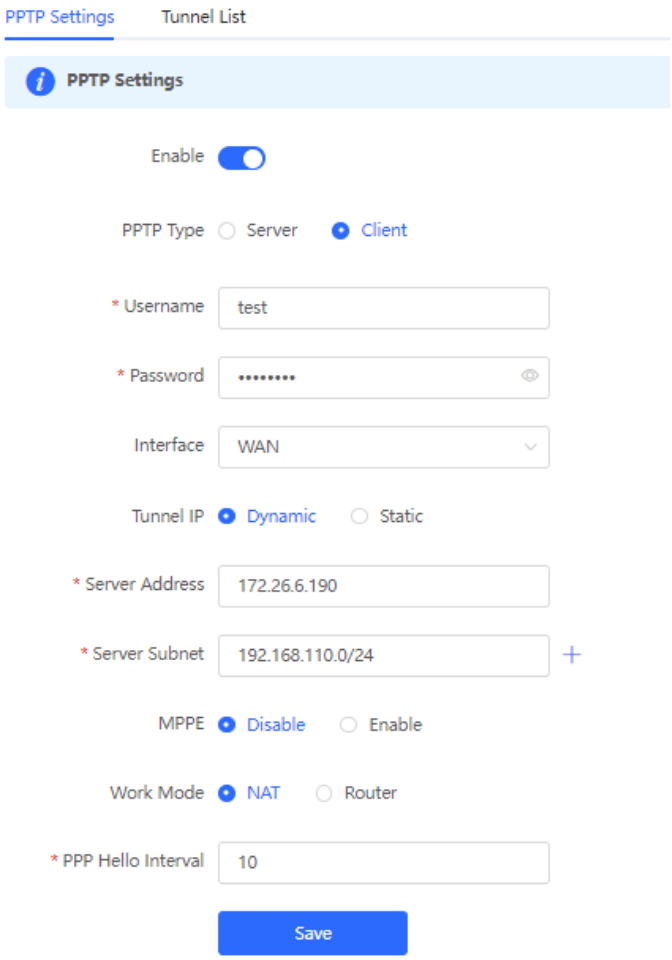
Caution

The value of **Peer Subnet** is the local IP address range of its branch.

(2) Branch side:

a Log in to the Reyee EG with the default IP address of 192.168.110.1.

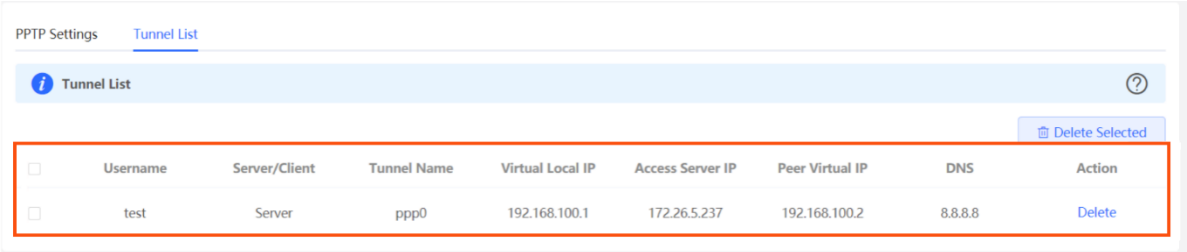
b Switch to the **Local** mode. Choose **VPN > PPTP**, enable **PPTP**, and set **PPTP Type** to **Client**.



Caution

- PPTP Type: Select Client.
- Username and Password: Fill in the username and password that have been added in the headquarters.
- Tunnel IP: Select the address in the IP address range of the address pool filled in by the headquarters. If Dynamic is selected, the IP address of the address pool is assigned randomly. If Static is selected, any address in the address pool can be entered without conflicts.
- Server Address: Fill in the WAN port address of the headquarters. The public network IP address is required. Here, a private network address is just for reference.
- Peer Subnet: Specify the internal network segment of the headquarters. The value and internal network segment of the branch cannot overlap.
- Work Mode: Specify whether the headquarters is allowed to access the branch intranet. If so, select Router. If not, select NAT.

c Check the VPN connection status.



4.7.2 L2TP VPN

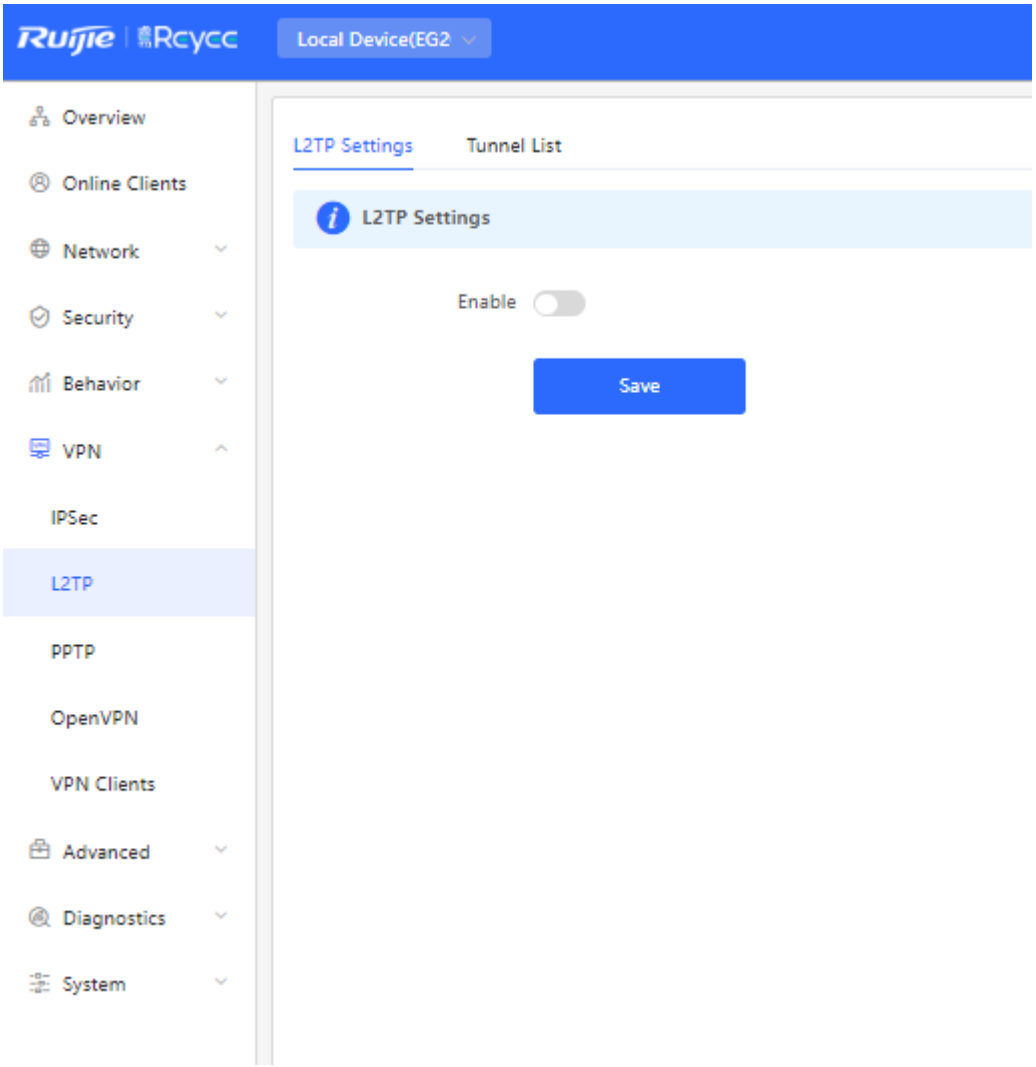
L2TP VPN is typically used in client-to-site and site-to-site scenarios. For example, clients work from home and need to access company server through L2TP VPN tunnels; a company has three branches that are distributed in three different places of the Internet, and each branch needs to establish a tunnel with each other through a router.

1. Client-to-Site Scenario Configuration

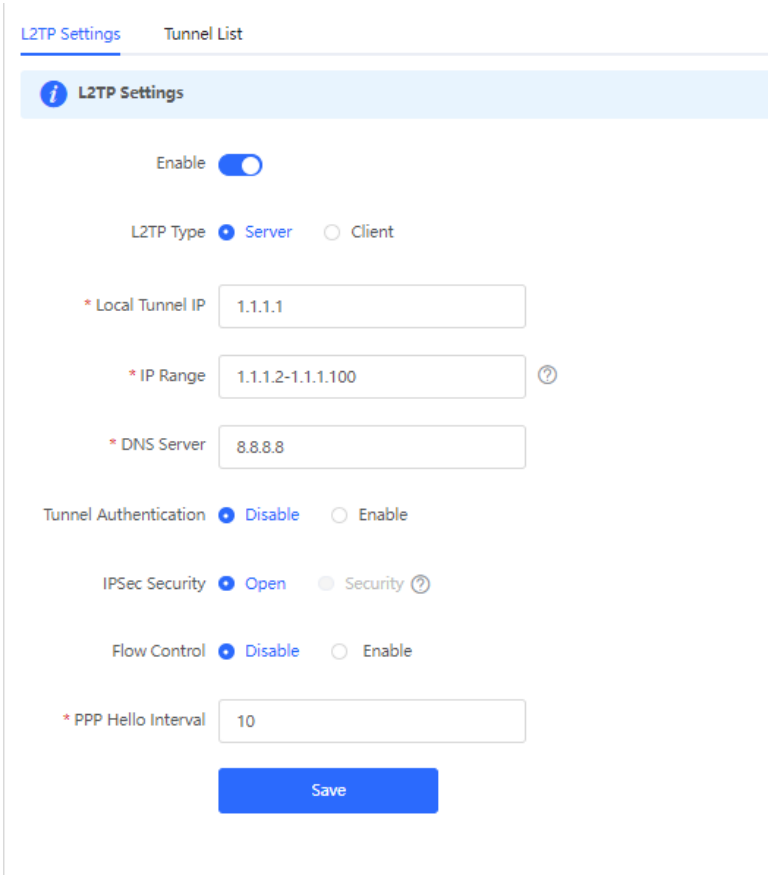
(1) Headquarters side:

a Log in to the Reyee EG with the default IP address of 192.168.110.1.

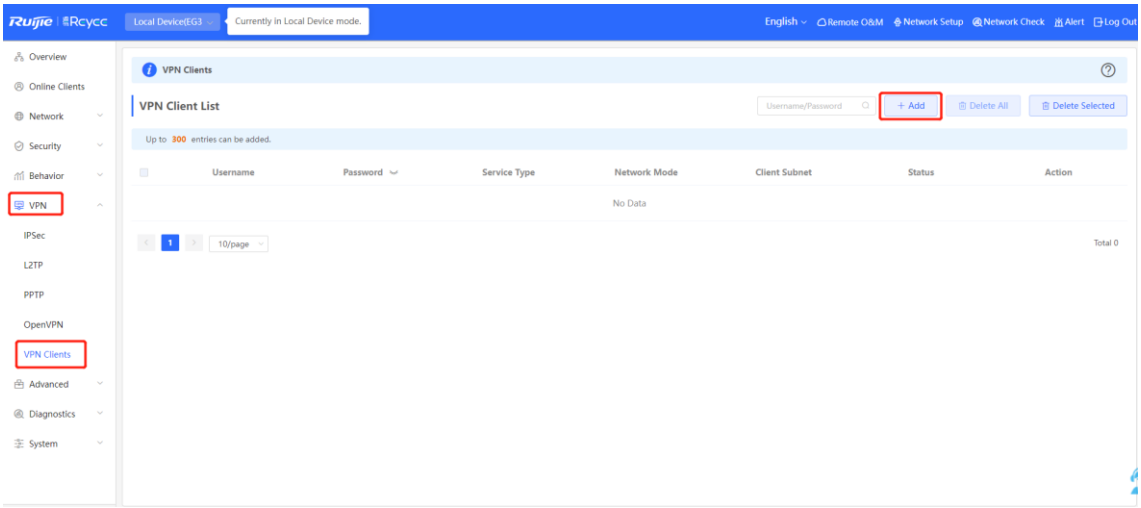
b Switch to the **Local** mode. Choose **VPN** > **L2TP**.

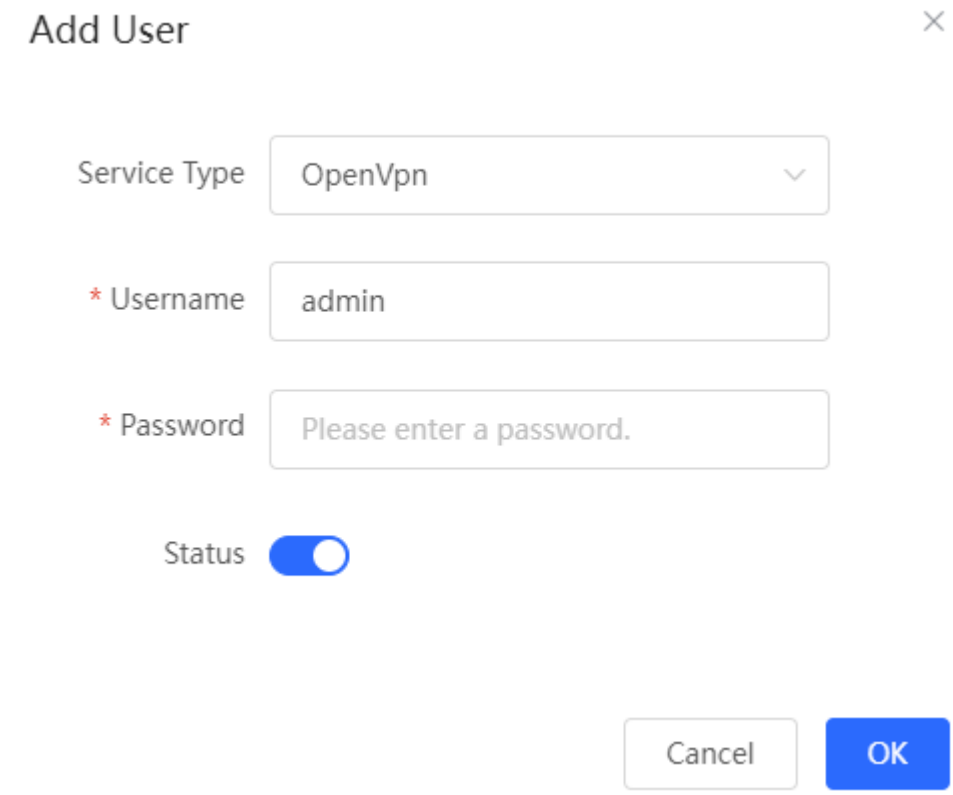


c Enable L2TP, perform L2TP configuration, and click **Save**.



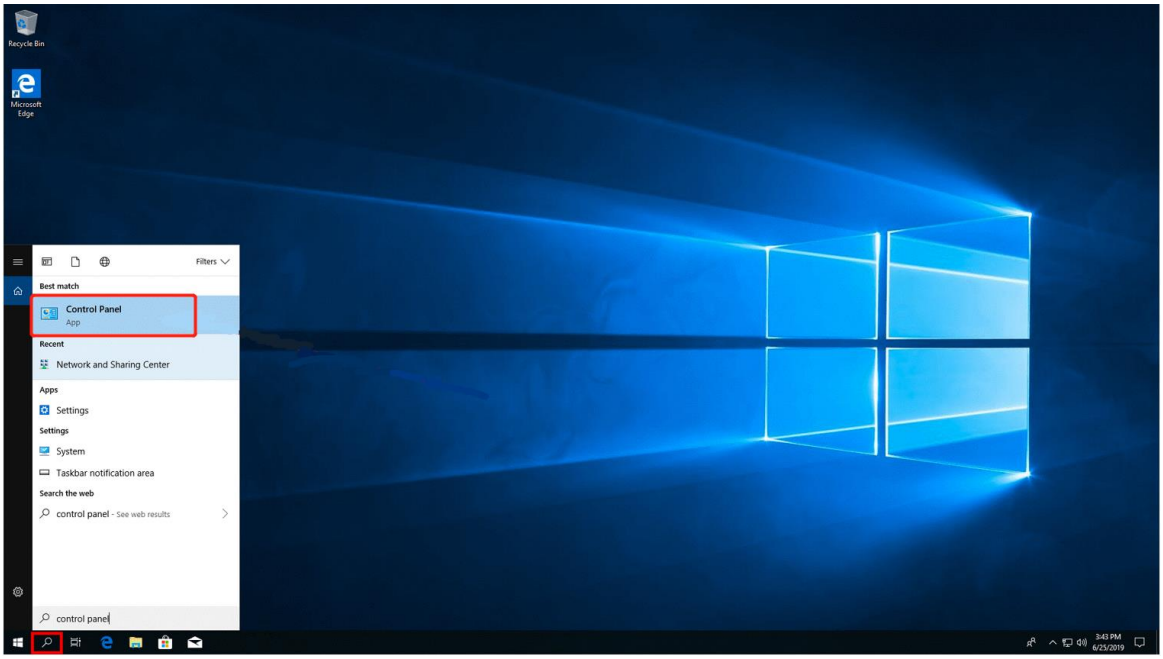
d Choose **Local Device > VPN** > **VPN Clients** and configure VPN clients.

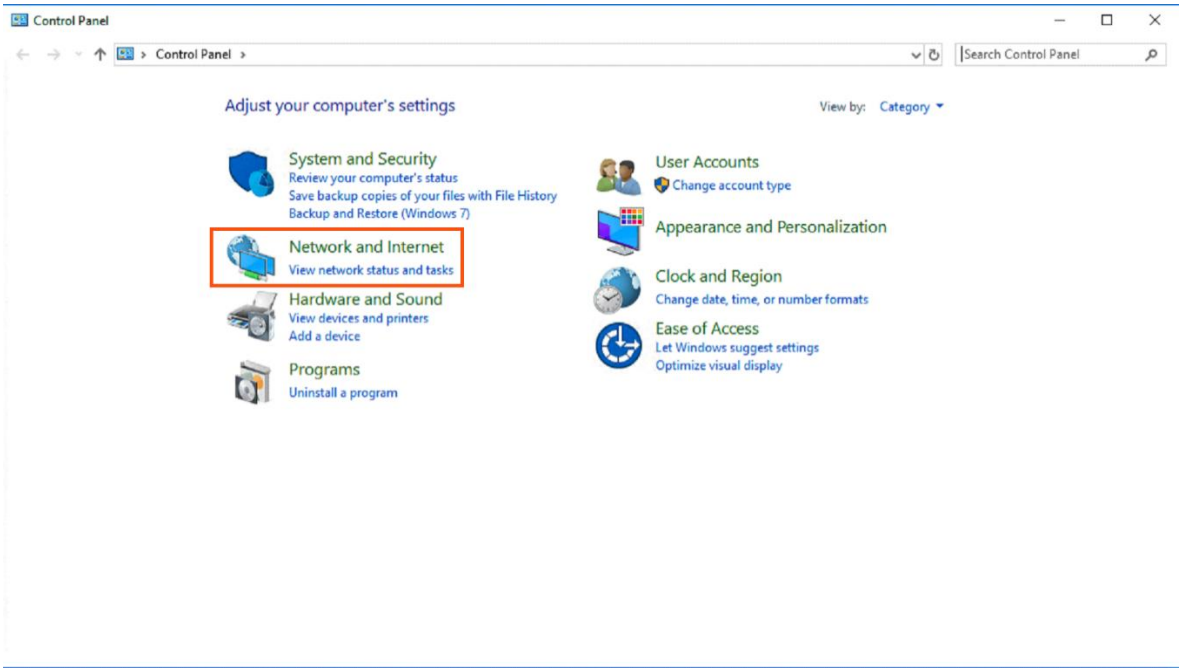


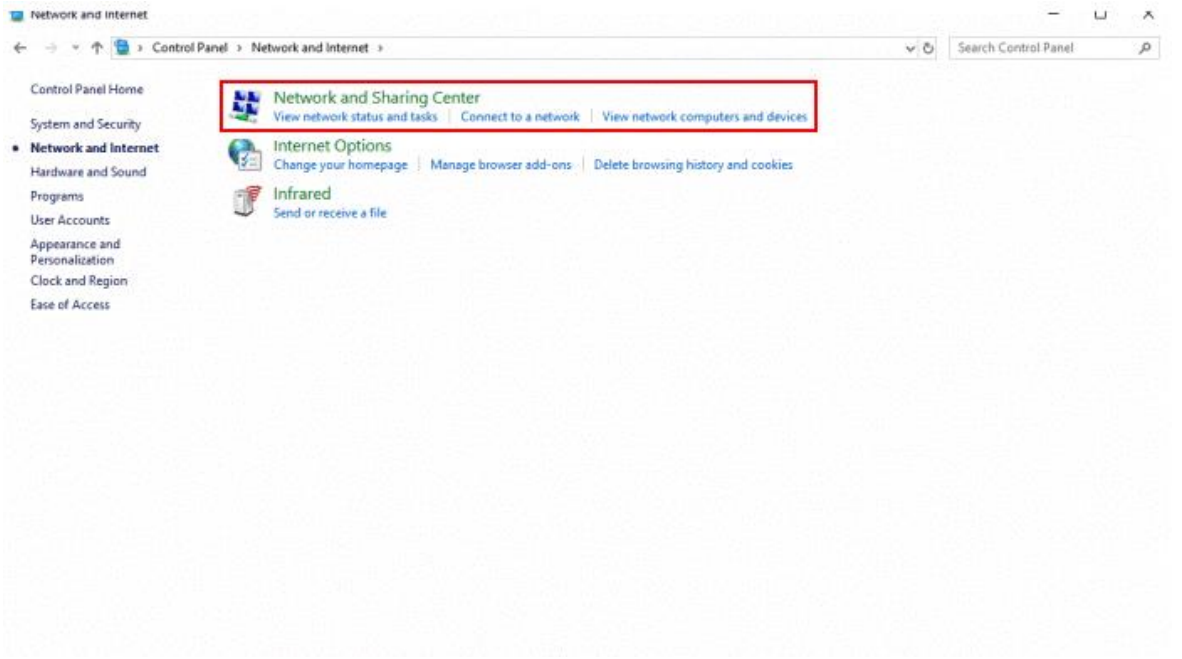


(2) Client side (Windows 10 is used as an example):

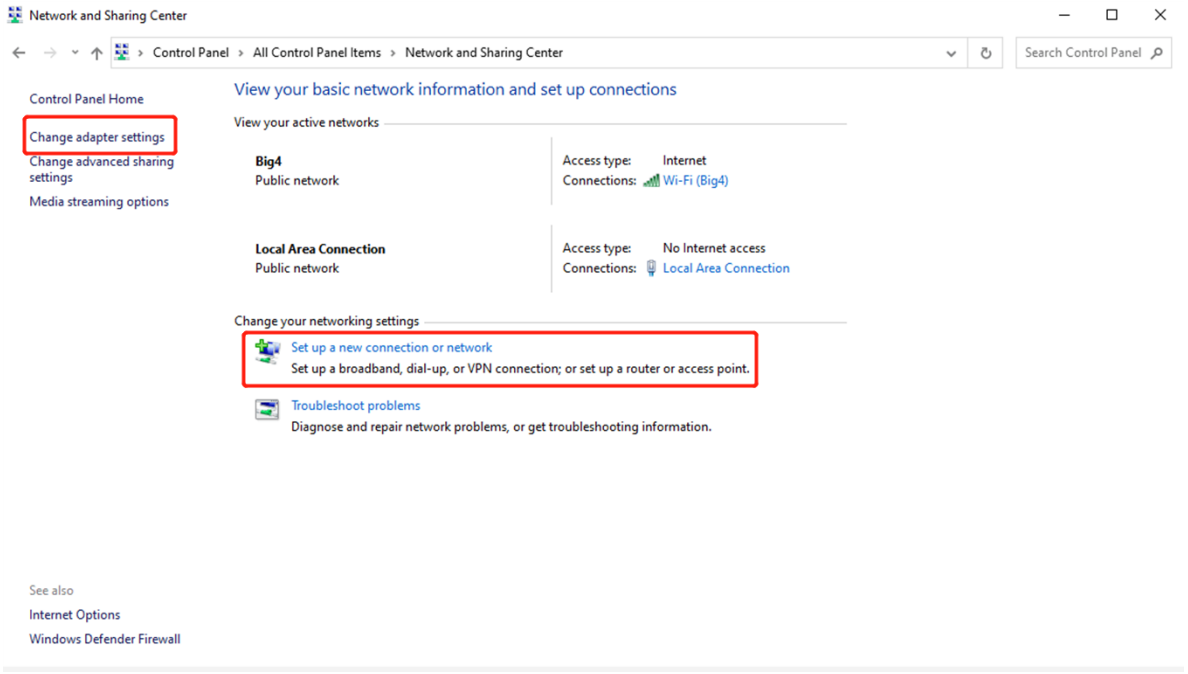
a Choose **Control Pane** > **Network and Internet** > **Network and Sharing Center**.

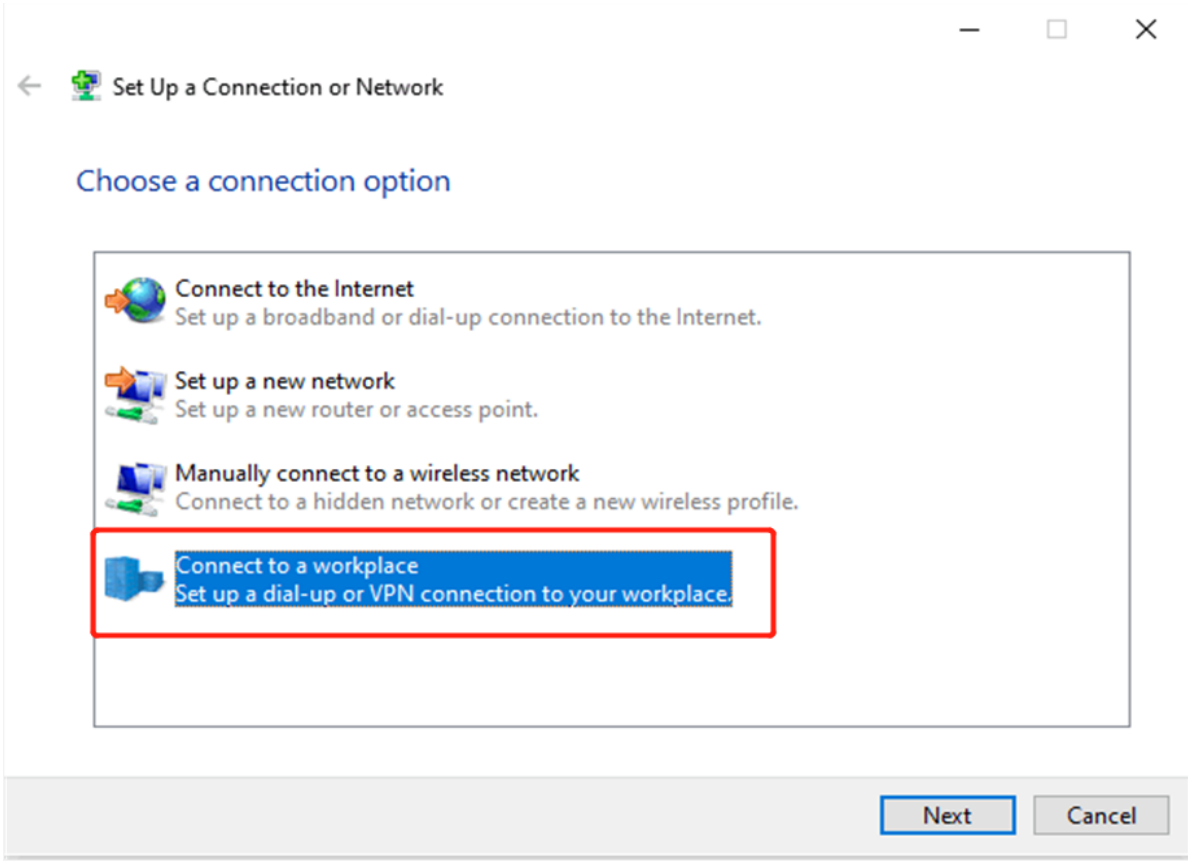


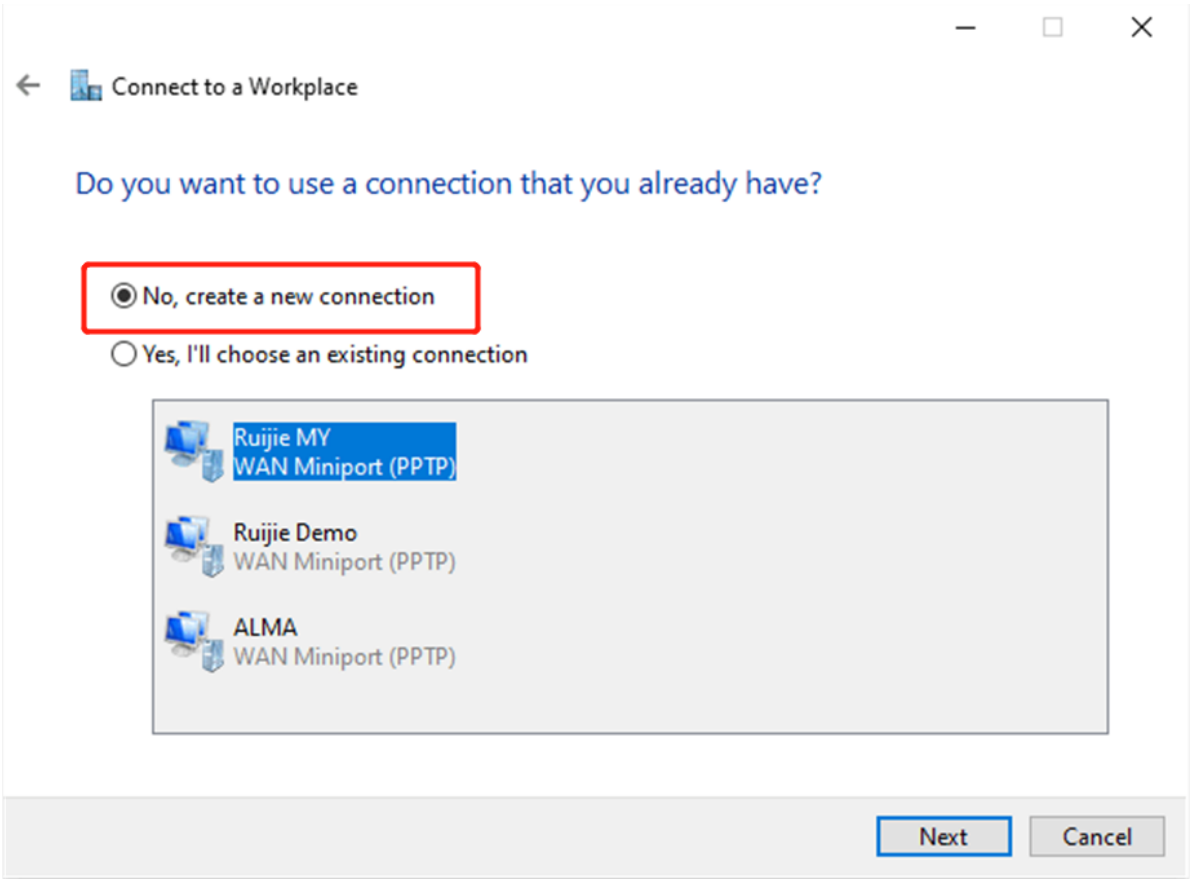


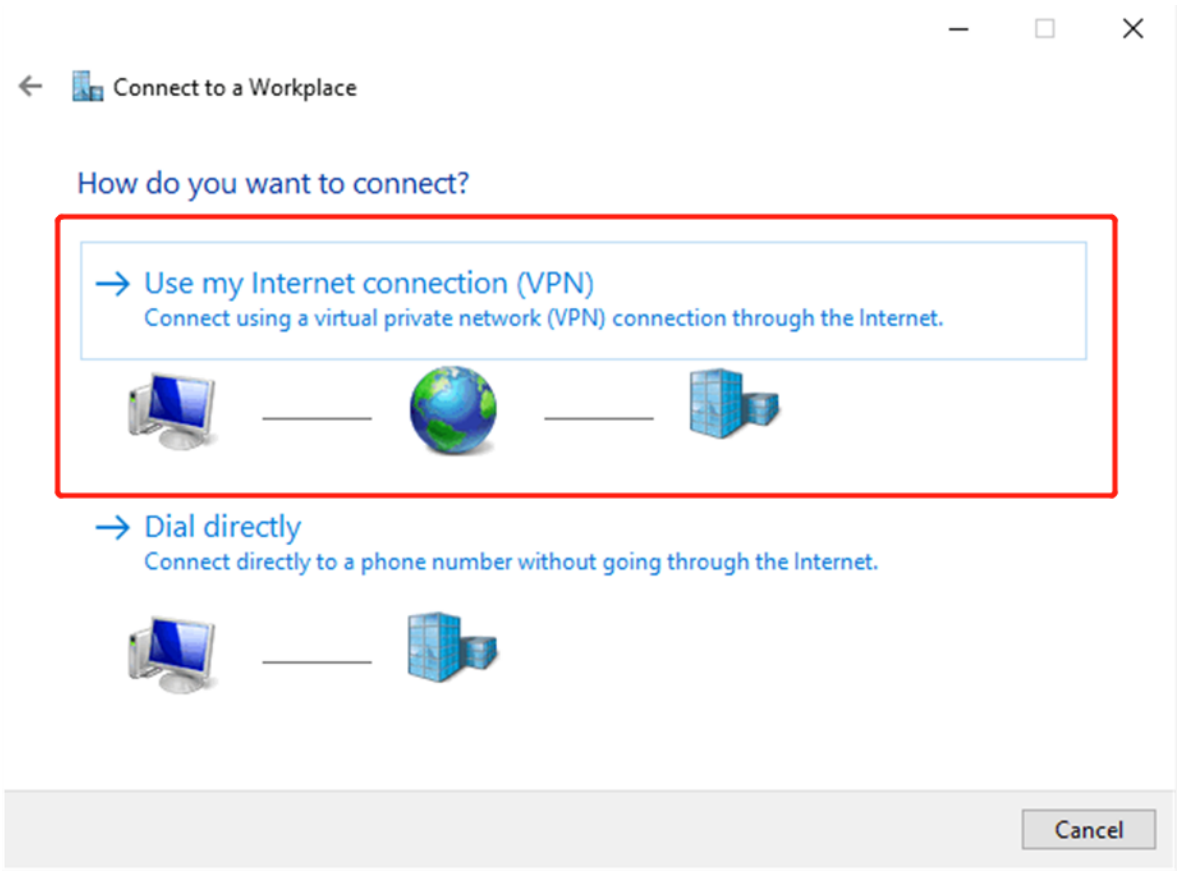


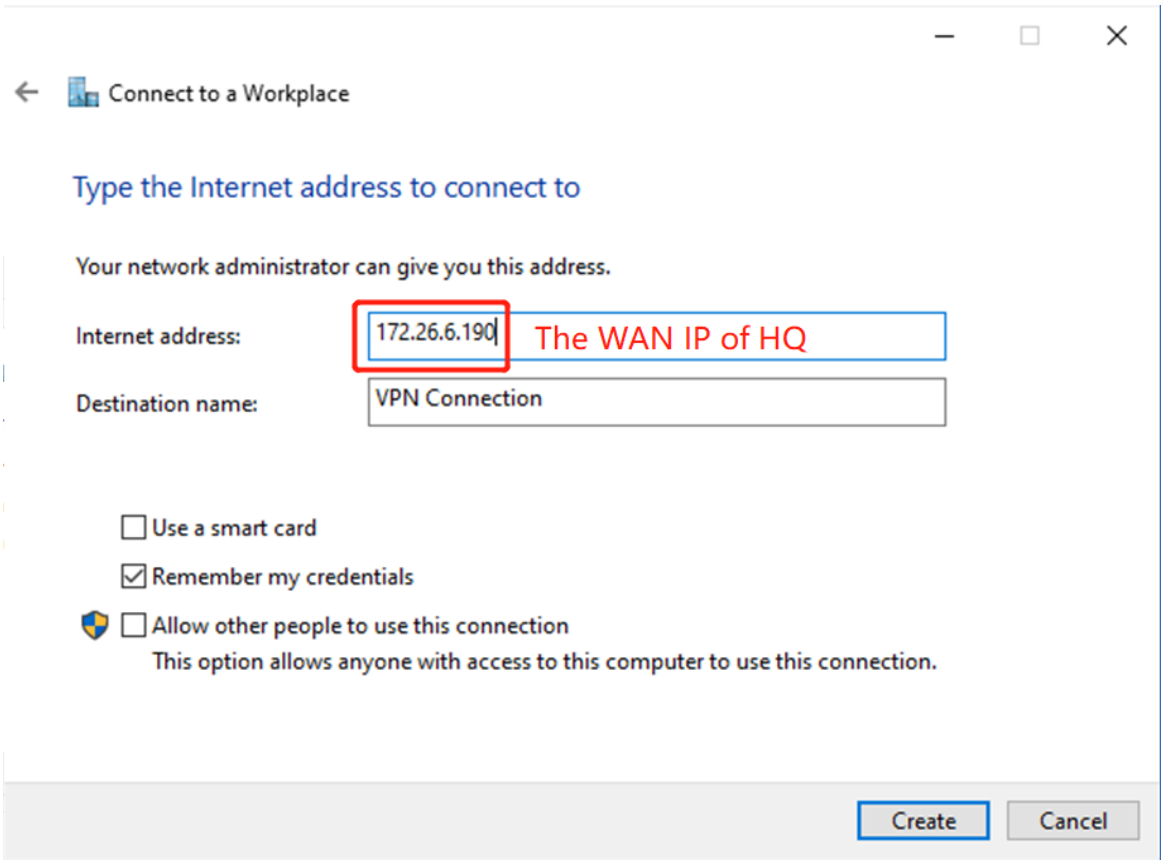
b Configure a VPN connection.


Network and Sharing Center
Control Panel › All Control Panel Items › Network and Sharing Center
Search Control Panel
Control Panel Home
Change adapter settings
Change advanced sharing settings
Media streaming options
View your basic network information and set up connections
View your active networks
Big4
Public network
Access type: Internet
Connections: Wi-Fi (Big4)
Local Area Connection
Public network
Access type: No Internet access
Connections: Local Area Connection
Change your networking settings
Set up a new connection or network
Set up a broadband, dial-up, or VPN connection; or set up a router or access point.
Troubleshoot problems
Diagnose and repair network problems, or get troubleshooting information.
See also
Internet Options
Windows Defender Firewall

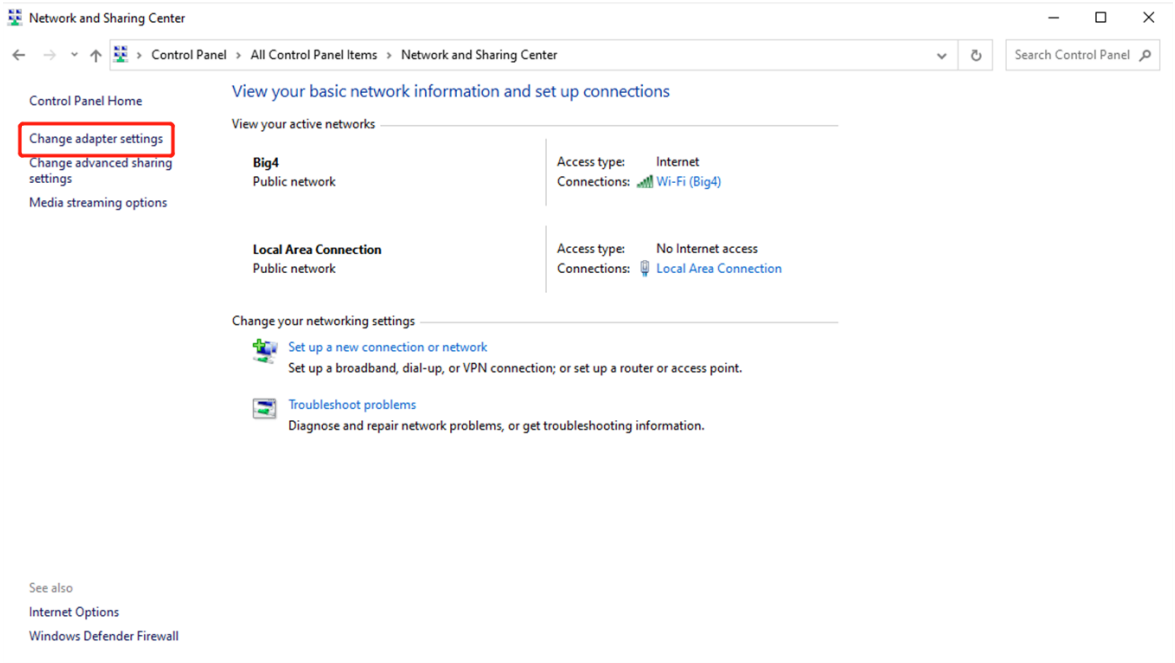

Set Up a Connection or Network
Choose a connection option
Connect to the Internet
Set up a broadband or dial-up connection to the Internet.
Set up a new network
Set up a new router or access point.
Manually connect to a wireless network
Connect to a hidden network or create a new wireless profile.
Connect to a workplace
Set up a dial-up or VPN connection to your workplace.
Next
Cancel

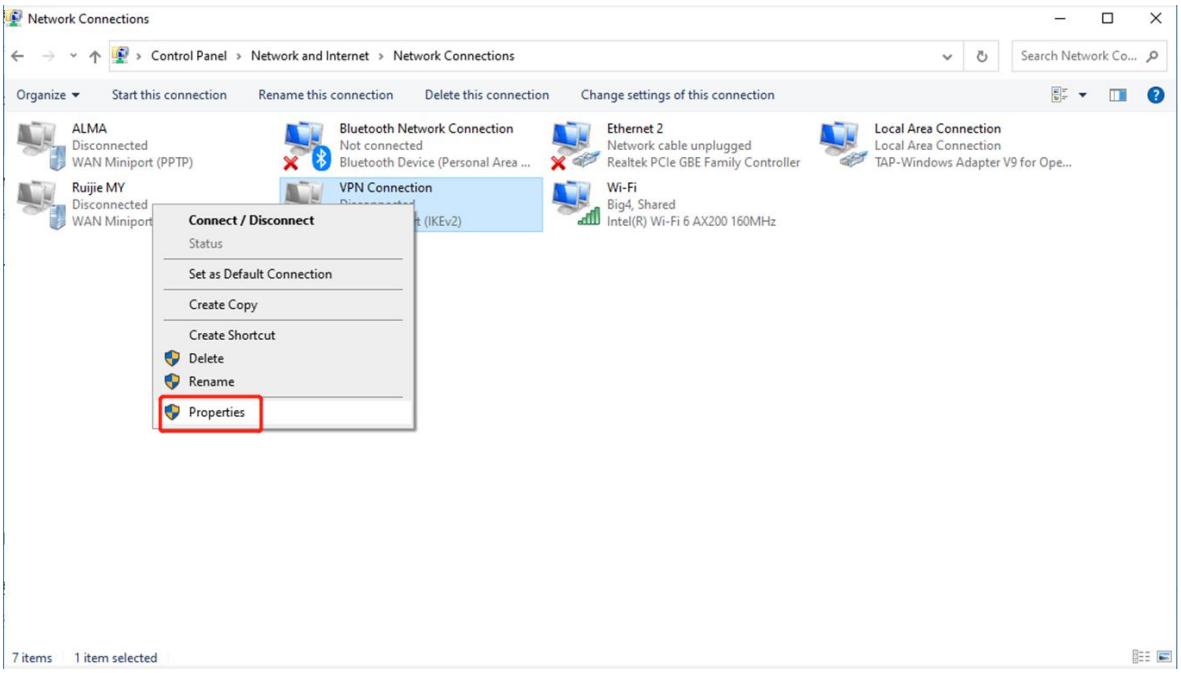

Connect to a Workplace
Do you want to use a connection that you already have?
No, create a new connection
Yes, I'll choose an existing connection
Ruijie MY
WAN Miniport (PPTP)
Ruijie Demo
WAN Miniport (PPTP)
ALMA
WAN Miniport (PPTP)
Next
Cancel

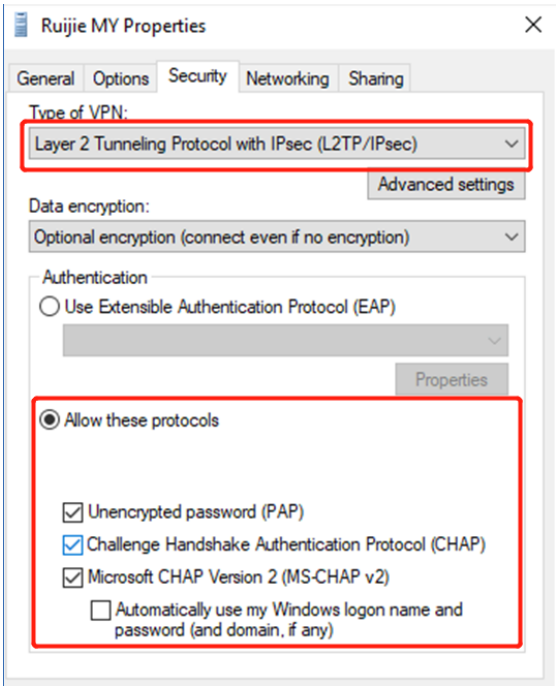

Connect to a Workplace
How do you want to connect?
Use my Internet connection (VPN)
Connect using a virtual private network (VPN) connection through the Internet.
Dial directly
Connect directly to a phone number without going through the Internet.
Cancel



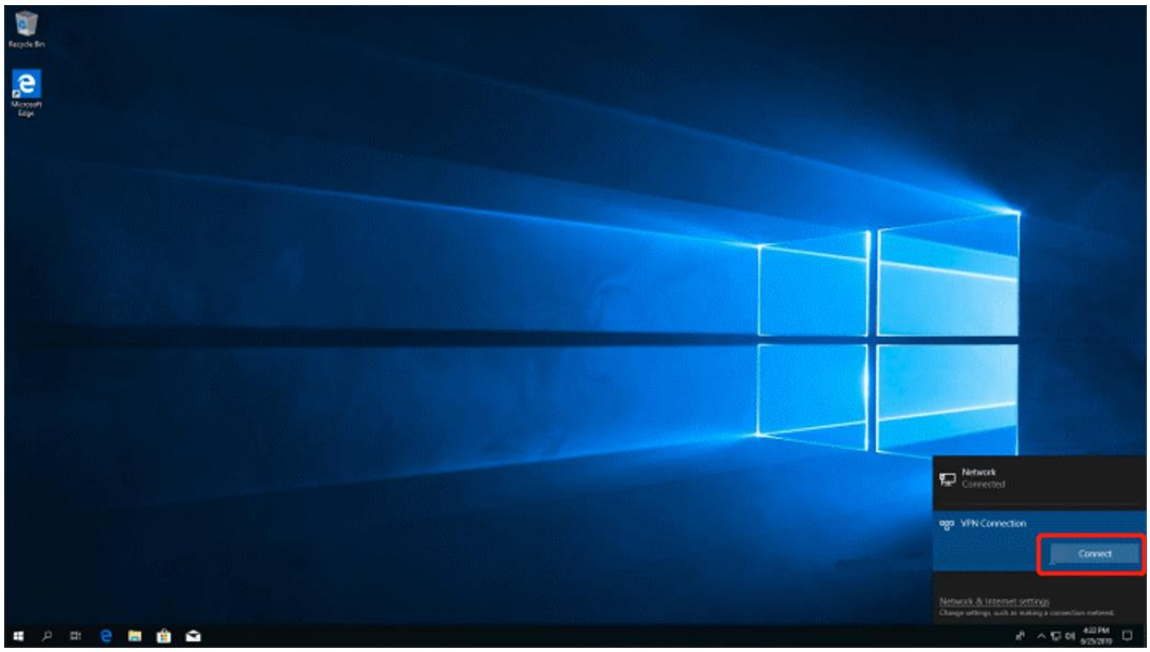
c Change adapter's settings.

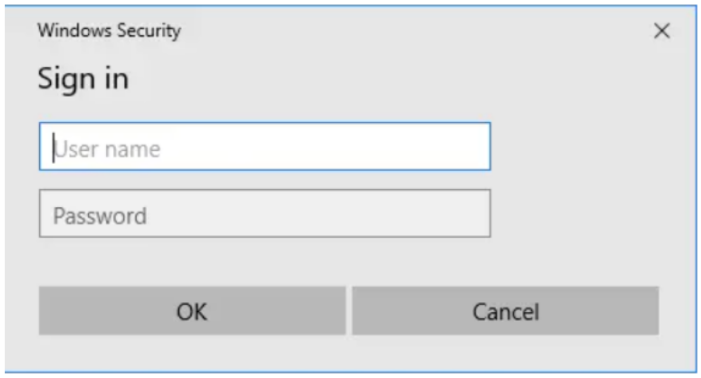


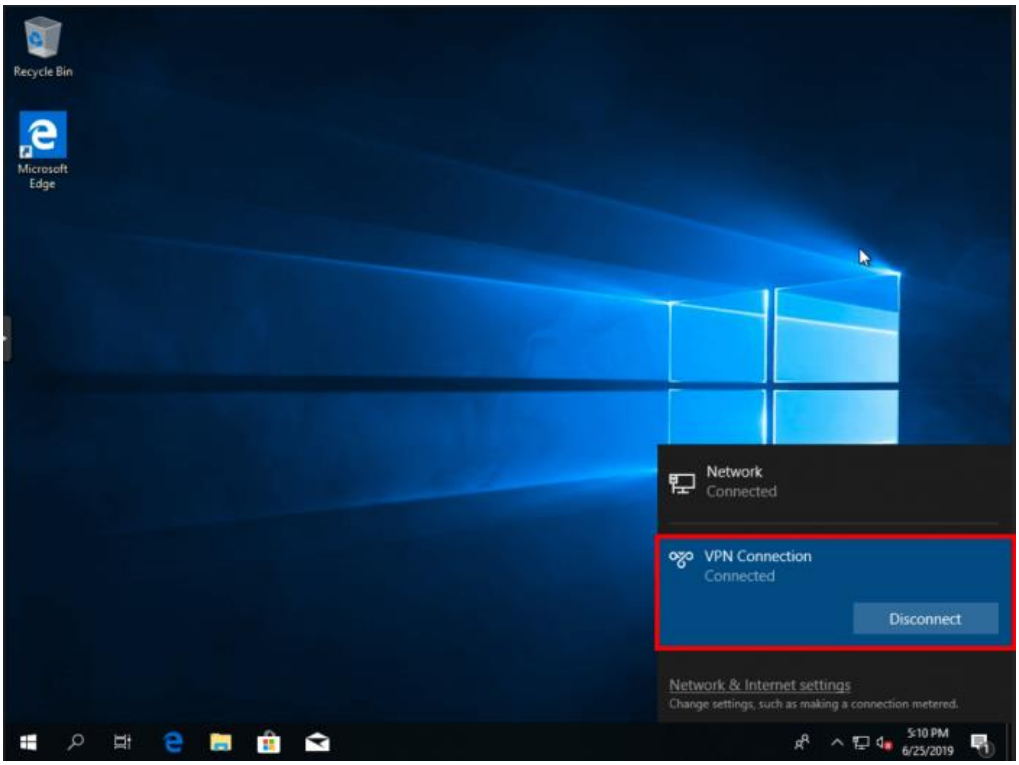




d Check the VPN connection status.


Network
Connected
VPN Connection
Connect
Network & Internet settings


Windows Security
Sign in
User name
Password
OK
Cancel


Recycle Bin
Microsoft Edge
Network
Connected
VPN Connection
Connected
Disconnect
Network & Internet settings
Change settings, such as making a connection metered.
5:10 PM
6/25/2019

e If your PC cannot access internal devices (192.168.10.0/24) of the headquarters after the VPN connection is set up, add the following static route on your PC. The IP address 192.168.100.2 is the PC's IP address obtained from the headquarters. Then the PC can access internal devices of the headquarters.

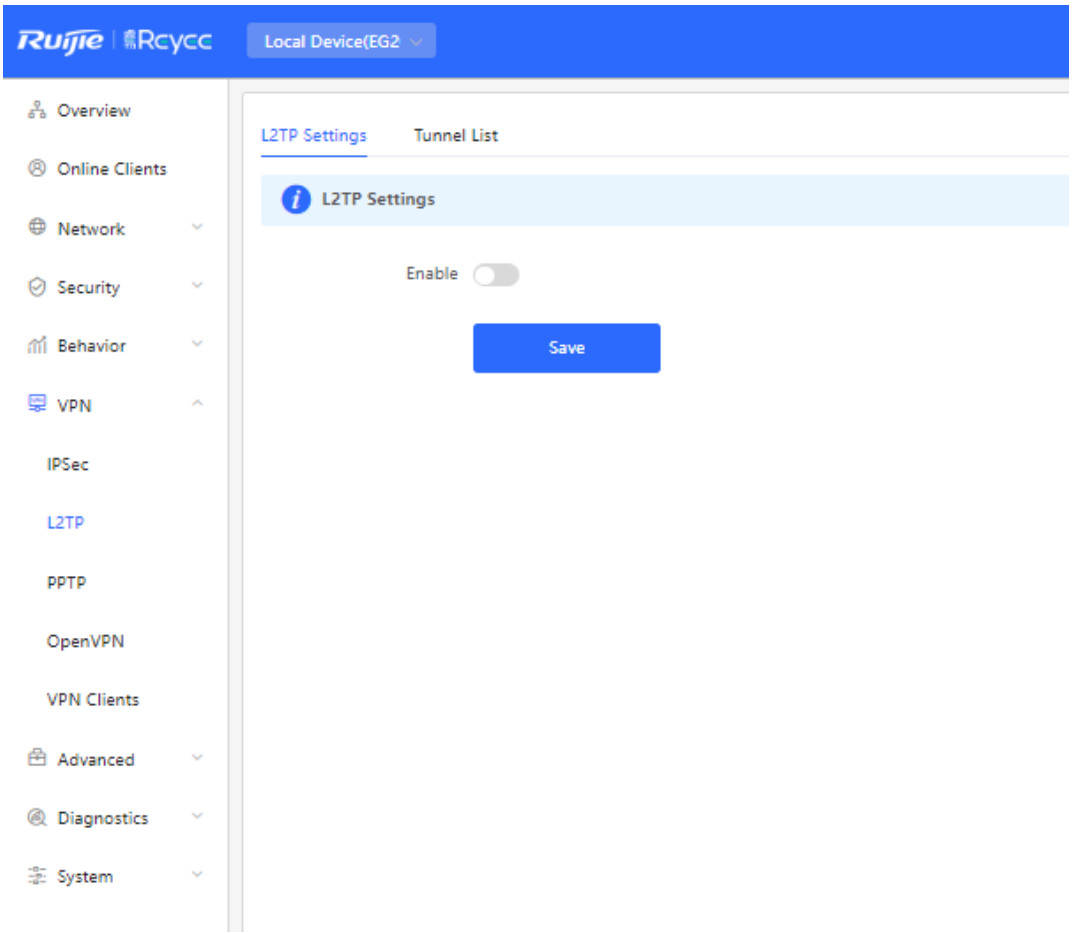
```
C:\Users\Daisy>route add 192.168.168.10.0 mask 255.255.255.0 192.168.100.2
```

2. Site-to-Site Scenario Configuration

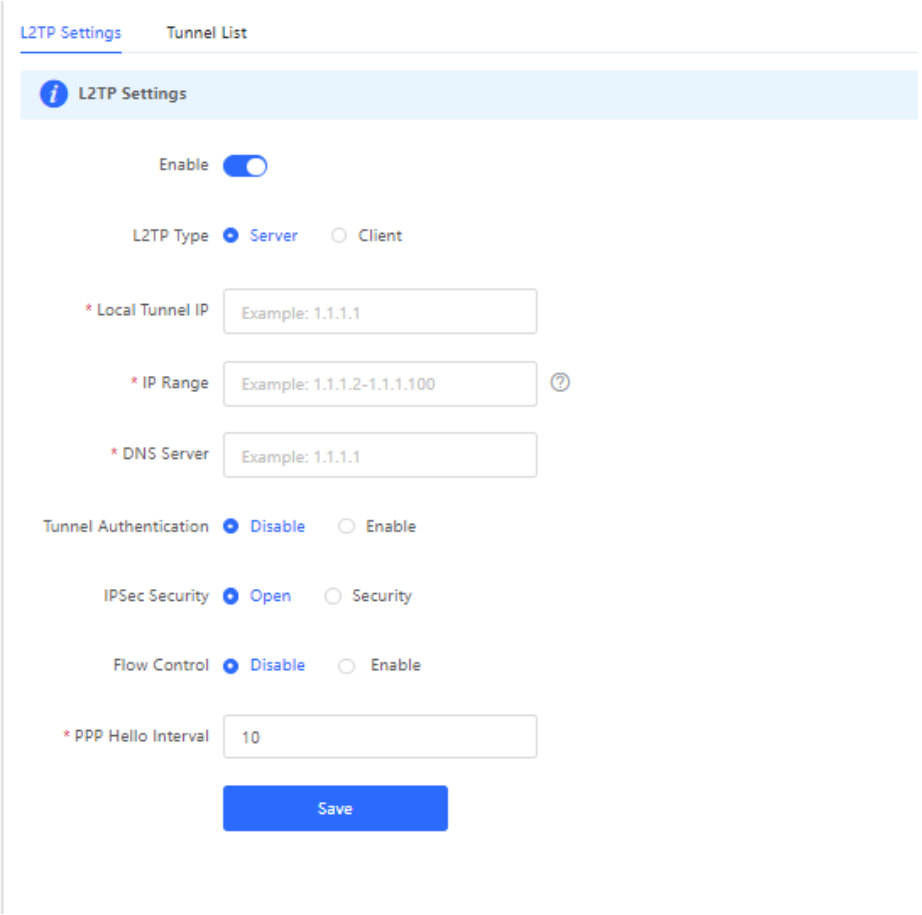
(1) Headquarters side:

a Log in to the Reyee EG with the default IP address of 192.168.110.1.

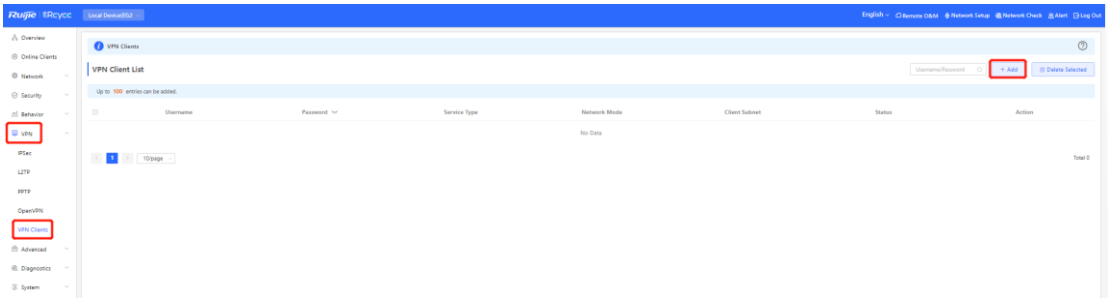
b Switch to the **Local** mode. Choose **VPN** >**L2TP**.

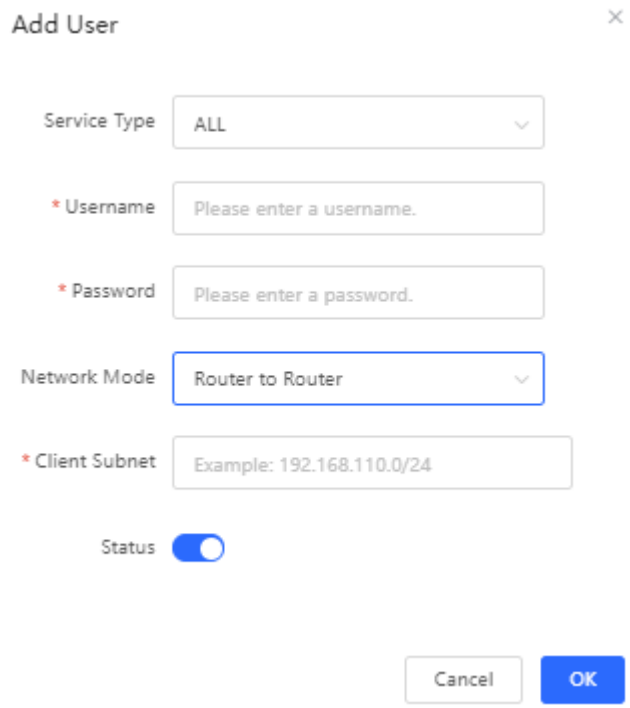


c Enable L2TP, set **L2TP Type** to **Server**, perform L2TP configuration, and click **Save**.



d Choose **Network** > **VPN Clients** and configure VPN clients.





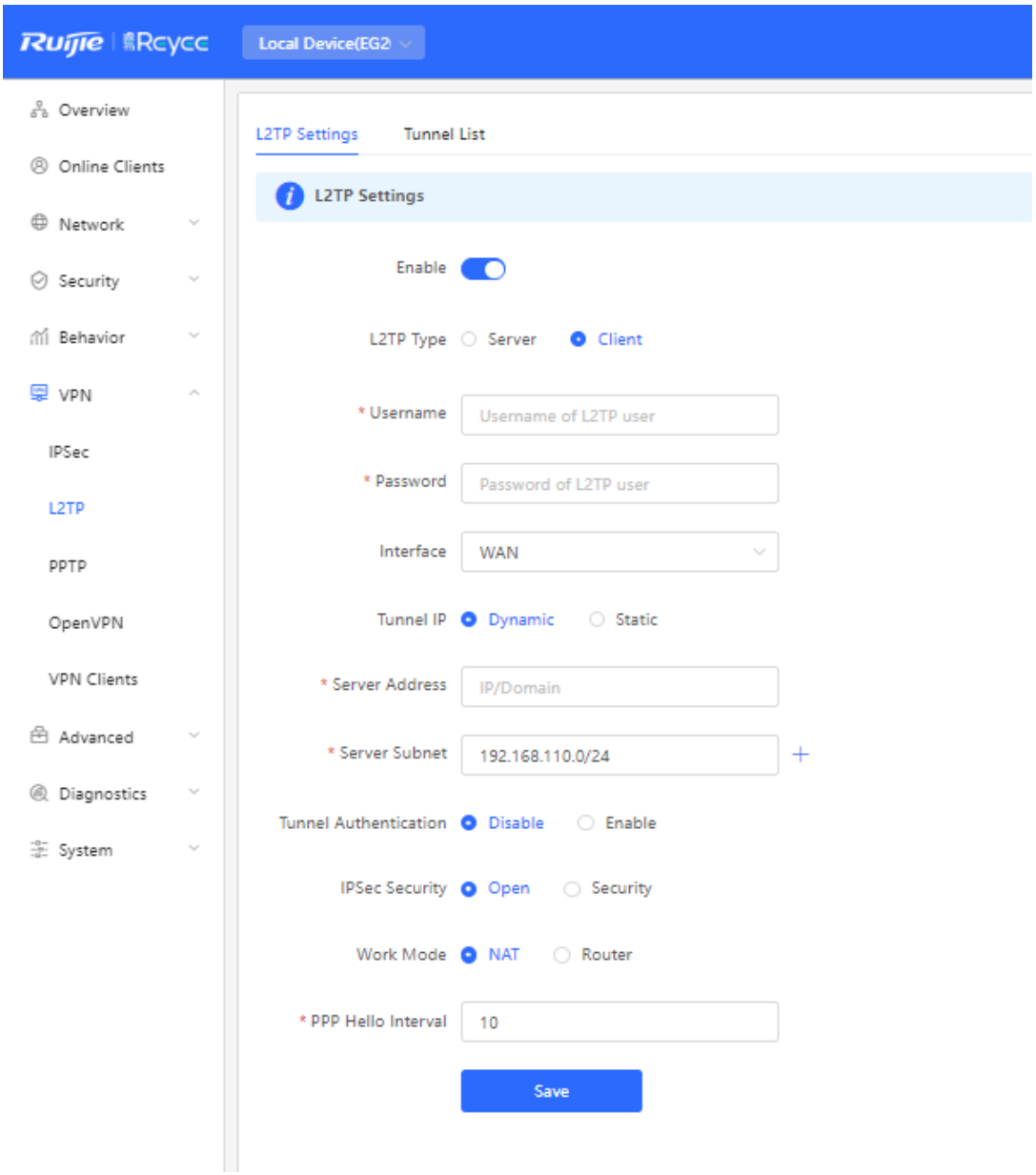
Caution

The value of **Peer Subnet** is the local IP address range of its branch.

(2) Branch side:

a Log in to the Reyee EG with the default IP address of 192.168.110.1.

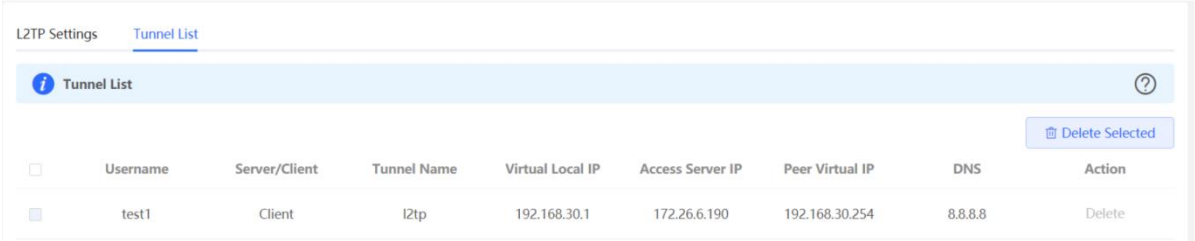
b Switch to the **Local** mode. Choose **Gateway** > **VPN** > **L2TP**, enable **L2TP**, and set **L2TP Type** to **Client**.



Caution

- **NAT**: NAT is applied to incoming L2TP packets (the source IP address is replaced with the local virtual IP address).
- **Router**: Only incoming L2TP packets are routed.

c Check the VPN connection status.



4.7.3 IPsec VPN

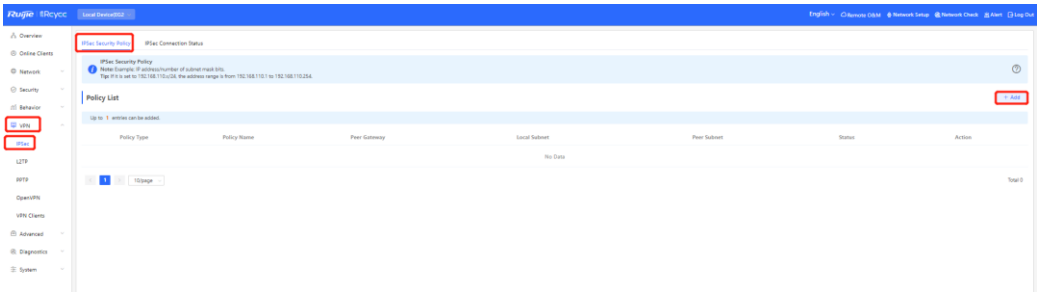
IPsec VPN is used for site-to-site scenarios. For example, three branches of a company are distributed in three different places of the internet; each branch uses a router to establish tunnels with each other; data between the company intranets (several PCs) is securely interconnected through the IPsec VPN tunnels established by through these routers.

IPsec VPN only applies to site-to-site scenarios.

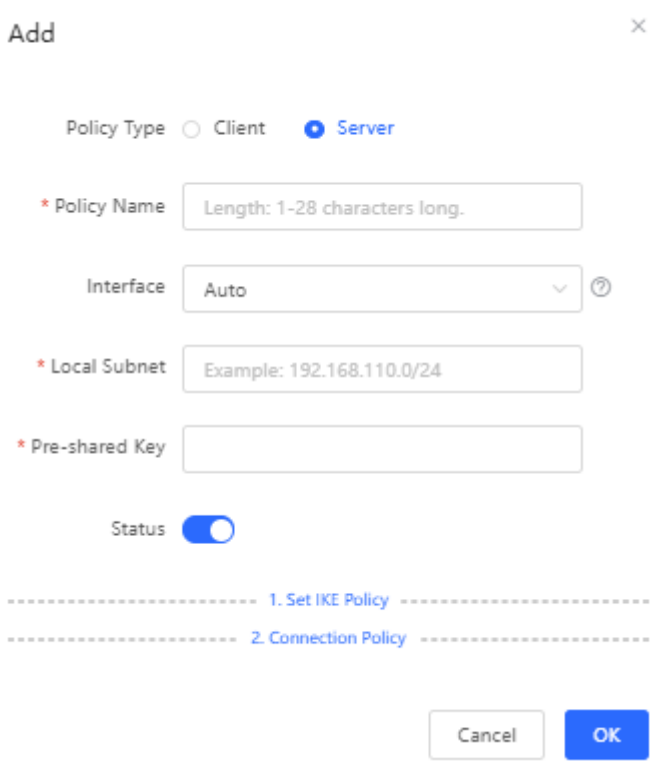
(1) Headquarters side:

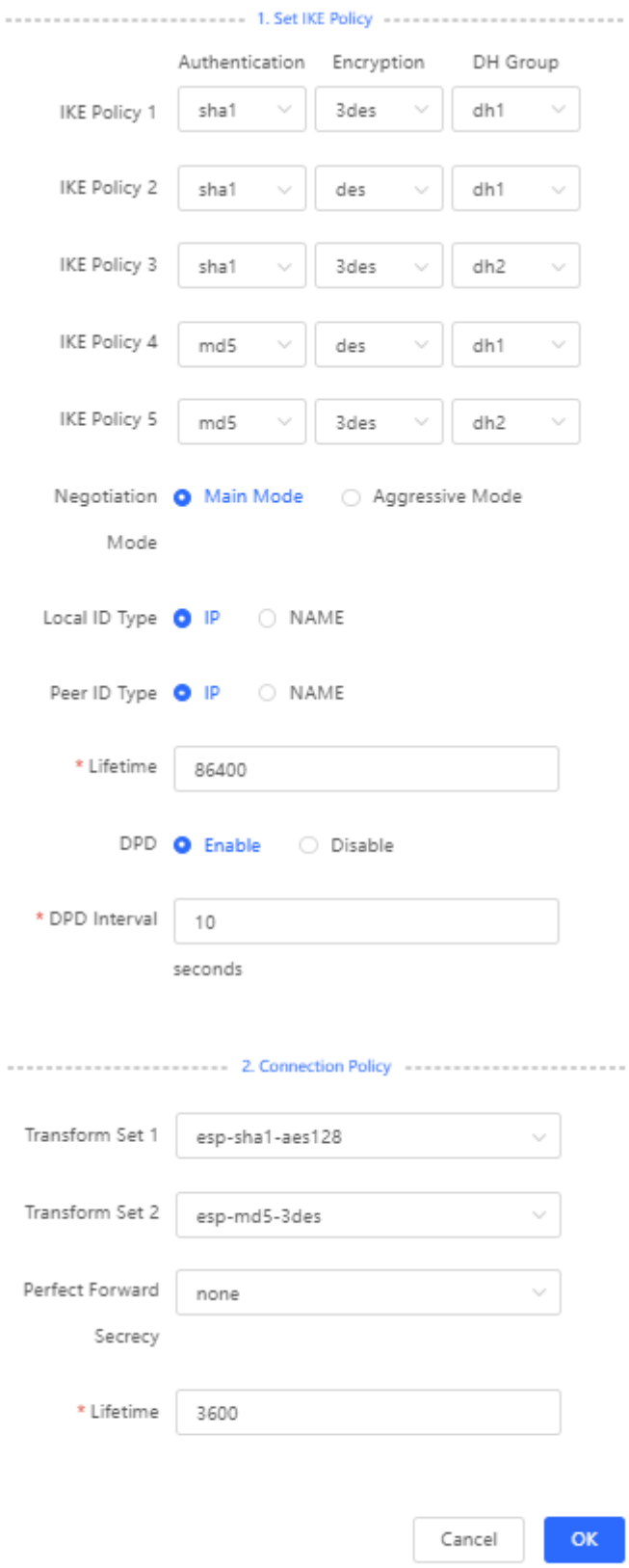
a Log in to the Reyee EG with the default IP address of 192.168.110.1.

b Switch to the **Local** mode. Choose **VPN** > **IPSec** > **IPSec Security Policy**.



c Configure an IPsec VPN security policy.

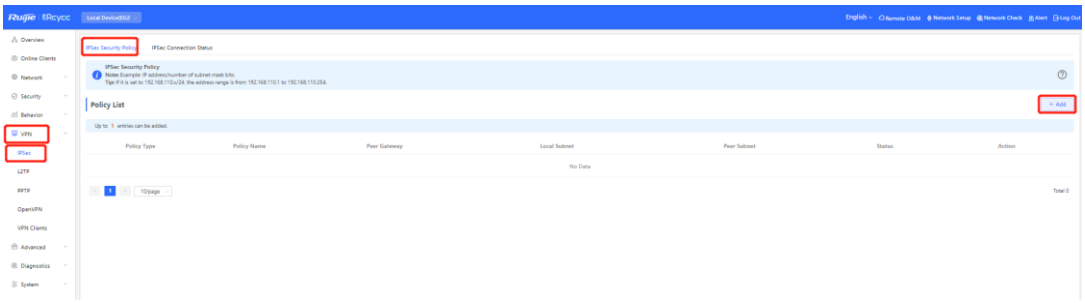




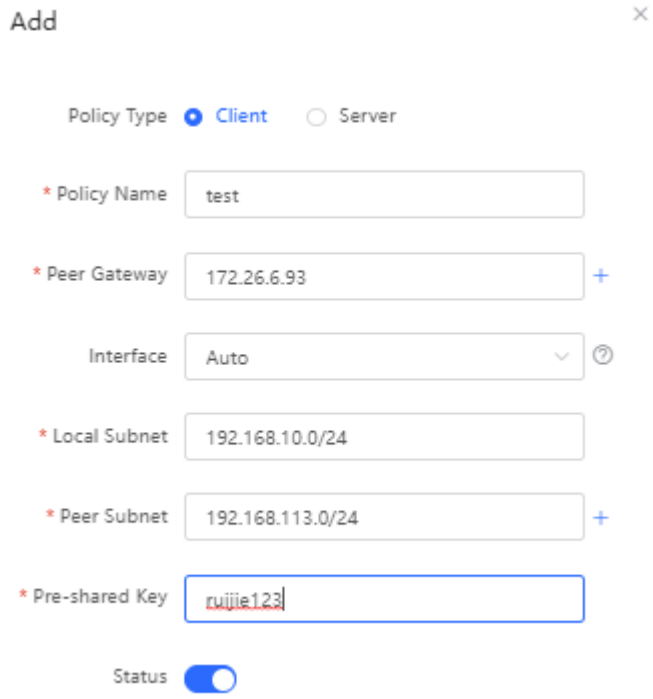
(2) Branch side:

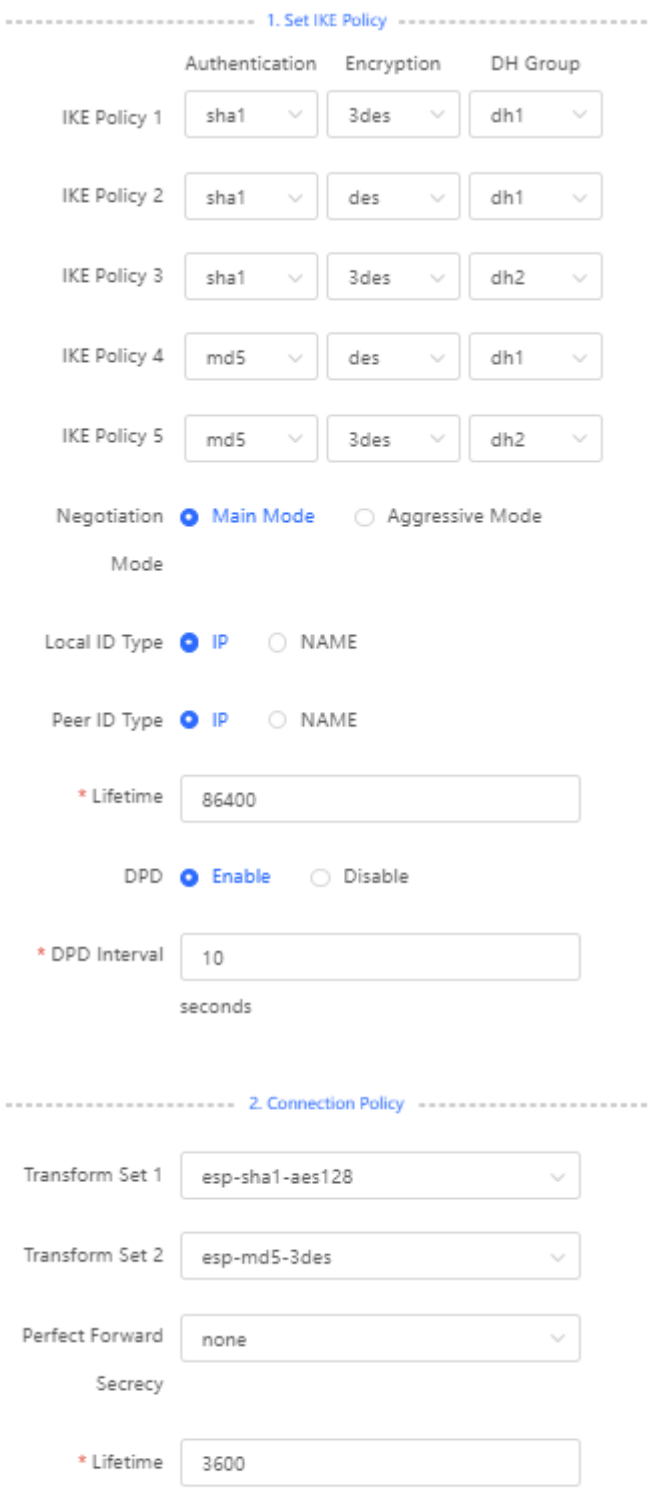
a Log in to the Reyee EG with the default IP address of 192.168.110.1.

b Switch to the **Local** mode. Choose **VPN** > **IPSec** > **IPSec Security Policy**.

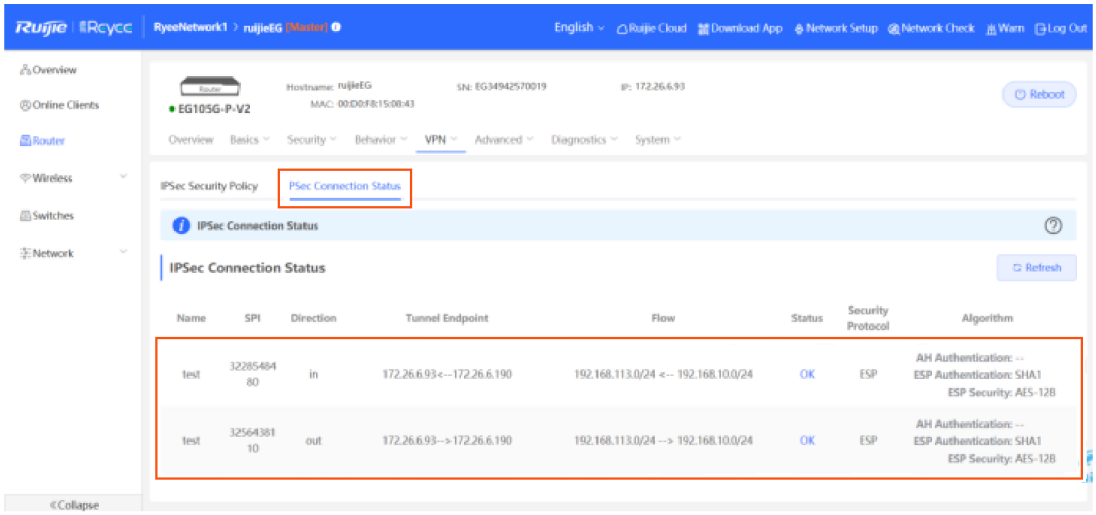


c Configure an IPsec policy. Ensure that the IKE policy and connection policy are the same on both sides.





d Check the IPsec connection status.



Caution

If your headquarters EG has no public IP address configured for other external devices, you need to configure port mapping on external devices and configure **Local ID Type** as **NAME** on devices of the headquarters and branches.

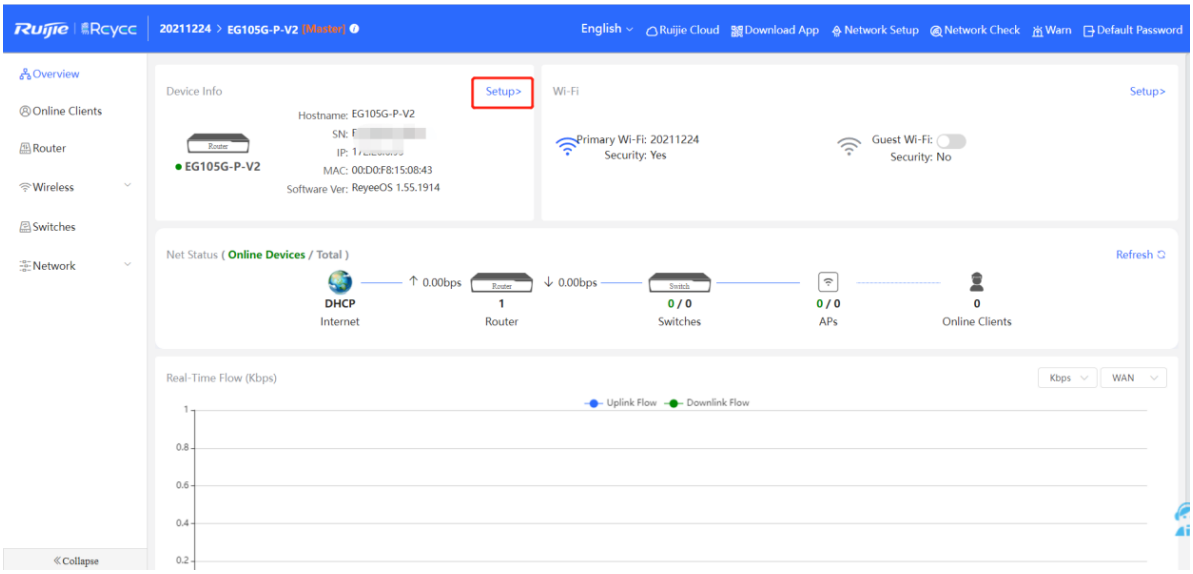
4.7.4 L2TP Over IPsec VPN

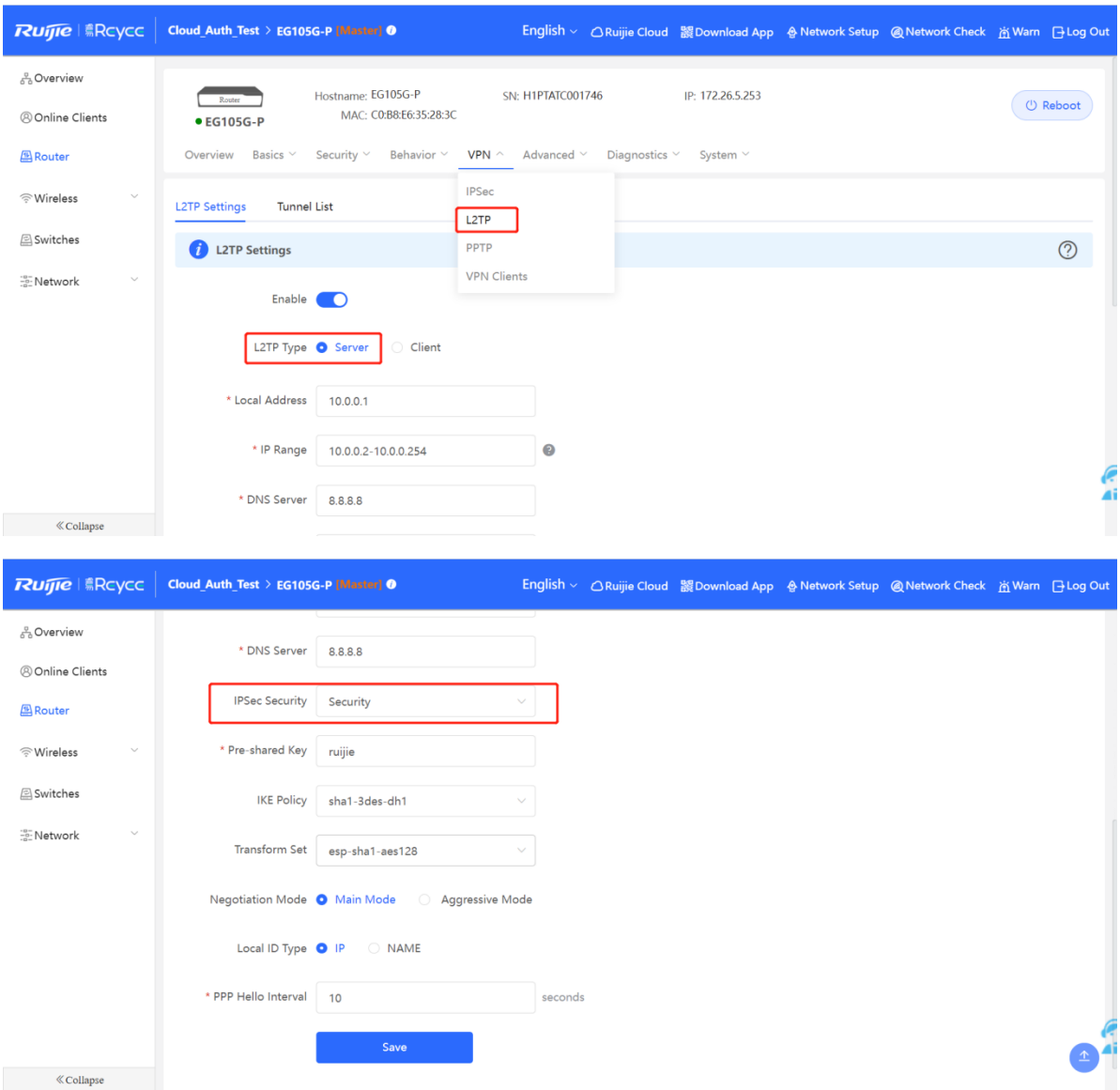
L2TP over IPsec VPN is typically used in site-to-site and client-to-site scenarios. For example, three branches of a company are distributed in three different places of the Internet, each branch uses a router to establish tunnels with each other, and data between the company intranets (several PCs) is securely interconnected through L2TP over IPsec VPN tunnels established by these routers, the staff who work at home can access company data through L2TP over IPsec VPN tunnels.

(1) Headquarters side:

a Log in to the Reyee EG with the default IP address of 192.168.110.1.

b Switch to the **Local** mode. Choose **VPN > L2TP** and configure **IPsec Security**.

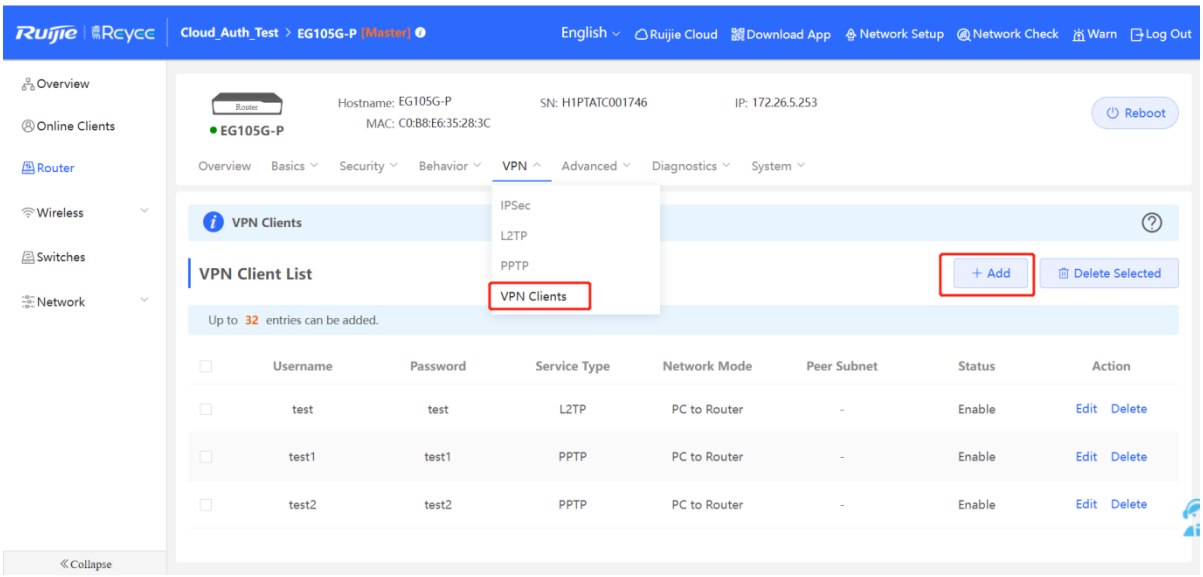


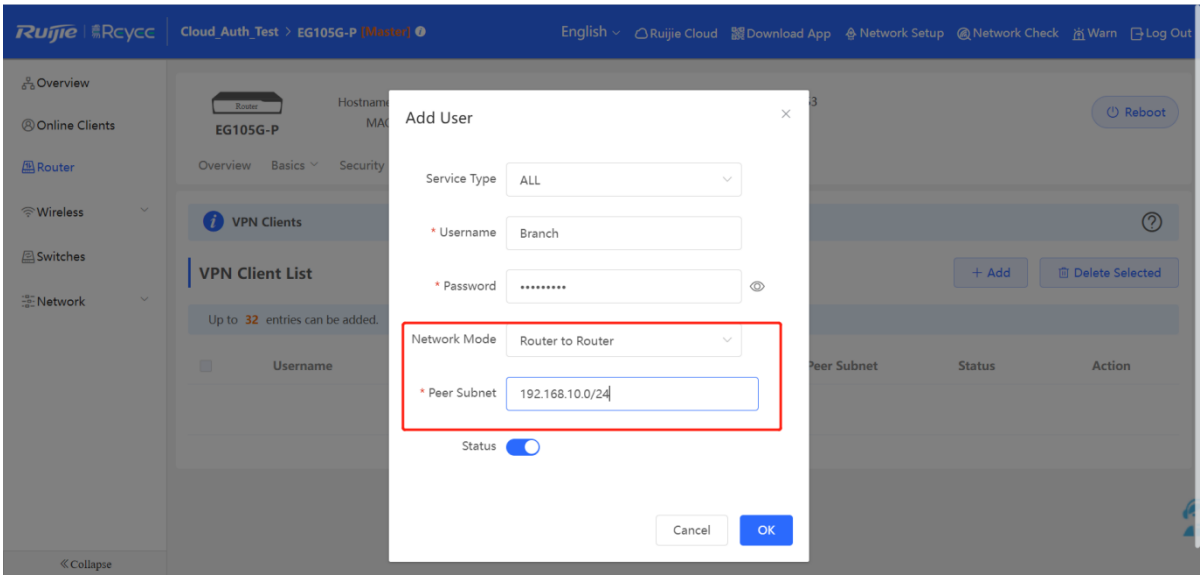


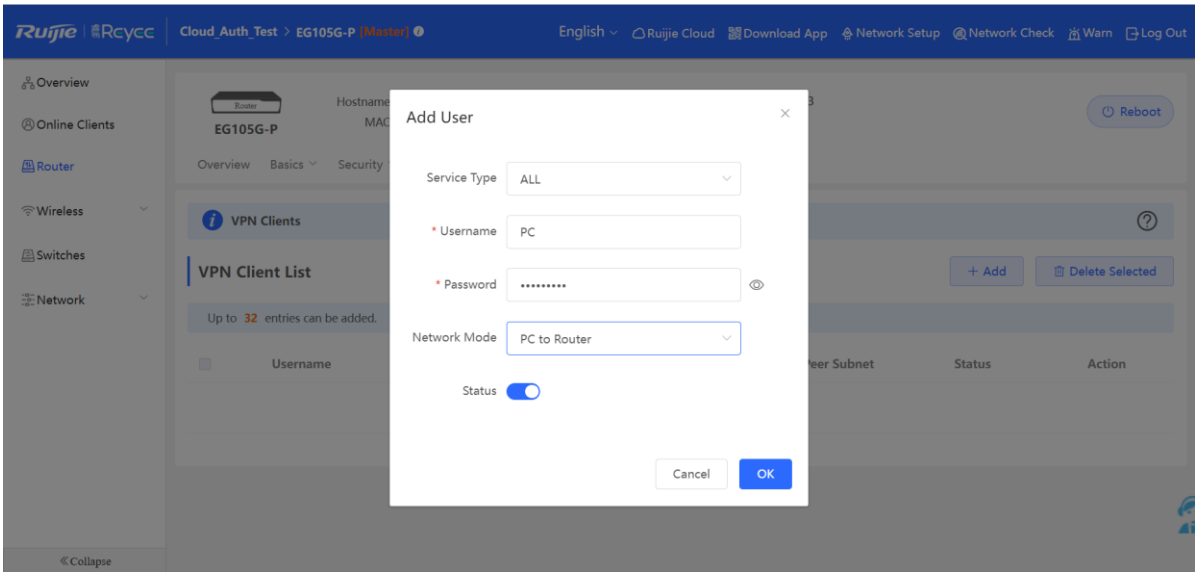
Caution

- **PPP Hello Interval**: indicates the interval for sending hello messages on the PPP over IPsec connection.
- **IPsec Security**: indicates whether IPsec is used.
- **Pre-shared Key**: indicates the pre-shared key required for IPsec encryption.
- **Local ID Type**: When the WAN port of the headquarters is configured with the public IP address, select **IP**. When the WAN port of the headquarters is configured with the private IP address, select **NAME** and configure DMZ on the external device.

c Configure VPN clients for the branch EG and PC.







Caution

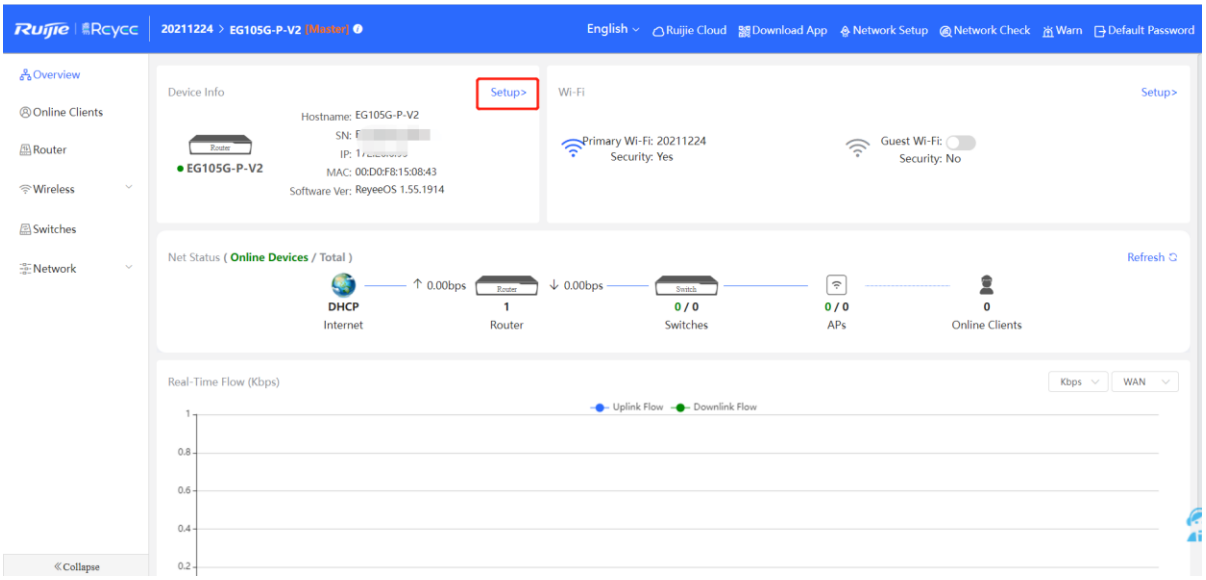
- **PC to Router**: A connection is established between a PC and a terminal.

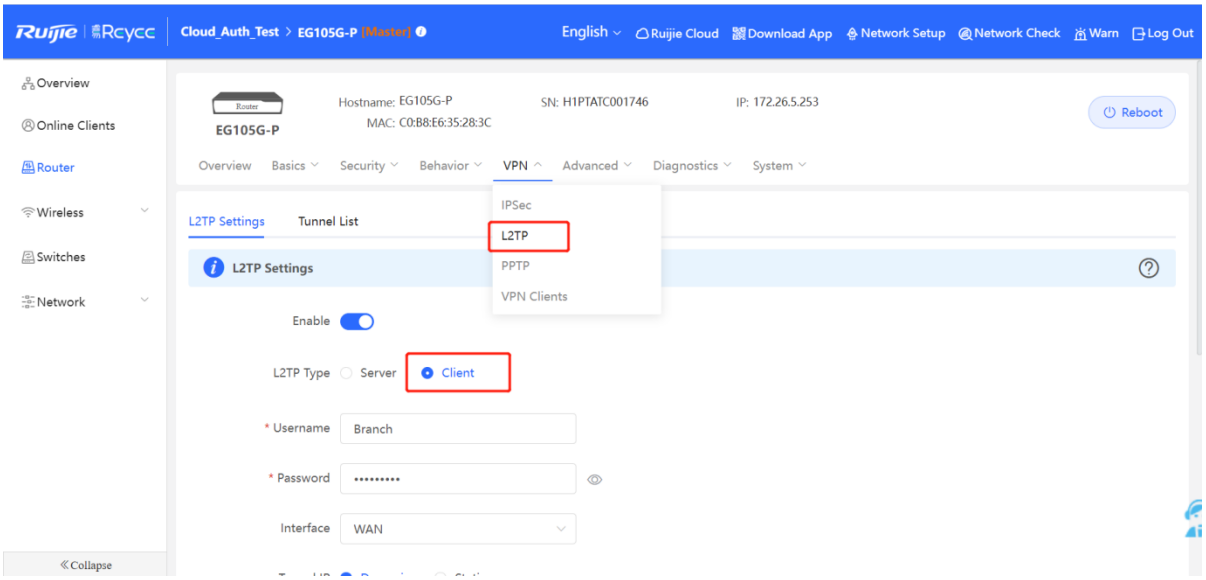
- **Router to Router**: A direct, non-shared, and secure connection is set up between two terminals.

(2) Branch side:

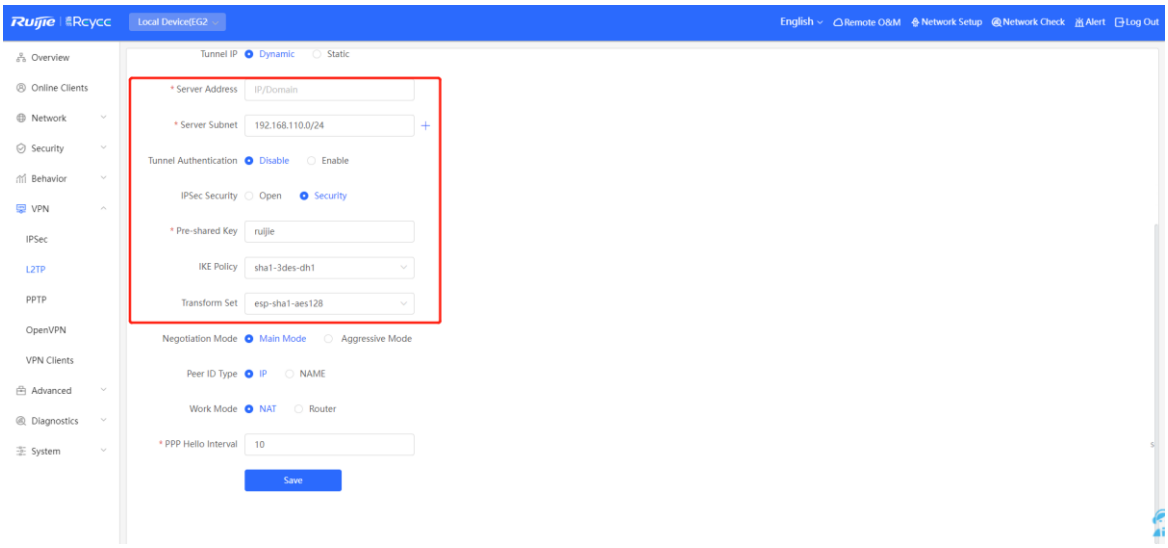
a Log in to the Reyee EG with the default IP address of 192.168.110.1.

b Choose **Setup > VPN > L2TP** and enable **IPsec Auth**.

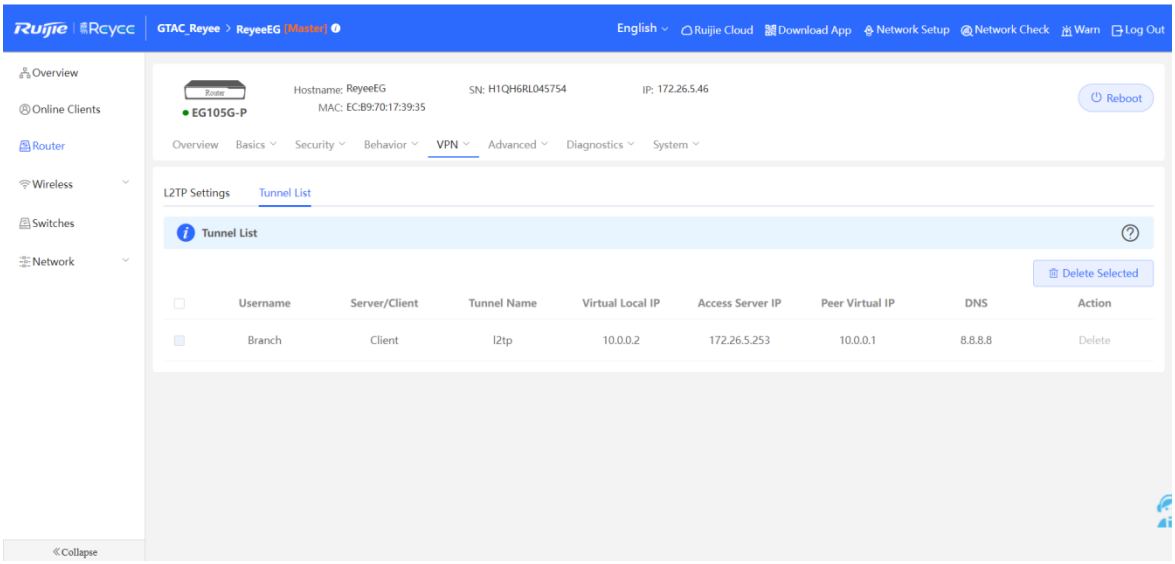




c Configure an IPsec security, and ensure that the values of **Pre-share Key**, **IKE Policy**, and **Transform Set** are the same on both sides.

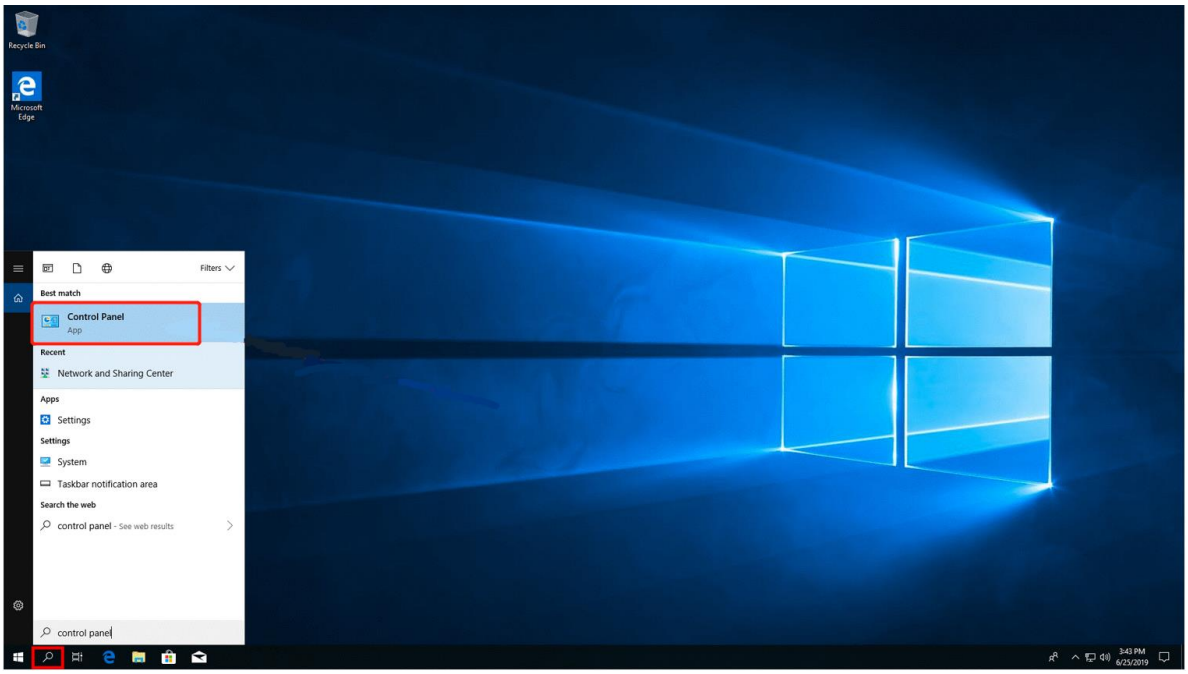


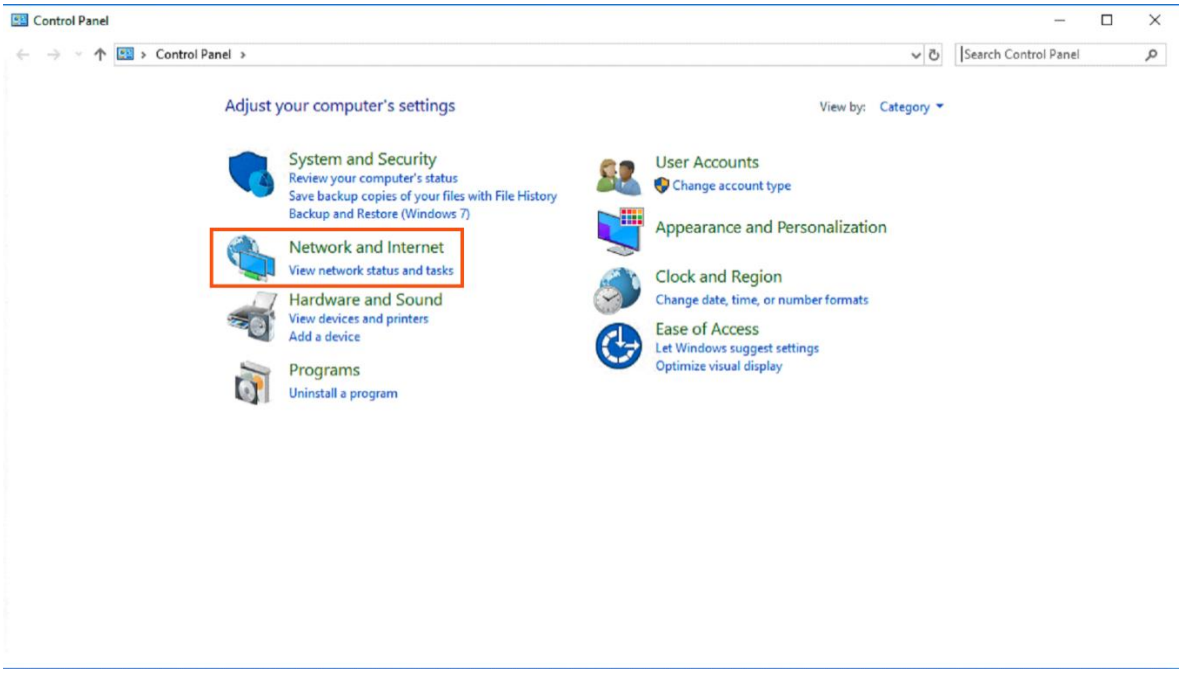
d Check the L2TP over IPsec connection status.

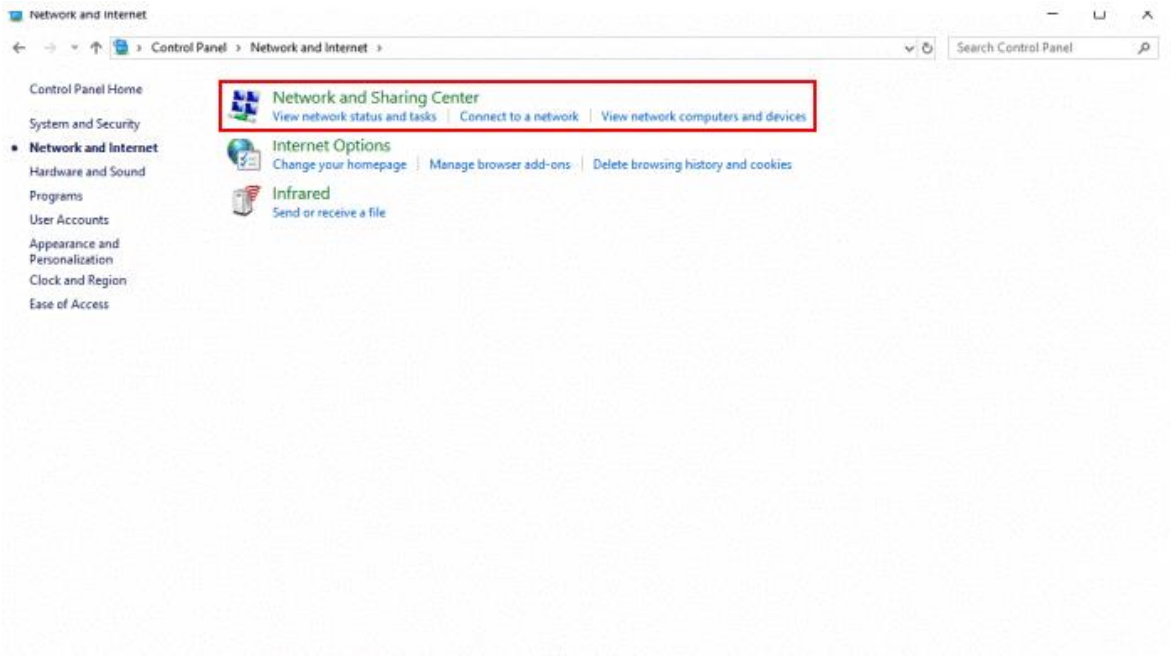


(3) Client side (Windows 10 is used as an example):

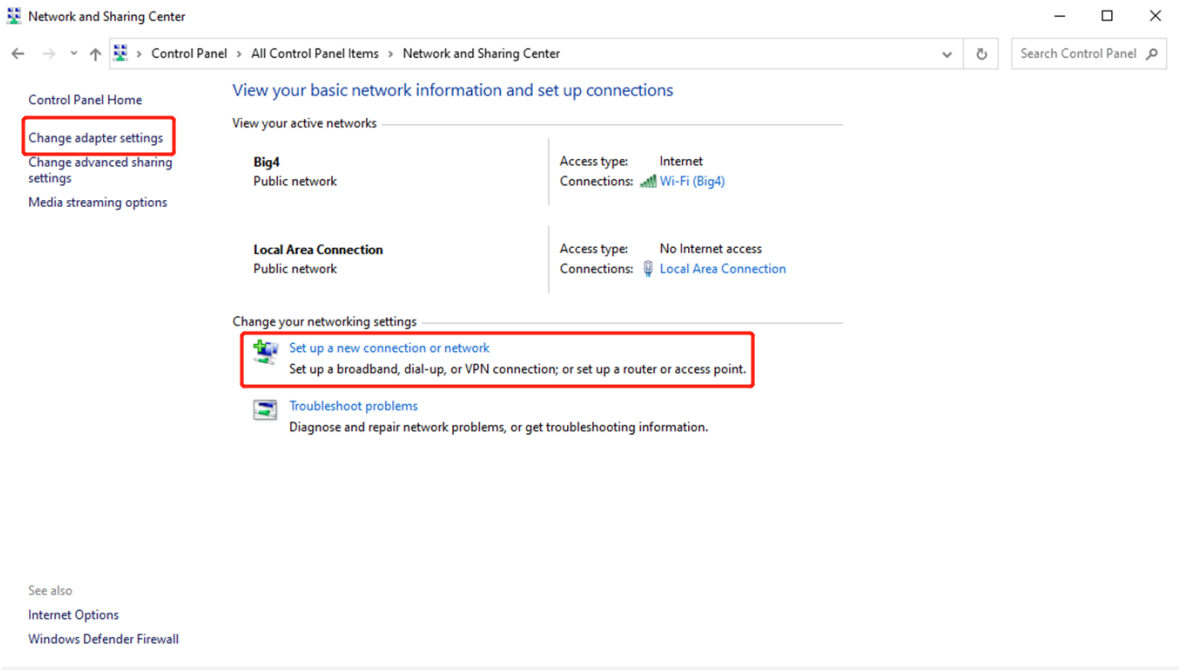
a Choose **Control Panel** > **Network and Internet** > **Network and Sharing Center**.

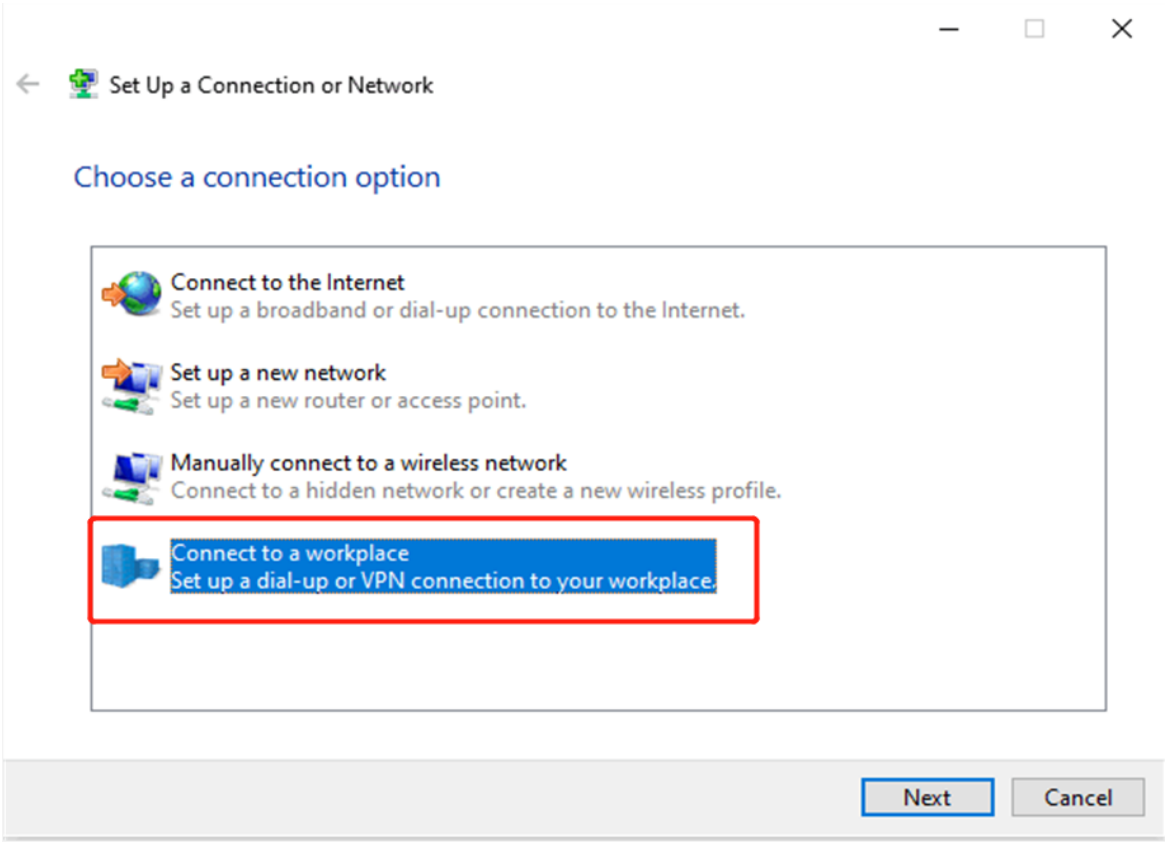

Recycle Bin
Microsoft Edge
Filters
Best match
Control Panel
App
Recent
Network and Sharing Center
Apps
Settings
Settings
System
Taskbar notification area
Search the web
control panel - See web results
control panel
3:43 PM
6/25/2019

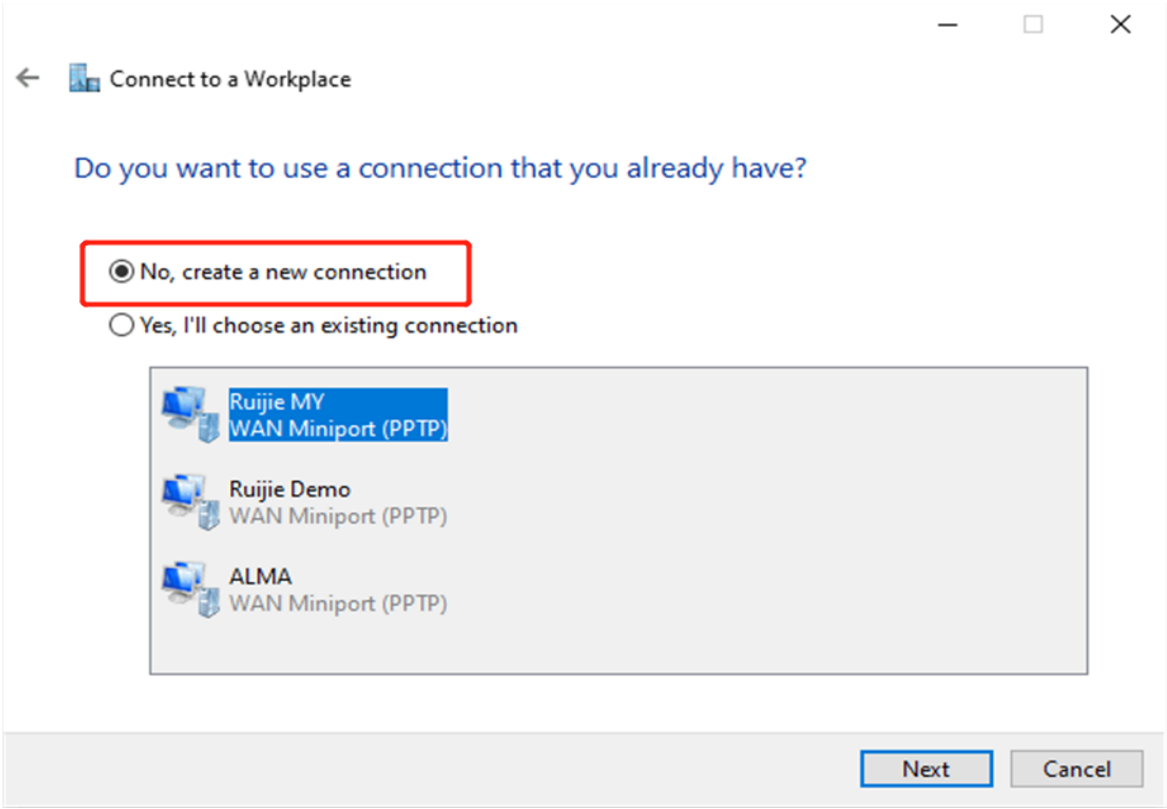

Control Panel
Control Panel
Search Control Panel
Adjust your computer's settings
View by: Category
System and Security
Review your computer's status
Save backup copies of your files with File History
Backup and Restore (Windows 7)
Network and Internet
View network status and tasks
Hardware and Sound
View devices and printers
Add a device
Programs
Uninstall a program
User Accounts
Change account type
Appearance and Personalization
Clock and Region
Change date, time, or number formats
Ease of Access
Let Windows suggest settings
Optimize visual display

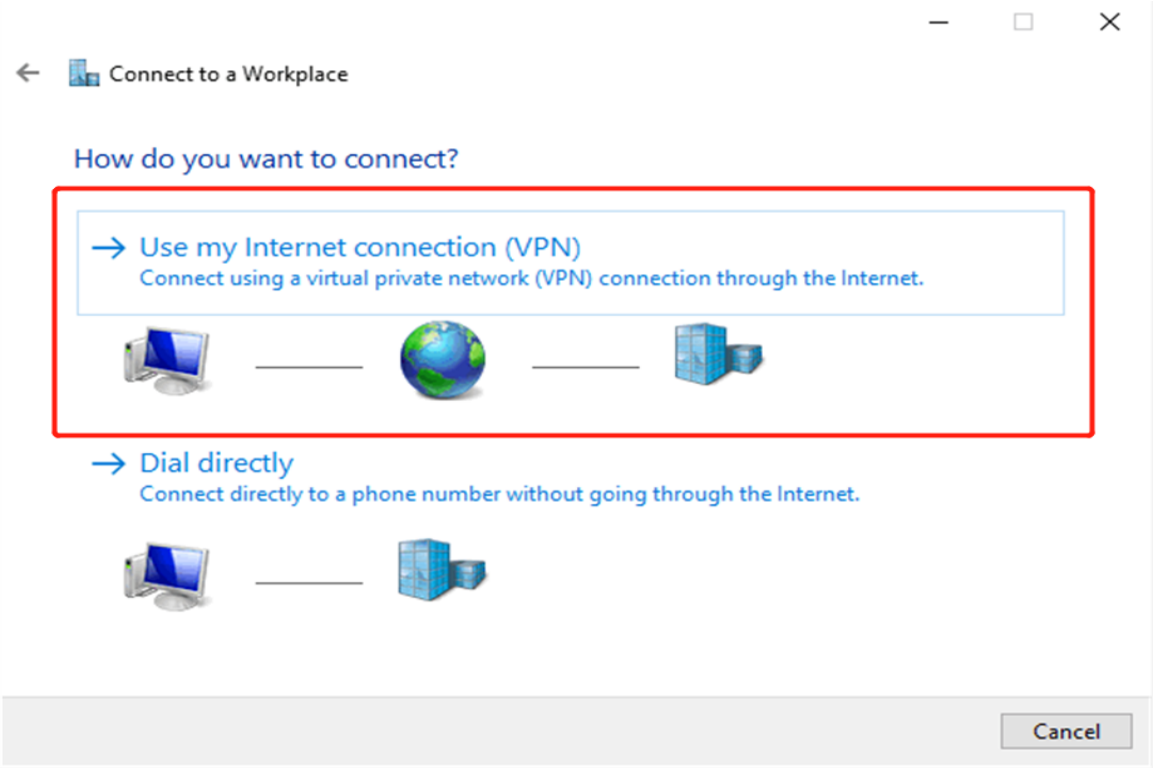


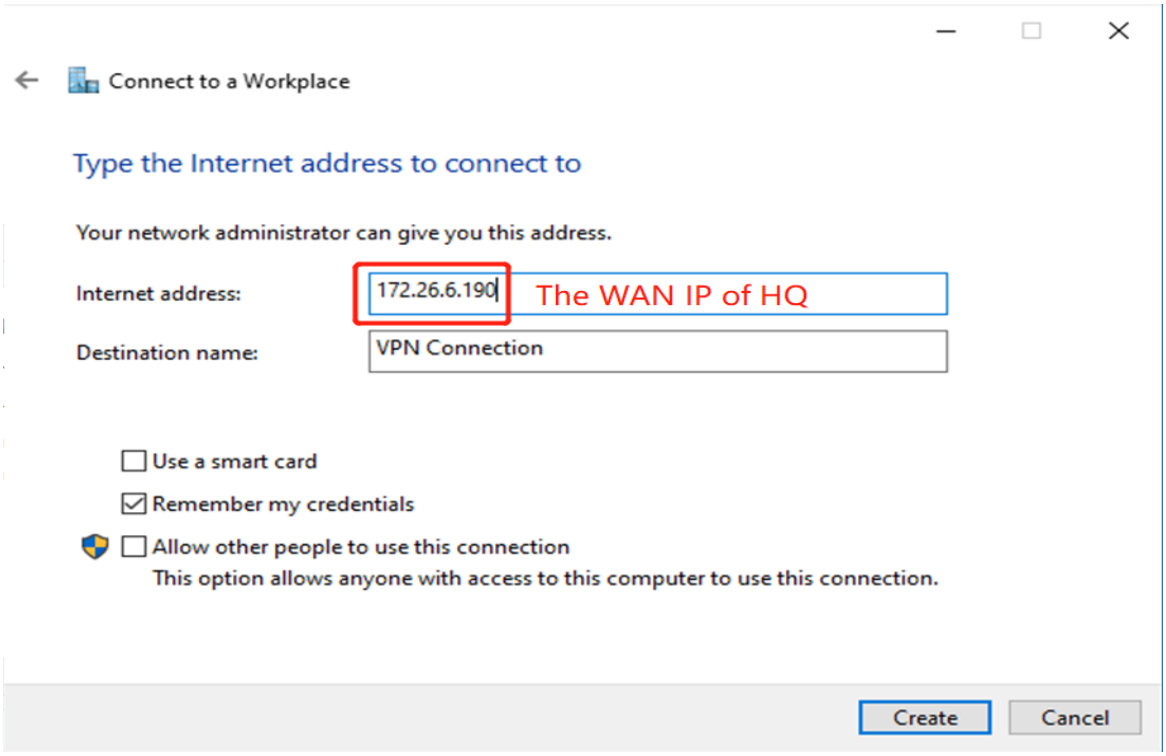
b Configure a VPN connection.



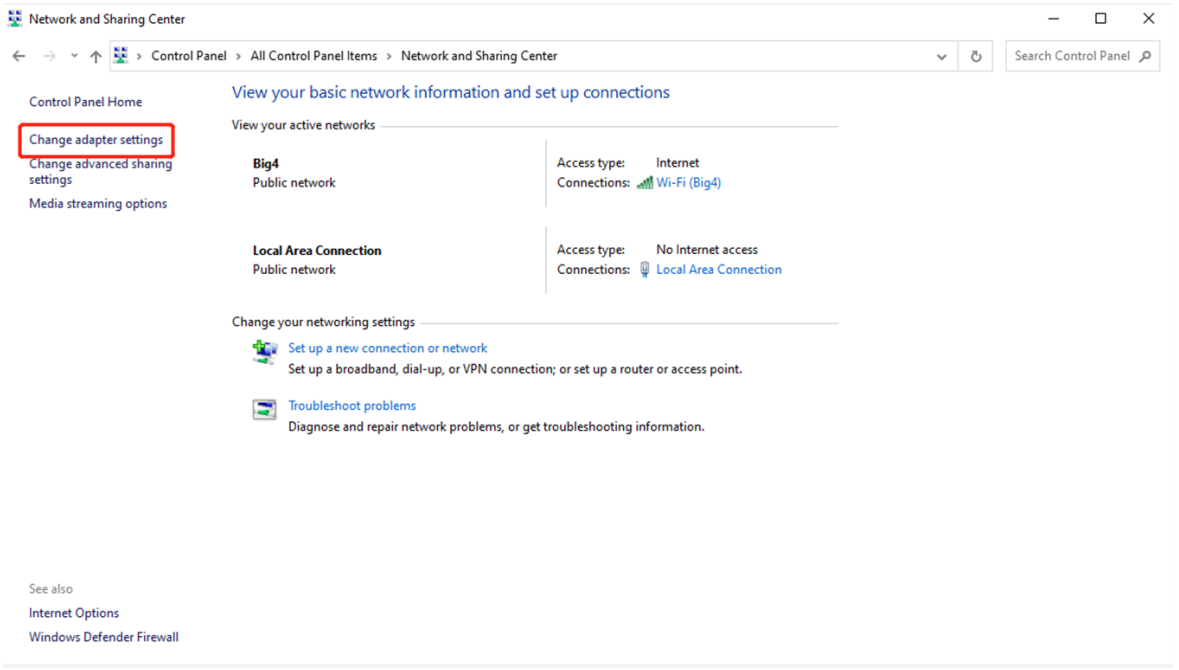

Set Up a Connection or Network
Choose a connection option
Connect to the Internet
Set up a broadband or dial-up connection to the Internet.
Set up a new network
Set up a new router or access point.
Manually connect to a wireless network
Connect to a hidden network or create a new wireless profile.
Connect to a workplace
Set up a dial-up or VPN connection to your workplace.
Next
Cancel

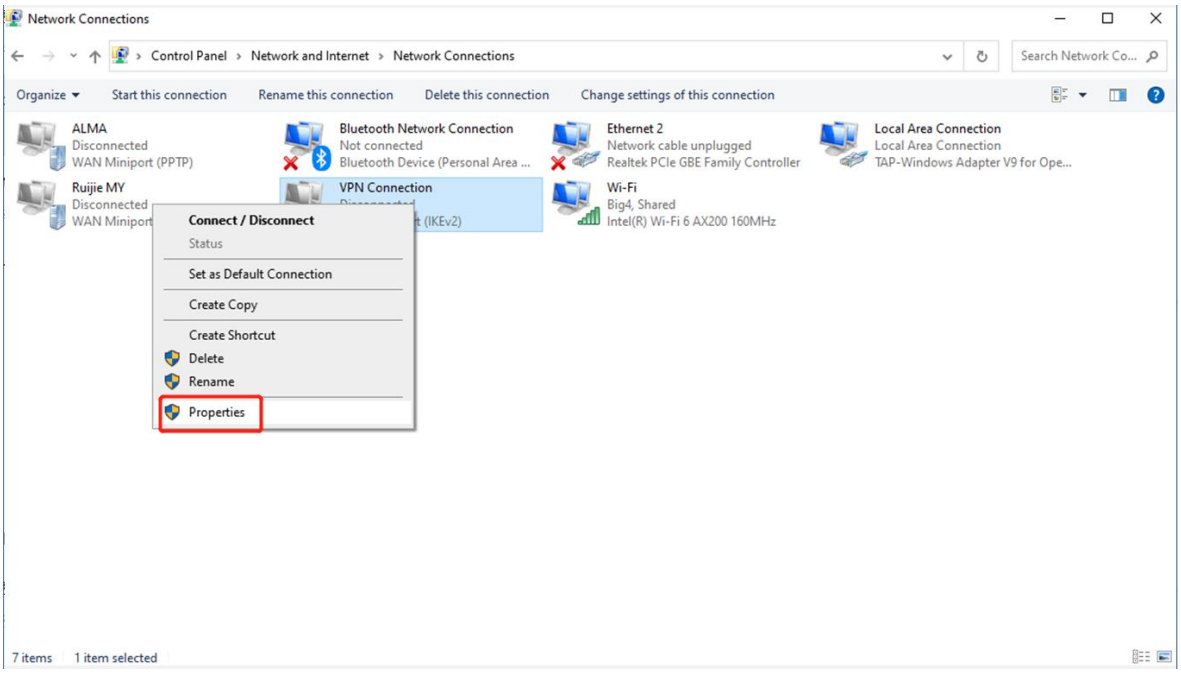

Connect to a Workplace
Do you want to use a connection that you already have?
No, create a new connection
Yes, I'll choose an existing connection
Ruijie MY
WAN Miniport (PPTP)
Ruijie Demo
WAN Miniport (PPTP)
ALMA
WAN Miniport (PPTP)
Next
Cancel

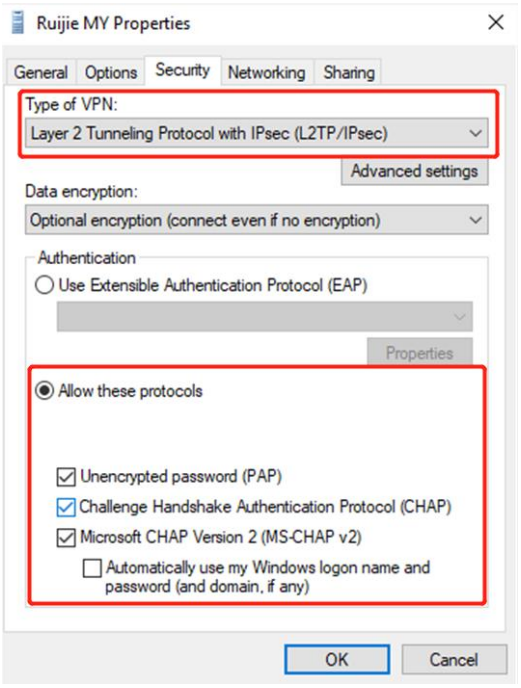




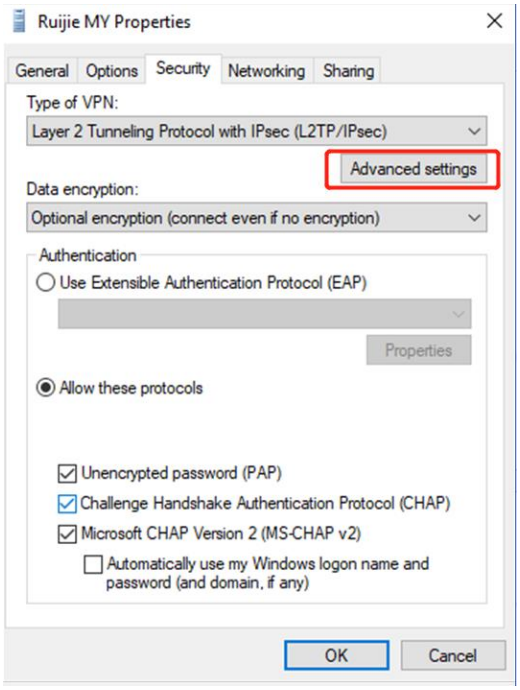
c Change adapter's settings.

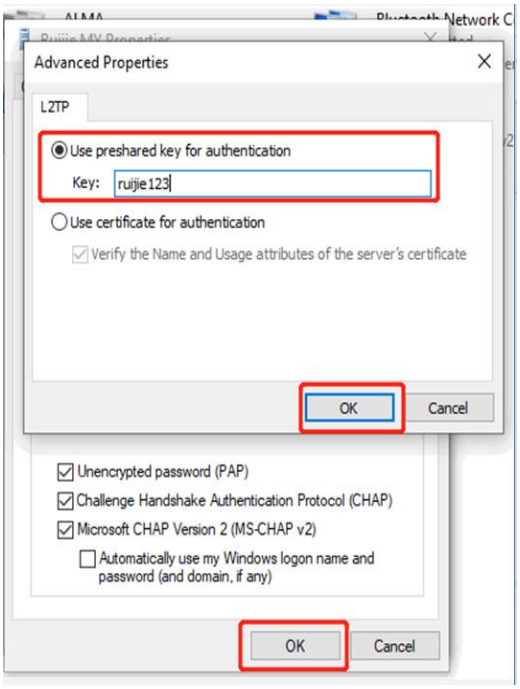

Network and Sharing Center
Control Panel › All Control Panel Items › Network and Sharing Center
Search Control Panel
Control Panel Home
Change adapter settings
Change advanced sharing settings
Media streaming options
View your basic network information and set up connections
View your active networks
Big4
Public network
Access type: Internet
Connections: Wi-Fi (Big4)
Local Area Connection
Public network
Access type: No Internet access
Connections: Local Area Connection
Change your networking settings
Set up a new connection or network
Set up a broadband, dial-up, or VPN connection; or set up a router or access point.
Troubleshoot problems
Diagnose and repair network problems, or get troubleshooting information.
See also
Internet Options
Windows Defender Firewall


Network Connections
Control Panel › Network and Internet › Network Connections
Search Network Co...
Organize
Start this connection
Rename this connection
Delete this connection
Change settings of this connection
ALMA
Disconnected
WAN Miniport (PPTP)
Bluetooth Network Connection
Not connected
Bluetooth Device (Personal Area ...
Ethernet 2
Network cable unplugged
Realtek PCIe GBE Family Controller
Local Area Connection
Local Area Connection
TAP-Windows Adapter V9 for Ope...
Ruijie MY
Disconnected
VPN Connection
Wi-Fi
Big4, Shared
Intel(R) Wi-Fi 6 AX200 160MHz
Connect / Disconnect
Status
Set as Default Connection
Create Copy
Create Shortcut
Delete
Rename
Properties
7 items
1 item selected

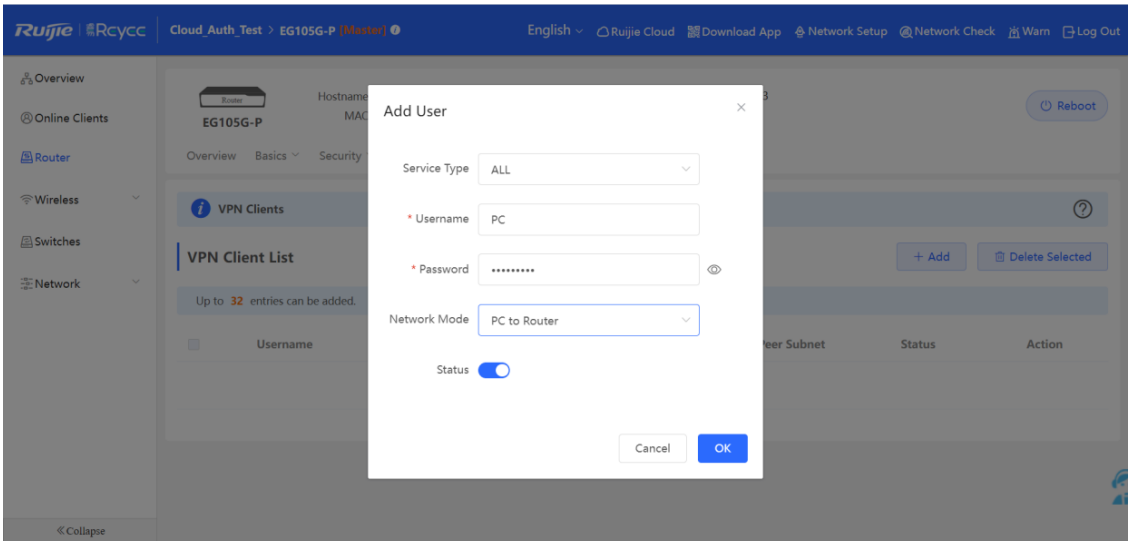


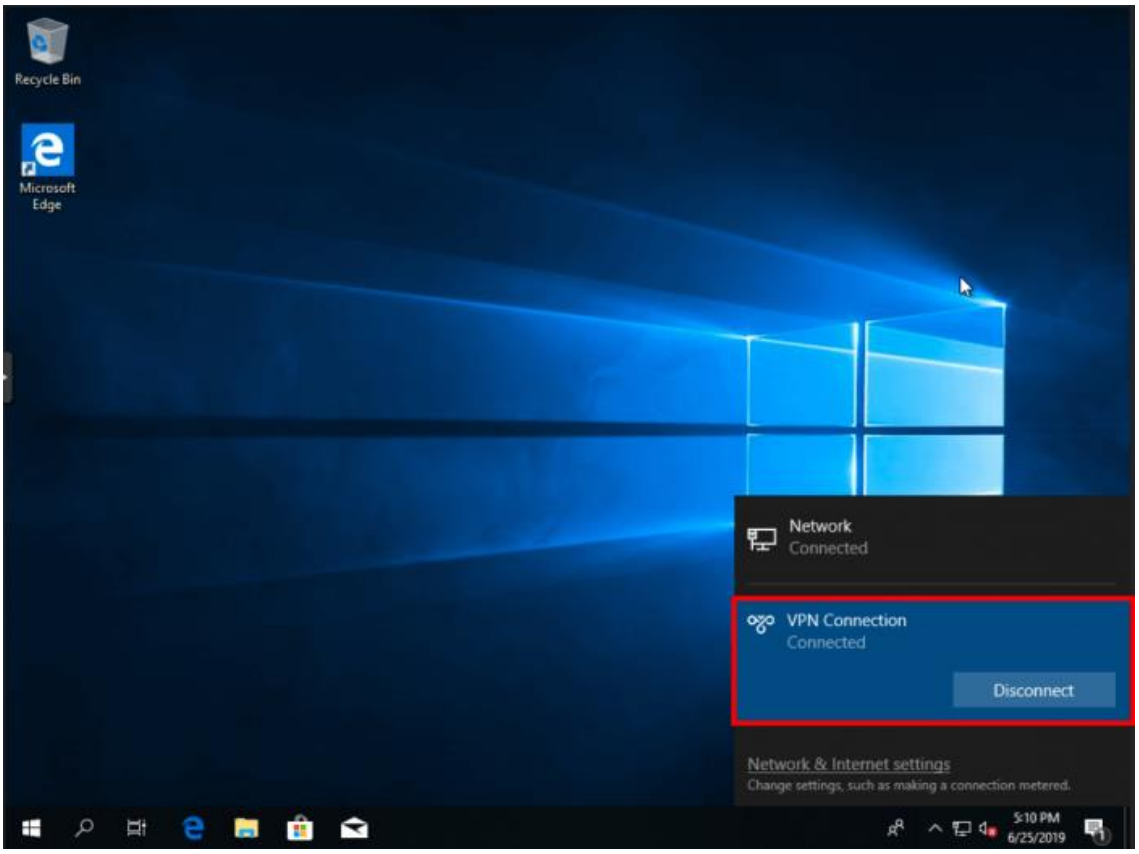
d Click **Advanced Settings** to configure the pre-shared password.





e Set **Network Mode** to **PC to Router**.





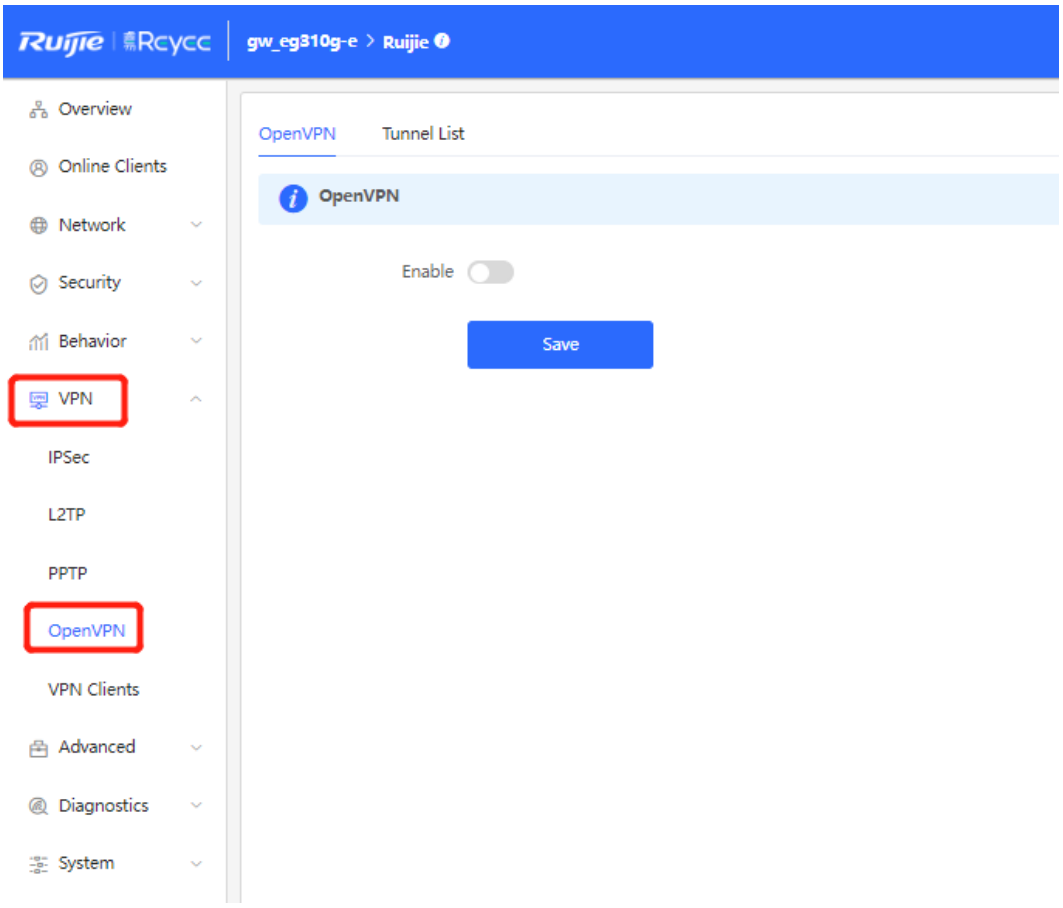
4.7.5 Open VPN

Open VPN is typically used in site-to-site and client-to-site scenarios. Open VPN is an application-layer VPN implementation based on the OpenSSL library. Compared with traditional VPN, open VPN is simple to use. VPN is a virtual private channel or a tunnel that provides secure data transmission between enterprises. Open VPN is full-featured SSL VPN that uses Layer 2 or Layer 3 secure network technology and industrial standard Secure Sockets Layer (SSL) or Transport Layer Security (TLS). SSL and TLS are security protocols that provide security and data integrity for network communications. Open VPN supports flexible client authorization modes, and supports certificates, usernames and passwords, allowing users to connect to the VPN through virtual interfaces. Open VPN is not the web proxy-based application or browser-based access.

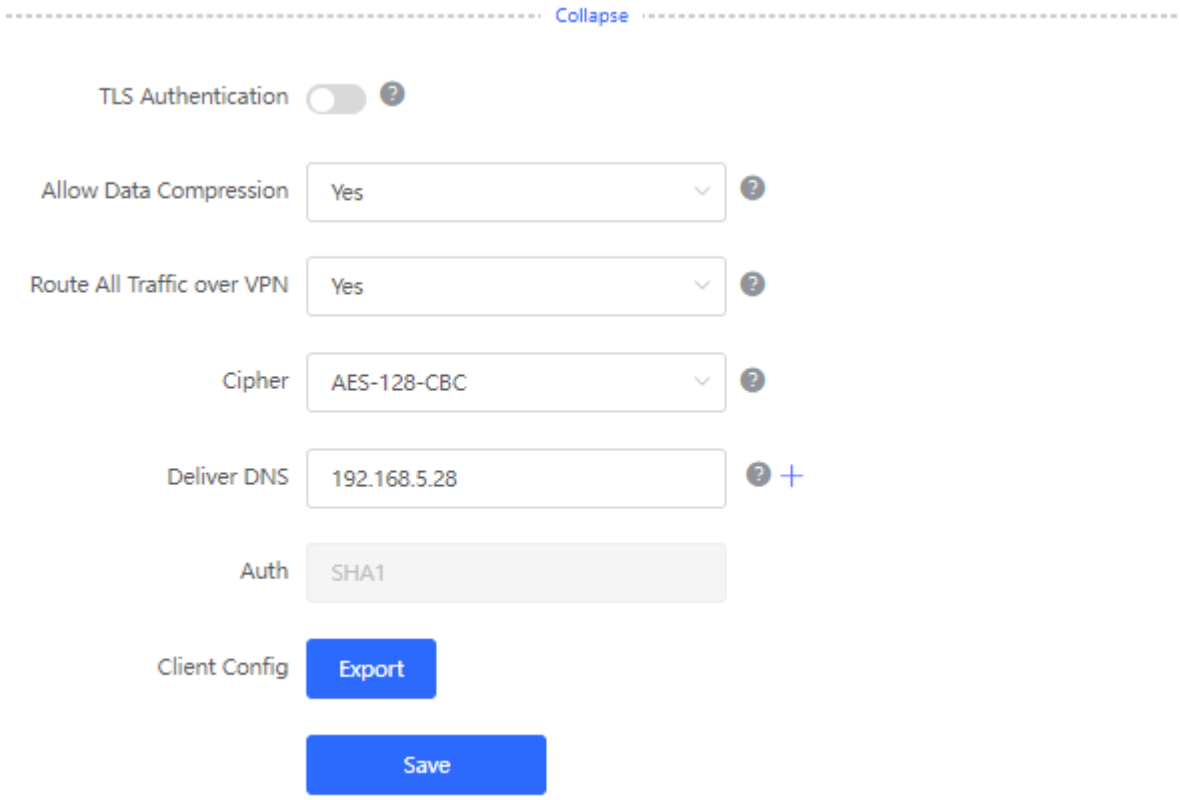
(1) Headquarters side:

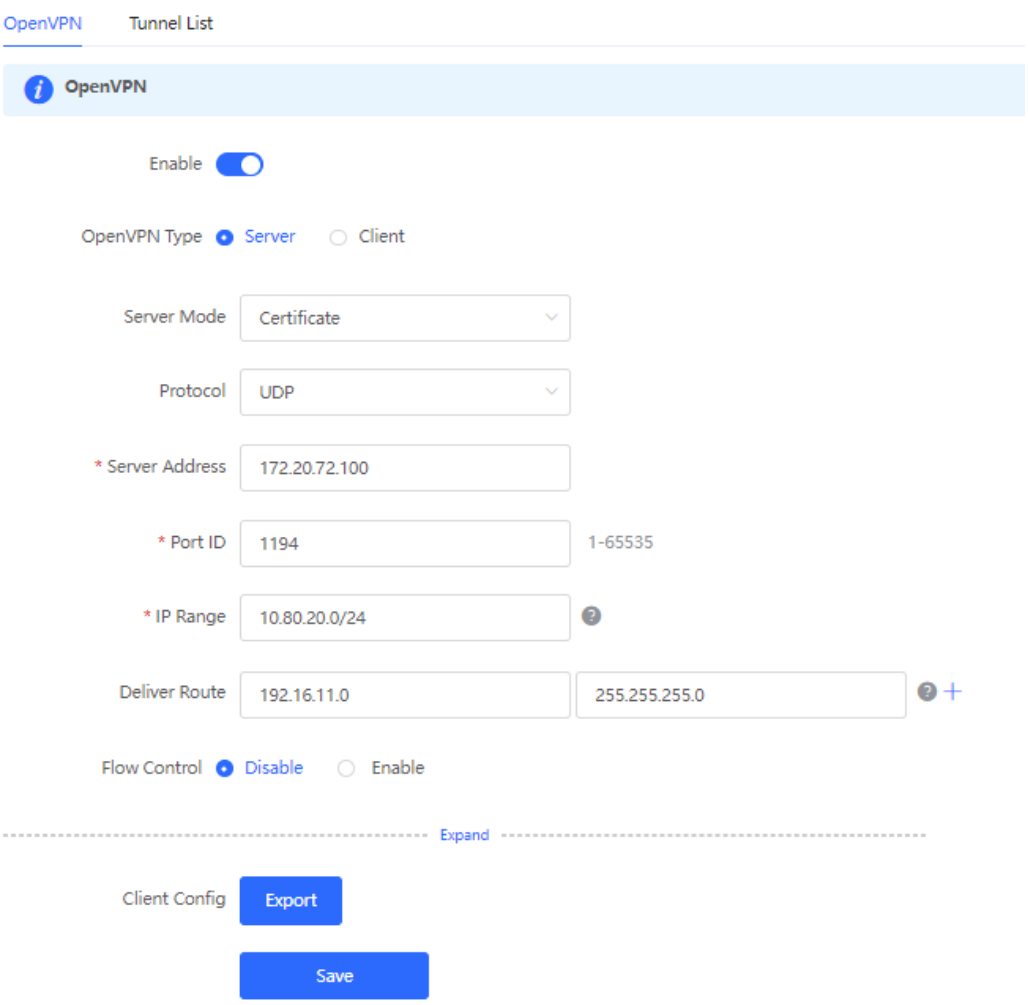
a Log in to the Reyee EG with the default IP address of 192.168.110.1.

b Switch to the **Local** mode. Choose **VPN** > **OpenVPN**.



c Enable **Open VPN** and configure VPN information.

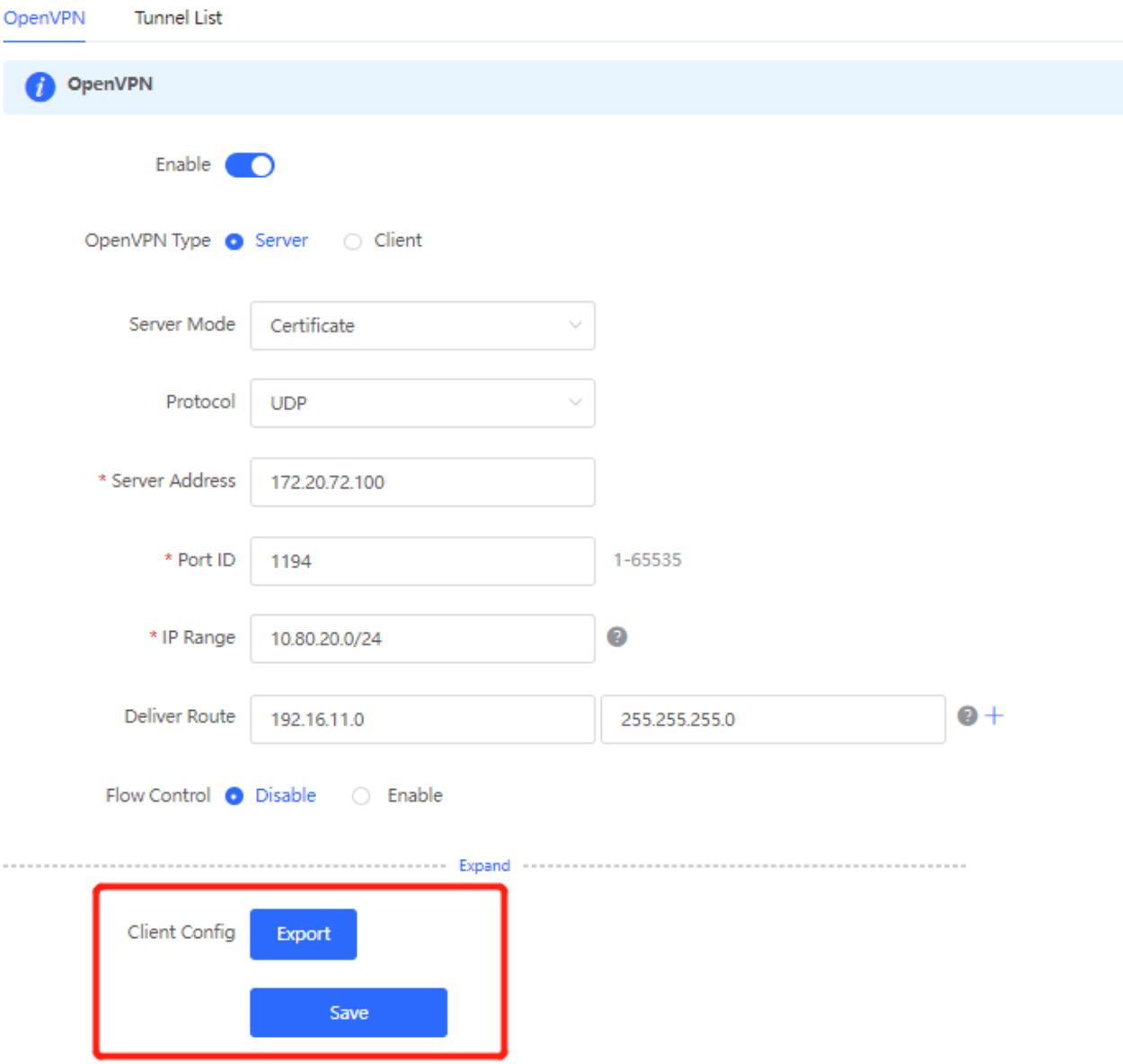

Collapse
TLS Authentication
Allow Data Compression
Yes
Route All Traffic over VPN
Yes
Cipher
AES-128-CBC
Deliver DNS
192.168.5.28
Auth
SHA1
Client Config
Export
Save



- **OpenVPN Type**: Select **Server** or **Client** as needed
- **Server Mode**: Select an authentication mode.
  - Account: You have to enter the correct account password, and import the CA certificate file on the client.
  - Certificate: You have to import the correct CA certificate, client certificate, and private key file on the client.
  - Account & Certificate: You have to enter the correct account password and import the correct CA certificate, client certificate, and private key file on the client.
  - **Protocol**: Select **TCP** or **UDP**.
- **Server Address**: Enter the WAN IP address or domain name.
- **Port ID**: Use port 1194 by default.
- **IP Range**: Assign IP addresses in the range to clients.
- **Deliver Route**: The route of the client is used when the client accesses the intranet of the server.
- **Advanced configuration:**
- **TLS authentication**: A VPN connection is secured with the TLS key.
- **Allow Data Compression**: The value is **Yes** by default.

- **Route All Traffic over VPN**: The value is **No** by default.
- **Cipher**: You can select a data encryption algorithm. AES-128-CBC is used by default.
- **Deliver DNS**: A DNS address is assigned to a client.
- **Auth**: SHA1 is used by default.

d Click **Save** to save the configuration and click **Export** to export client configuration.



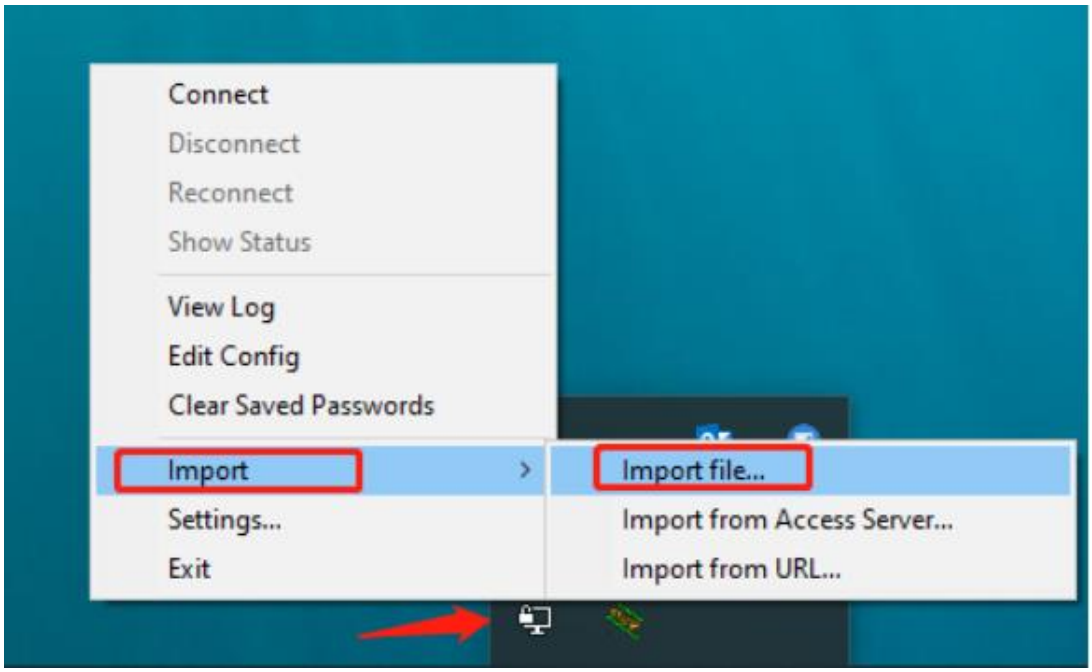
(2) Client side (Windows 10 is used as example):

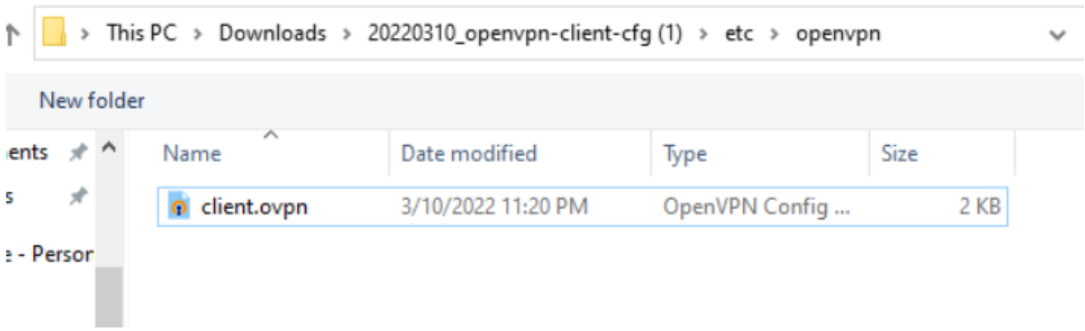
a Download and install OpenVPN application to your PC.

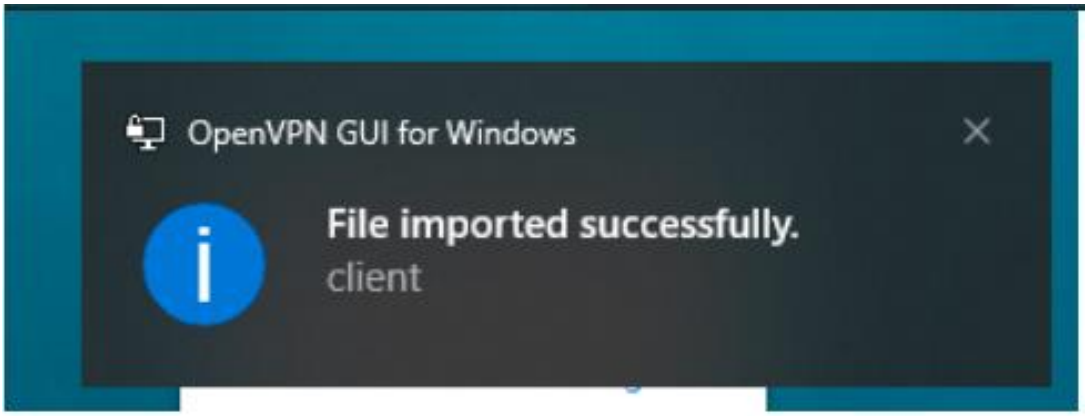
You can download OpenVPN client at https://openvpn.net/community-downloads/. Select a suitable version for your PC.

b Import client configuration to the OpenVPN client after the OpenVPN client is installed on your PC.

- Export the client configuration on the web page.
- Right-click **OpenVPN** and choose **Import** > **Import file...** to import the client configuration on the client.

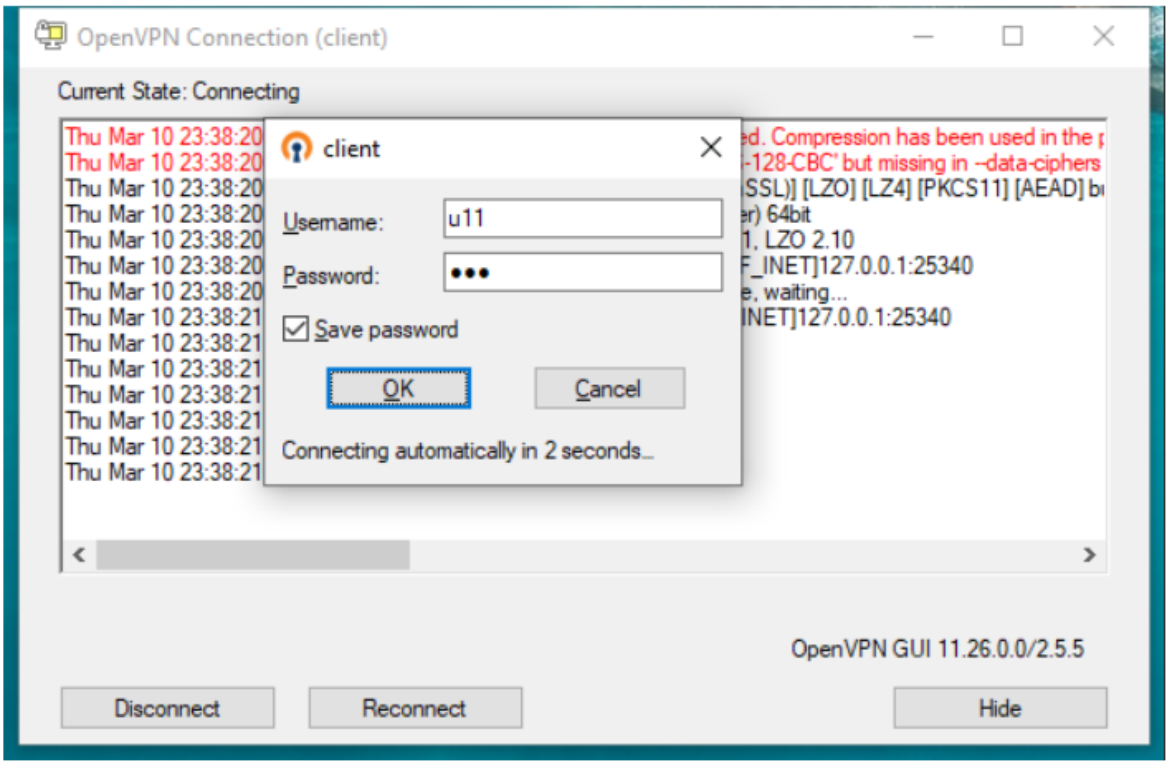


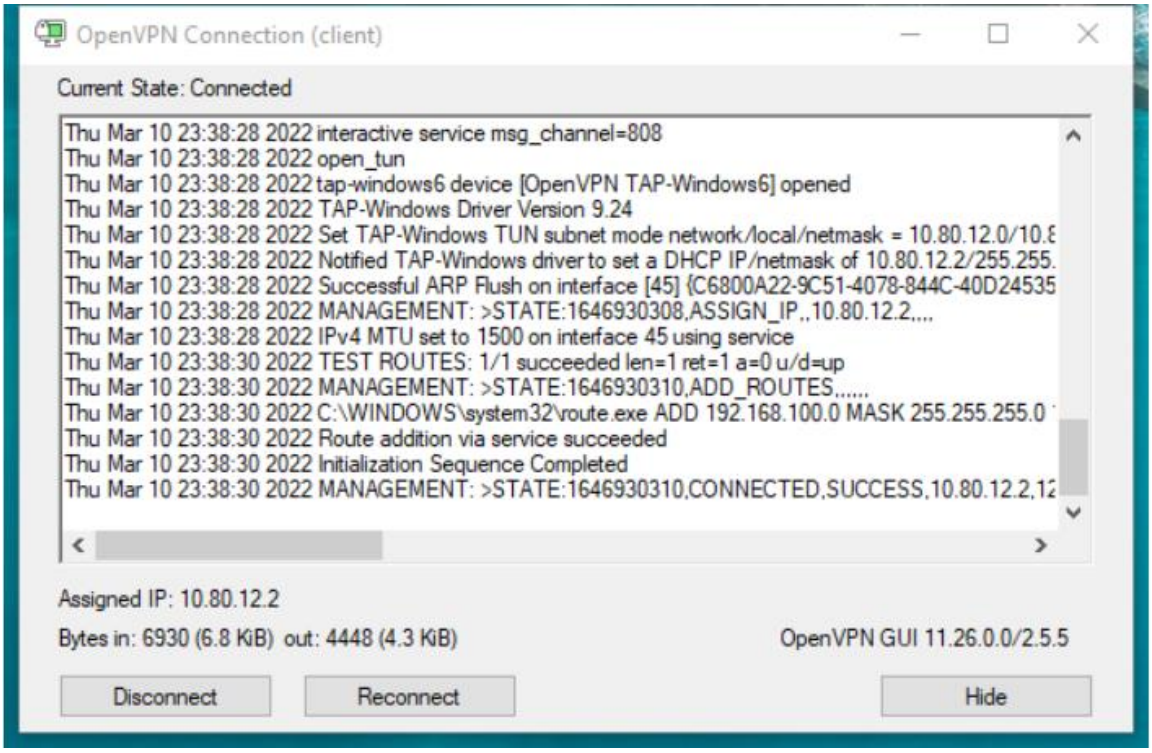




After the message "**File Imported successfully**" appears, you can connect to the VPN.

c Click **OpenVPN** and select **Connect**. If you use the account authentication method, enter your VPN account.





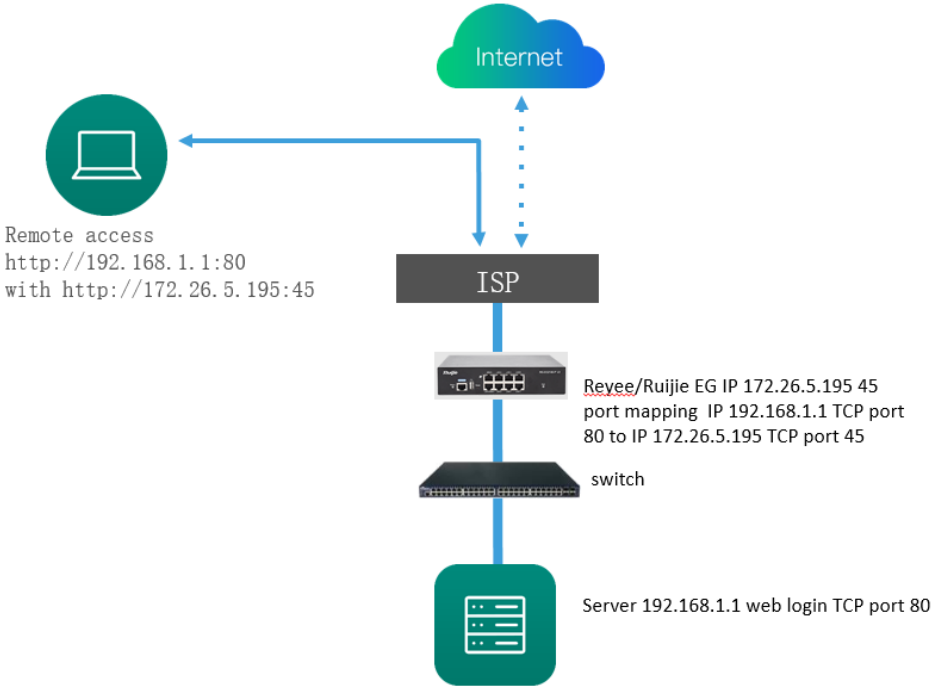
4.8 Port Mapping

Port mapping is used to map the internal server IP address and port number to external IP address so that extranet staffs can access internal servers. The difference between port mapping and DMZ is that port mapping only map one or more ports, but DMZ will map all ports.

- Typical scenario of port mapping

The port mapping function can establish a mapping relationship between the IP address and port number of a WAN port and the IP address and port number of a server on the LAN, so that all access traffic destined for a service port of the WAN port is redirected to the corresponding port of the specified LAN server. This function enables external users to proactively access the service host on the LAN through the IP address and port number of the specified WAN port.

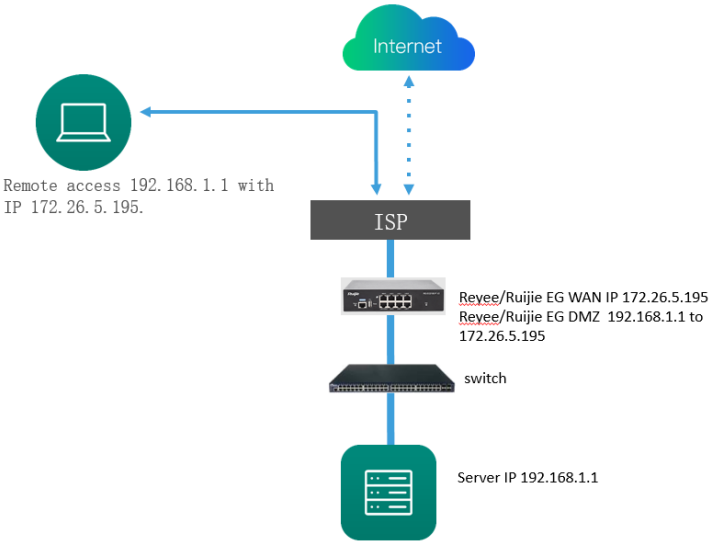
Port mapping enables users to access cameras or computers on their home networks when they are in companies or on a business trip.



- Typical scenario of DMZ

  When an incoming data packet does not hit any port mapping entry, the packet is redirected to the LAN server according to the Demilitarized Zone (DMZ) rule. All data packets proactively sent from the Internet to the device are forwarded to the designated DMZ host, realizing LAN server access of external network users. DMZ provides the external network access service while ensuring security of other hosts on the LAN.

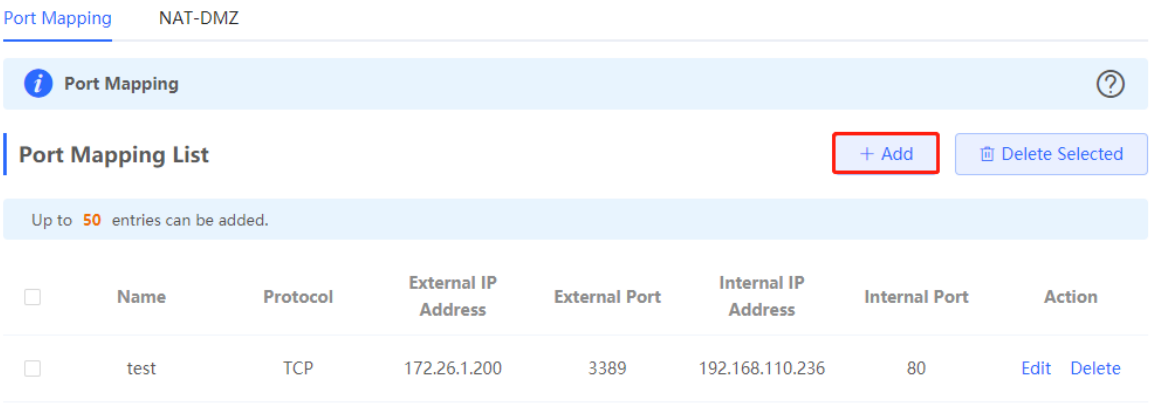
  Port mapping or DMZ is used when an external network user wants to access the LAN server, for example, access a server deployed on the intranet when the user is in the enterprise or on a business trip.



4.8.1 Configuring Port Mapping

(1) Switch to the **Local** mode. Choose **Advanced** > **Port Mapping** > **Port Mapping**.

(2) Click **Add**. In the dialog box that appears, enter the rule name, service type, protocol type, external port/range, internal server IP address, and internal port/range. You can create a maximum of 50 port mapping rules.



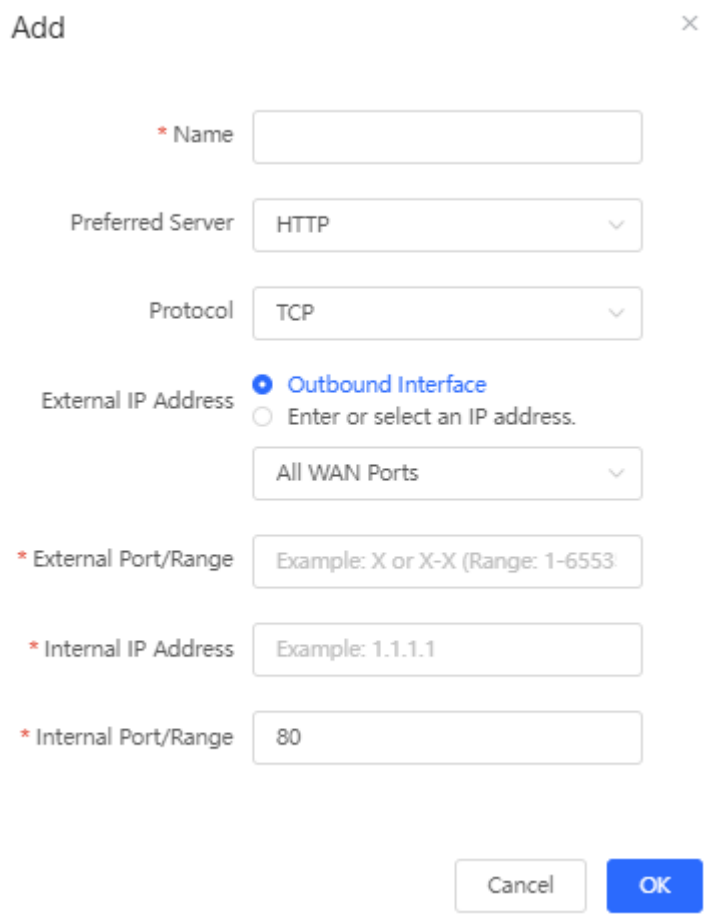


Table 4-5 Port Mapping Configuration

Parameter	Description
Name	Enter the description of a port mapping rule, which is used to identify the rule.
Preferred Server	Select the type of a service to be mapped, such as HTTP or FTP. The internal port number commonly used by the service is automatically entered. If the service type is unknown, select **Custom**.
Protocol	Select the transmission layer protocol type used by a service, such as TCP or UDP. The value **ALL** indicates that the rule applies to both protocols. The value must comply with the client configuration of the service.
External IP Address	Specify the host address used for accessing the external network. **Outbound Interface**: You can select **All WAN Ports** or specify a WAN port. **Enter or select an IP address**: Select or enter the IP address of a WAN port.

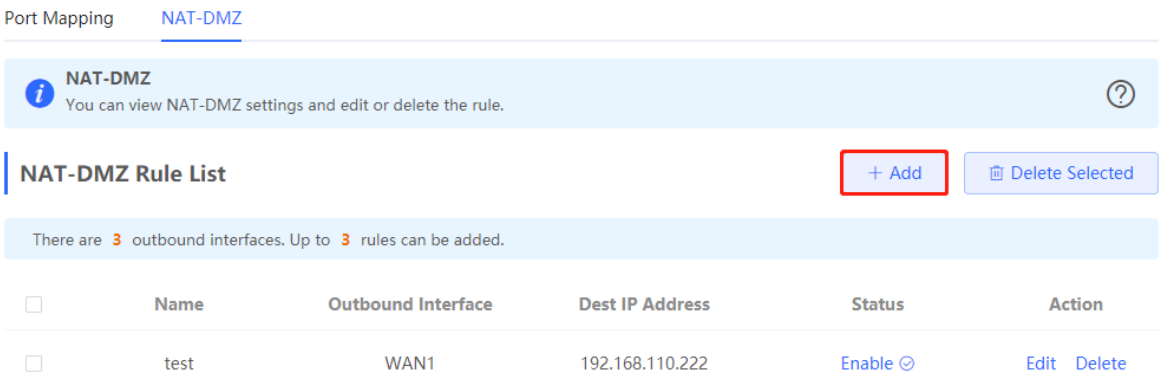
Parameter	Description
External Port/Range	Specify the port number used for Internet access. You need to confirm the port number in the client software, such as the camera monitoring software. You can enter a port number or a port range, such as 1050-1060. If you enter a port range, the value of **Internal Port/Range** must also be a port range.
Internal IP Address	Specify the IP address of the internal server to be mapped to the WAN port, that is, the IP address of the LAN device that provides Internet access, such as the IP address of a network camera.
Internal Port/Range	Specify the service port number of the internal server to be mapped to the WAN port, that is, the port number of the application that provides Internet access, such as port 8080 of the web service. You can enter a port number or a port range, such as 1050-1060. If you enter a port range, the number of ports must be the same as that specified in **External Port/Range**.

(3) Check whether the external network device can access services on the destination host using the external IP address and external port number.

4.8.2 Configuring NAT-DMZ

(1) Switch to the **Local** mode. Choose **Advanced** > **Port Mapping** > **NAT-DMZ**.

(2) Click **Add**. Enter the rule name and internal server IP address, select the interface to which the rule applies, specify the rule status, and click **OK**. You can configure only one DMZ rule for an outbound interface.



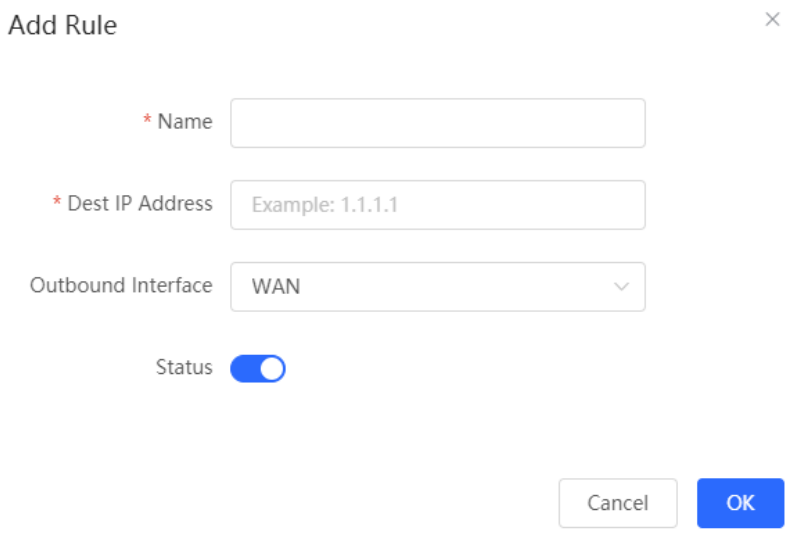


Table 4-1 DMZ Rule Configuration

Parameter	Description
Name	Enter the description of a mapping rule, which is identify the rule.
Dest IP Address	Specify the IP address of the DMZ host to which packets are redirected, that is, the IP address of the internal server that can be accessed from the Internet.
Outbound Interface	Specify the WAN port in the DMZ rule. You can configure only one rule for a WAN port.
Status	Specify whether the rule is effective. The rule is effective when **Status** is enabled.

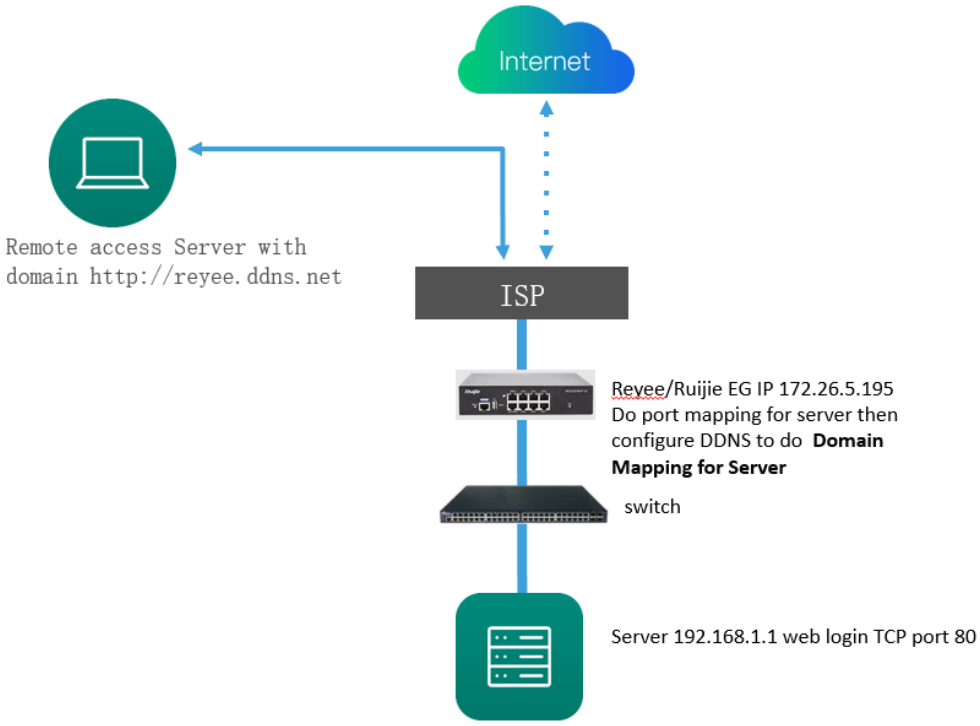
Caution

When both DMZ and port mapping are configured, port mapping takes precedence.

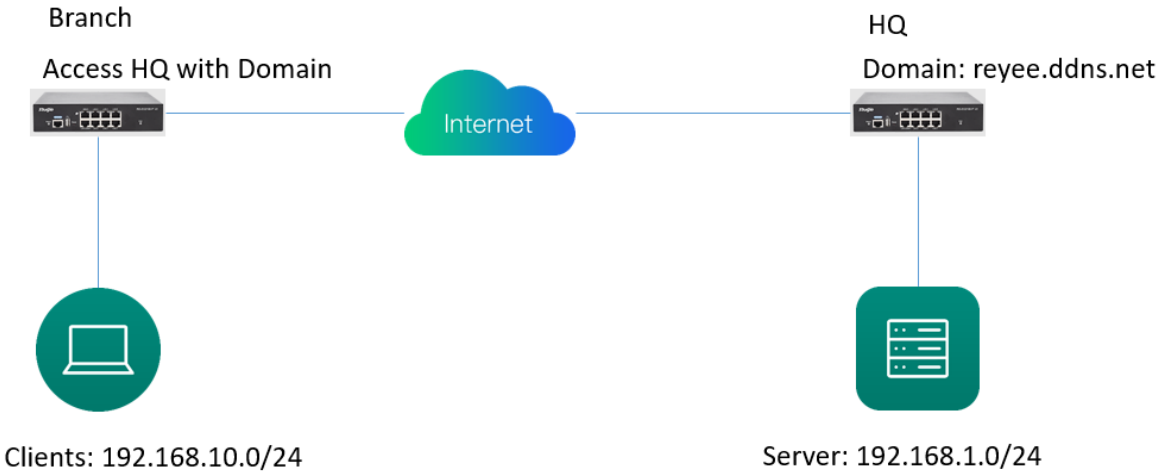
4.9 Dynamic DNS

Dynamic Domain Name Server (DDNS) is to map a user's dynamic IP address to a fixed domain name. Each time a user connects to the network, the client program will transfer the dynamic IP address of the user host to the server program located on a host of a service provider. Then the server program is responsible for providing DNS services and implementing dynamic domain name resolution.

- Server access with the domain name

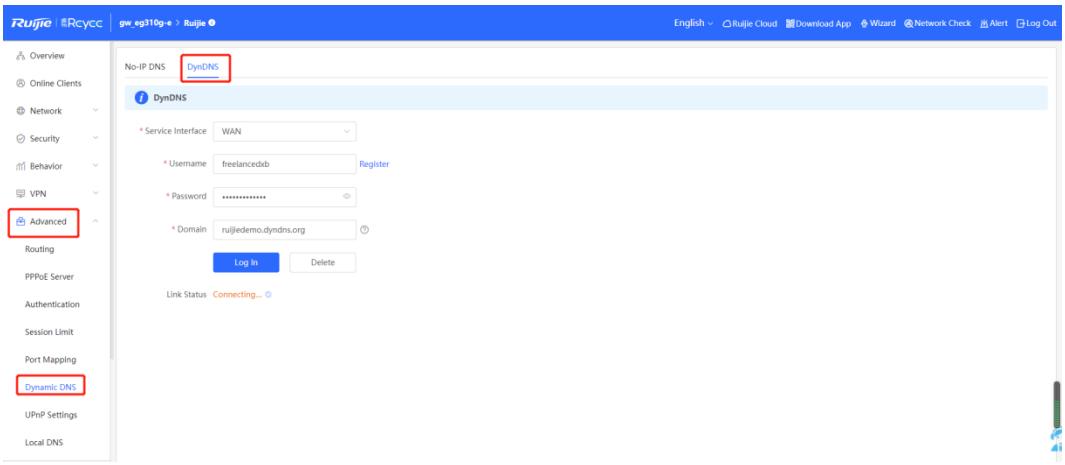


- VPN connection with the domain name



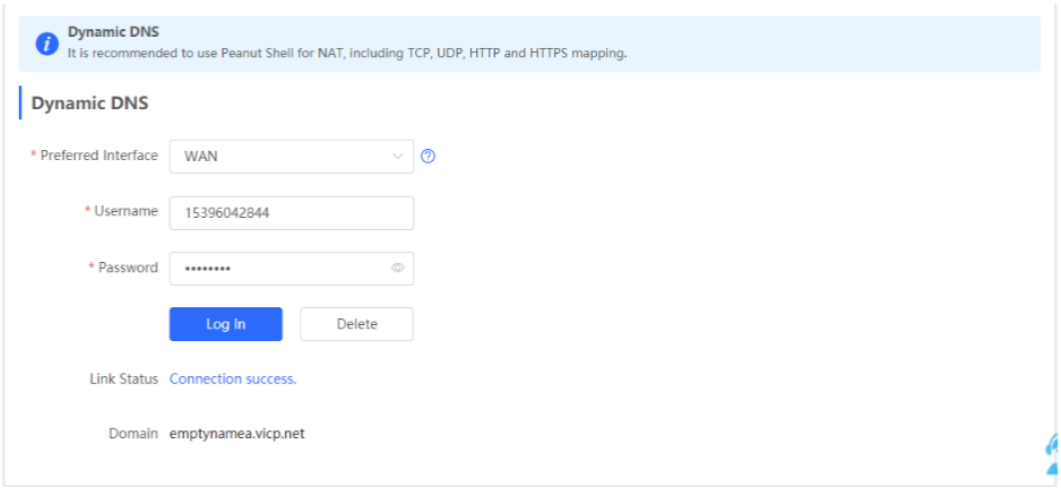
(1) Switch to the **Local** mode. Choose **Advanced > Dynamic DNS**.

There are three DDNS servers you can choose to connect: Peanut Shell DDNS, NO-IP DNS, and DynDNS.



(2) When Peanut Shell DDNS is used, you are advised to use WeChat or Peanut Shell to scan the QR code to register an account.

(3) You can use the value of **Domain** to access the intranet server or headquarters device.



4.10 Authentication

4.10.1 Application Scenario

As wireless networks become popular, Wi-Fi has become one of the marketing means for merchants. Users can connect to Wi-Fi provided by the merchants to surf the Internet after watching advertisements or following WeChat official accounts. In addition, to defend against security vulnerabilities, a wireless office network usually allows only employees to associate with Wi-Fi, so identities of clients need to be verified.

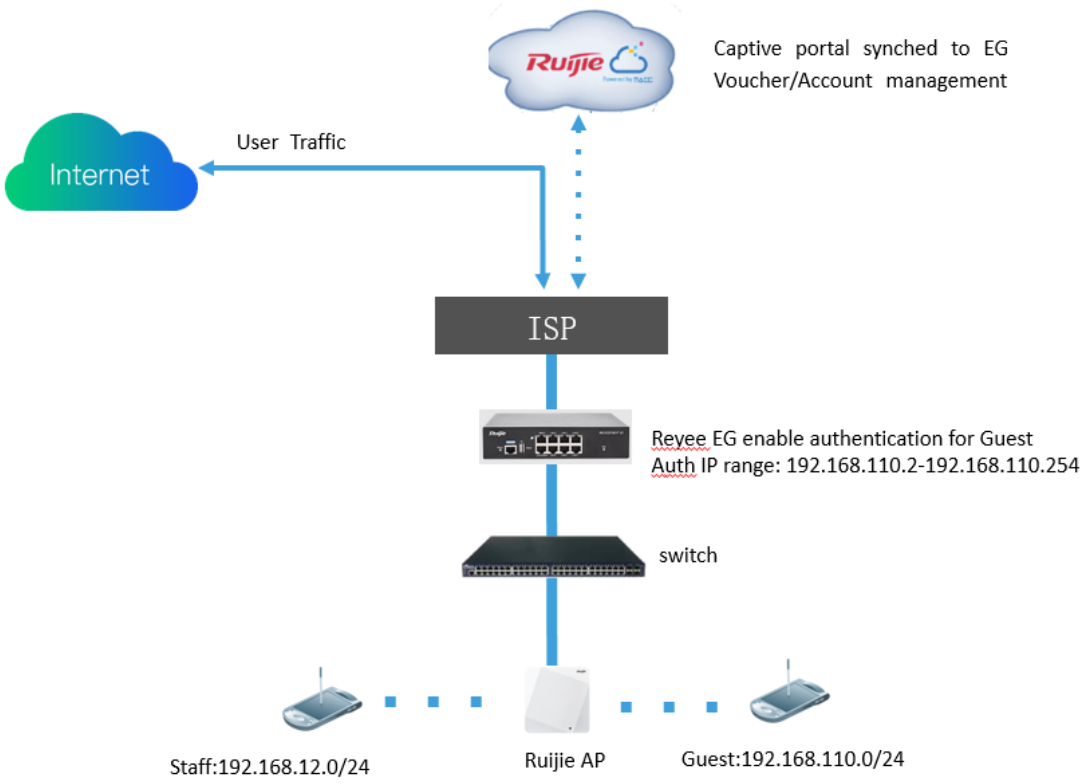
The device uses portal authentication to implement information display and user management. After users connect to Wi-Fi, traffic is not routed to the Internet. Wi-Fi users must pass authentication at the Portal authentication website, and only authenticated users are allowed to use network resources. Merchants or enterprises can customize Portal pages for identity authentication and advertisement display.

(1) Before you enable Wi-Fi authentication, ensure that wireless signals are stable and users can connect to Wi-Fi and surf the Internet normally. The wireless SSID used for authentication on a network should be set to **open**. Encryption may lead to exceptions during Wi-Fi interconnection through authentication.

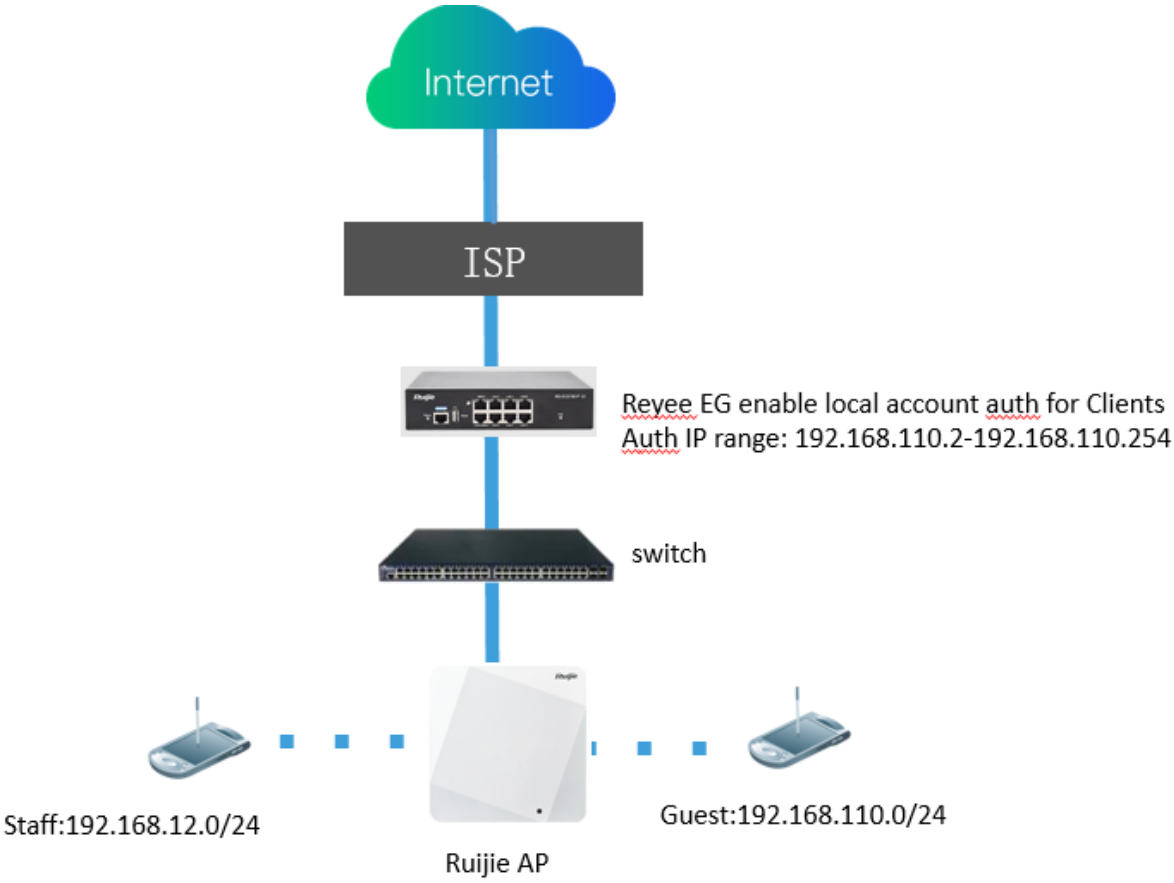
(2) If the IP address of an AP on a network is within the authentication scope, add the AP as the authentication-free user. For details, see section 4.2.10.7 Authentication-Free.

- On a Layer 2 network, add the MAC address of the AP to the authentication-free MAC address whitelist.
- On a Layer 3 network, add the IP address of the AP to the authentication-free IP address whitelist.

- **Cloud authentication scenario**



- **Local account authentication scenario**

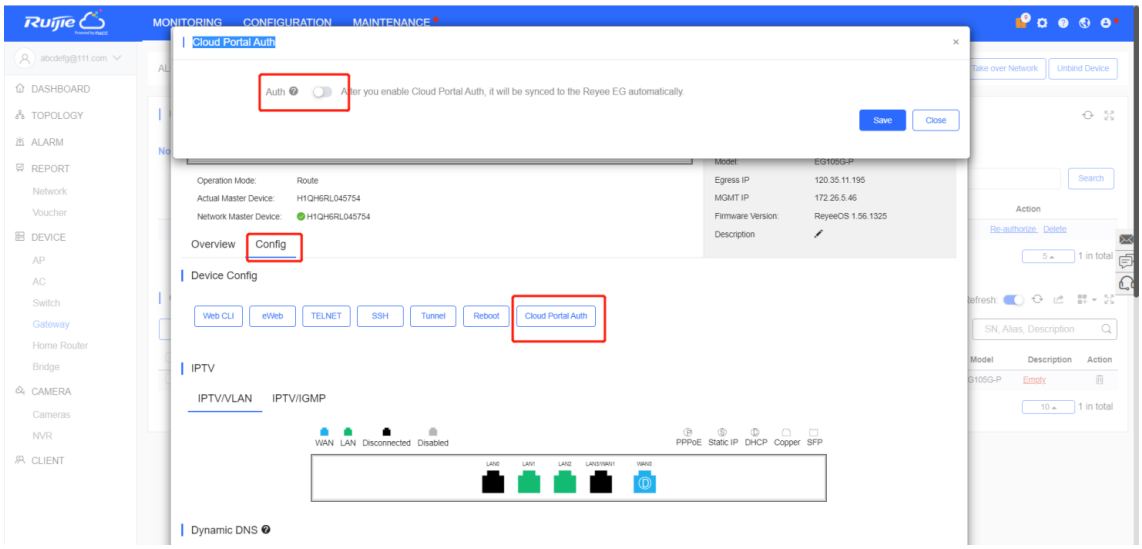


4.10.2 Cloud Authentication

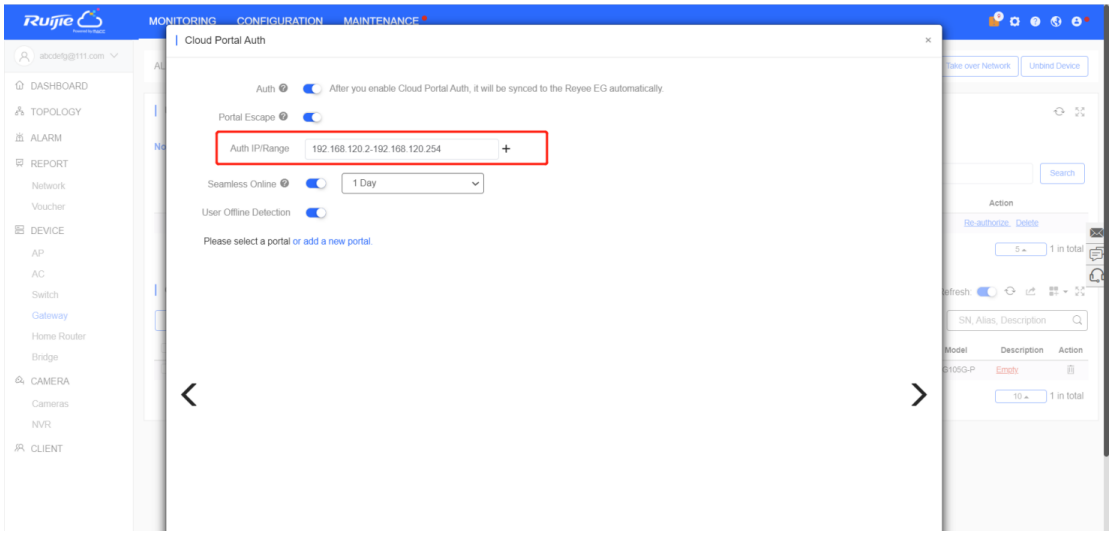
Reyee EG devices support cloud portal authentication, including one-click, voucher, account, SMS (integration with Twilio) authentication modes.

(1) Configure cloud authentication on the cloud, and click the SN of the EG to access the page of EG details.

(2) Choose **Config** > **Cloud Portal Auth**.



(3) Enter the value of **Auth IP/Range** for the user that needs to be authenticated before Internet access.

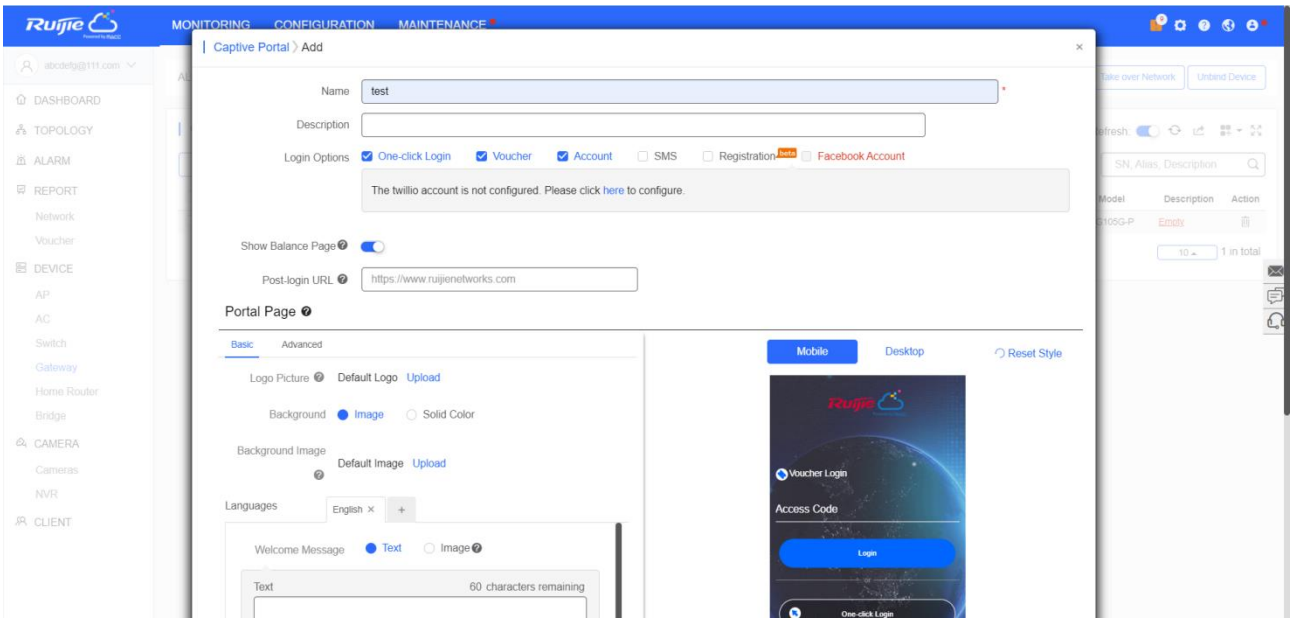


Portal Escape: When the cloud server goes Down, this function enables clients to access the Internet directly without authentication.

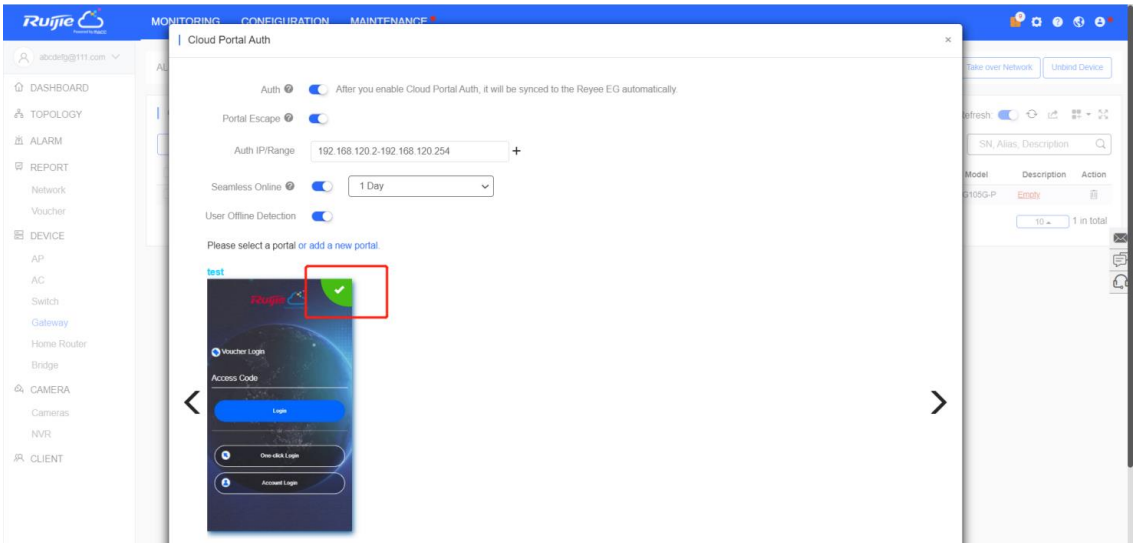
Seamless Online: Users only need to pass the authentication once. If they want to go online again, authentication is not required. After users go online, they do not need to log in again in the specified period. You can choose **1 Day**, **1 Week**, **1 Month**, or **Always**.

User Offline Detection: Users do not access the Internet after the validity period.

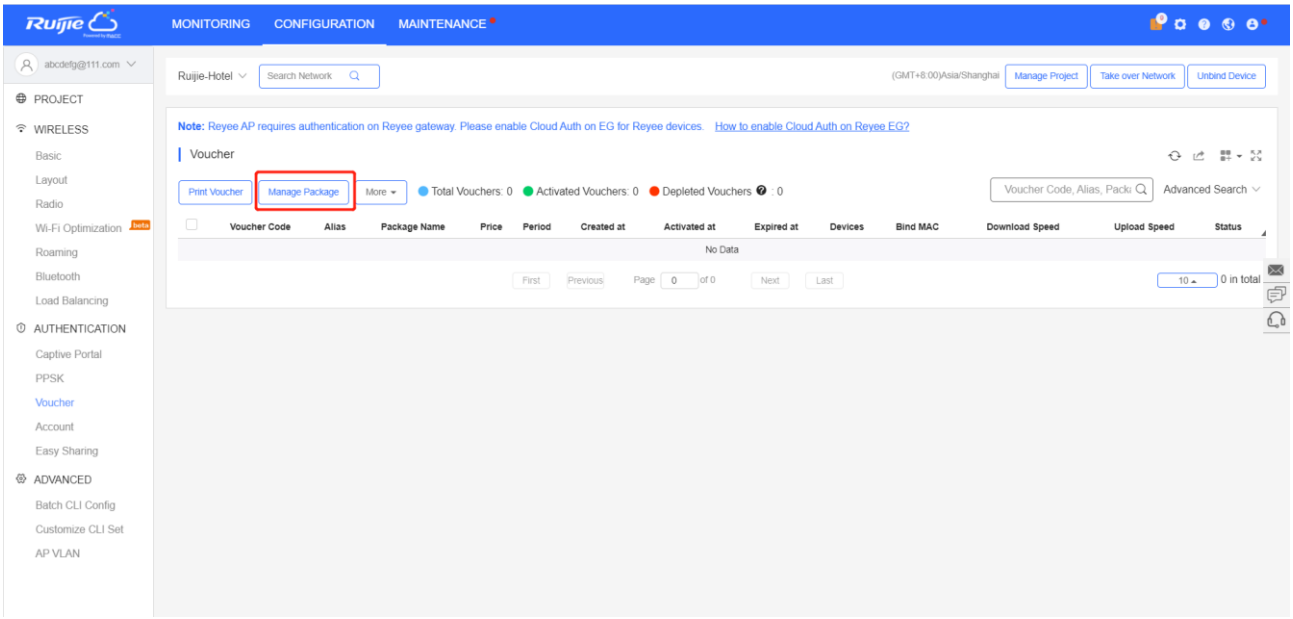
(4) Click **add a new portal** to add a portal page.



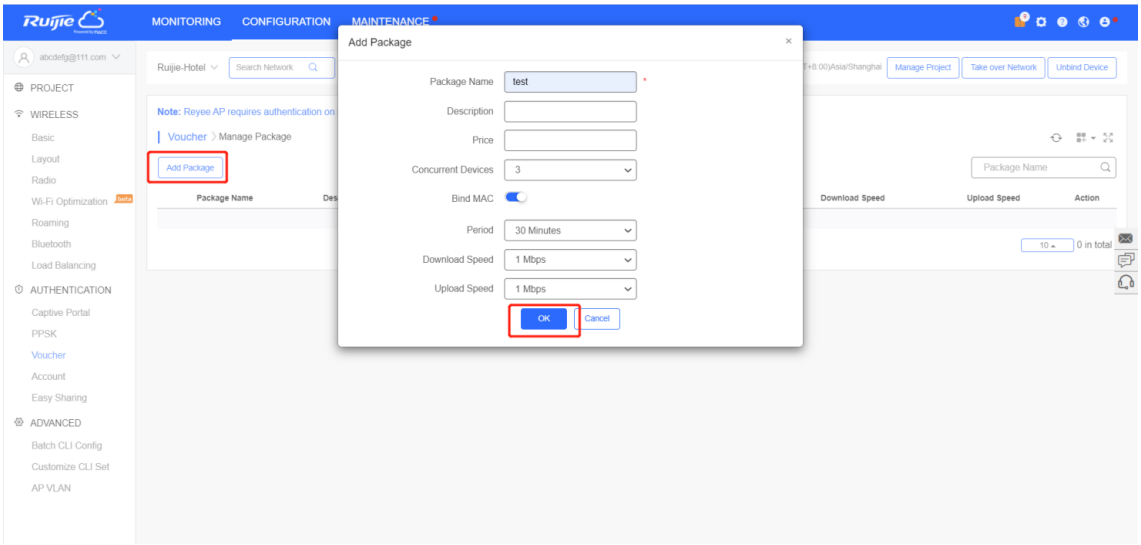
(5) Click the portal page to apply it and click **Save**.



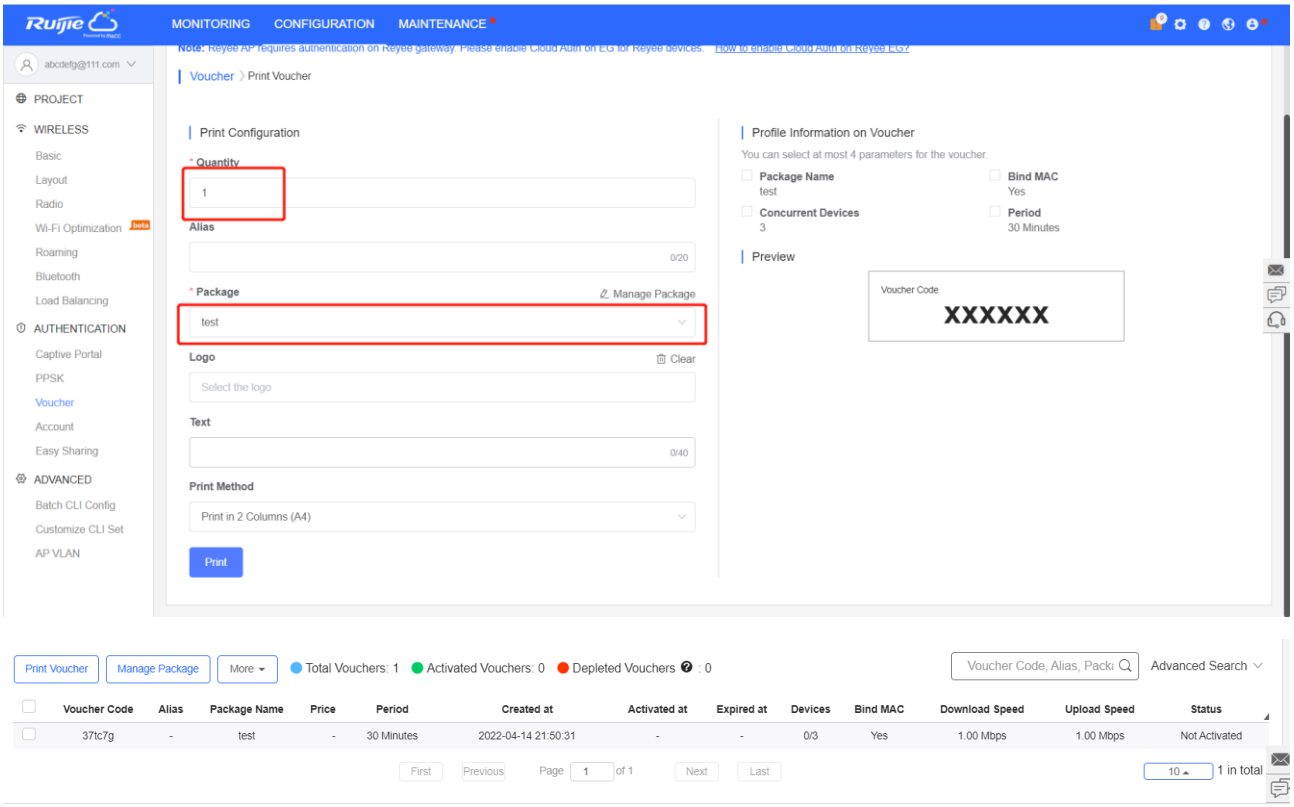
(6) If you use voucher or account authentication, choose **Configuration > Voucher/Account** to add a voucher or an account used for clients. Click **Manage Package** to add a package.



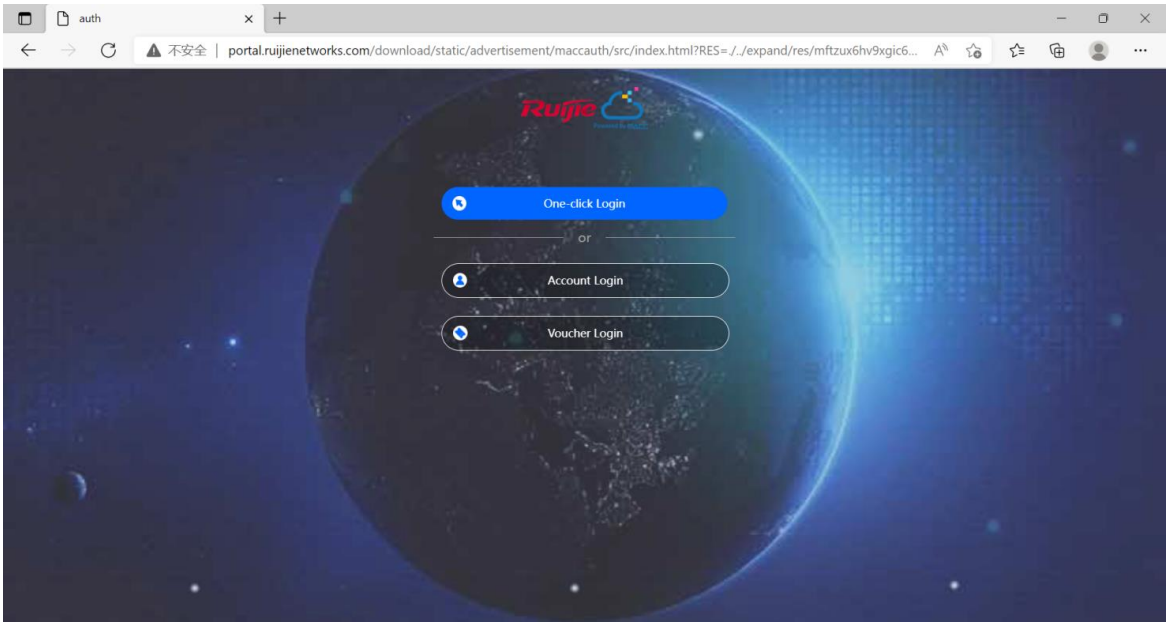
(7) Click **Add Package** and fill in **Price**, **Concurrent Devices**, **Bind MAC**, **Period**, **Download Speed**, and **Upload Speed**.



(8) Click **Print Voucher** to add a voucher. Fill in **Quantity** and choose the package you add just now. Then click **Print.**



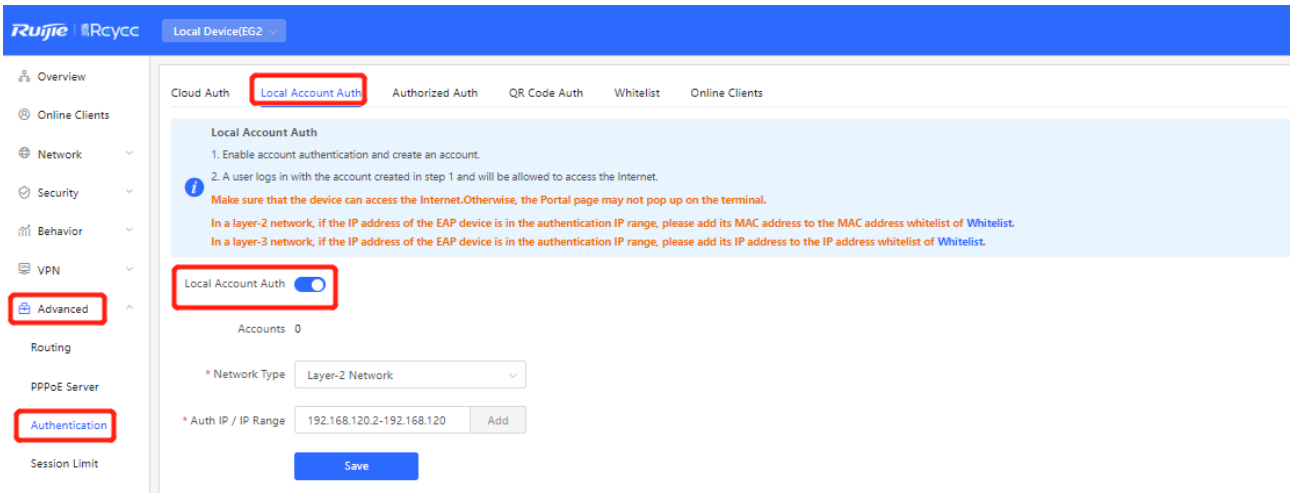
(9) Click **One-Click** to log in and perform authentication on the PC.



4.10.3 Local Account Authentication

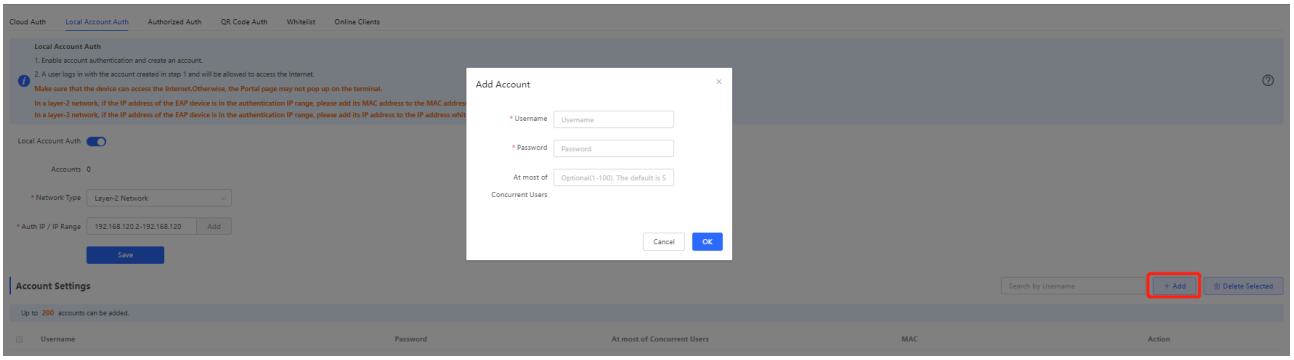
Reyee EG devices provide local account authentication. The portal page and account are all created locally.

(1) Switch to the **Local** mode. Choose **Advanced > Authentication > Local Account Auth**, enable local account authentication, fill in **Auth IP/IP Range**, and click **Save**.



Auth IP/IP Range: The IP address of a client who needs to be authenticated. The value and other IP addresses for authentication cannot overlap.

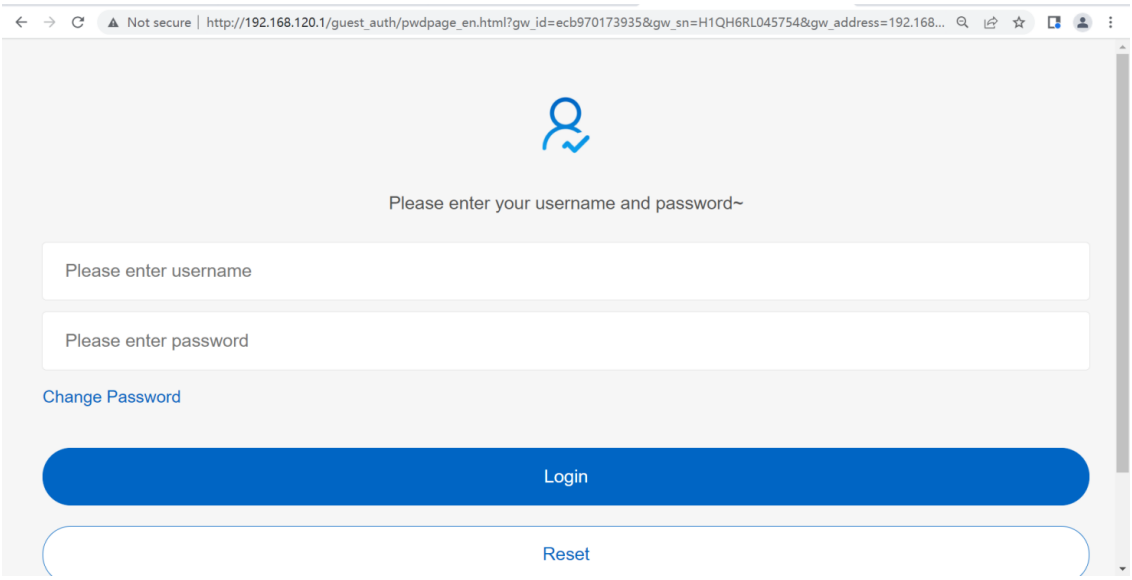
(2) Add the account used by clients. Up to 200 accounts can be added.



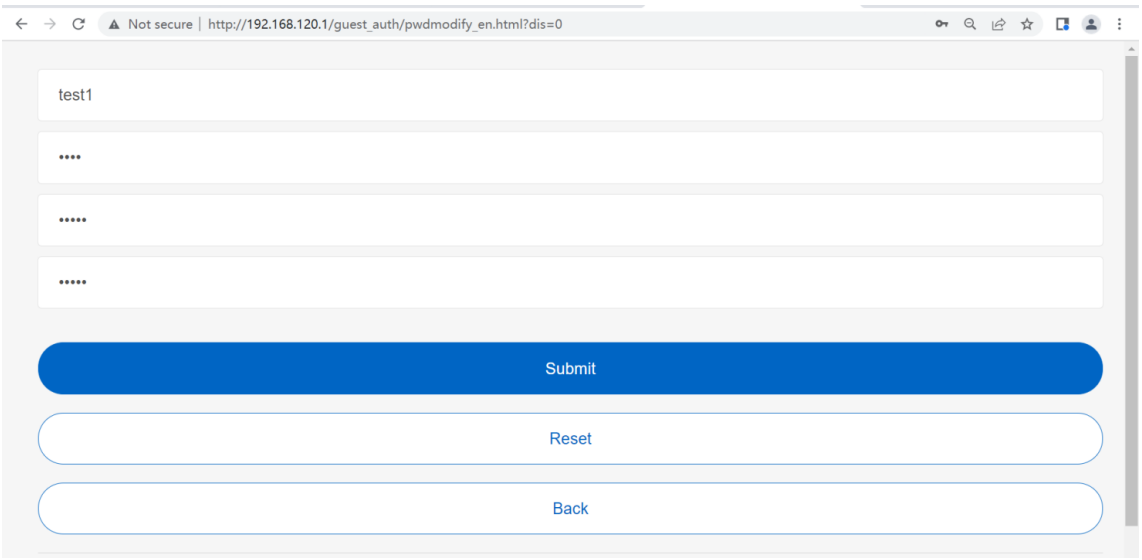
Caution

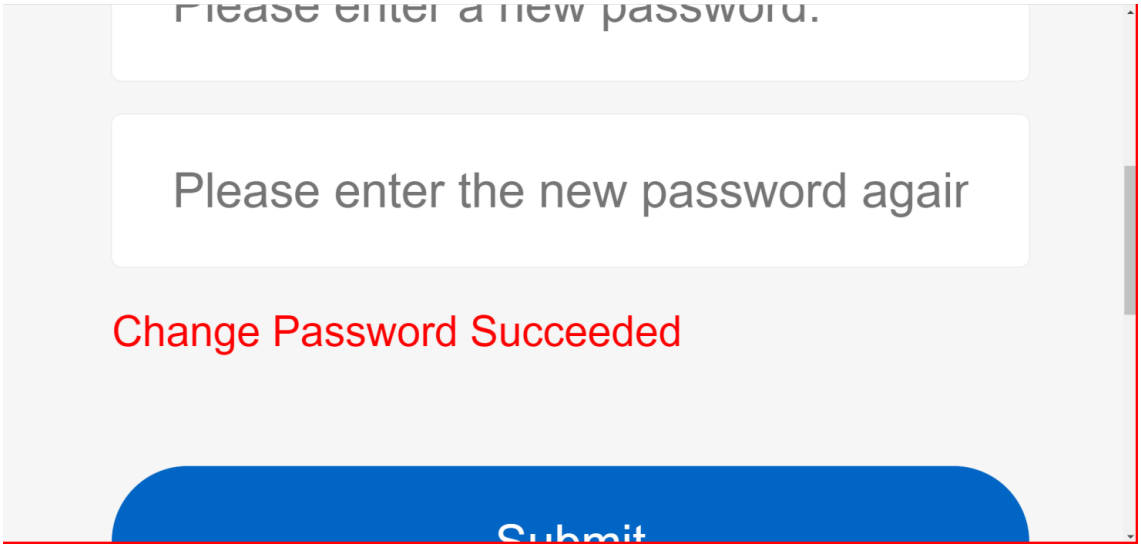
The account can be used by multiple clients.

(3) Perform authentication on the PC. Generally, the portal page is displayed automatically. If the page is not displayed, try to enter 1.1.1.1 to redirect to the portal page. The page is displayed based on your browser language setting.

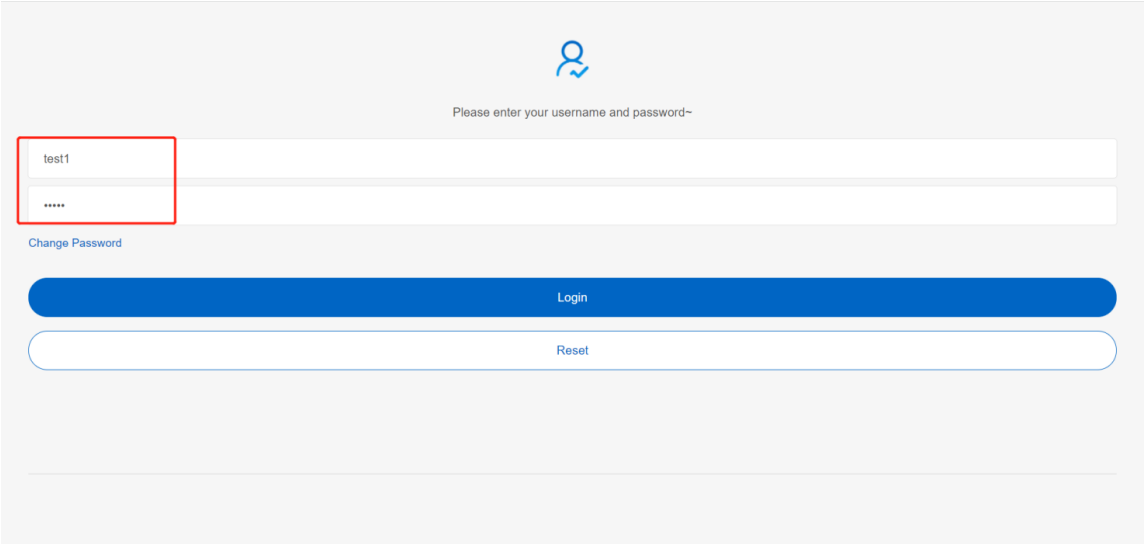


(4) Enter **username** and **password** obtained from a manager. To change the password, click **Change Password**.

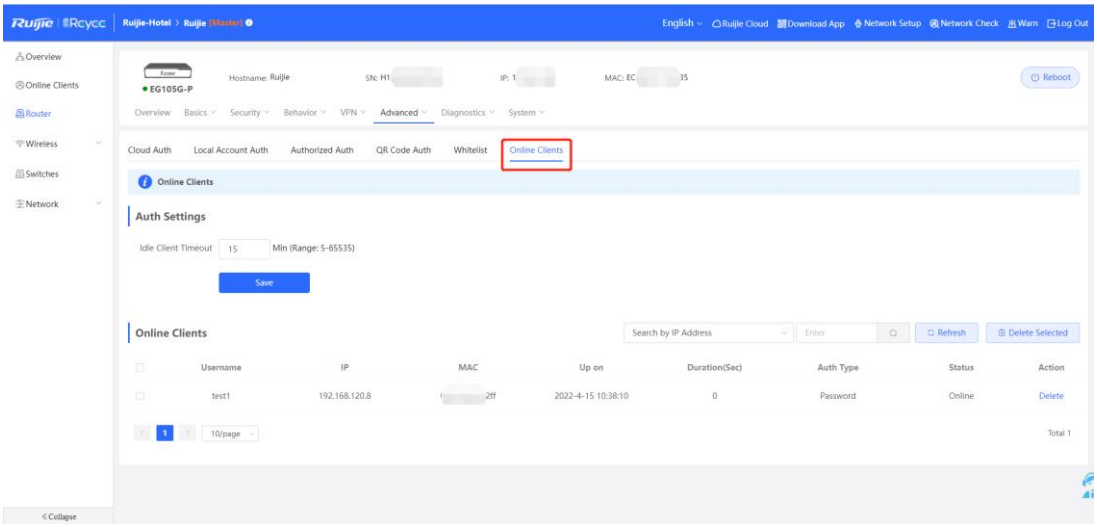




(5) Enter the new username and password to log in. The page will appear automatically after you log in, and then you can access the Internet.



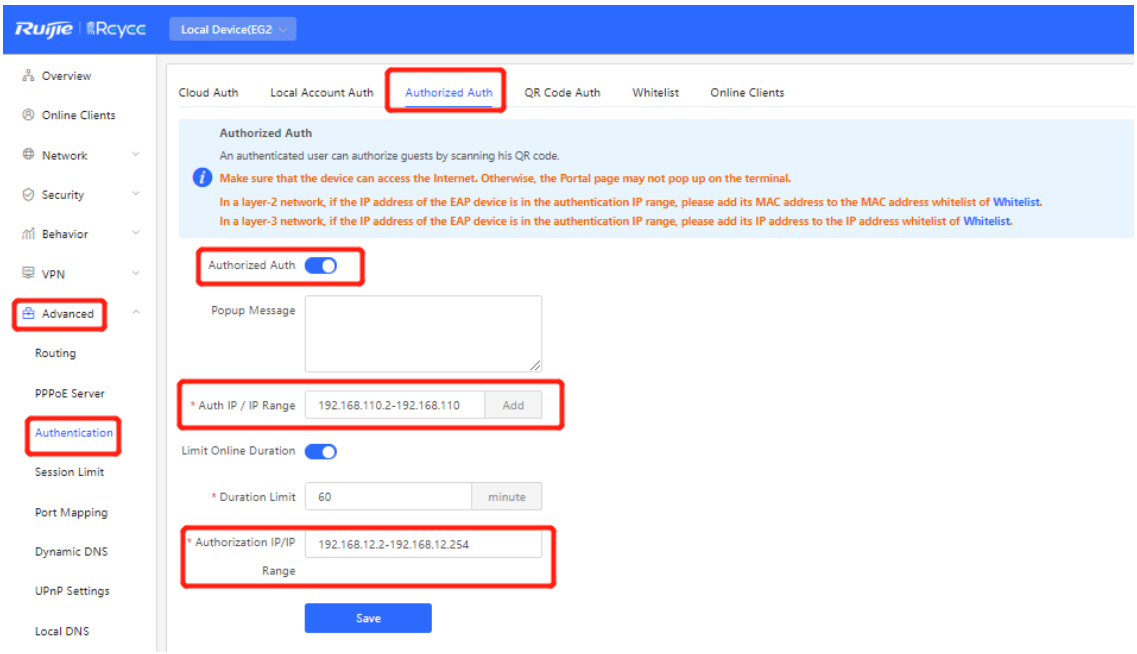
(6) Check online information on the EG.



4.10.4 Authorized Authentication

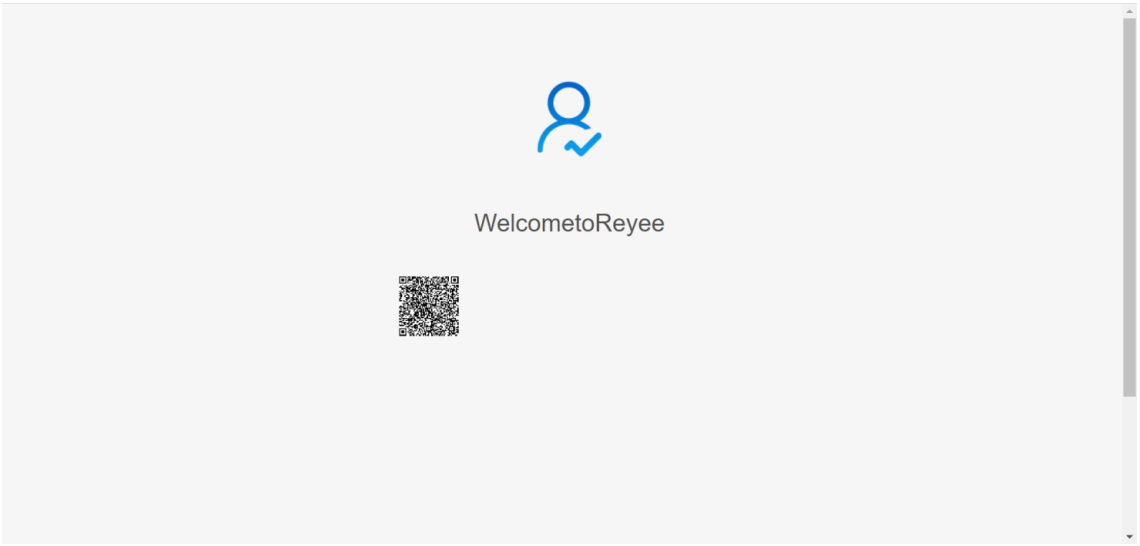
Reyee EG devices supports **Authorized Auth**. When this function is enabled, an authenticated user can authorize guests by scanning the QR code.

(1) Switch to the **Local** mode. Choose **Advanced** > **Authentication** > **Authorized Auth**, and enable **Authorized Auth**.

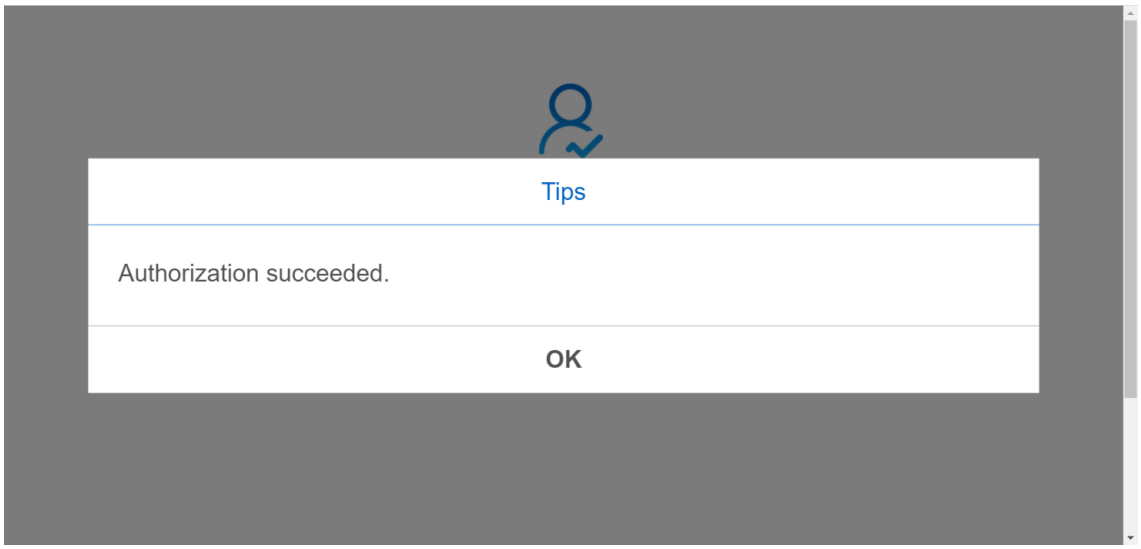


- **Auth IP/IP Range**: indicates the guest's IP address to be authenticated or range of guests' IP addresses to be authenticated.
- **Limit Online Duration**: indicates the online duration of a guest.
- **Authorization IP/IP**: indicates the IP address of the authenticated user.

(2) The following authentication portal page is displayed automatically after the guest is connected to the Internet.



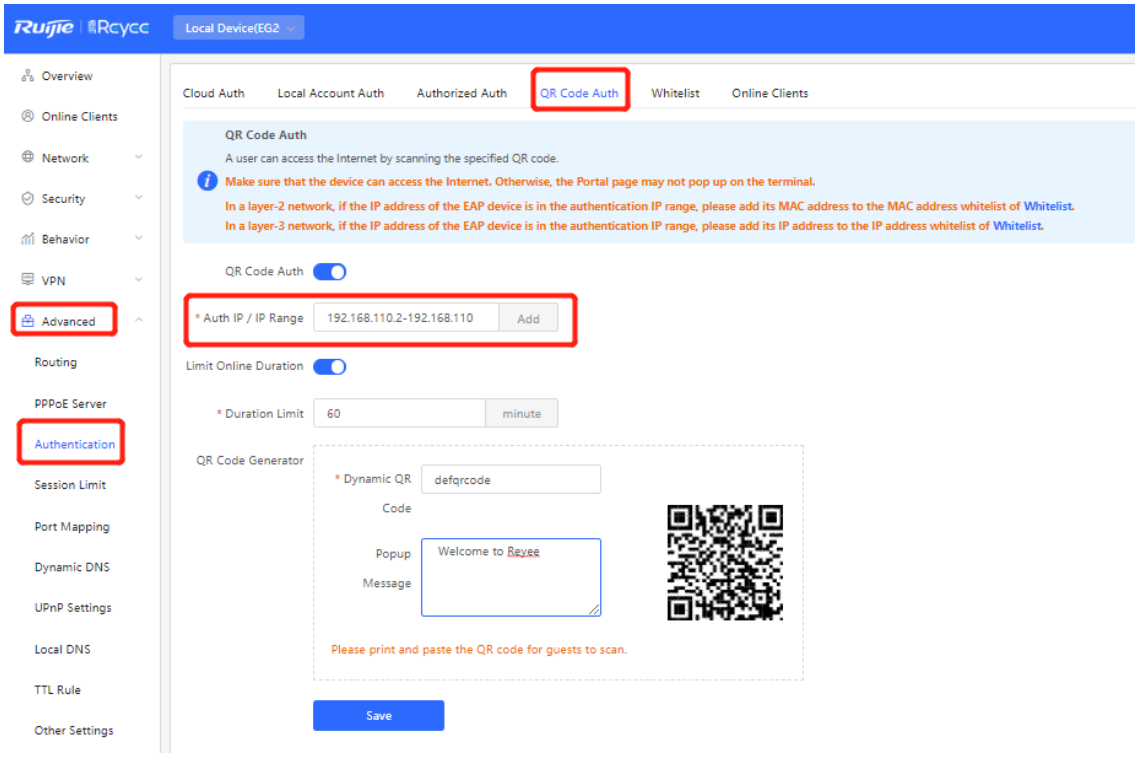
(3) After the authorized client scans the QR code, the guest is authorized to access the Internet.



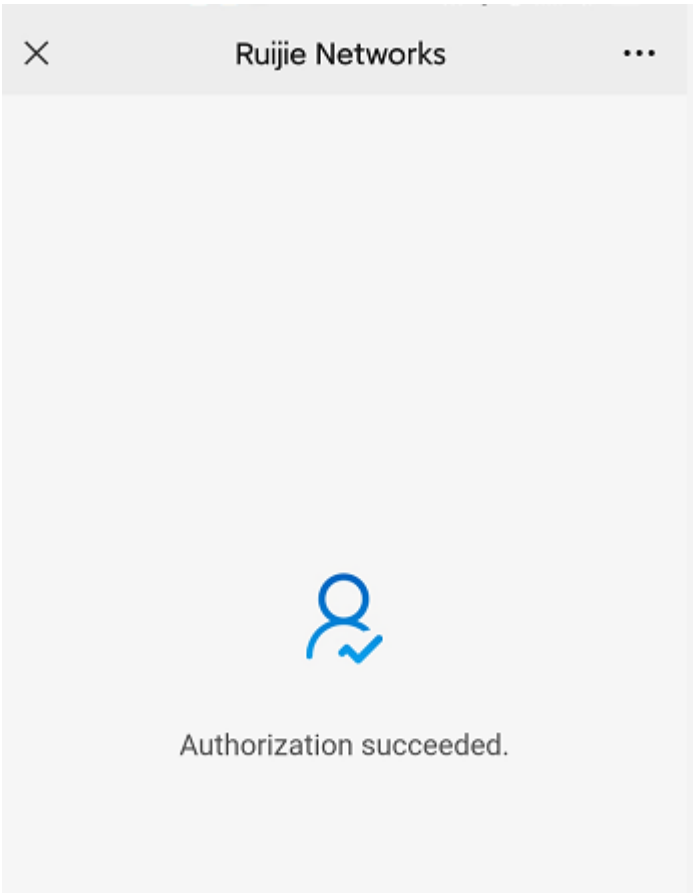
4.10.5 QR Code Authentication

Reyee EG devices support QR code authentication. This function enables a user to access the Internet by scanning the specified QR code.

(1) Switch to the **Local** mode. Choose **Advanced** > **Authentication** > **QR Code Auth**, and enable **QR Code Auth**.



- **Auth IP / IP Range**: indicates the IP address of a guest.
- **Limit Online Duration**: indicates the online duration of a guest.
- **QR Code Generator**: indicates the QR code used for guests to scan.

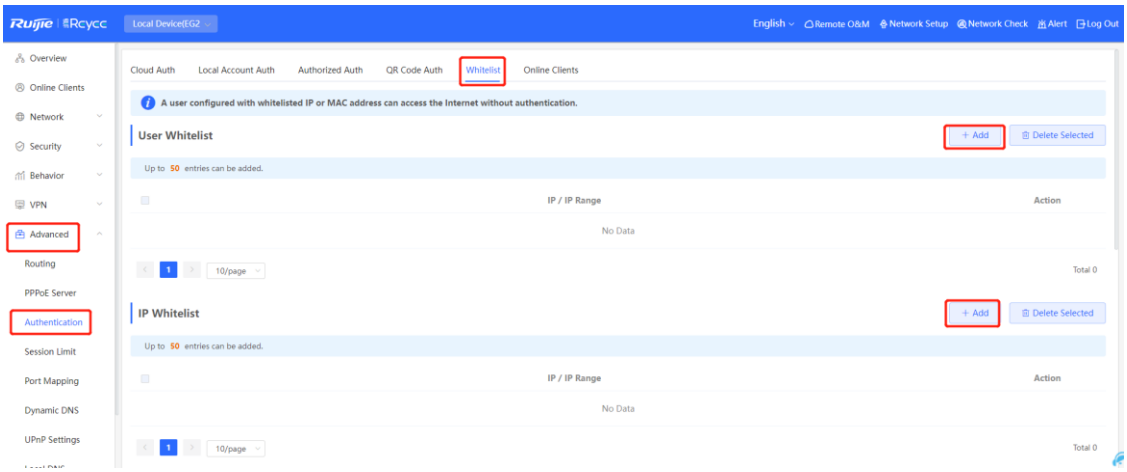


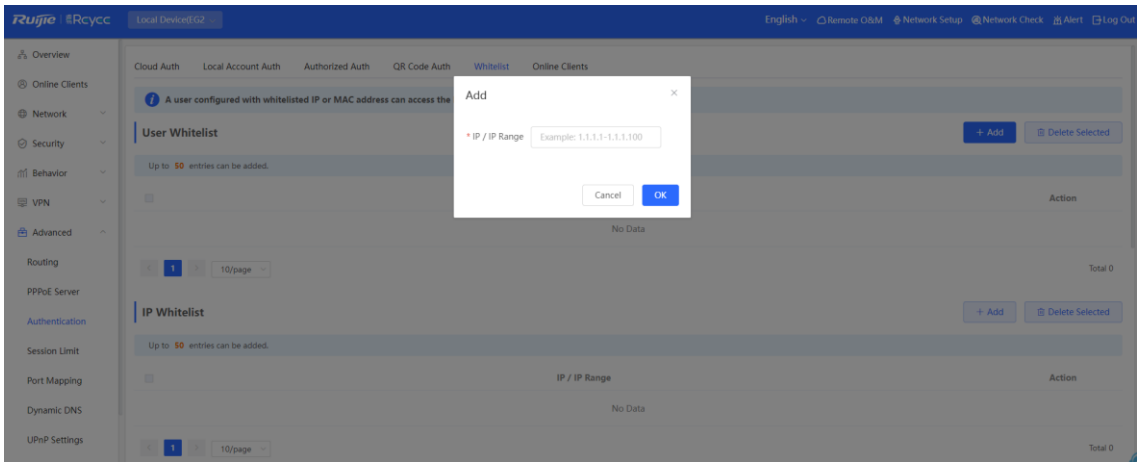
(2) The guest scan the QR code, and then can access the Internet.

4.10.6 Whitelist

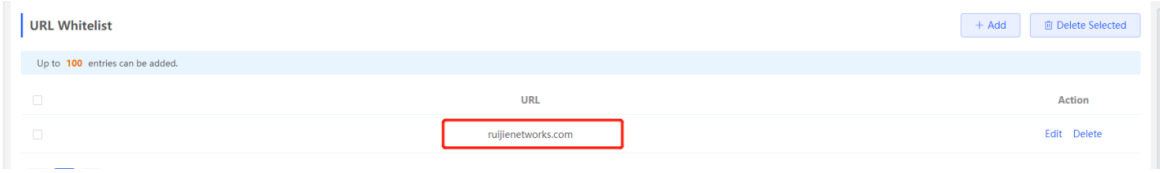
A user configured with whitelisted IP or MAC address can access the Internet without authentication.

(1) Switch to the **Local** mode. Choose **Advanced > Authentication > Whitelist**, and add **User Whitelist**, **IP Whitelist**, **URL Whitelist**, **MAC Whitelist**, or **MAC Blacklist**.





- **User Whitelist:** indicates that users can access the Internet without authentication. Up to 50 entries can be added.
- **IP Whitelist:** indicates that users can access an external IP address without authentication. Up to 50 entries can be added.
- **URL Whitelist:** indicates that users can access a URL without authentication. Up to 100 entries can be added.
- The following URL is the default URL added for cloud authentication.



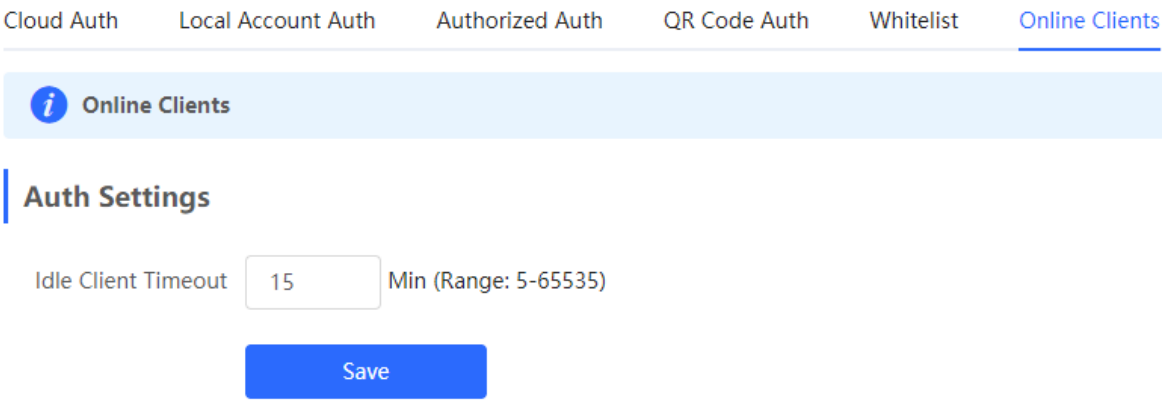
- **MAC Whitelist:** indicates that a user with the whitelisted MAC address can access the Internet without authentication. Up to 250 accounts can be added.
- **MAC Blacklist:** indicates that a user with the blacklisted MAC address is prevented from accessing the Internet.

4.10.7 Online Clients

1. Configuring the Idle Client Timeout

Switch to the Local mode. Choose Local Device > Advanced > Authentication > Online Clients.

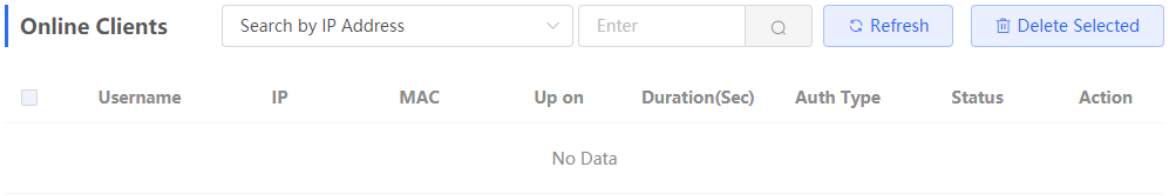
You can configure the idle client timeout. The default value is 15 minutes. If no traffic from an online user passes through the device within the specified period, the device will disconnect the user. The user can access the Internet again only after being re-authenticated.



Idle Client Timeout: The idle client will be disconnected after 15 minutes. The value ranges from 5 to 65535, in minutes.

2. Disconnecting a User

The online client list displays information about all the current online clients, including the client IP address, client's MAC address, login time, and authentication mode. You can find client information based on the IP address, MAC address, or username. Find the target client in the online client list and click **Delete** in the **Action** column to delete the client and end the Wi-Fi connection of the client.



4.10.8 WeChat Authentication

1. Overview

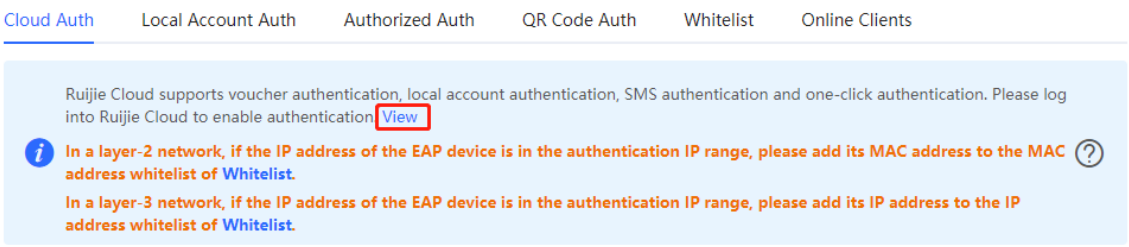
The EG device is connected to the MACC authentication server on the cloud. After Wi-Fi users connect to Wi-Fi, a Portal page is displayed. Users need to switch to WeChat and follow the WeChat official account before they can access the Internet. WeChat authentication is applicable to the shopping mall scenario, where merchants guide customers to follow their WeChat official accounts through WeChat authentication.

2. Getting Started

(1) Connect Wi-Fi through WeChat that is a Layer 2 protocol. Ensure that the authentication device can obtain MAC addresses of the wireless users.

- The gateway address of wireless users to be authenticated is deployed on the authentication device.
- If the gateway address is not deployed on the authentication device, the device functions as a DHCP server to allocate IP addresses to wireless users and obtain MAC addresses of the wireless users. In this scenario, you need to set **Network Type** to **Layer-3 Network**.

(2) Complete the corresponding configuration on the WeChat Official Account platform and Ruijie Cloud platform before you enable authentication on the device. Ruijie Cloud supports voucher authentication, local account authentication, SMS authentication, and one-click authentication. Log in to Ruijie Cloud to enable authentication.



3. Configuration Steps

(1) Switch to the **Local** mode. Choose **Advanced** > **Authentication** > **Cloud Auth**.

(2) Enable WeChat authentication for Internet access.

Enable authentication, set **Server Type** to **Connect Wi-Fi via WeChat**, configure **Network Type**, **Auth Server URL**, **Redirect IP**, and **Client Escape**, and click **Save**.

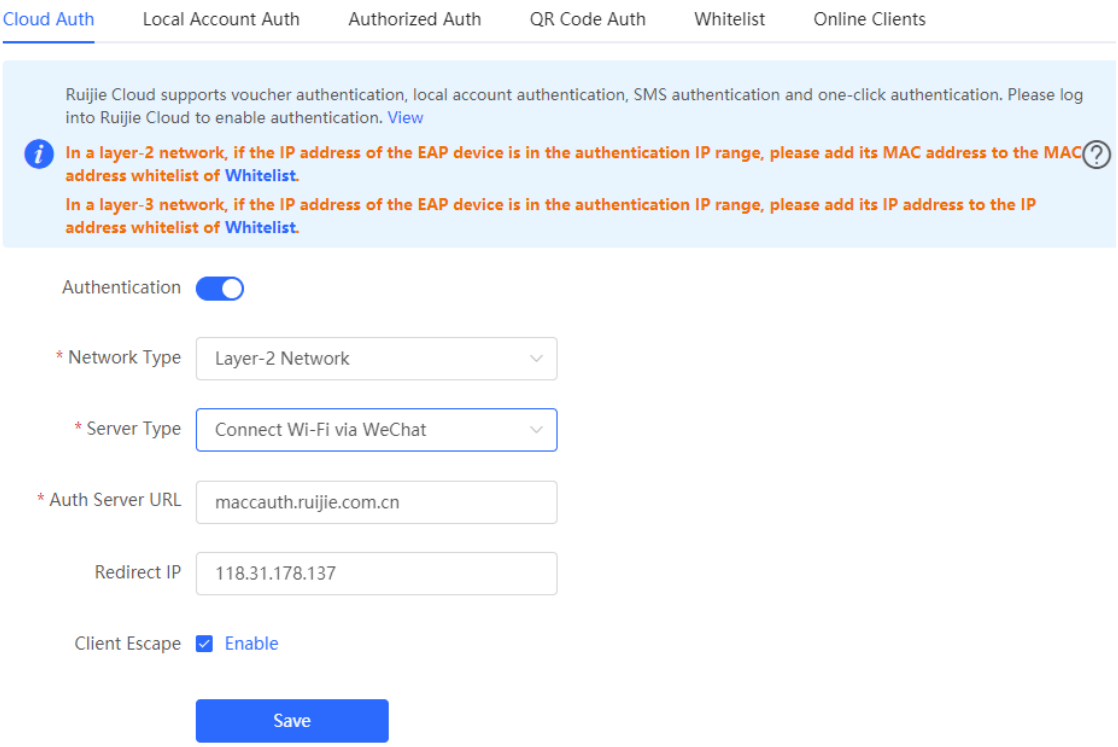


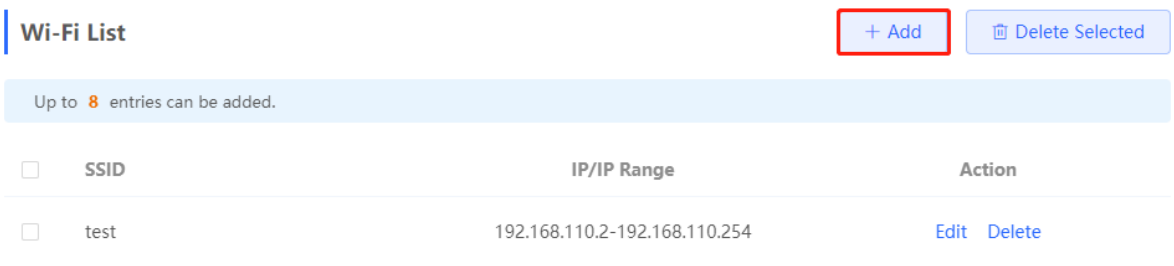
Table 4-6 WeChat Authentication Configuration

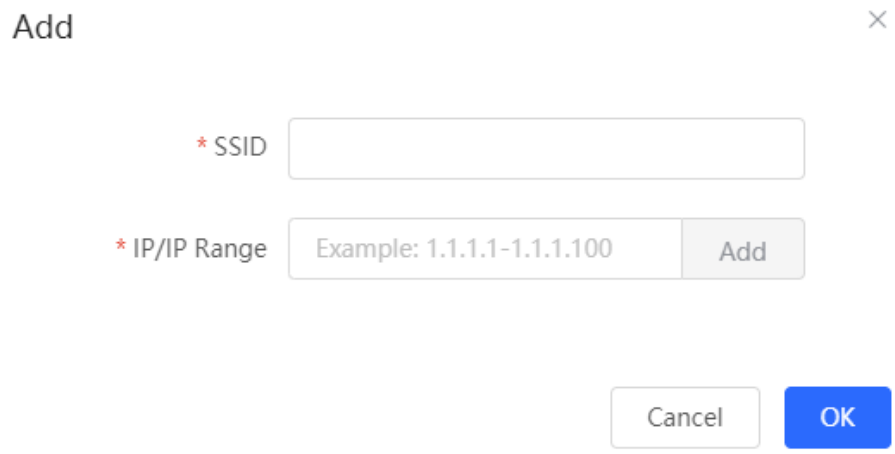
Parameter	Description
Network Type	The default value is **Layer-2 Network**. Select a network type based on the actual network environment. Interconnection between Wi-Fi and the WeChat platform is performed on a Layer 2 network. On a Layer 3 network, you need to connect downlink devices to the current authentication device through the DHCP relay agent and deploy the DHCP address pool for authentication-engaged network segments on the authentication device. In this way, the authentication device can obtain MAC addresses of wireless users through DHCP. In this scenario, set this parameter to **Layer-3 Network**.
Server Type	Select **Connect Wi-Fi via WeChat**.
Auth Server URL	After you complete MACC server configuration, the MACC server returns a URL. The device sends an authentication request to this URL.
Redirect IP	The value corresponds to a menu or link address configured in the official account. The default value is 118.31.178.137. In most cases, you do not need to change the value. When a user is redirected to the WeChat official account, the user needs to visit this IP address before subsequent authentication.
Client Escape	After this function is enabled, the authentication function is disabled on the device if the authentication server fails, so that all the users can directly access the Internet. After the server recovers, the authentication function is enabled automatically.

(3) Configure the authentication scope.

Click **Add** on the current page. In the dialog box that appears, enter the SSID and IP address range that requires authentication, and click **OK**.

For clients (such as printers, computers, or some users) that do not require authentication, set **IP/IP Range** to authentication-free, so that these clients can directly access the Internet.



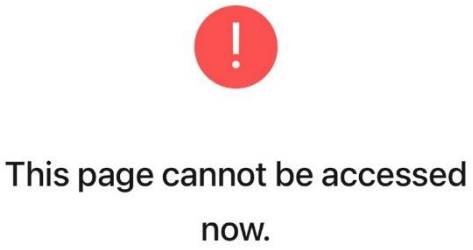


4. Verifying Configuration

When a mobile phone connects to the specific Wi-Fi, the portal authentication page pops up automatically. The user visits the WeChat page under instructions on the portal authentication page, follows the WeChat official account, clicks the menu or auto reply link to complete authentication. Then the user can normally access the Internet. After successful user authentication, you can choose **Advanced** > **Authentication** > **Online Clients** to view information about this authenticated user. For details, see section **错误!未找到引用源。错误!未找到引用源。**.

5. Troubleshooting

- When a user clicks the authentication menu or link in the official account during WeChat authentication, the message "**This page cannot be accessed now."** is displayed, leading to an authentication failure.

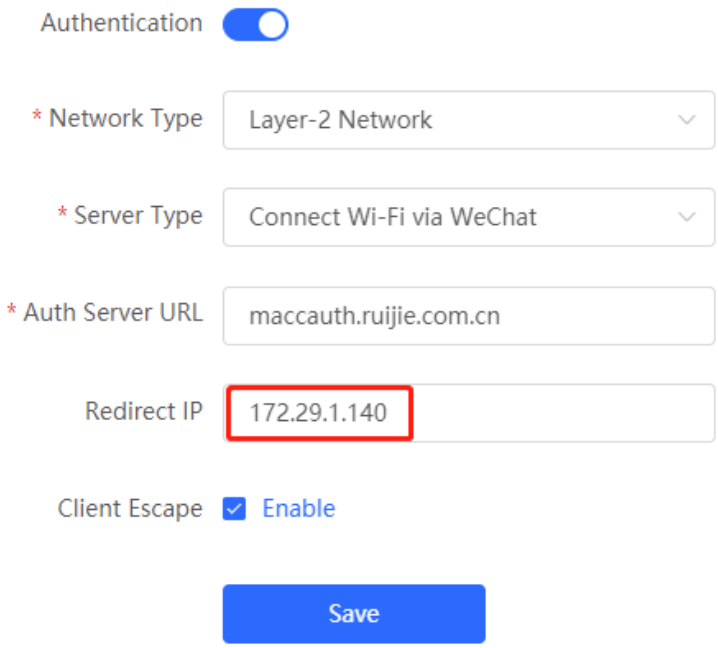


Cause: The link address configured in the official account authentication entry on the official account Platform is regarded as insecure by Security Center of the WeChat client. When a client sends a request to this address, WeChat blocks this request.

Solution: Change the forced redirection address and the address in the official account authentication menu or link to an IP address not used on the LAN. For example, if the network segment 172.29.0.0 is not used on the LAN, set both the official account redirection IP address and the link address in the official account to 172.29.1.140.

Caution

If the official account redirection IP address is set to an IP address in a network segment used on the LAN, WeChat authentication will fail.



4.10.9 Enterprise WeChat Authentication

1. Overview

Similar to WeChat authentication, Wi-Fi users need to switch to the enterprise WeChat after connecting to Wi-Fi and complete applet authentication in the workspace before they can access the Internet. Enterprise WeChat authentication can be used to manage Internet access of employees and guests in the enterprise environment.

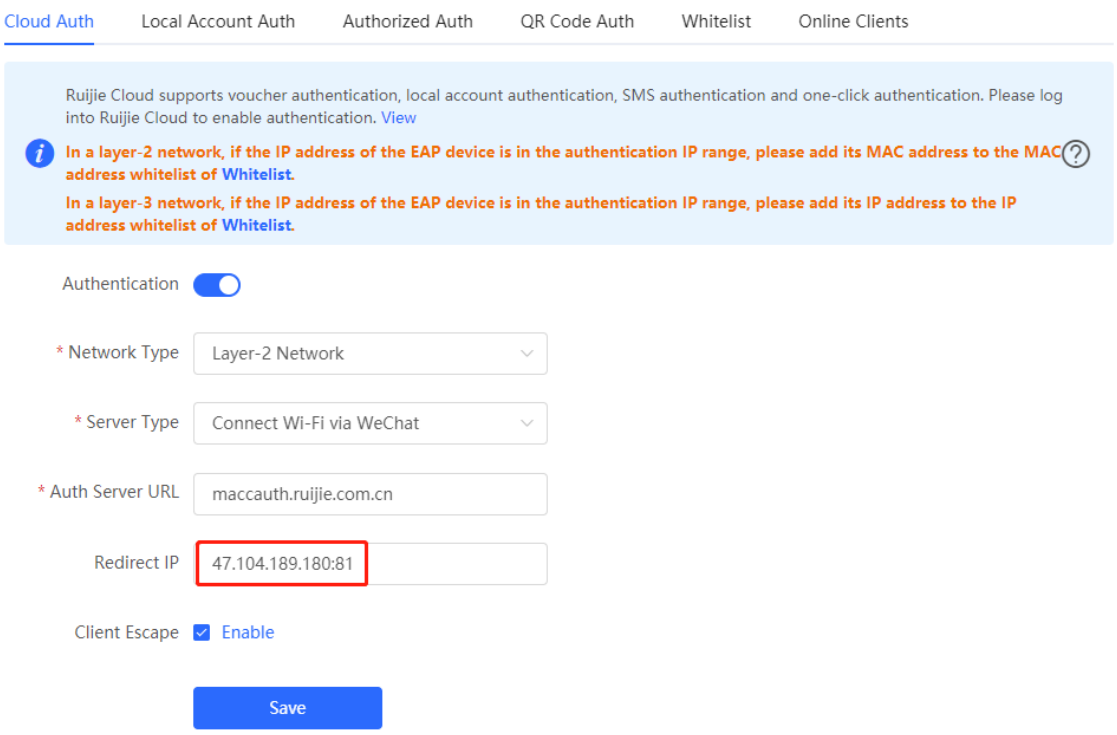
2. Getting Started

The operations are the same as those in section **错误!未找到引用源。 错误!未找到引用源。**. Before you enable enterprise WeChat authentication, complete relevant configurations on the enterprise WeChat console and Ruijie Cloud platform.

3. Configuration Steps

Switch to the **Local** mode. Choose **Advanced** > **Authentication** > **Cloud Auth**.

The configuration steps are similar to those in WeChat authentication. The major difference is that the official account redirection IP address in enterprise WeChat authentication must be set to 47.104.189.180:81. For details, see section 错误!未找到引用源。错误!未找到引用源。.



Employee Authentication

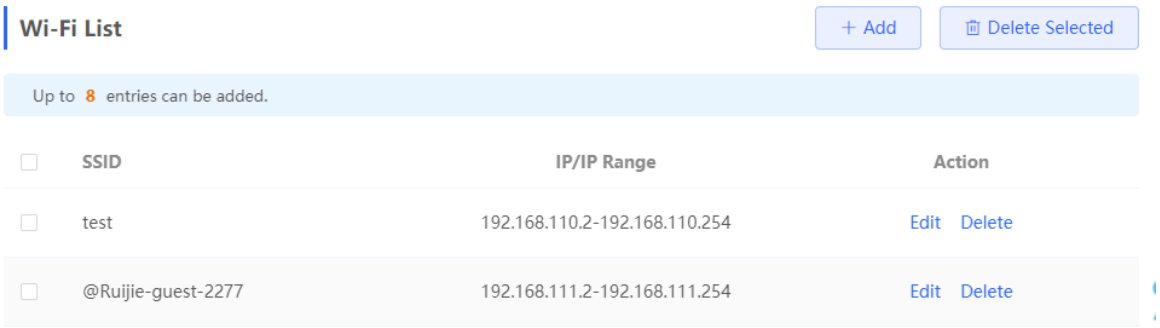
Make sure that employees have joined the enterprise WeChat organization. When an employee connects a mobile phone to Wi-Fi, the employee is automatically redirected to the enterprise WeChat for authentication. After the employee opens the enterprise WeChat, the employee needs to access the **Workspace** menu of the enterprise WeChat and click the authentication app created by the administrator to obtain an Internet access permission. After the authentication success message is displayed, the employee can access the Internet normally.

The enterprise WeChat may not be started on the portal authentication page on some mobile phones due to low compatibility. In this case, users can manually open the enterprise WeChat and continue follow-up operations.

Guest Authentication

When a guest visits an enterprise, the employee can authorize the guest to connect to the Wi-Fi network of the enterprise. After the guest connects to the guest Wi-Fi, the authentication QR code is displayed. At this time, the authenticated employee scans the QR code using the enterprise WeChat on the mobile phone and enters the guest name. Then the guest can pass authentication and access the Internet normally.

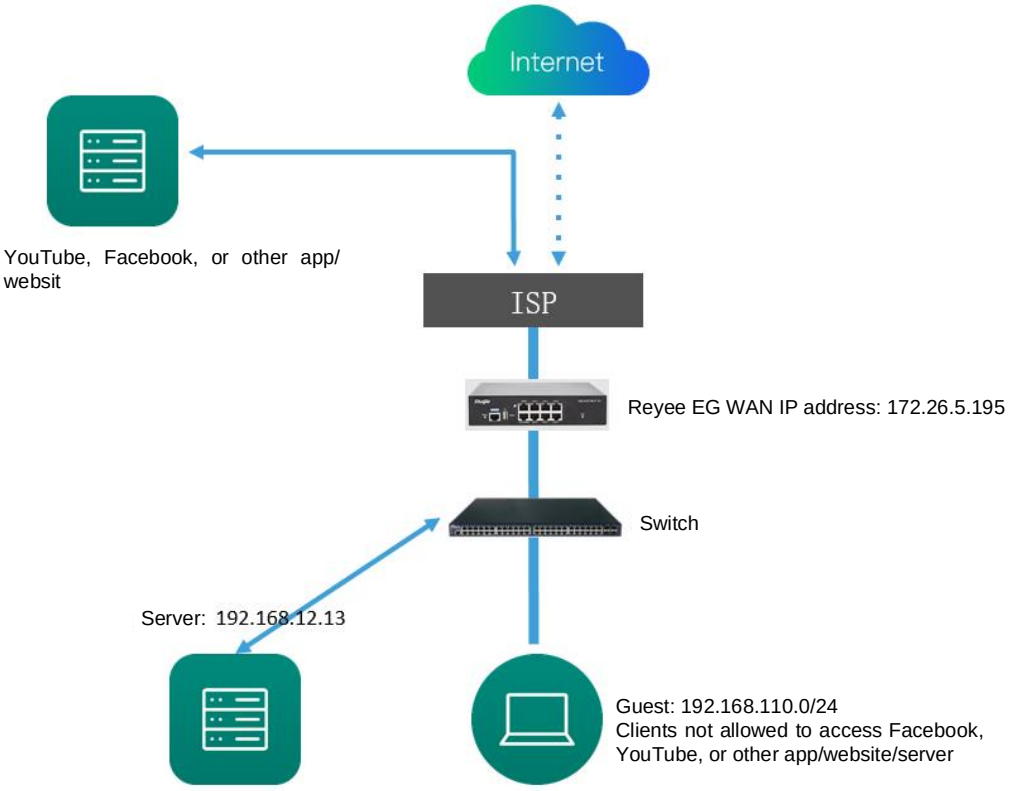
When configuring guest authentication, you need to configure at least two Wi-Fi SSIDs and corresponding network segments in the Wi-Fi list, which are used for employee and guest connections, respectively.



4.11 Behavior

4.11.1 Application Scenario

Online behavior management aims to block or prohibit specific Internet access behaviors of LAN users. Online behavior management is classified into five categories: app control, website filtering, QQ management, flow control, and access control. The effective range of each behavior management policy is flexibly controlled by the specified client IP address and effective time.



4.11.2 App Control

App control aims at controlling the range of specific apps that can be accessed by users. By default, users can access any app. After an app control policy is configured, users on the current network cannot access prohibited apps. App access can be prohibited based on the specified user group and time range. For example, employees on the office network are prohibited from accessing entertainment and game software during work periods to improve network security.

1. Configuring App Control

(1) Switch to the **Local** mode. Choose **Behavior** > **App Control**.

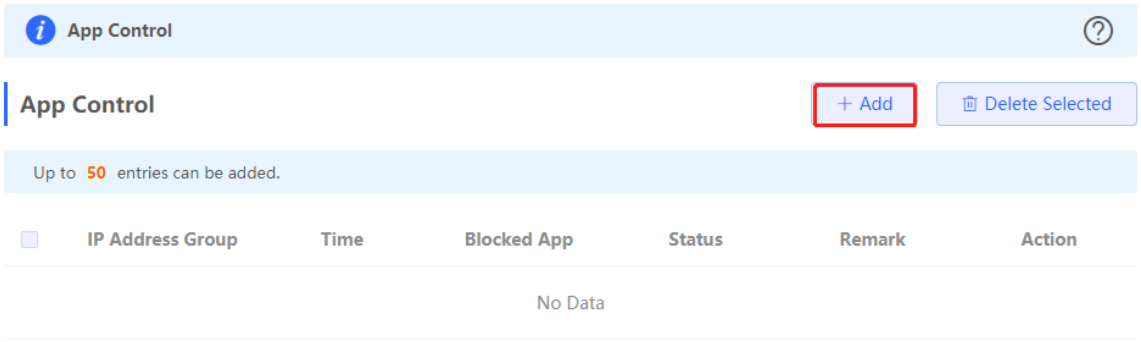
(2) Switch the application library.

The application lists vary depending on regions. Chinese and International versions of the application library are available. Select the version based on the regions.

Click to select **Application Library Version** and click **OK**. The version is switched after a few minutes.

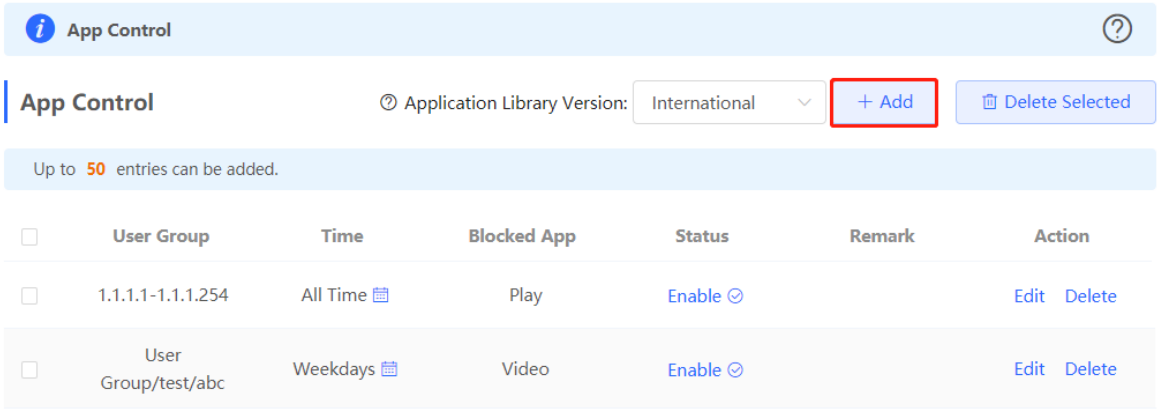
Caution

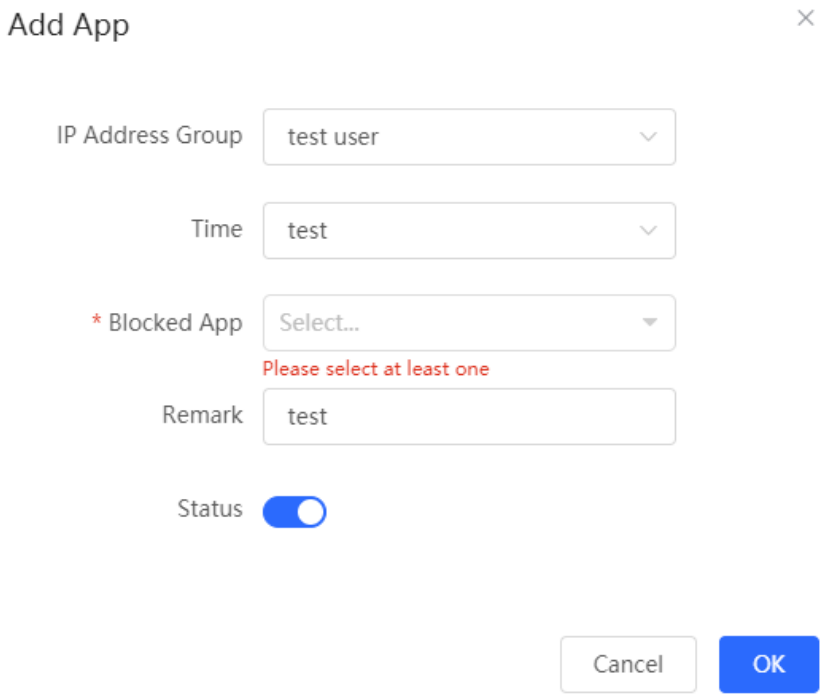
- It takes about 1 minute to switch the application library version. Please wait.
- If you switch the application library, the old application control policy may take ineffective. Proceed with caution.

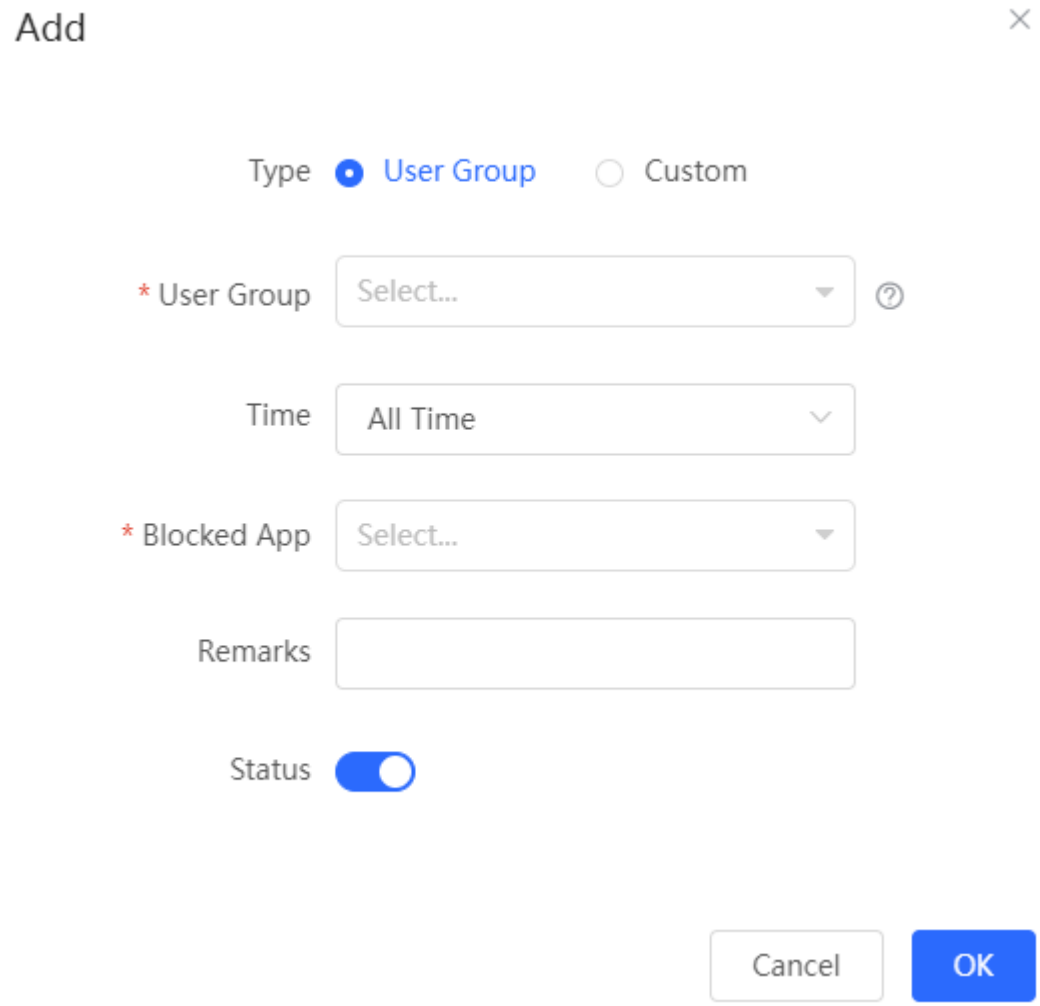


(3) Configure App Control.

Click **Add** to create an App control policy.




Add App
IP Address Group
test user
Time
test
* Blocked App
Select...
Please select at least one
Remark
test
Status
Cancel
OK



Parameter	Description
Type	● **User Group**: The policy is applicable to users in the specified user group. Select the target user group. ● **Custom**: The policy is applicable to users in the specified IP address range. Enter the managed IP address range manually.
User Group	Select the users managed by the policy from the list of user groups. For details on how to configure a user group list, see section 6.2 User Management. If all members in the user group are selected, the policy takes effect for the user group and is also valid for new members added to this group.
IP Address Group	If the IP address range is restricted by the app control policy and the type of the policy is set to **Custom**, enter the IP address range manually.

Parameter	Description
Time	Specify the time range under app control. In the specified time range, managed clients cannot access the selected apps in the list of prohibited apps. You can select a time range from the drop-down list box, or select **Custom** and manually enter the specific time range.
Blocked App	Specify the apps or app groups to be blocked.
Remark	Enter the policy description.
Status	Specify whether to enable the app control policy.

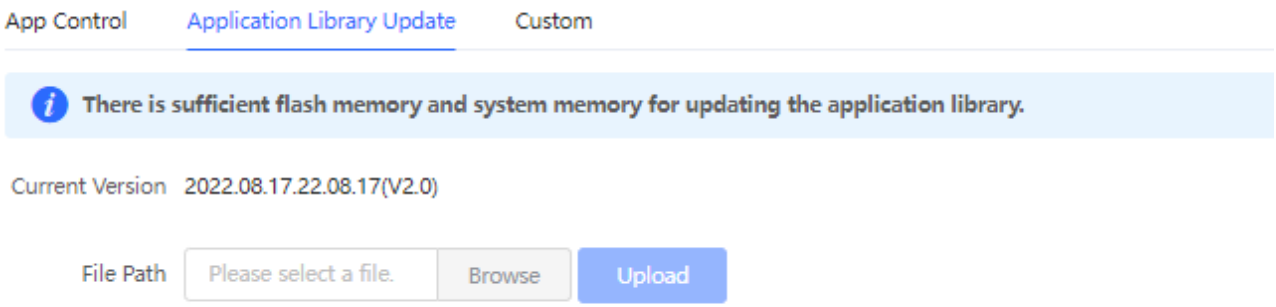
2. Upgrading the Application Library

The app control function relies on the application library, and the application library is updated with the app version. You can upgrade the application library to the latest version on the **Application Library Update** page.

(1) Switch to the Local mode. Choose Behavior > App Control > Application Library Update.

Caution

- Upgrading the application library version takes about 1 minute to take effect. Do not cut off power during the upgrade. You can view the current application library version on the page.
- Perform subsequent operations based on memory information displayed on the page. If the memory is insufficient, you are advised to restart the device and then upgrade the application library.
- After the application library is upgraded, the original app control policy may become invalid. Therefore, exercise caution when performing this operation.



(2) Click **Browse**. Select an application library upgrade file.

(3) Click **Upload** to upload the upgrade file.

(4) Click **OK**. Wait for the system to automatically complete the upgrade.

3. Configuring Custom Apps

Based on traffic packets of certain websites or apps that are obtained by the device, users can analyze and extract 5-tuple information (protocol, source IP address, source port, destination IP address, and destination port) of the packets. You can define apps that are not in the default application list.

After custom apps are configured successfully, you can configure control policies for custom apps on the app control page to block users from accessing the custom apps on the current network.

(1) Switch to the **Local** mode. Choose **Behavior** > **App Control** > **Custom**.

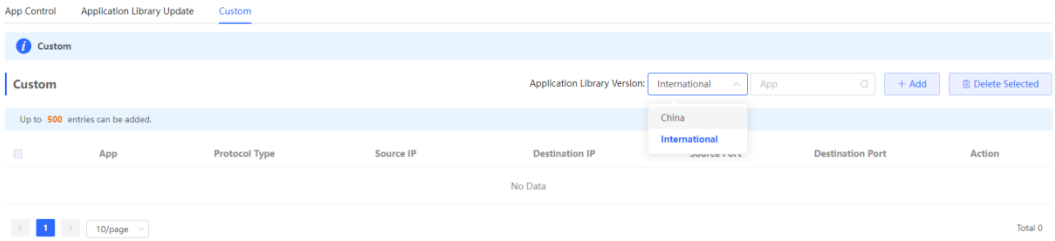
(2) Switch the application library.

The supported app list varies depending on regions. Chinese and international versions of the application library are available. Select an application library version based on the actual region.

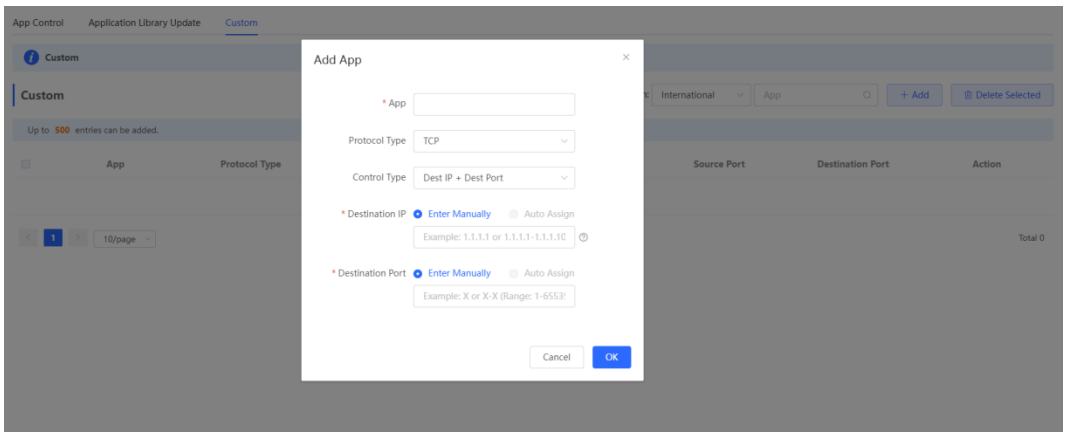
Click **Application Library Version** and select a version. In the displayed dialog box, click **OK**. Wait for a period of time for the system to complete switching.

Caution

- Switching the application library version takes about 1 minute to take effect.
- After the application library version is switched, the original app control policy may become invalid. Therefore, exercise caution when performing this operation.



(3) Click **Add**. Enter information about a custom app.



Parameter	Description
App	Configure the app name (the name must be unique in the app list).
Protocol Type	Select a protocol type based on the protocol used by obtained packets. It can be set to TCP, UDP, or IP.
Control Type	Select a rule type based on 5-tuple information of extracted packets. It can be set to the following: **Src IP + Src Port** **Dest IP + Dest Port** **Src IP + Dest IP**
Source/Destination IP	Enter the source or destination IP address.

Parameter	Description
Source/Destination Port	Enter the source or destination port number.

Note

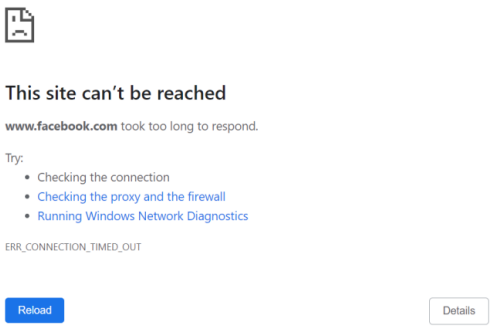
- If **Control Type** is set to **Src IP + Src Port**, you need to set the source IP address and source port.
- If **Control Type** is set to **Dest IP + Dest Port**, you need to set the destination IP address and destination port.
- If **Control Type** is set to **Src IP + Dest IP**, you need to set the source and destination IP addresses. The source IP address can be also to **Auto Assign**.

(4) Click **OK**.

4. Verifying the Configuration

Add a policy for rejecting access to Facebook and YouTube according to **错误!未找到引用源。错误!未找到引用源。**.

Try to access Facebook on the guest PC. Then you will find the access failure.



4.11.3 Website Management

Website management consists of website grouping and filtering. Website grouping refers to the classification of website URLs. You can modify existing website groups or create website groups. Website filtering refers to access control for existing website groups to prohibit users' access to websites in specific groups. Website filtering can be applied based on the specified user group and time range. For example, employees on the office network are prohibited from accessing game websites during work periods to improve network security.

(1) Switch to the **Local** mode. Choose **Behavior > Website Management**.

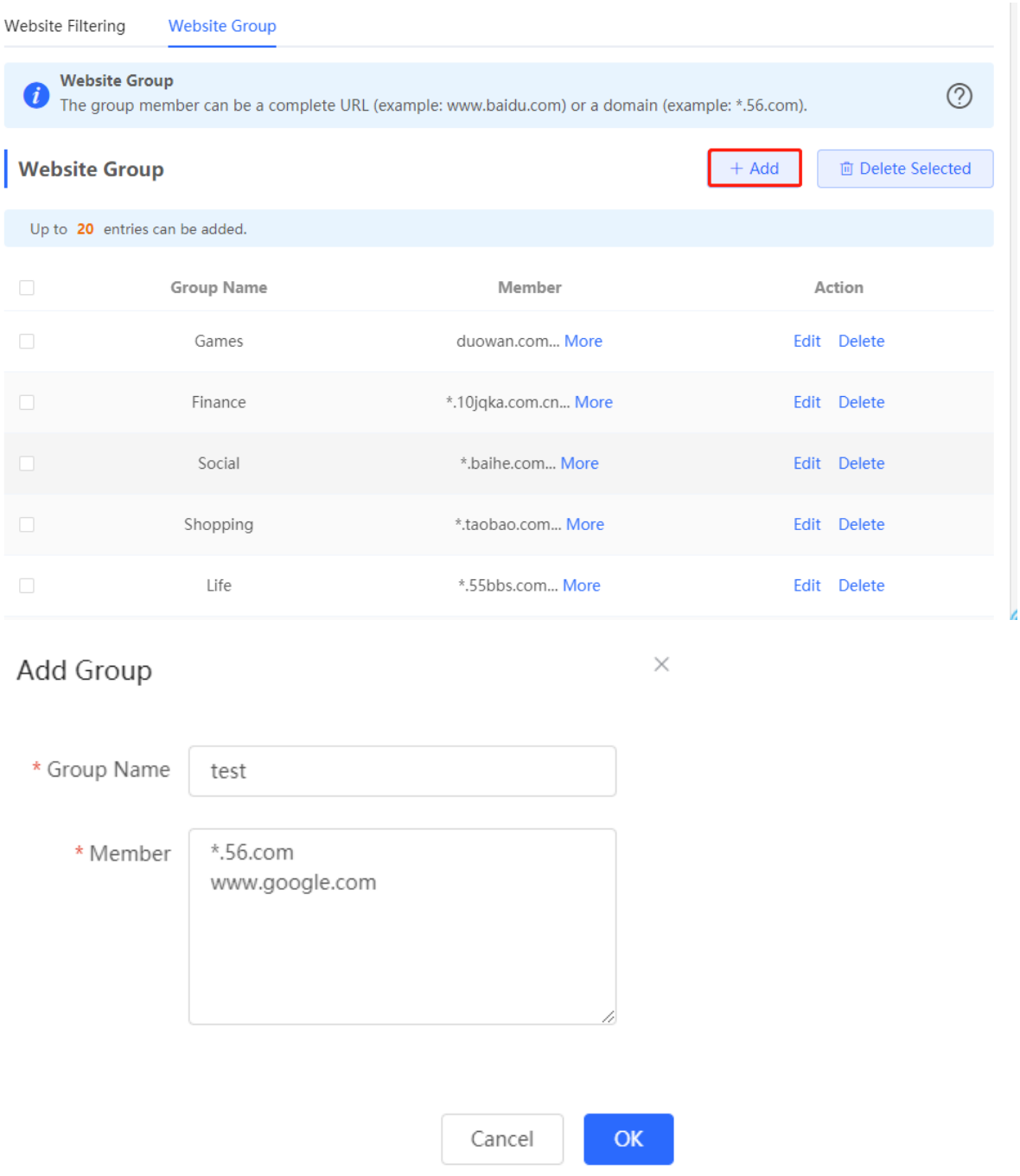
(2) Configure website groups.

a Click the **Website Group** tab. On the page that appears, all the created website groups are displayed in the list. Find the target group and click **More** in the **Member** column to view all the website URLs in the group. Find the target group and click **Edit** in the **Action** column to modify the member website URLs in the group. Find the target group and click **Delete** in the **Action** column to delete the group.

b Click **Add** to create a website group.

Caution

If a website filtering rule in a website group is being referenced, the group cannot be deleted from the website group list. To delete this group, modify the website filtering configuration to remove the reference relationship first.



Parameter	Description
Group Name	Configure a unique name for a website group. The name can be a string of 1 to 64 characters.

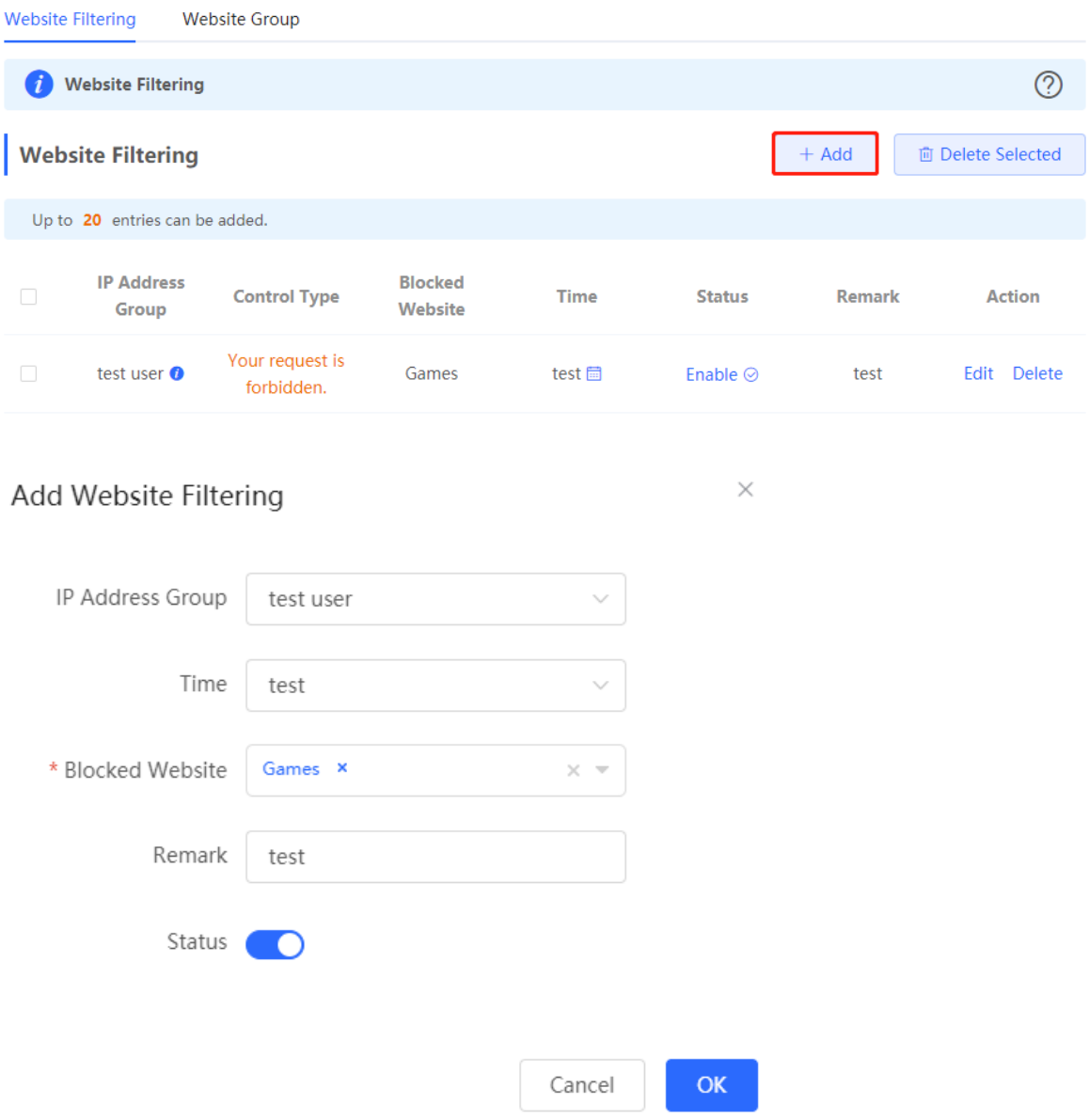
Parameter	Description
Member	Specify members in the website group. You can enter multiple websites in a batch. The group member can be a complete URL (such as www.baidu.com) or keyword in the URL (domain name with a wildcard in front, such as *.baidu.com). The wildcard can only appear at the beginning of a URL, and cannot be in the middle or end of the domain name.

(3) Configure website filtering.

a Choose **Gateway > Behavior** > **Website Management** > **Website Filtering**.

b Click the **Website Filtering** tab. On the page that appears, all the created website filtering rules are displayed in the list. Click **Edit** to modify rule information and click **Delete** to delete the specific filtering rule.

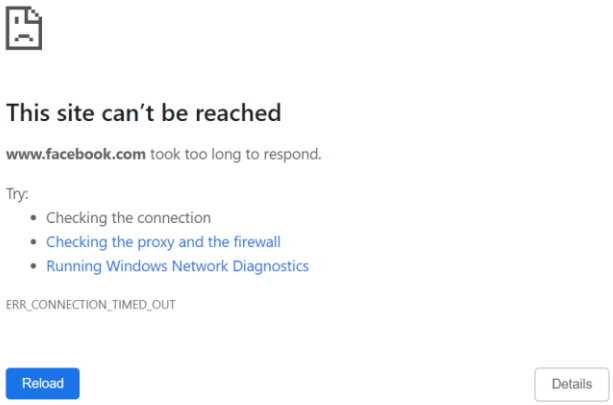
c Click **Add** to create a website filtering rule.



Parameter	Description
Type	● **User Group**: The policy is applicable to users in the specified user group. Select the target user group. ● **Custom**: The policy is applicable to users in the specified IP address range. Enter the managed IP address range manually.
User Group	Select the users managed by the policy from the list of user groups. For details on how to configure a user group list, see section 6.2 User Management. If all members in the user group are selected, the policy takes effect for the user group and is also valid for new members added to this group.
IP Address Group	If the IP address range is restricted by the app control policy and the type of the policy is set to **Custom**, enter the IP address range manually.
Time	Specify the time range under website filtering control. In the specified time range, managed clients cannot access the prohibited websites. You can select a time range from the drop-down list box, or select **Custom** and manually enter the specific time range.
Blocked Website	Configure the type of websites to be blocked. You can select an existing website group. After a website group is selected, users are prohibited from accessing all websites in this group. For details on how to create or modify a website group, see **错误!未找到引用源。**.
Remark	Enter the rule description.
Status	Specify whether to enable the website filtering rule.

d Click **OK**.

(4) Try to access Facebook on the guest PC. Then you will find the access fails.



4.11.4 Access Control

Access control enables the device to match data packets passing through the device based on specific rules and to permit or drop data packets in the specified time range. This function controls whether to permit LAN users' access to the Internet and whether to block a specific data flow. The device matches packets based on the MAC address or IP address.

(1) Switch to the **Local** mode. Choose **Behavior** > **Access Control**.

The access control rule list displays the created access control rules. Click **Add** to add an access control rule.

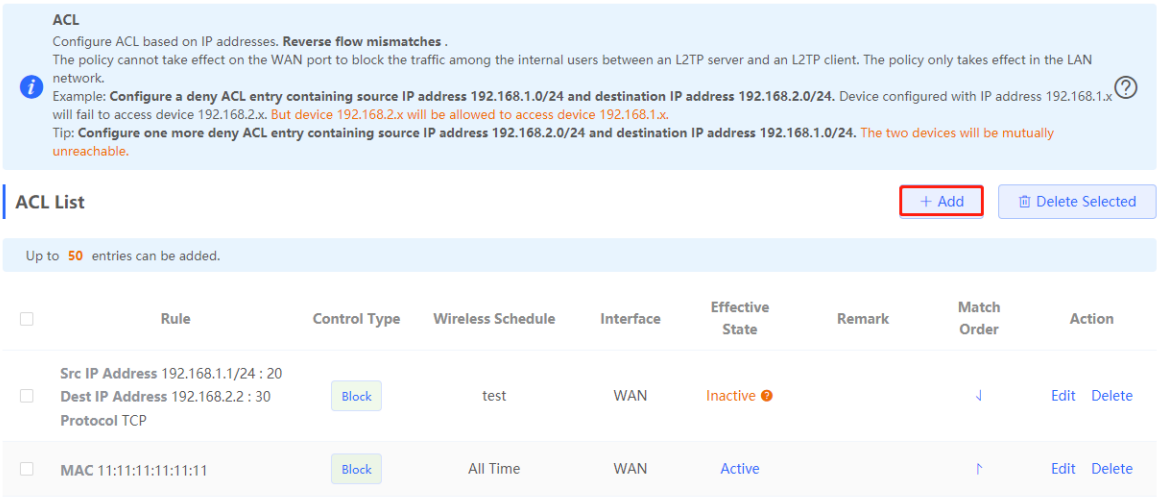


Table 4-9 Access Control Rule Information

Parameter	Description
Effective State	Indicate whether a rule takes effect. If **Inactive** is displayed, the current system time may be not in the effective time range. Move the cursor to to view the detailed cause.
Match Order	All the created ACL rules are displayed in the ACL list, with the latest rule listed on the top. The device matches rules according to their sorting in the list. You can manually adjust the rule matching sequence by clicking or in the list.
Action	You can modify or delete a rule.

(2) Configure a MAC address-based ACL rule.

MAC address-based ACL rules enable the device to match data packets based on the source MAC address, and are typically used to control Internet access from online users or specific clients.

Set **Based on MAC**, enter the MAC address of a client, select a rule type, set the effective time range, and click **OK**.

Note

MAC address-based ACL rules are valid on WAN ports by default.

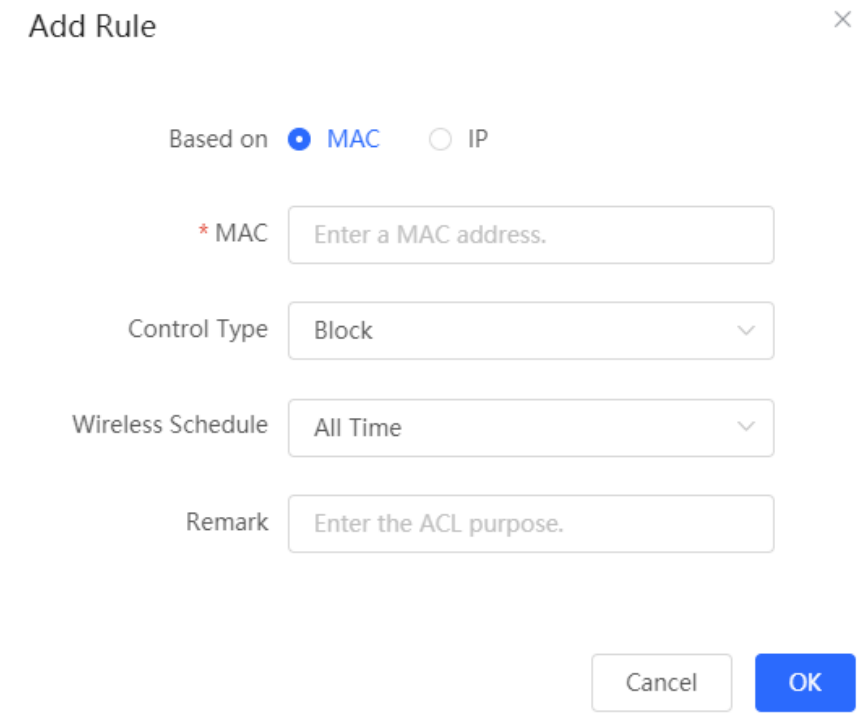


Table 4-10 MAC Address-based ACL Configuration

Parameter	Description
MAC	Enter the client's MAC address to be controlled by the ACL rule. After you click the input field, the current client information is displayed. You can click to automatically enter the corresponding MAC address.
Control Type	Specify the method for processing data packets matching conditions. ● Allow: Permit the data packets matching the conditions. ● Block: Drop the data packets matching the conditions.
Wireless Schedule	You can select a time range from the drop-down list box, or select **Custom** and manually enter the specific time range.
Remark	Enter the rule description, which is used to uniquely identify a rule.

(3) Configure an IP address-based ACL rule.

IP address-based ACL rules enable the device to match data flows based on the source IP address, destination IP address, and protocol number.

Set **Based on IP**, enter the source IP address and port of a data flow, set the destination IP address and port of the data flow, select the protocol type, rule type, effective time range, and effective port, and click **OK**.

Caution

IP address-based ACL rules take effect in only one direction. For example, in a rule that defines **Block**, the source IP address segment is 192.168.1.0/24 and the destination IP address segment is 192.168.2.0/24. Based on this rule, the device at 192.168.1.x cannot access the device at 192.168.2.x, but the device at 192.168.2.x can access the device at 192.168.1.x. To block bidirectional access on this network segment, you need to configure another blocking rule with the source IP address segment 192.168.2.0/24 and destination IP address segment 192.168.1.0/24.

L2TP and PPTP VPN support only IP address-based access control, and effective ports must be on the LAN.

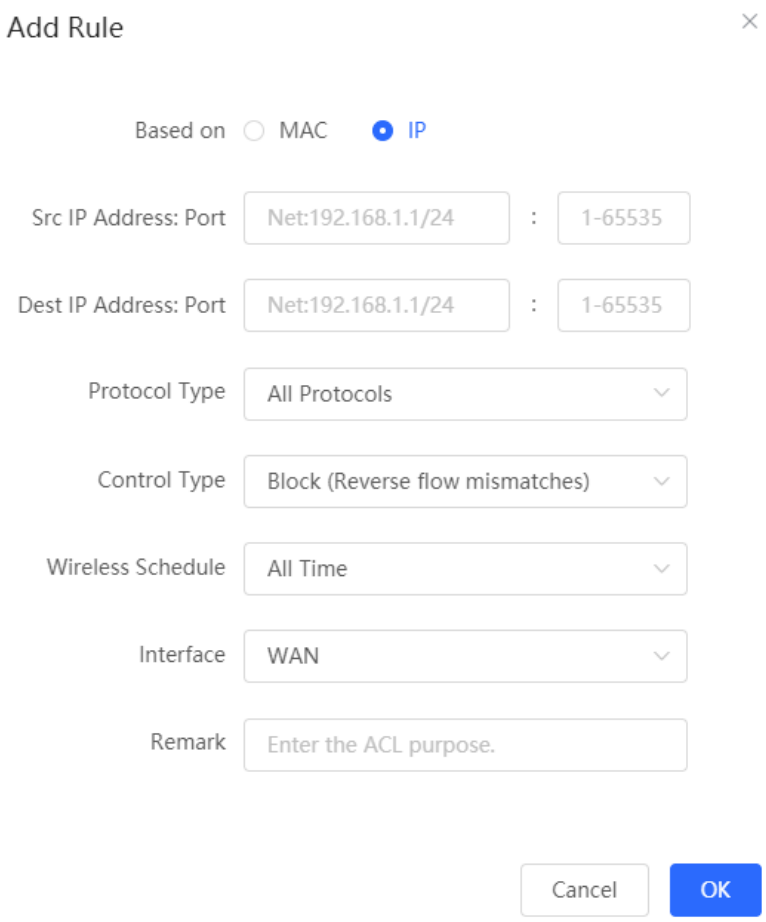


Table 4-11 IP Address-based ACL Configuration

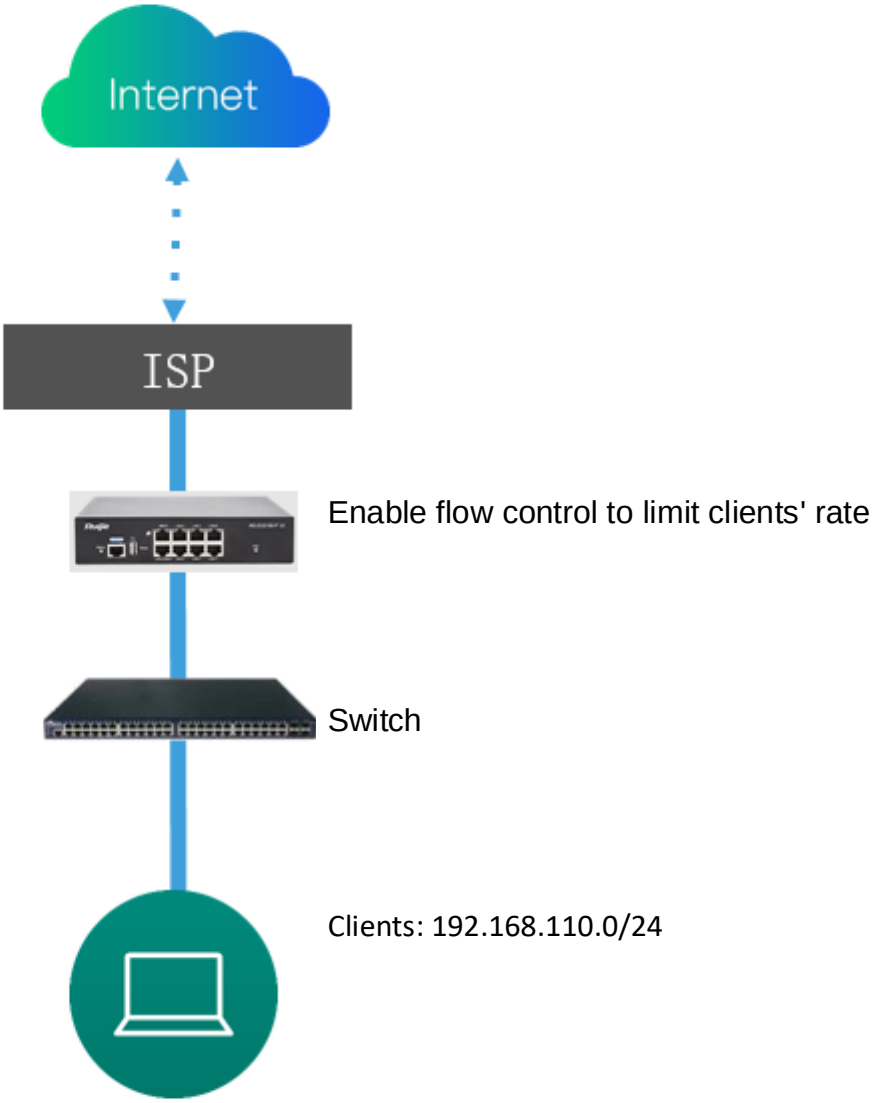
Parameter	Description
Src IP Address: Port	Enter the source IP address and port number for data packet matching. If this parameter is not specified, the device matches all the IP addresses and port numbers. The source IP address can be a single IP address (such as 192.168.1.1) or an IP address range (such as 192.168.1.1/24).
Dest IP Address: Port	Enter the destination IP address and port number for data packet matching. If this parameter is not specified, the device matches all the IP addresses and port numbers. The destination IP address can be a single IP address (such as 192.168.1.1) or an IP address range (such as 192.168.1.1/24).
Protocol Type	Specify the protocol type for data packet matching. The options are **TCP**, **UDP**, and **ICMP**.
Control Type	Specify the method for processing data packets matching conditions. ● Allow: Permit the data packets matching the conditions. ● Block: Drop the data packets matching the conditions. This rule is valid only in one direction, and does not block reverse flows.

Parameter	Description
Wireless Schedule	You can select a time range from the drop-down list box, or select **Custom** and manually enter the specific time range.
Interface	Select the port to which the rule applies. ● LAN: The rule takes effect on a LAN port to control data packets to the LAN. ● WAN: The rule takes effect on a WAN port to control data packets received from or sent to the Internet.
Remark	Enter the rule description, which is used to uniquely identify a rule.

4.12 Flow Control

4.12.1 Application Scenario

Flow control enables the device to classify flows based on rules and process flows using different policies based on their categories. Flow control can be used to guarantee key flows and suppress malicious flows. It can be also used when the bandwidth is insufficient or flows need to be distributed properly.



4.12.2 Smart Flow Control

1. Overview

To limit uplink and downlink traffic bandwidth of device ports (such as WAN and WAN 1), you can enable smart flow control. After the line bandwidth is configured for a port, the uplink and downlink traffic of the port will be limited within the specified range. In addition, per-user bandwidth must be intelligently adjusted according to the number of users so that users can fairly share the bandwidth.

2. Configuration Steps

(1) Switch to the **Local** mode. Choose **Behavior** > **Flow Control** > **Smart Flow Control**.

(2) Toggle the switch to **Enable** on the **Smart Flow Control** tab and set the line bandwidth based on the bandwidth actually allocated by an ISP. If the device has multiple lines, you can set the bandwidth for these

WAN ports separately.

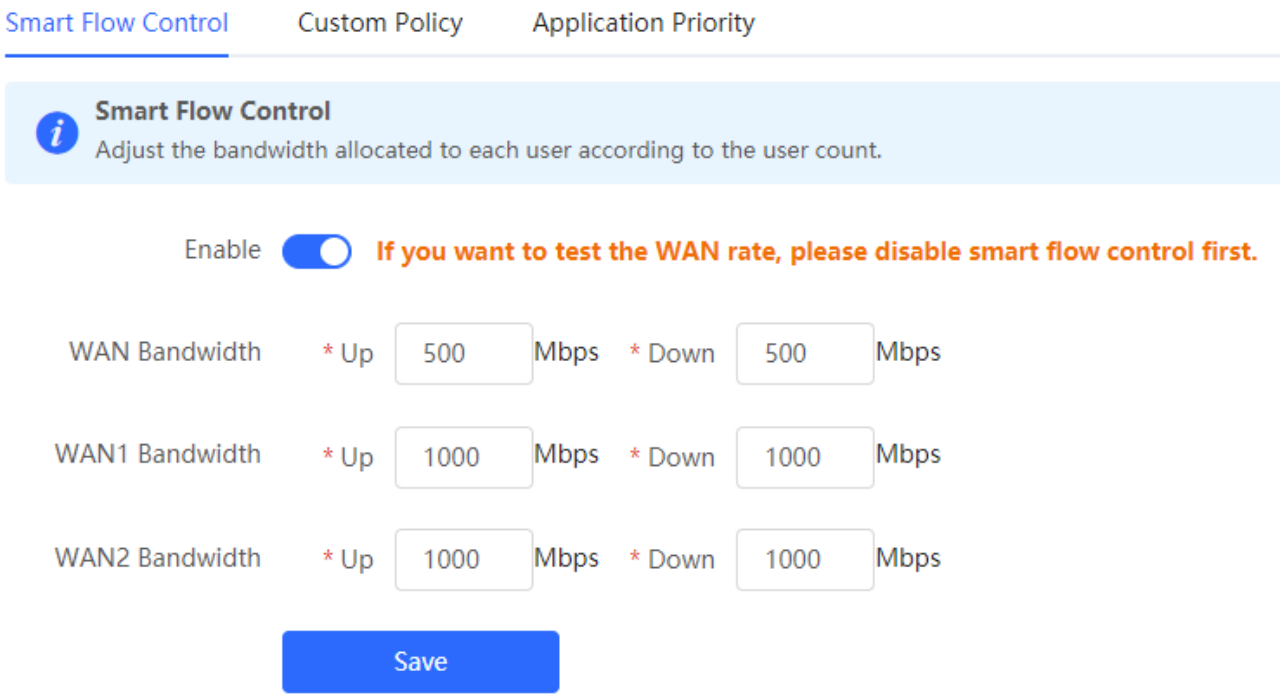


Table 4-7 Smart Flow Control Configuration

Parameter	Description
Enable	Specify whether to enable the smart flow control function. By default, smart flow control is disabled.
WAN Bandwidth	Set the uplink and downlink bandwidth limits for WAN ports, in Mbit/s.

(3) Click **Save** to make the configuration take effect.

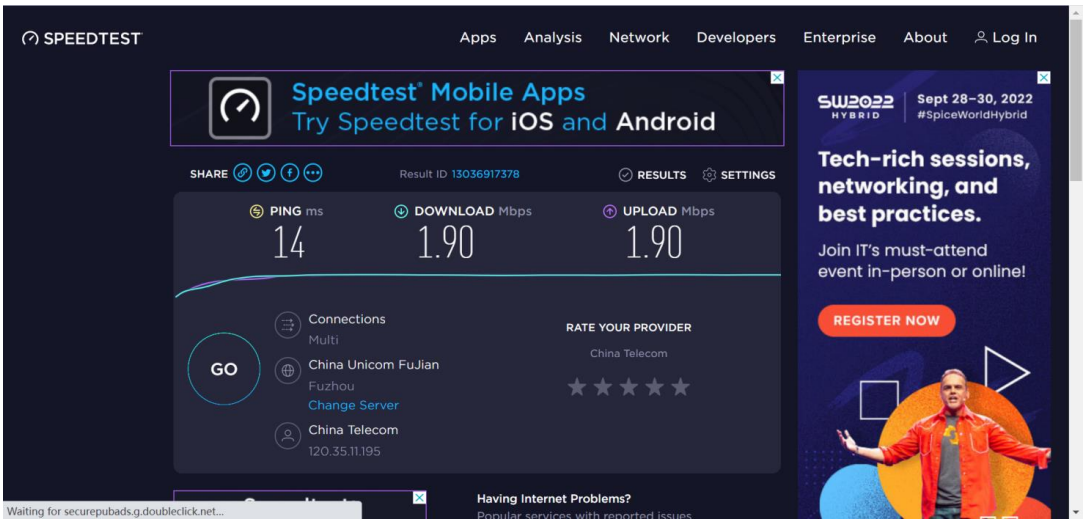
Caution

Enabling flow control will affect network speed testing. To test the network speed, disable flow control first.

Note

Smart flow control can be used to control the line traffic in different networking modes, including bandwidth-based, static IP address, and dynamic IP address.

(4) Perform the speed test. The following figure shows that the guest's upload or download speed falls below 2 Mbit/s.



4.12.3 Custom Policies

1. Overview

Custom policies are used to restrict the traffic with specific IP addresses based on smart flow control, thereby meeting bandwidth requirements of specific users or servers. When creating a custom flow control policy, you can flexibly configure the limited user range, bandwidth limit, limited application traffic, and rate limit mode. A custom policy takes precedence over the smart flow control configuration.

Custom policies are classified into normal policies, MACC policies, and VPN policies based on their application scope:

- Normal policies are used to control common traffic.
- VPN policies are used to control VPN traffic.
- MACC policies are flow control policies configured on the cloud. The web management page only displays the policies. MACC policies cannot be modified on the web management page. To modify an MACC policy, log in to the MACC.

2. Getting Started

Before you configure a custom policy, enable smart flow control. For details, see section 错误!未找到引用源。错误!未找到引用源。.

3. Configuration Steps

Choose **Gateway** > **Behavior** > **Flow Control** > **Custom Policy**.

(1) Set **Policy Type**.

Note

The **Cloud Policy** option is displayed in **Policy Type** only after a MACC policy is configured on the MACC.

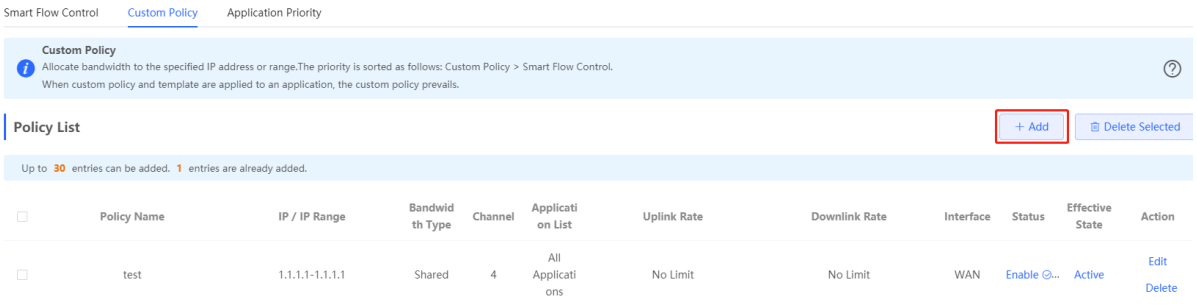
(2) Switch the application library.

The application lists vary depending on regions. Chinese and International versions of the application library are available. Select the version based on the regions.

Click to select **Application Library Version** and click **OK**. The version is switched after a few minutes.

Caution

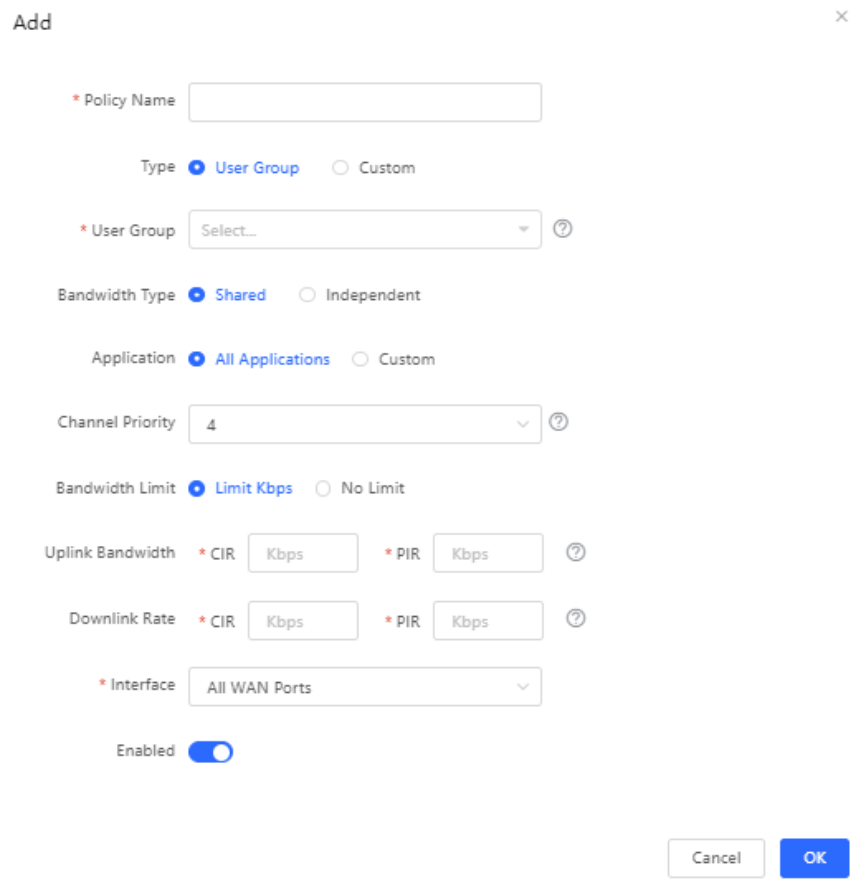
- It takes about 1 minute to switch the application library version. Please wait.
- If you switch the application library, the template of the application priority will be reset (see section 6.6.4 Application Priority), and the old application control policy may take ineffective (see section 6.4 App Control). Proceed with caution.



(1) Set a custom policy.

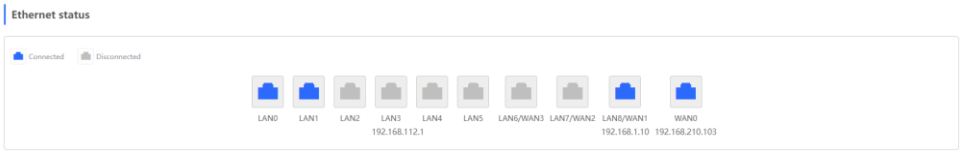
- Set a custom normal policy.

  a Set **Policy Type** to **Normal Policy** and click **Add** to create a custom normal flow control policy.
  A maximum of 30 custom normal policies can be configured.



b Configure items related to a normal policy.

Parameter	Description
Policy Name	A policy name uniquely identifies a custom flow control policy. It cannot be modified.
Type	Type of a flow control policy: ● **User Group**: The policy is applied to users in a specified user group. You need to select a user group to be managed. ● **Custom**: The policy is applied to users in a specified IP address segment. You need to manually enter the IP address range to be managed.
User Group	Select a user to be managed by the policy from the user group list. . If you select all members of a user group, the policy takes effect on the entire user group (it also takes effect on members added to the user group later).

Parameter	Description
IP/IP Range	Specify the IP address range for the flow control policy to take effect. When **Type** is set to **Custom**, enter the IP address manually. You can enter a single IP address or an IP address segment. The IP address range must be within a LAN segment. You can choose **Overview** > **Ethernet status** to check the network segment of the current LAN port. For example, the network segment of the LAN port shown in the figure below is 192.168.110.0/24. 
Bandwidth Type	● **Shared**: All users in a user group (all IP addresses in an address range) share the configured uplink and downlink bandwidths, and the bandwidth of a single user is not limited. ● **Independent**: All users in a user group (all IP addresses in an address range) share the configured uplink and downlink bandwidths, and the maximum bandwidth of a single user can be limited.
Application	When **Bandwidth Type** is set to **Shared**, the flow control policy can be configured to take effect only on specified applications. ● **All Applications**: The flow control policy takes effect on all applications in the current application library. ● **Custom**: The flow control policy takes effect only on specified applications in the application list. When **Bandwidth Type** is set to **Independent**, some models do not support application selection and the flow control policy takes effect on all applications in the current application library by default. For the models, contact technical support engineers.
Application List	When **Application** is set to **Custom**, it specifies the applications on which the policy takes effect. Traffic of the selected applications is limited by the policy.
Channel Priority	Specify the traffic guarantee level. The value ranges from 0 to 7. A smaller value indicates a higher priority and the value 0 indicates the highest priority. Different traffic priority values correspond to different application groups in an application template. The value 2 indicates the key group, value 4 indicates the normal group, and value 6 indicates the suppression group. For the description of application groups in a priority template, see **错误!未找到引用源。错误!未找到引用源。**.
Bandwidth Limit	Configure whether to limit the bandwidth. ● **Limit Kbps**: You can set the uplink and downlink bandwidth limits as required. ● **No Limit**: When the bandwidth is sufficient, the used maximum bandwidth is not limited. When the bandwidth is insufficient, the minimum bandwidth cannot be guaranteed.

Parameter	Description
Uplink Bandwidth Downlink Rate	Configure the uplink or downlink data transmission rate, in kbit/s. ● **CIR**: Specifies the minimum bandwidth that can be shared by all users when the bandwidth is insufficient. ● **PIR**: Specifies the total maximum bandwidth that can be occupied by all users when the bandwidth is sufficient. ● **PIR per User**: Specifies the maximum bandwidth that can be occupied by each user when multiple users share the bandwidth. It is optional and can be configured only when **Bandwidth Type** is set to **Independent**. The rate is not limited by default.
Interface	Specify the WAN port on which the policy takes effect. When it is set to **All WAN Ports**, the policy will be applied to all WAN ports.
Enabled	Set whether to enable the flow control policy. If it is disabled, the policy does not take effect.

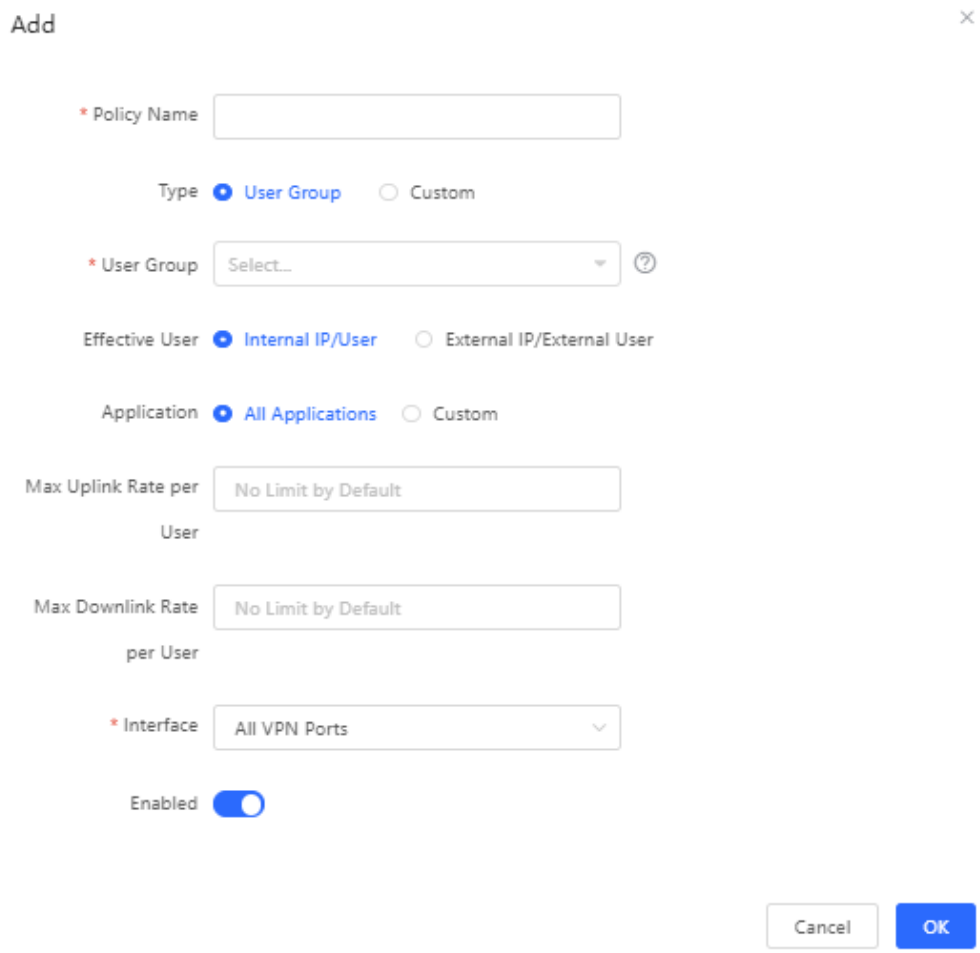
Caution

After switching the application library version, you may need to reconfigure the application list.

c Click **OK**.

- Set a custom VPN policy.

  a Set **Policy Type** to **VPN Policy** and click **Add** to create a custom VPN flow control policy.
  A maximum of 10 VPN policies can be configured.



b Configure items related to a VPN policy.

Parameter	Description
Policy Name	A policy name uniquely identifies a custom flow control policy. It cannot be modified.
Type	Type of a flow control policy: ● **User Group**: The policy is applied to users in a specified user group. You need to select a user group to be managed. ● **Custom**: The policy is applied to users in a specified IP address segment. You need to manually enter the IP address range to be managed.
User Group	Select a user to be managed by the policy from the user group list. If you select all members of a user group, the policy takes effect on the entire user group (it also takes effect on members added to the user group later).
Effective User	Specify the type of effective users: ● **Internal IP/User**: For a gateway, IP addresses of clients connected to the gateway are internal IP addresses. ● **External IP/External User**: For a gateway, non-gateway internal IP addresses are external IP addresses, such as the internal IP address of the VPN server. Configuration suggestions are as follows: ● When clients are configured to control VPN traffic, select **Internal IP/ User** to control traffic of internal network users. When the VPN server is configured to control VPN traffic, select **External IP/External User** to control traffic of external network users. ● For the VPN of the NAT model, the external IP address of the server must be in the IP address segment of the VPN address pool. ● For the VPN in router mode, the IP address segment must be set to IP addresses of restricted users. For the VPN in router mode, to configure flow control on internal IP addresses of clients, set internal IP addresses to the IP addresses of the flow control objects.
Application	When **Bandwidth Type** is set to **Shared**, the flow control policy can be configured to take effect only on specified applications. ● **All Applications**: The flow control policy takes effect on all applications in the current application library. ● **Custom**: The flow control policy takes effect only on specified applications in the application list. When **Bandwidth Type** is set to **Independent**, some models do not support application selection and the flow control policy takes effect on all applications in the current application library by default. For the models, contact technical support engineers.
Application List	When **Application** is set to **Custom**, it specifies the applications on which the policy takes effect. The traffic of the selected applications is limited by the policy.
Max Uplink Rate per User Max Downlink Rate per User	Configure the maximum uplink or downlink data transmission rate when multiple users share the bandwidth, in kbit/s. It is optional and can be configured only when **Bandwidth Type** is set to **Independent**. The rate is not limited by default.
Interface	Specify the VPN port on which the policy takes effect. When it is set to **All VPN Ports**, the policy is applied to all traffic of the VPN type.

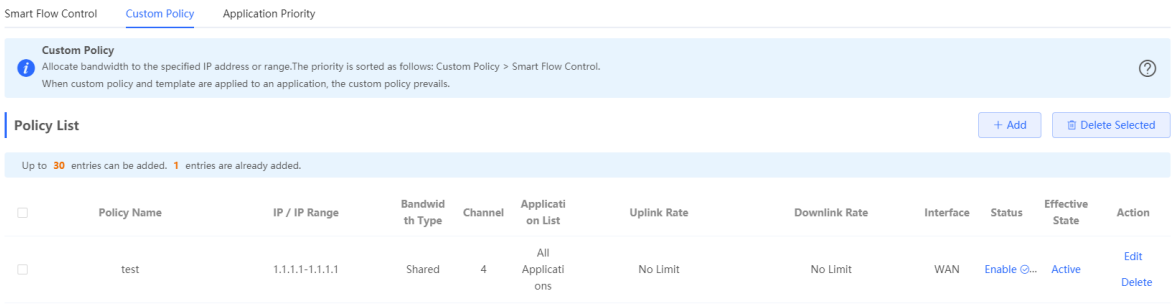
Parameter	Description
Enabled	Set whether to enable the flow control policy. If it is disabled, the policy does not take effect.

c Click OK.

(3) View Custom Policies

The current custom policies are displayed in the **Policy List** section. You can modify and delete a custom policy. To delete multiple custom policies in a batch, select the desired policies and click **Delete Selected**.

- Normal policy list



- VPN policy list

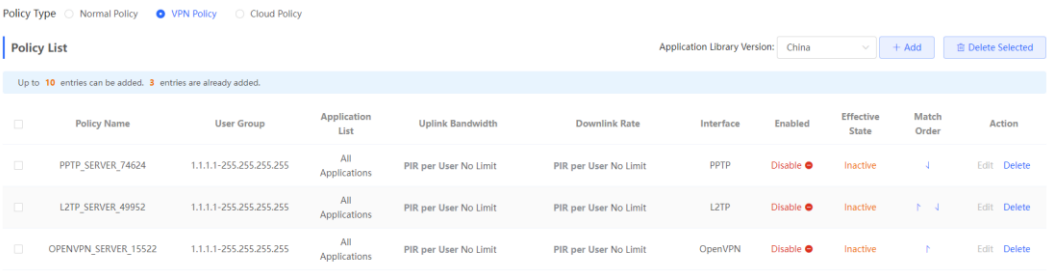


Table 4-8 Policy List Information

Parameter	Description
Application List	**Application List** contains the applications for which the policy is valid. If **Application Library** matches **Application** that is set to **Custom** and supported by the policy,  is displayed in **Application List**. If not,  is displayed.
Status	Whether the current policy is enabled. You can click to edit the status. If **Application Library** does not match **Application** that is set to **Custom** and supported by the policy, you cannot edit **Status** directly. Click **Edit** in the action bar to edit the policy or switch the application library.

Parameter	Description
Effective State	Whether the policy is effective in the current system. If **Inactive** is displayed, check whether the policy is enabled, whether the policy-enabled port exists, and whether **Application Library** matches **Application** for which the policy is valid.
Match Order	All the created custom policies are displayed in the policy list, with the latest policy listed on the top. The device matches policies according to their sorting in the list. You can manually adjust the policy matching sequence by clicking or in the list.
Action	You can modify and delete a custom policy.

4.12.4 Application Priority

1. Overview

After smart flow control is enabled, you can set the application priority to provide guaranteed bandwidth for applications with a high priority and suppress the bandwidth for applications with a low priority. You can predefine a list of applications whose bandwidth needs to be guaranteed preferentially and a list of applications whose bandwidth needs to be suppressed as needed.

Caution

If one application exists in both the custom policy list and application priority list, the custom policy takes effect.

2. Getting Started

- Before you configure an application priority, enable smart flow control. For details, see section **错误!未找到引用源。错误!未找到引用源。**.
- Confirm that the appropriate application library is selected on the **Custom Policy** page (see section 6.6.3 Custom Policies).

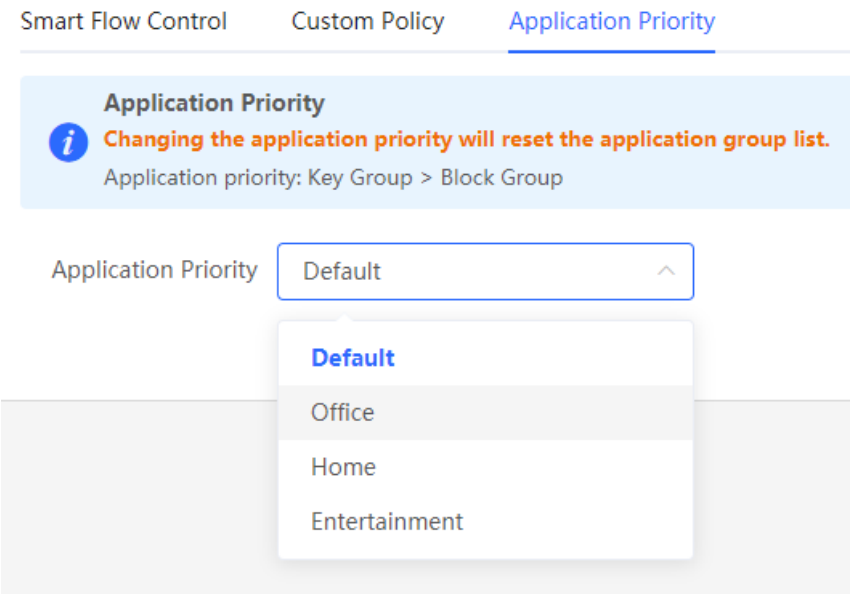
3. Configuration Steps

Switch to the Local mode. Choose Behavior > Flow Control > Application Priority.

(1) Create an application priority template.

Select a template from the **Application Priority** drop-down list box.

Four application priority templates are predefined to meet needs in different scenarios. You can switch among the templates as needed.



The application priority templates are as follows:

- **Default**: This template is used during device initialization. The traffic bandwidth is not guaranteed or suppressed for any application.
- **Office**: This template is designed for the office scenario, where application traffic from the office network is guaranteed preferentially.
- **Home**: This template is designed for the home scenario, where application traffic from the home network is guaranteed preferentially.
- **Entertainment**: This template is designed for the entertainment scenario, where application traffic from the entertainment network is guaranteed preferentially.

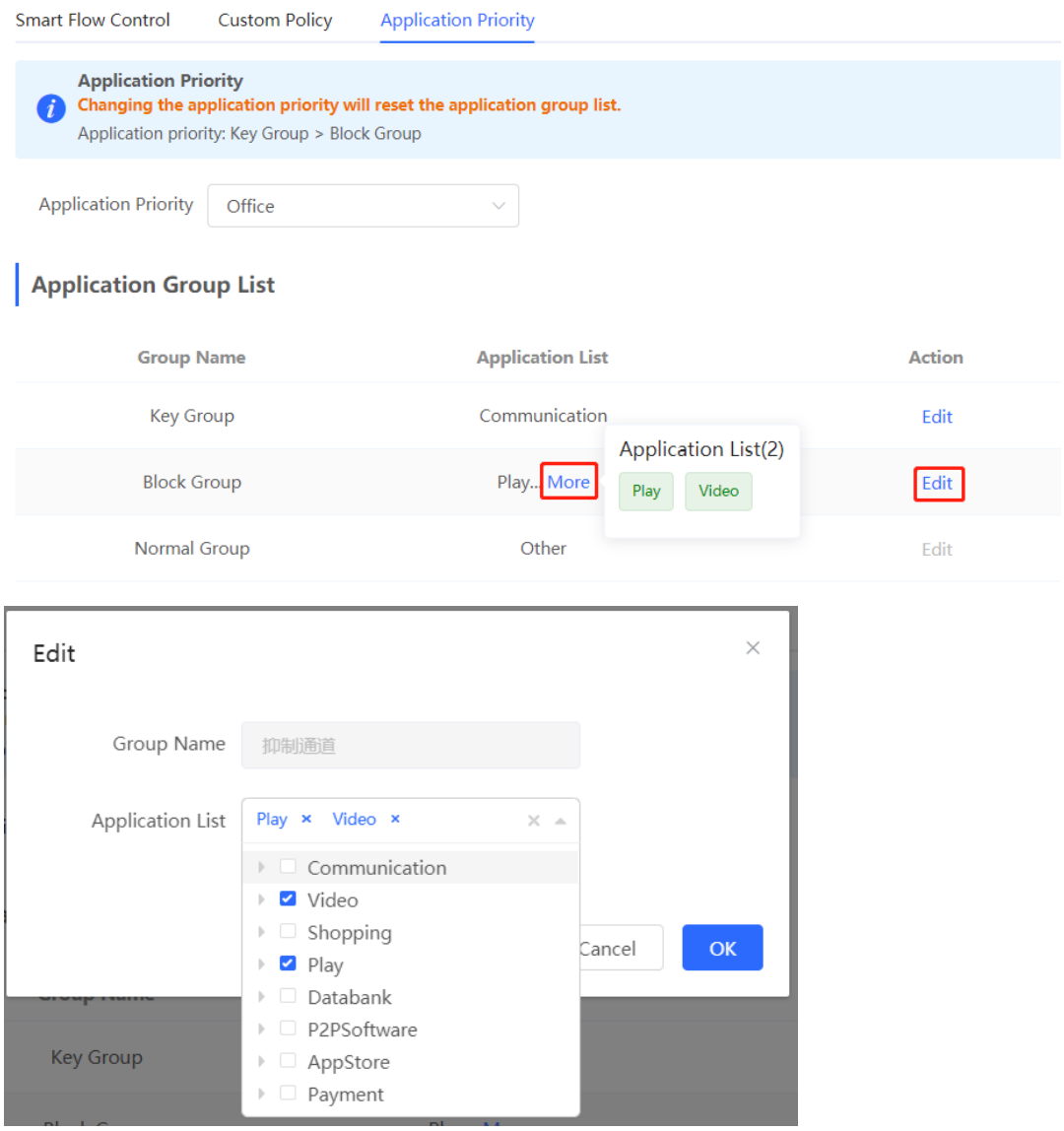
(2) Create an application group list.

Each default template has three application groups: key group, block group, and normal group. The application priorities of the key group, normal group, and block group are in descending order:

- **Key Group**: Traffic from applications in the application list for this group is guaranteed preferentially.
- **Block Group**: Traffic from applications in the application list for this group is suppressed to preferentially guarantee the traffic from applications with a higher priority.
- **Normal Group**: All the applications in the application library beyond **Key Group** and **Block Group** are included in this group. Traffic from applications in this group are guaranteed after traffic from applications of **Key Group** is guaranteed.

After you select a template, **Key Group**, **Block Group**, **Normal Group**, and the application list for each group in the current template are displayed. You can click **More** to view details of each application list.

You can click **Edit** in the **Action** column next to the key group and block group to edit the application list, allowing traffic from these applications to be guaranteed or suppressed.

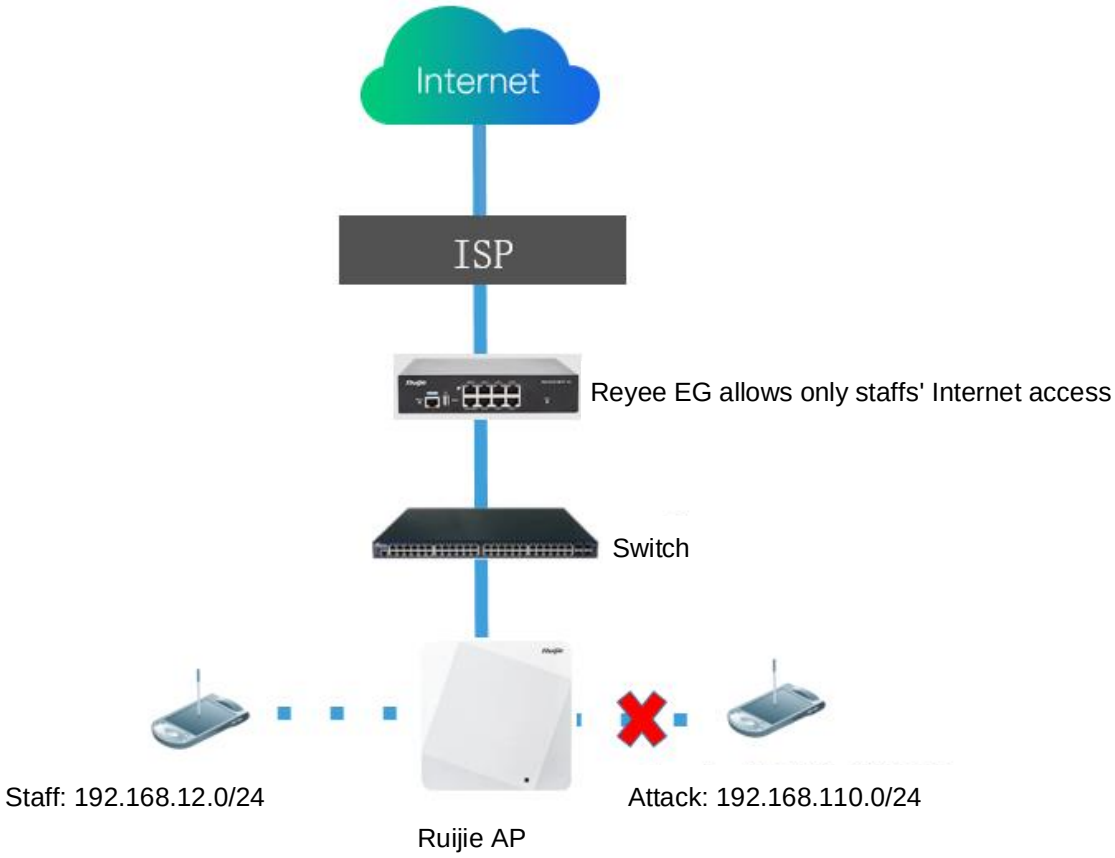


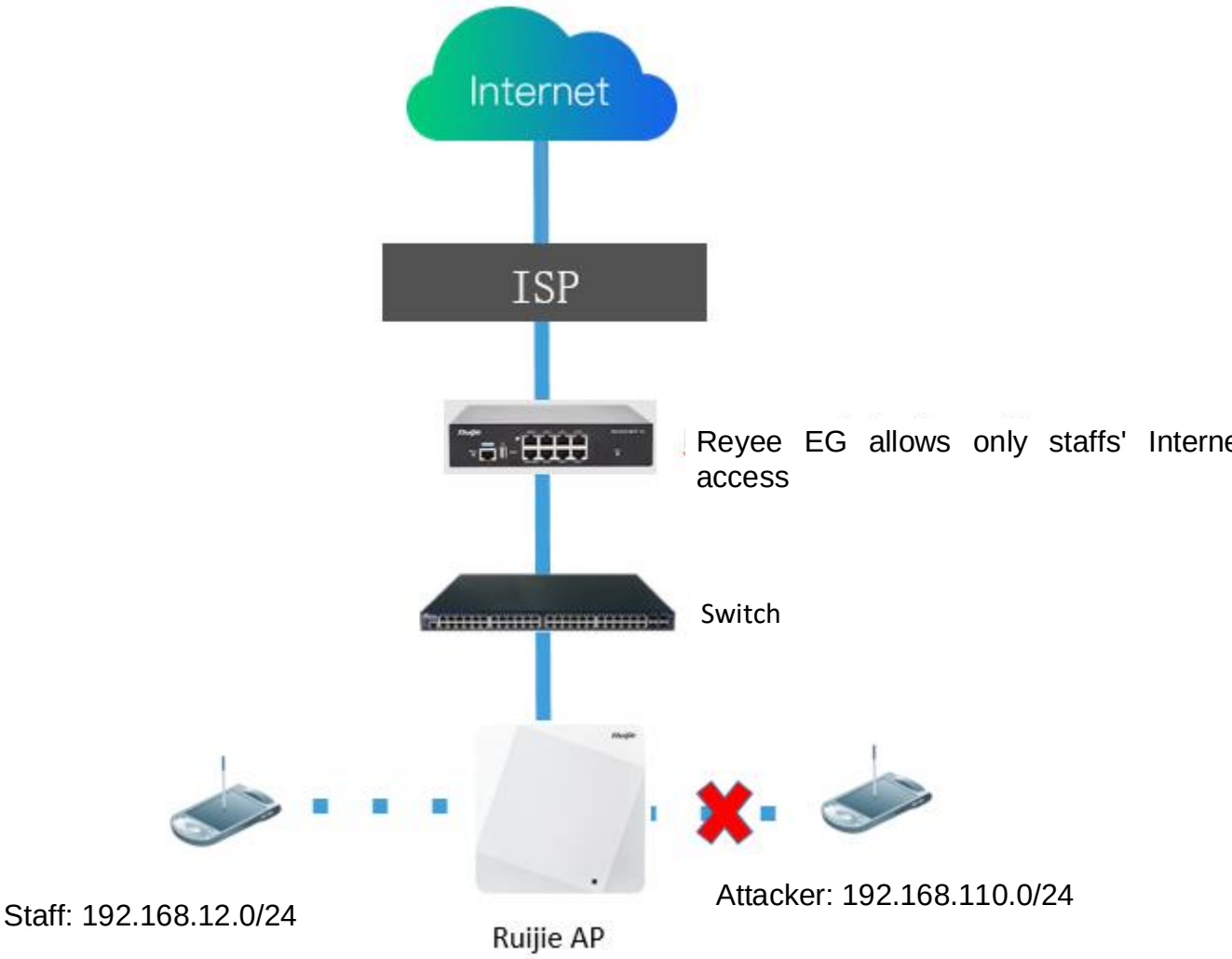
Caution

- If you switch the application library, the application list will change.
- The application list will be reset after you switch the application priority template.

4.13 Security

4.13.1 Application Scenario





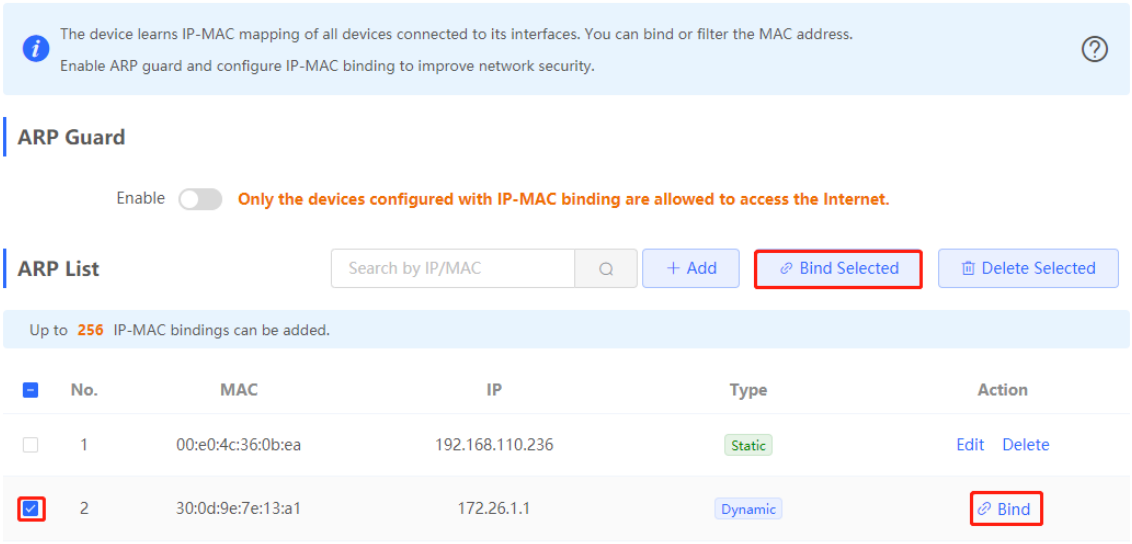
4.13.2 Configuring the ARP List and ARP Guard

The device learns IP addresses and MAC addresses of network devices connected to its interfaces and generates ARP entries. You can enable ARP guard and configure IP-MAC binding to restrict Internet access of LAN hosts and improve network security.

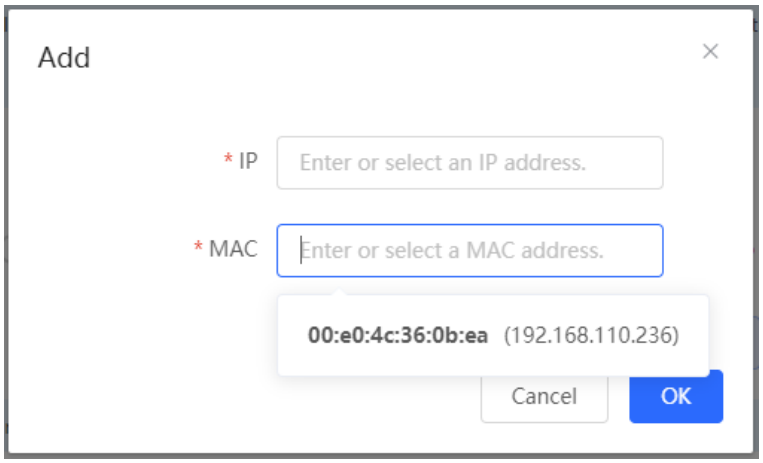
(1) Switch to the **Local** mode. Choose **Security** > **ARP List**.

(2) Before enabling ARP guard, you must configure the binding between IP addresses and MAC addresses in either of the following ways:

- Select a dynamic ARP entry in the ARP list and click **Bind**. You can select multiple entries to be bound at one time and click **Bind Selected** to bind them.

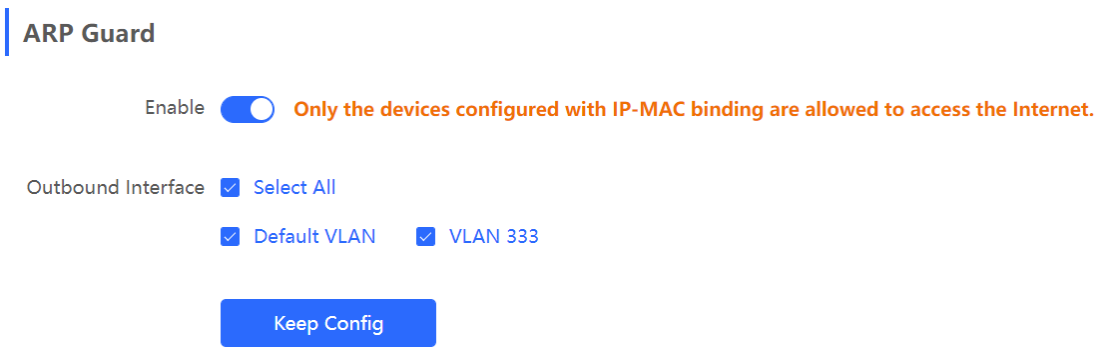


- Click **Add**, enter the IP address and MAC address to be bound, and click **OK**. The text box can display existing address mappings in the ARP list. You can click a mapping to automatically enter the address mapping.



(3) Click **Enable** to enable ARP guard.

After ARP guard is enabled, only LAN hosts with IP-MAC binding can access the external network.



Set the range for the function to take effect.

If you check **Select All**, the ARP guard function will take effect on all clients on the LAN. If you select a specified port, the ARP guard function will take effect only on clients connected to the port.

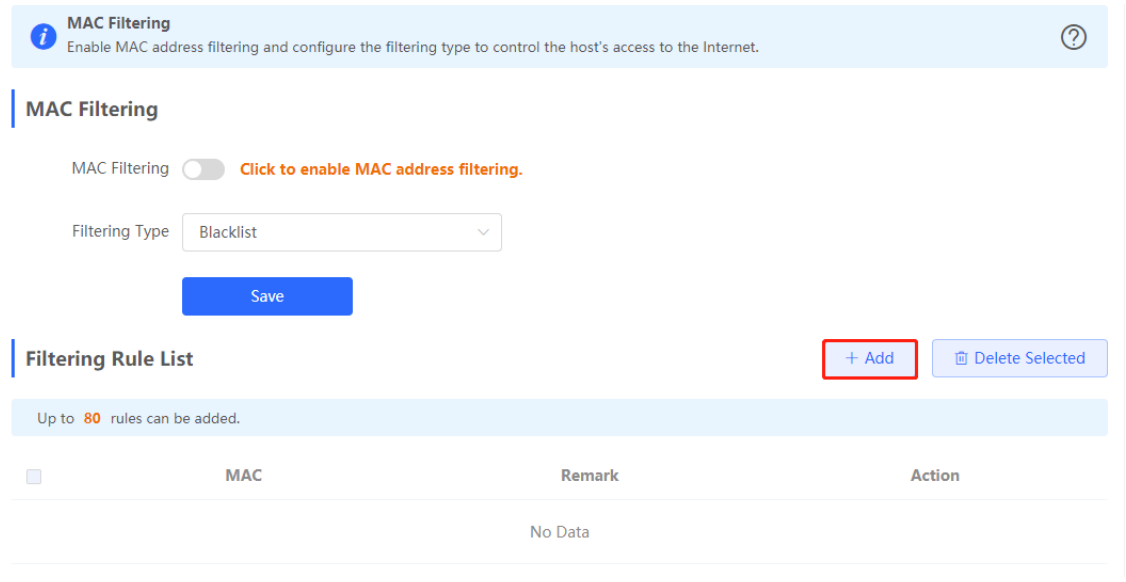
4.13.3 Configuring MAC Address Filtering

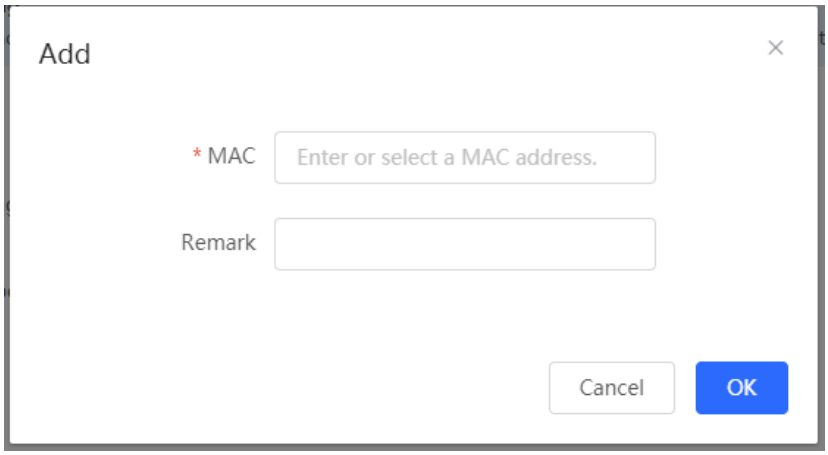
You can enable MAC address filtering and configure a whitelist or blacklist to effectively control Internet access from LAN hosts.

- Whitelist: Allow only hosts whose MAC addresses are in the filter rule list to access the Internet.
- Blacklist: Prevent hosts whose MAC addresses are in the filter rule list from accessing the Intern

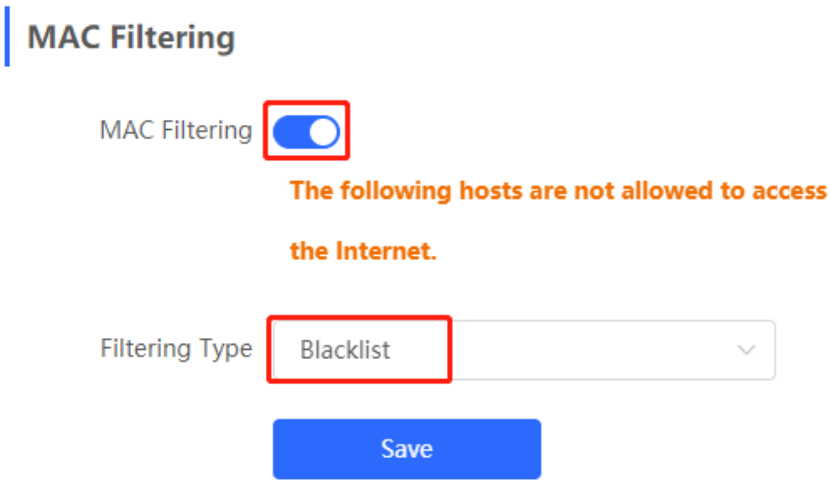
(1) Switch to the **Local** mode. Choose **Security** > **MAC Filtering**.

(2) Click **Add**. In the dialog box that appears, enter the MAC address and remarks. The text box can display existing address mappings in the ARP list. You can click a mapping to automatically enter the MAC address. Click **OK**. A filter rule is created.





(3) Enable MAC address filtering, set **Filtering Type**, and click **Save**.



4.13.4 Configuring Device Security

Note

This feature is supported by only R202 and later versions.

1. Overview

Prohibit Ping: This function identifies and directly discards ping packets in the traffic sent to the device, so as to prohibit the ping operation on the device. The device can be pinged from the administrative IP address only.

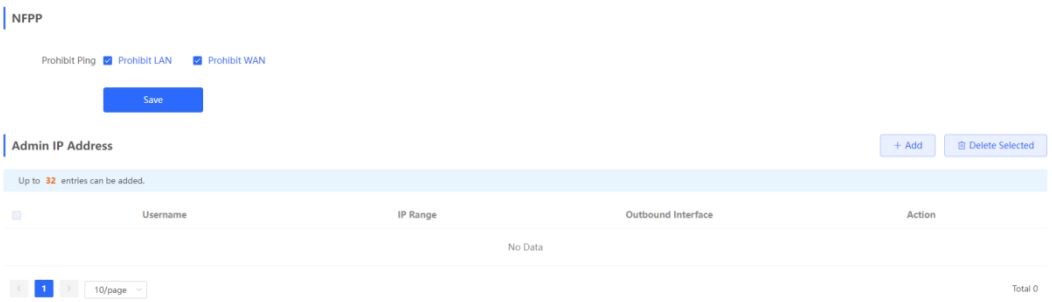
Admin IP Address: Packets sent from the administrative IP address are allowed to pass through.

2. Enabling the Ping Prohibition Function

Switch to the **Local** mode. Choose **Security** > **Local Safety**.

The ping prohibition function includes the following:

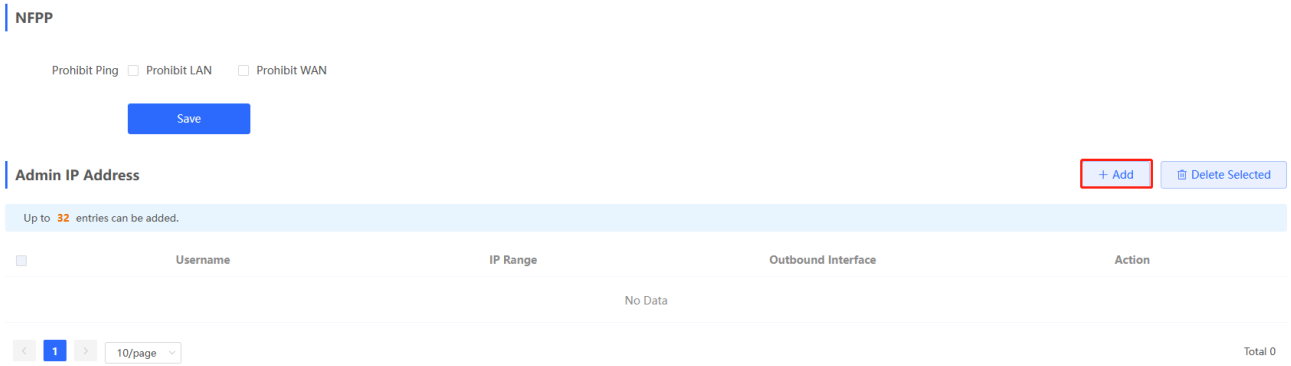
- If you select **Prohibit LAN**, ping packets sent from all clients on the LAN to the device will be discarded.
- If you select **Prohibit WAN**, ping packets sent from all clients on the WANs to the device will be discarded. Ping packets sent from a client to the device will be responded only after the IP address of the client is contained in **Admin IP Address**. For details on how to configure admin IP addresses, see Configuring an Admin IP Address.



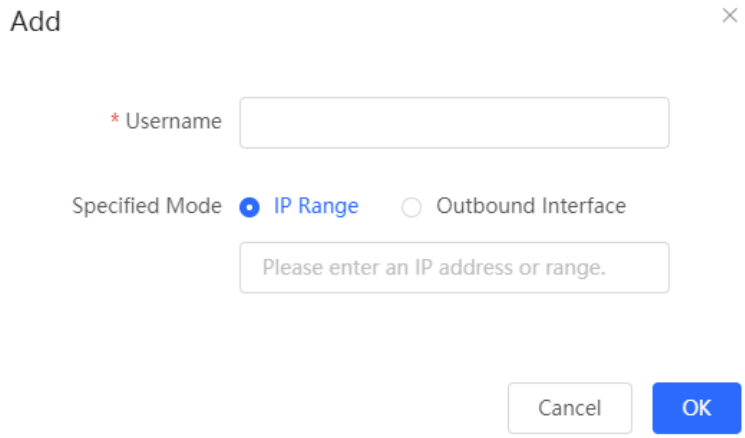
3. Configuring an Admin IP Address

Switch to the **Local** mode. Choose **Security** > **Local Safety**.

Click **Add**. Then you can configure admin IP address information.



- Configuring an admin IP address (based on an IP address)



(1) Configure a name for the admin IP address.

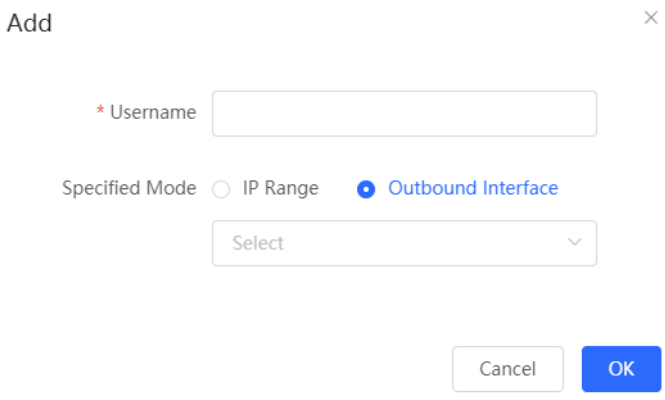
The name is a string of 1 to 32 characters.

(2) Set **Specific Mode** to **IP Range**.

(3) Configure an IP address.

You can specify a single IP address or an IP address range.

- Configuring an admin IP address (based on a port)



(1) Configure a name for the admin IP address.

The name is a string of 1 to 32 characters.

(2) Set **Specific Mode** to **Outbound Interface**.

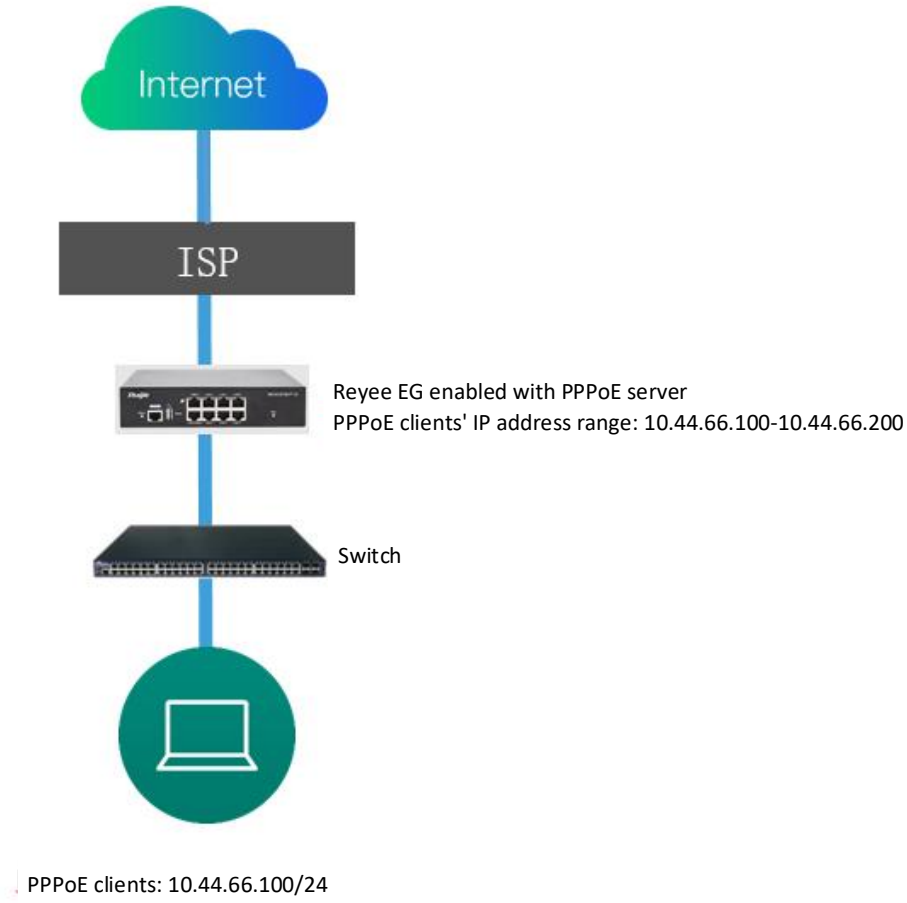
(3) Specify the port.

You can select a LAN port or WAN port as the outbound interface.

4.14 Configuring the PPPoE Server

4.14.1 Application Scenario

Point-to-Point Protocol over Ethernet (PPPoE) is a network tunneling protocol that encapsulates PPP frames into Ethernet frames. When the router functions as a PPPoE server, it provides the access service to LAN users and supports bandwidth management.



4.14.2 Global Settings

Switch to the **Local** mode. Choose **Advanced** > **PPPoE Server** > **Global Settings**.

Set **PPPoE Server** to **Enable** and configure PPPoE server parameters.

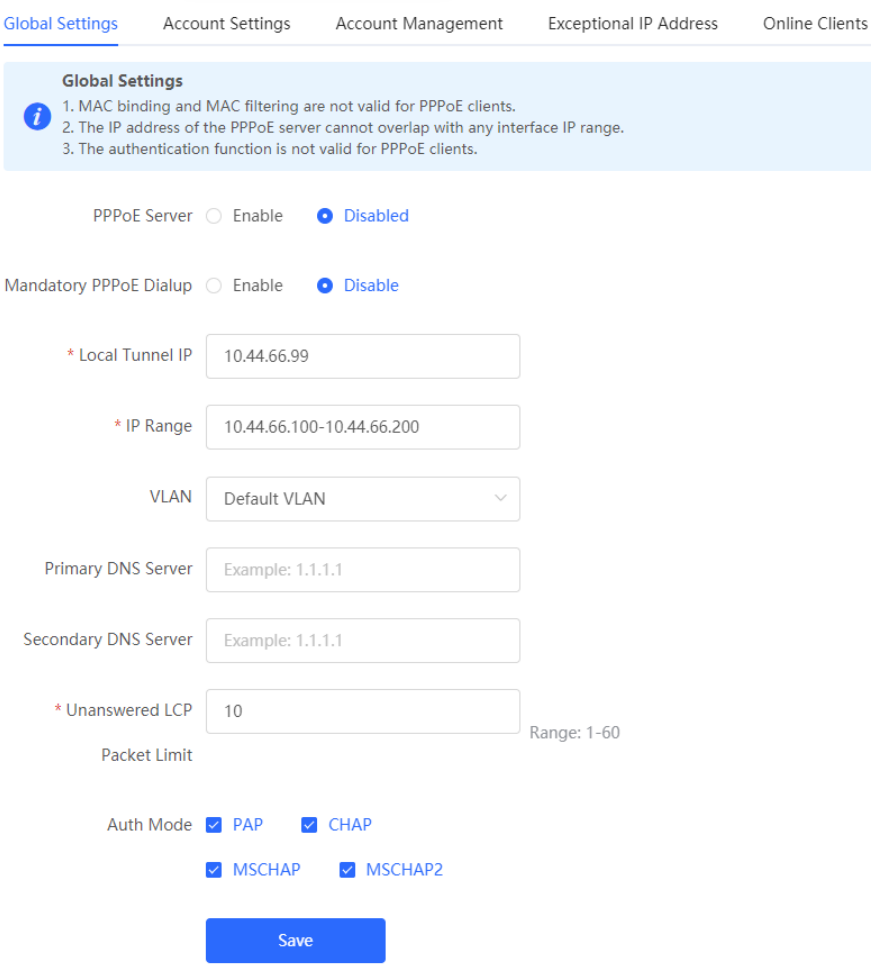


Table 4-7 PPPoE Server Configuration

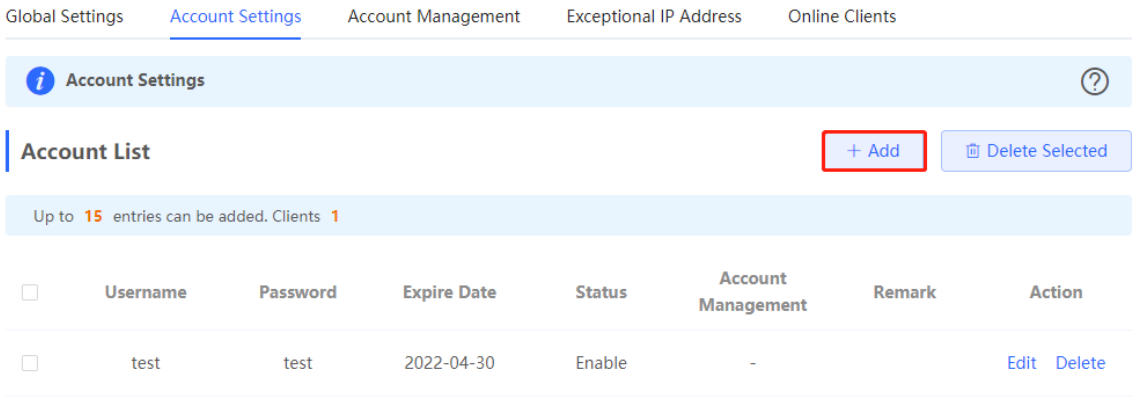
Parameter	Description
PPPoE Server	Specify whether to enable the PPPoE server function.
Mandatory PPPoE Dialup	Specify whether LAN users must access the Internet through dialing.
Local Tunnel IP	Set the P2P address of the PPPoE server.
IP Range	Specify the IP address range that can be allocated by the PPPoE server to authenticated users.
VLAN	Set the VLAN ID of the PPPoE server.
Primary/Secondary DNS Server	Specify the DNS server address delivered to authenticated users.
Unanswered LCP Packet Limit	When the number of LCP packets with no response in one link exceeds the specified value, the PPPoE server automatically disconnects the link.

Parameter	Description
Auth Mode	Select at least one authentication mode among PAP, CHAP, MSCHAP, and MSCHAP2.

4.14.3 Configuring a PPPoE User Account

Switch to the **Local** mode. Choose **Advanced** > **PPPoE Server** > **Account Settings**.

Click **Add** to create a PPPoE authentication user account. Created PPPoE authentication user accounts are displayed in the **Account List** section. Find the target account and click **Edit** to modify account information. Find the target account and click **Delete** to delete the account.



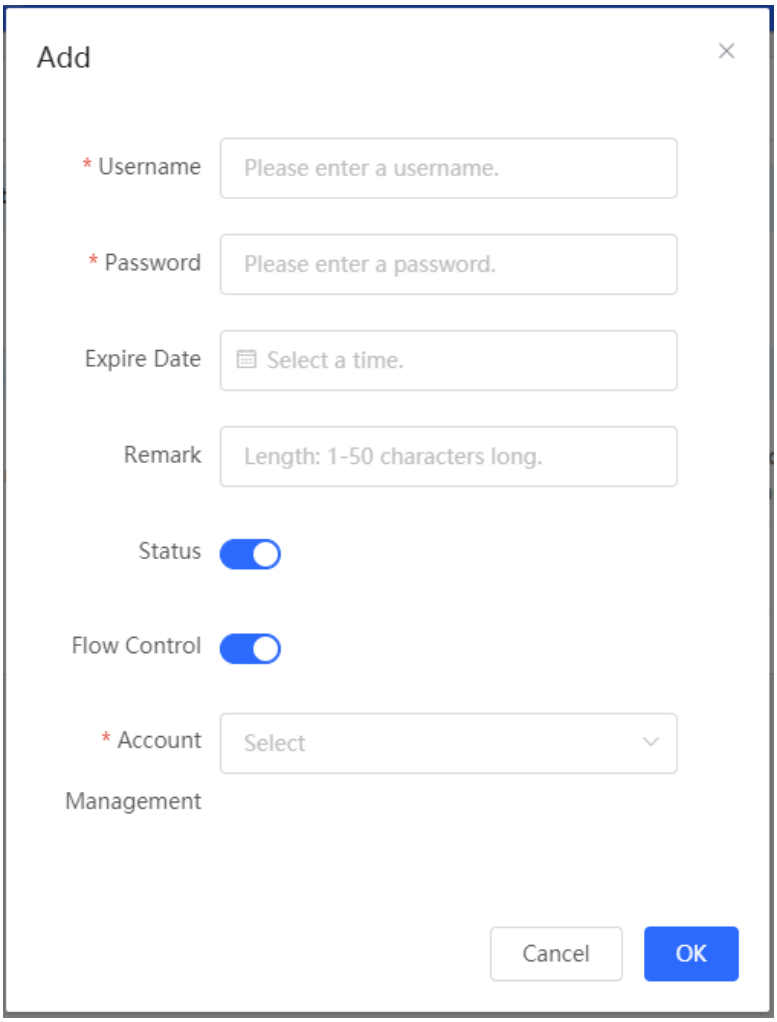


Table 4-8 PPPoE User Account Configuration

Parameter	Description
Username/Password	Set the username and password of the authentication account for Internet access through PPPoE dialing.
Expire Date	Set the expiration date of the authentication account. After the account expires, it can no longer be used for Internet access through PPPoE authentication.
Remark	Enter the account description.
Status	Specify whether to enable this user account. If the account is disabled, the account is invalid and cannot be used for Internet access through PPPoE authentication.

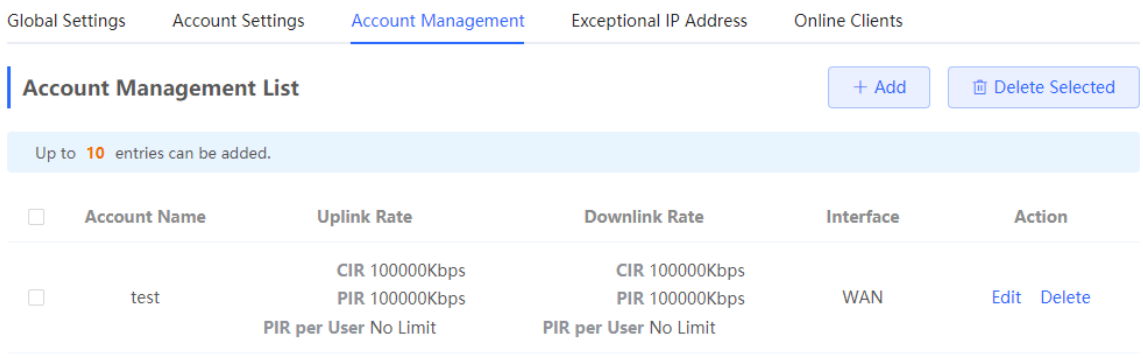
Parameter	Description
Flow Control	Specify whether to apply flow control on the account. If flow control is enabled, you need to configure flow control policies for PPPoE authentication users. If smart flow control is disabled, **Flow Control** must be disabled. To enable **Flow Control**, enable smart flow control first. For details on how to configure smart flow control, see section 6.6.2 **错误!未找到引用源。**.
Account Management	After flow control is enabled, you need to configure a flow control package for the current account to restrict user bandwidth accordingly. For details on how to configure and view flow control packages, see section 3.12.4 **错误!未找到引用源。**.

4.14.4 Configuring a Flow Control Package

Switch to the **Local** mode. Choose **Advanced** > **PPPoE Server** > **Account Management**.

If smart flow control is disabled, the flow control package for the account does not take effect. Before you configure a flow control package, enable smart flow control. For details on how to configure smart flow control, see section 6.6.2 **错误!未找到引用源。**.

Click **Add** to create a flow control package. Created flow control packages are displayed in the **Account Management List**. You can modify or delete the packages.



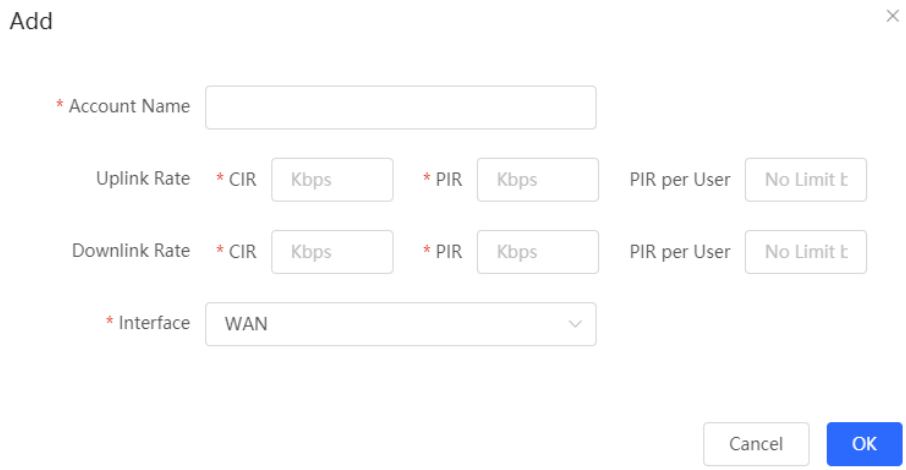


Table 4-9 PPPoE User Flow Control Package Configuration

Parameter	Description
Account Name	Set the name of the flow control package. When configuring an authentication account, you can select a flow control package based on the name.
Uplink/Downlink CIR	Specify the uplink and downlink committed information rate (CIR) for an authentication account when the bandwidth is insufficient.
Uplink/Downlink PIR	Specify the uplink and downlink peak information rate (PIR) that can be used by an authentication account when the bandwidth is sufficient.
Uplink/Downlink PIR per User	Specify the PIR that can be consumed by each user. This parameter is optional. By default, the PIR per user is not limited.
Interface	Specify the interface to which the flow control package applies.

4.14.5 Configuring Exceptional IP Addresses

Switch to the **Local** mode. Choose **Advanced** > **PPPoE Server** > **Exceptional IP Address**.

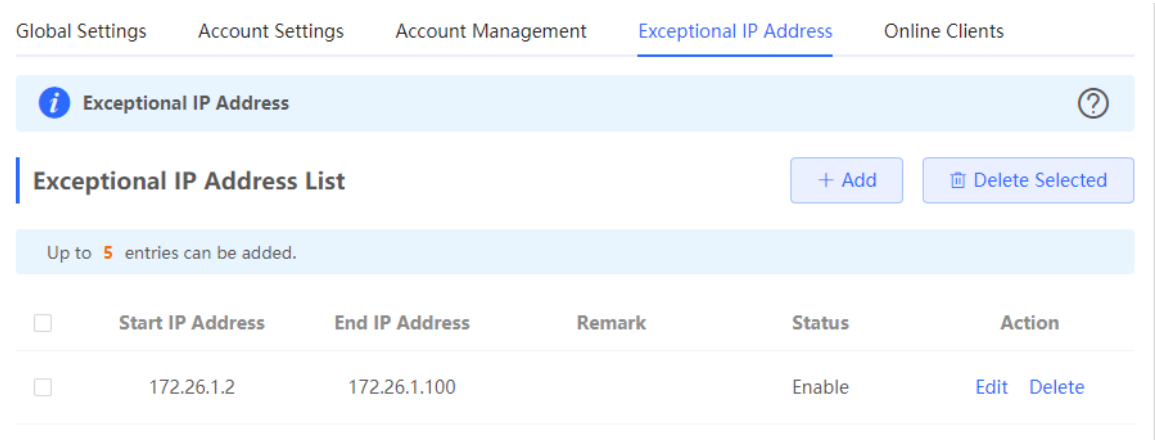
To configure clients with some IP addresses in a specific VLAN to access the Internet without passing account and password authentication, you can configure these IP addresses as exceptional IP addresses on the device enabled with the PPPoE server.

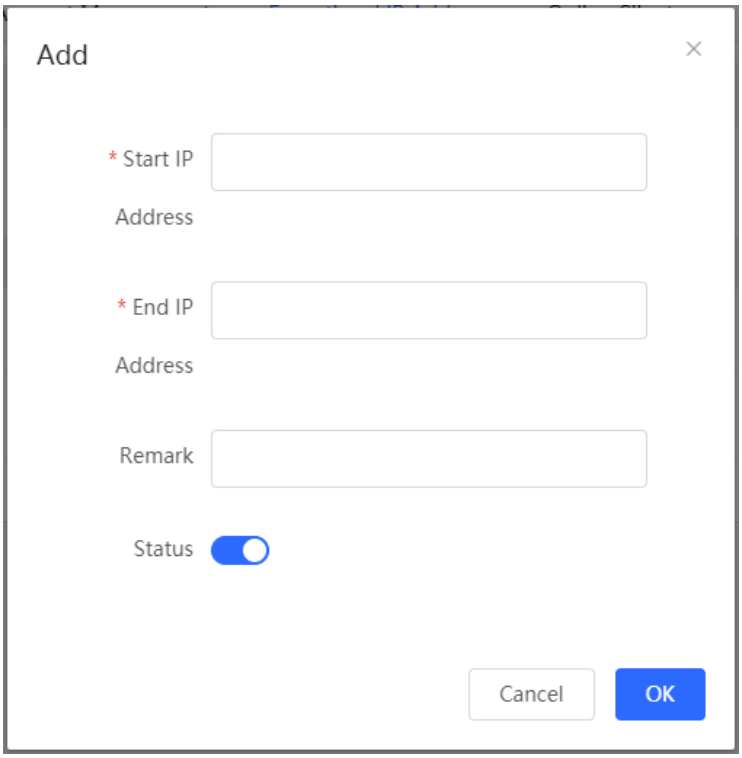
The created exceptional IP addresses are displayed in **Exceptional IP Address List**. Click **Edit** to modify the exceptional IP address and click **Delete** to delete the exceptional IP address.

Start IP Address/End IP Address: indicates the start or end exceptional IP address.

Remark: indicates the description of an exceptional IP address.

Status: indicates whether an exceptional IP address is valid.





4.14.6 Checking Online Users

Switch to the **Local** mode. Choose **Advanced** > **PPPoE Server** > **Online Clients**.

Check information about end users that access the Internet through PPPoE dialing. Click **Disconnect** to disconnect a user from the PPPoE server.

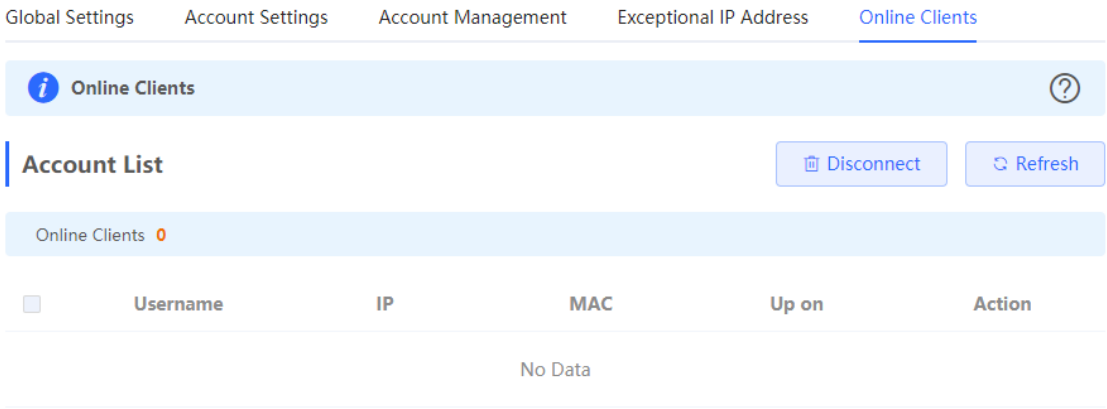


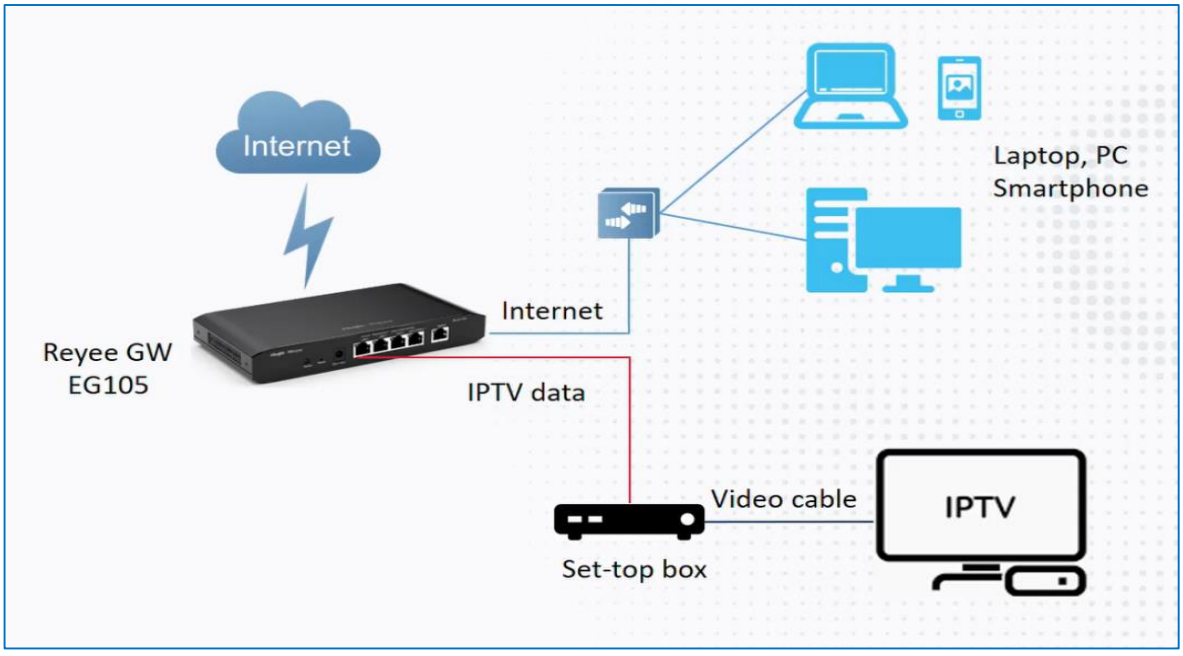
Table 4-10 PPPoE Online User Information

Parameter	Description
Username	Total number of online users that access the Internet through PPPoE dialing.
IP	IP address of the client.
MAC	MAC address of the client.
Up on	Time when the user accesses the Internet.

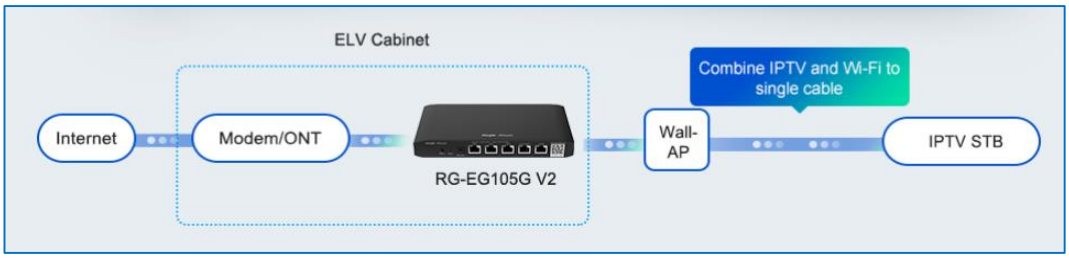
4.15 IPTV

4.15.1 Application Scenario

- **Scenario 1: Dual-WAN Scenario**



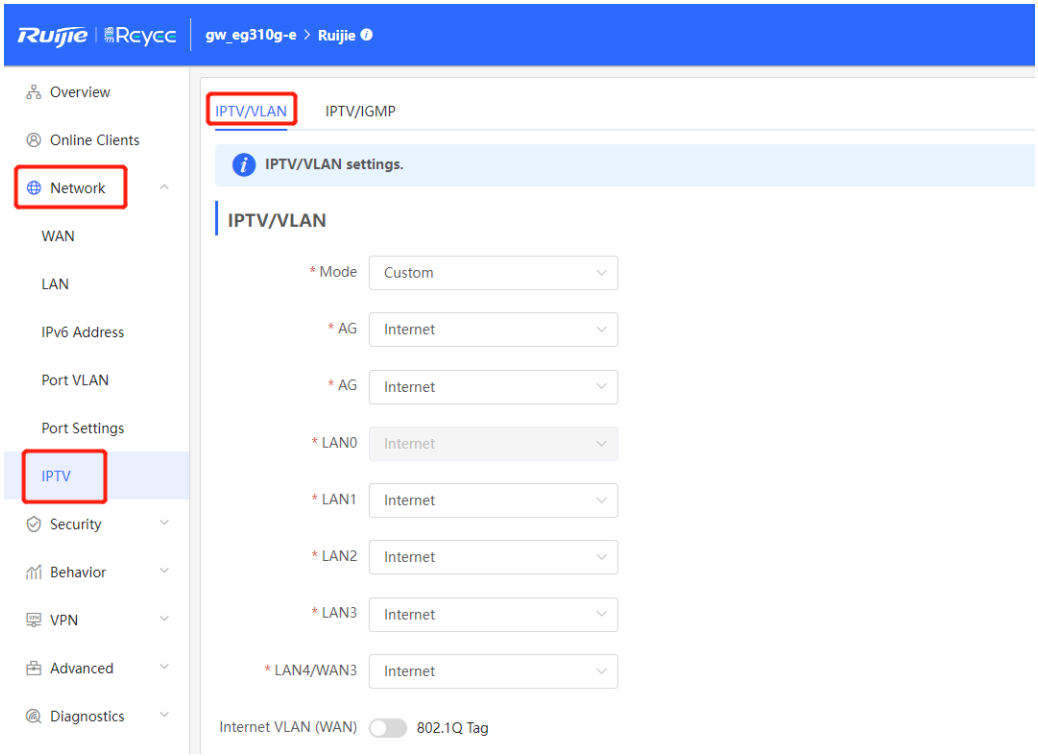
- **Scenario 2: Single-WAN Scenario**



4.15.2 Dual-WAN Configuration

(1) Connect the ISP cable with a WAN port, and connect your PC with a LAN port. Use the default IP address of 192.168.110.1 to log in to the Reyee EG and configure your EG to access the Internet successfully according to the wizard.

(2) Switch to the **Local** mode. Choose **Network** > **IPTV** > **IPTV/VLAN**.



(3) Configure **IPTV VLAN ID** or **IP-Phone VLAN ID**.

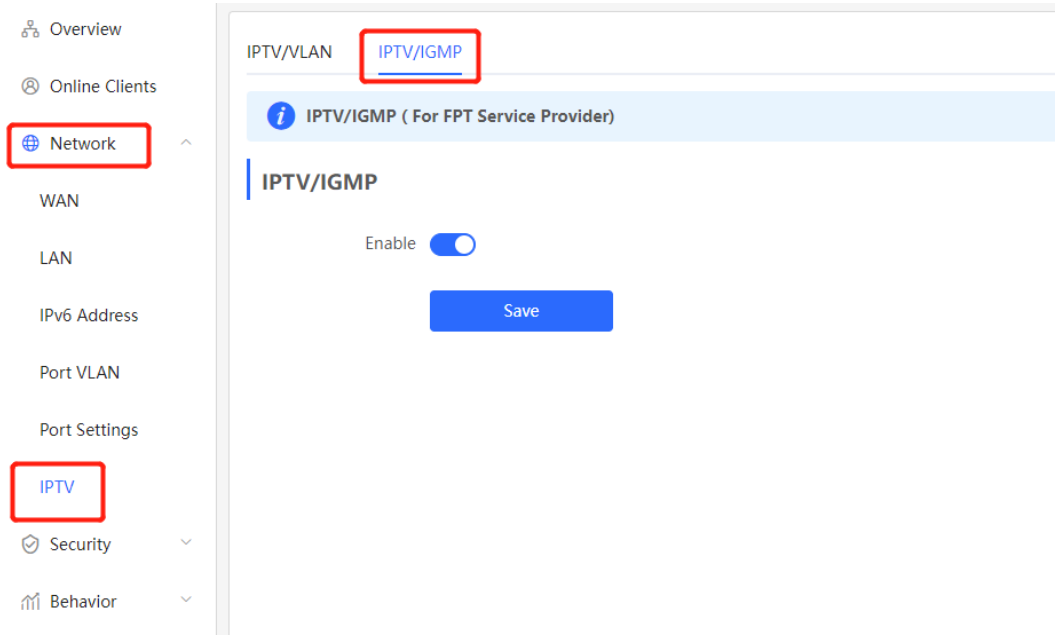
- If you are in following regions listed in the red box, you can choose the mode directly.

- If you are not in these regions, you can choose **Custom**. Then contact with an ISP for IPTV settings and connect the IPTV and IP phone with LAN ports. For example, the VLAN IDs for IPTV, IP phone, and Internet services are 100, 200, and 300, respectively.

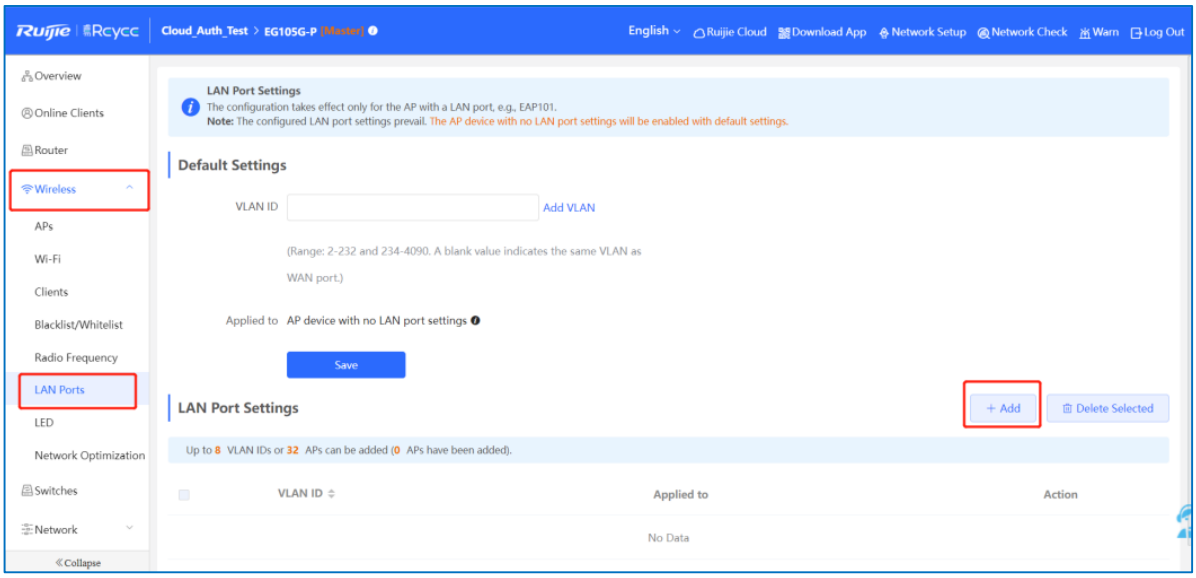
4.15.3 Single-WAN Configuration

After performing IPTV configuration on the Reyee EG that has only one WAN port, , you need to configure the IPTV VLAN 100 on the LAN port of the wall AP. If the router has two WAN ports, ignore this step.

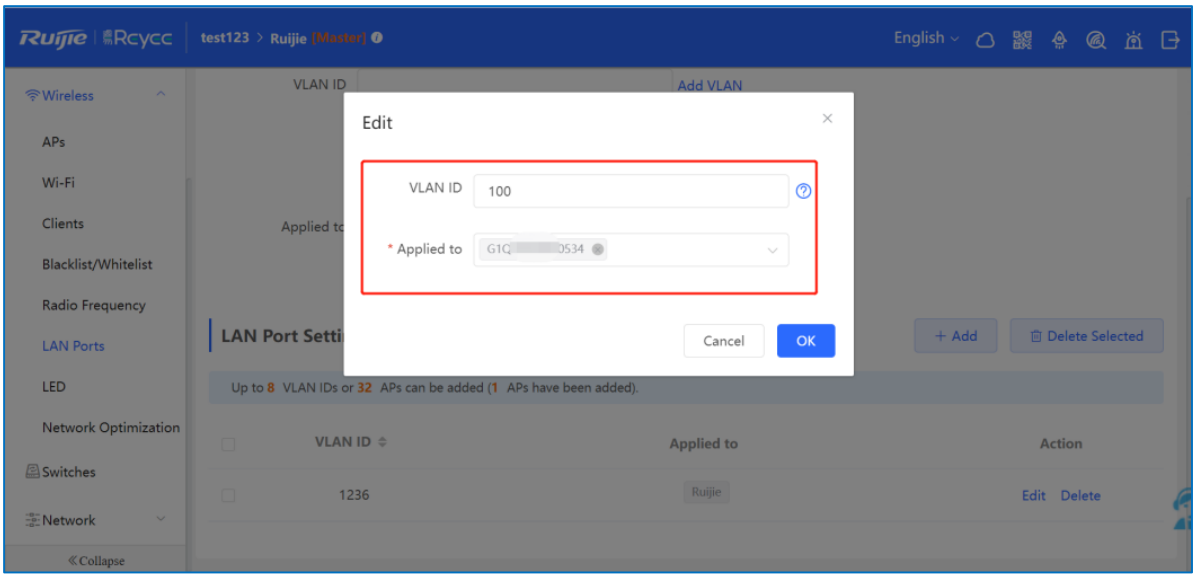
(1) Log in to the web management system. Choose **Network** > **IPTV** > **IPTV/IGMP** and enable **IPTV/IGMP**.



(2) Log in to the web management system of a wall AP. Choose **Wireless** > **LAN Ports** > **Add**.



Set the VLAN ID to 100, which is applied to the wall AP.



Caution

IPTV is supported by only Reyee OS 1.55 and later versions.

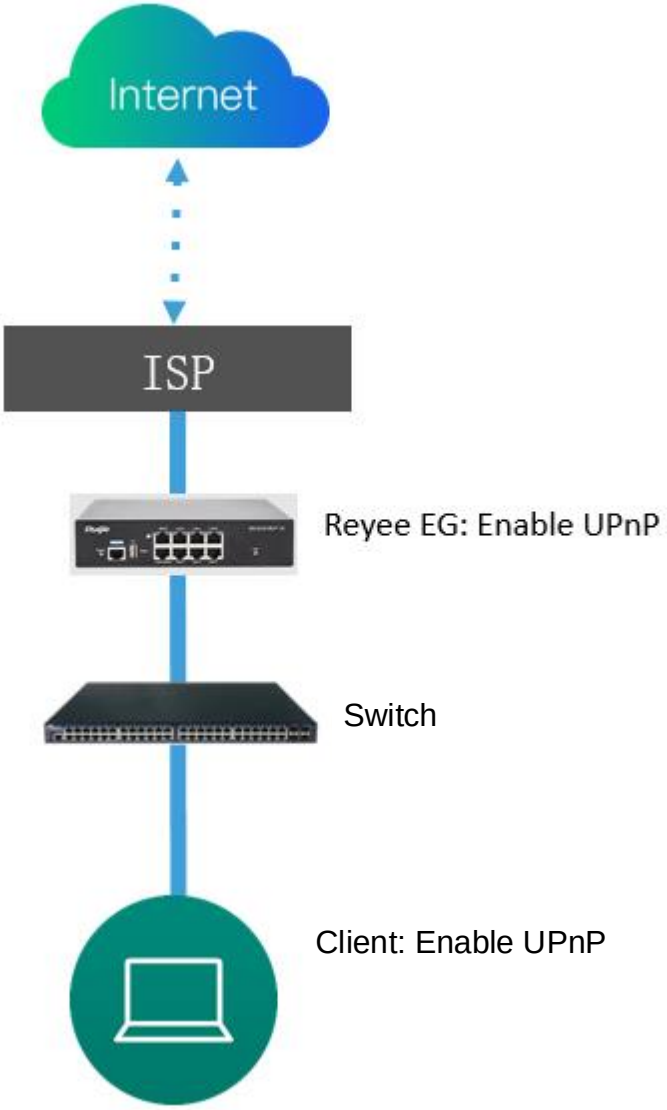
4.16 UPnP

Application Scenario

With the Universal Plug and Play (UPnP) function enabled, the device can switch the port used by the terminal's Internet service according to the terminal's request, achieving NAT conversion. When a terminal on the Internet wants to access resources of the device's intranet, the device can automatically add port mapping entries to realize service transmission across internal and external networks. Common applications that support the UPnP protocol include MSN Messenger, Thunder, BT, and PPLive.

There are three requirements for applying UPnP:

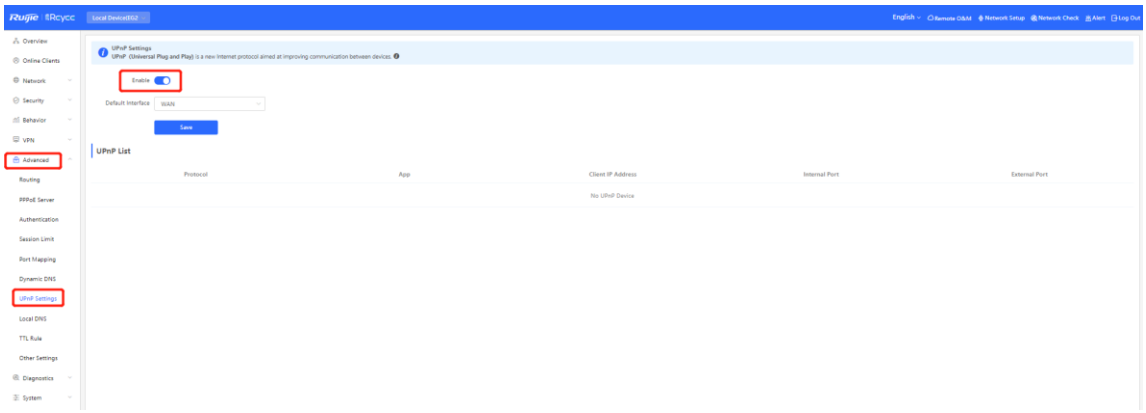
- The device must be enabled with UPnP.
- The operating system of internal hosts must support UPnP.
- Applications must support UPnP.



Procedure

(1) Switch to the **Local** mode. Choose **Advanced > UPnP Settings > Enable** to enable UPnP on your phone or PC.

(2) The router will automatically detect your device and enable port mapping for the device. Finally you can use the external IP address and port to access your phone or PC service.


Overview
Online Clients
Network
Security
Behavior
VPN
Advanced
Routing
PPPoE Server
Authentication
Session Limit
Port Mapping
Dynamic DNS
UPnP Settings
Local DNS
TTL Rule
Other Settings
Diagnostics
System
UPnP Settings
Enable
Default Interface
WAN
Save
UPnP List
Protocol
App
Client IP Address
Internal Port
External Port
No UPnP Device

5 Advanced Solution

5.1 Reyee Flow Control Solution

5.1.1 Application Scenario

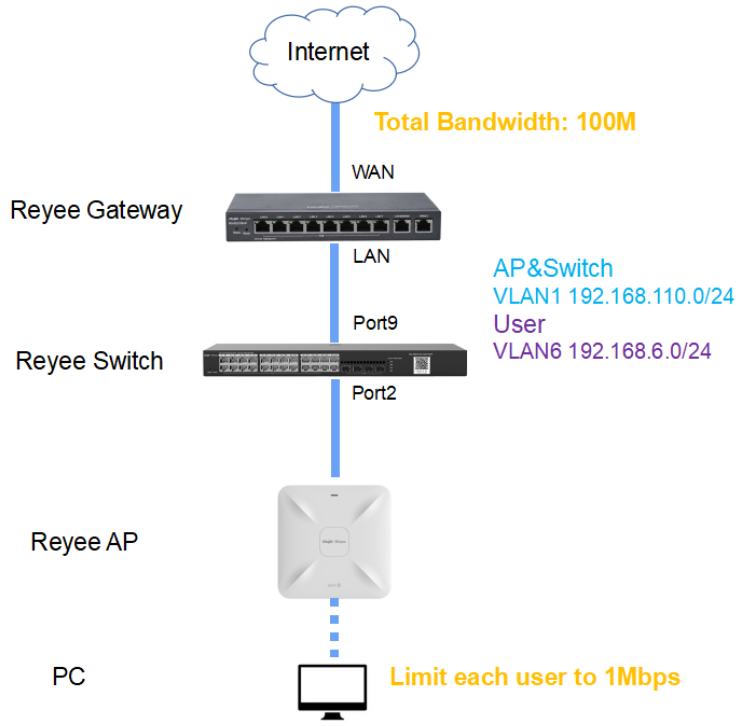
Flow control is used for setting rate limits of download and upload rates for the clients. With flow control configured, the router can protect the network bandwidth from being occupied by some clients.

5.1.2 Configuration Example

Requirement

The total bandwidth of the EG is limited to 100 Mbit/s and the rate of each user on the network segment of VLAN 6 is limited to 1 Mbit/s.

Network Topology



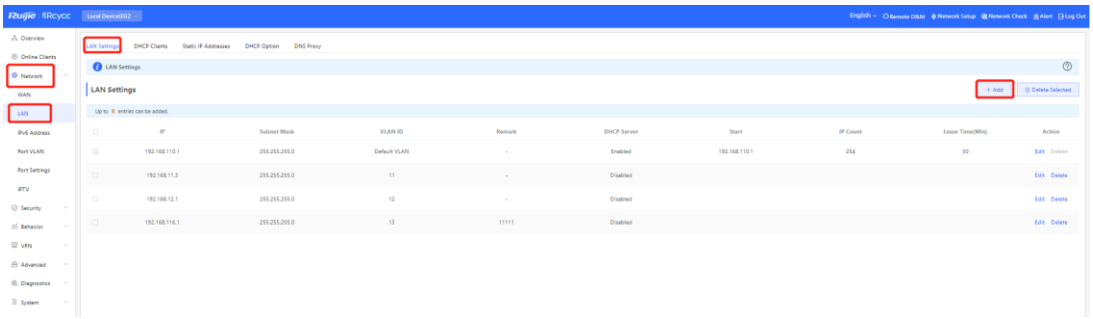
Network Description

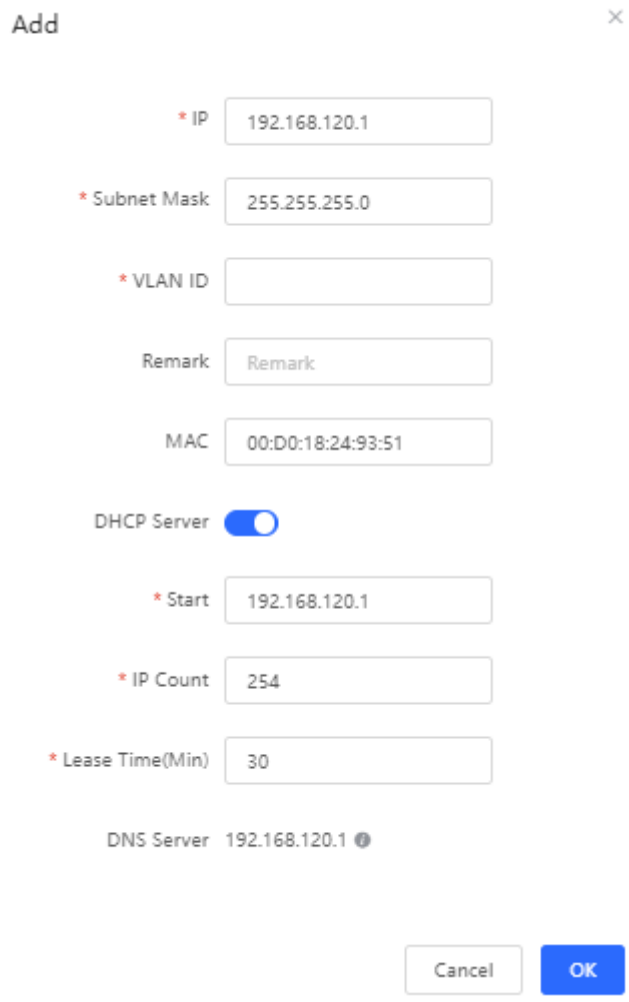
- The EG works as a DHCP server to assign IP addresses to users, Reyee AP, and Reyee switch.
- The Reyee AP and switch obtain the IP address 192.168.110.0/24 on the network segment of VLAN 1 for Internet access.
- The users obtain the IP address 192.168.6.0/24 on the network segment in VLAN 6 for Internet access.

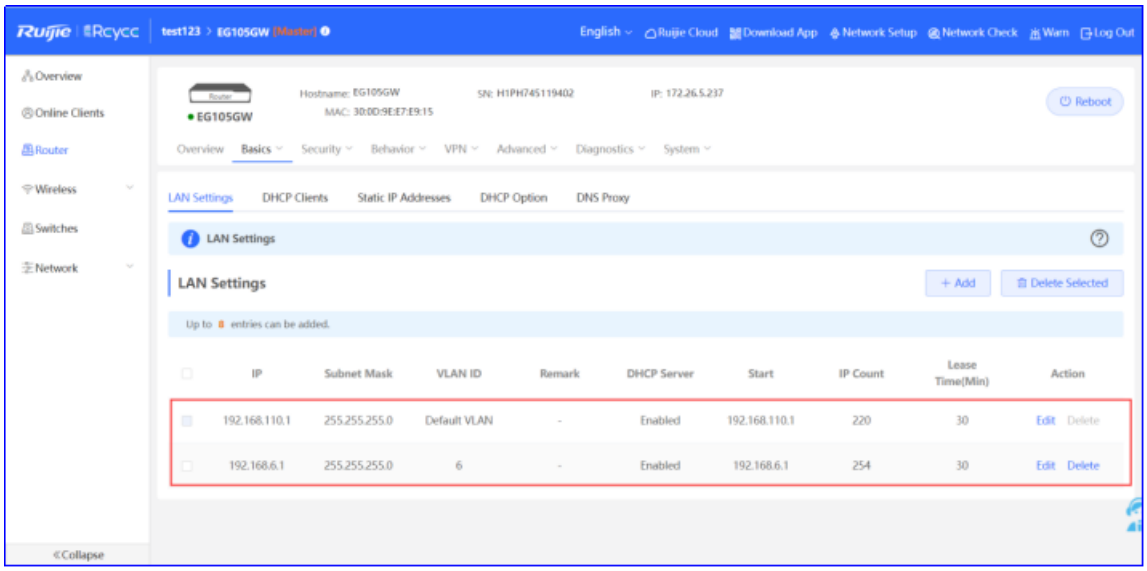
Configuration Steps

(1) Perform basic network configuration.

a Switch to the **Local** mode. Choose **Network** > **LAN** > **LAN Settings** > **Add** and perform LAN settings and DHCP address pools of VLAN 1 and VLAN 6 on the router.




Add
* IP
192.168.120.1
* Subnet Mask
255.255.255.0
* VLAN ID
Remark
Remark
MAC
00:D0:18:24:93:51
DHCP Server
* Start
192.168.120.1
* IP Count
254
* Lease Time(Min)
30
DNS Server
192.168.120.1
Cancel
OK



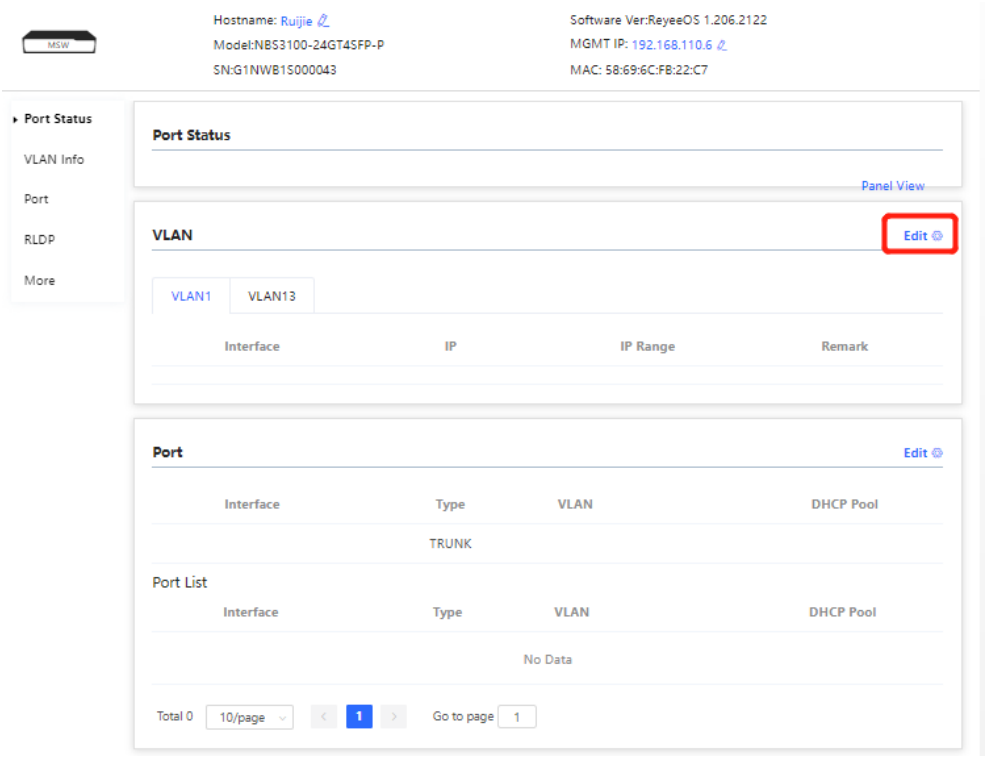
Caution

The network segment 192.168.110.0/24 is configured for VLAN 1.

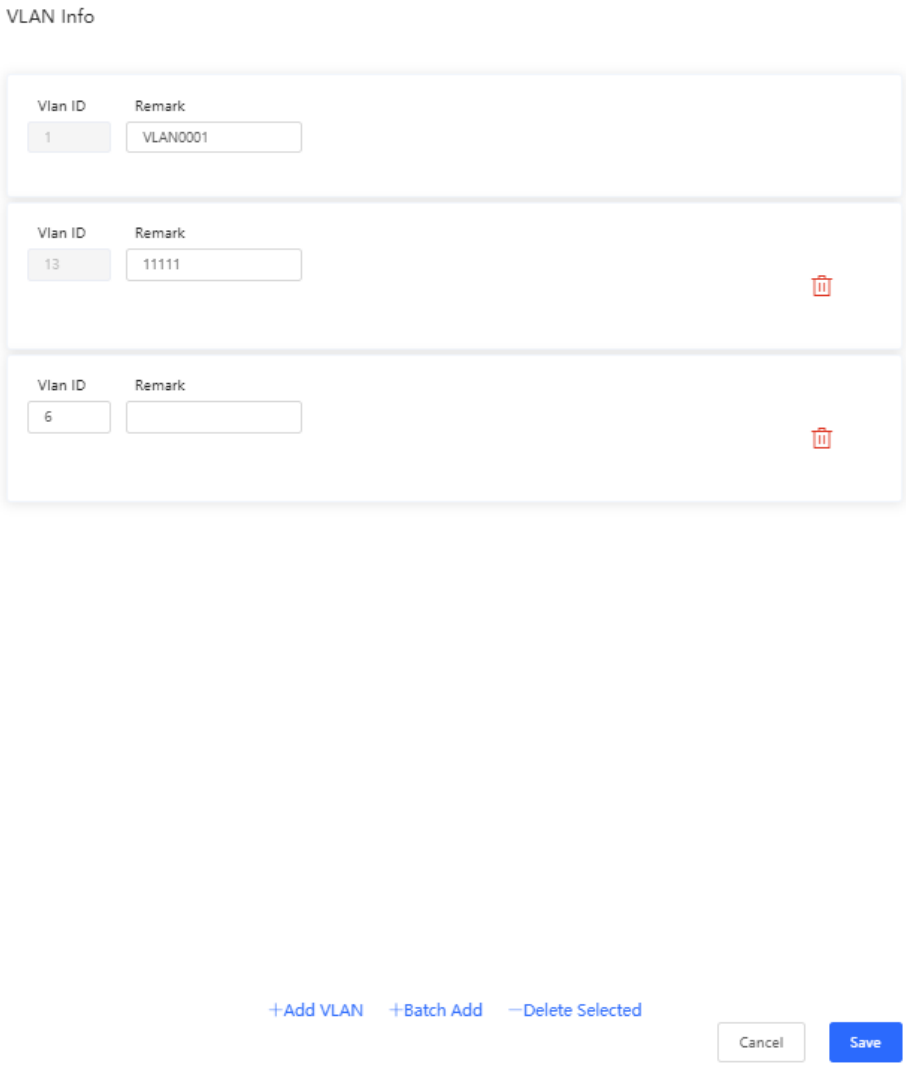
(2) Switch to the **Network** mode. Choose **Device** > **Switch**.

a Select a device from **Device List** and access the configuration page.

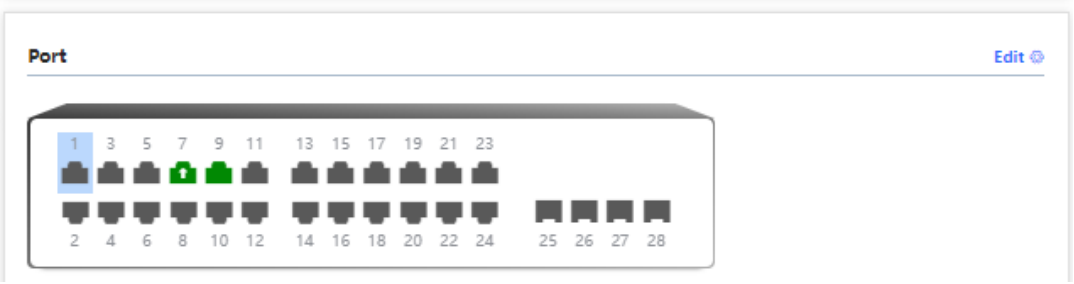
b In the **VLAN** pane, select a VLAN and click **Edit** to configure the VLAN.

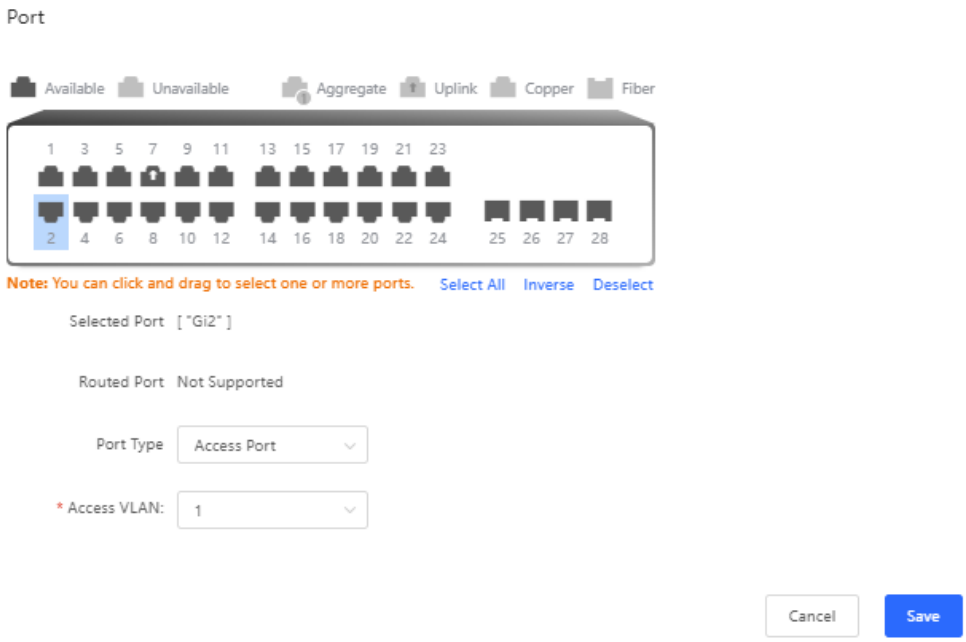


c Click **Add VLAN** to create VLAN 6 on the switch.

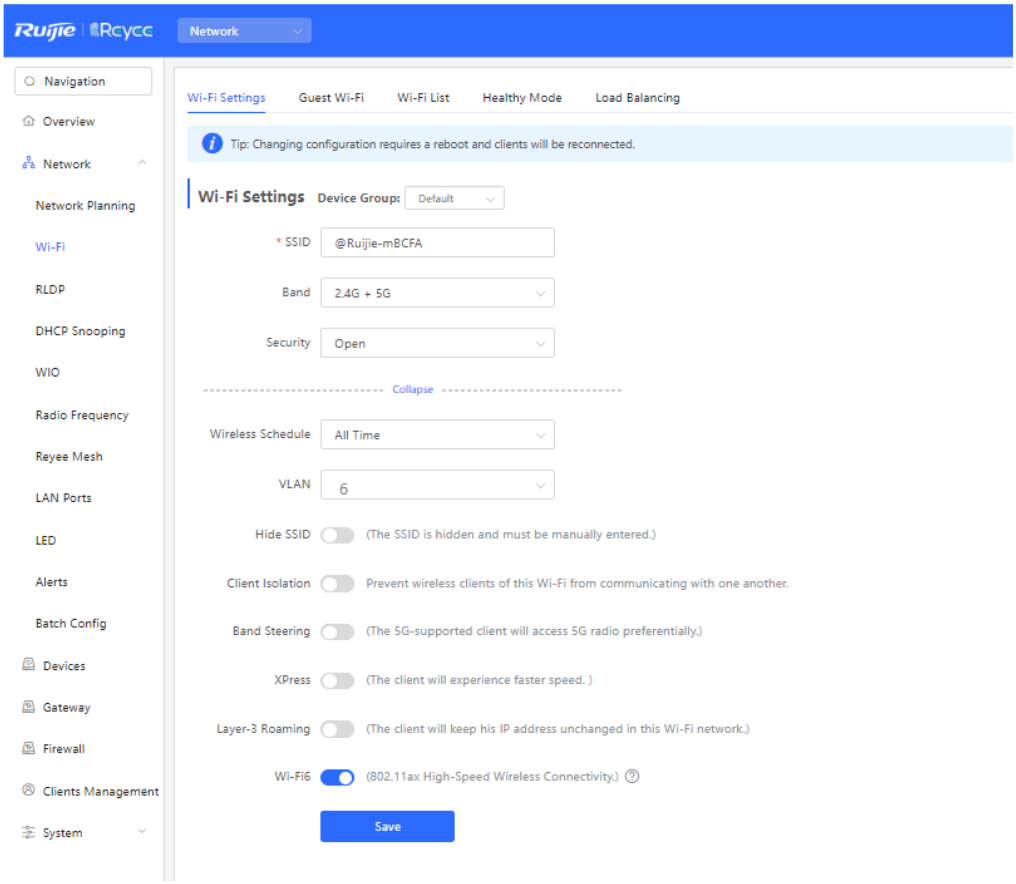


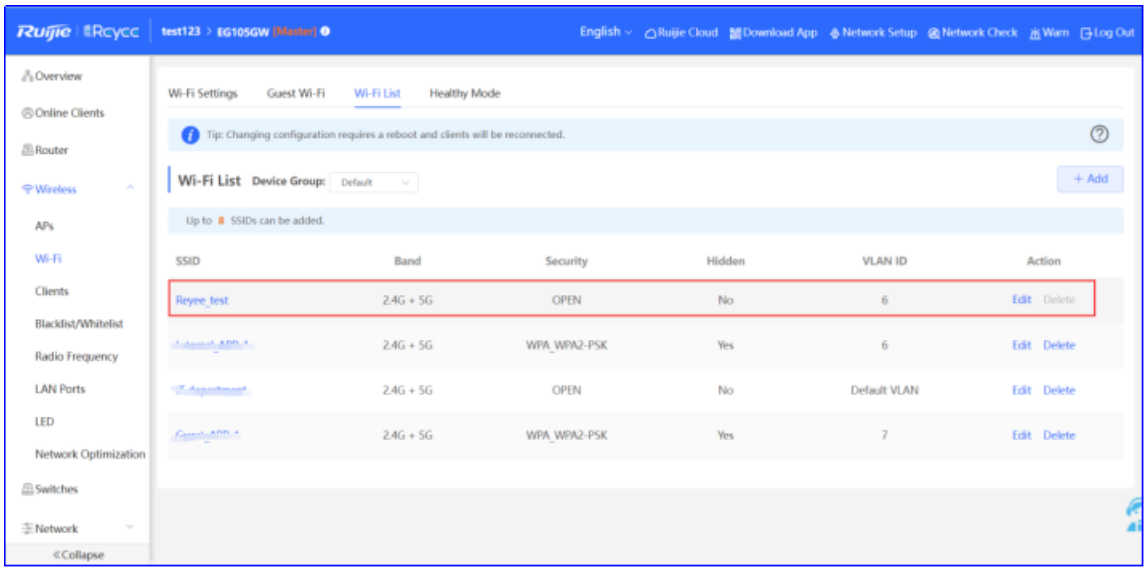
d In the **Port** pane, click **Edit**, configure port2 and port9 connected to the AP and EG as trunk ports and configure them to allow packets from VLAN 1 and VLAN 6 to pass through. Then check port settings on the switch.





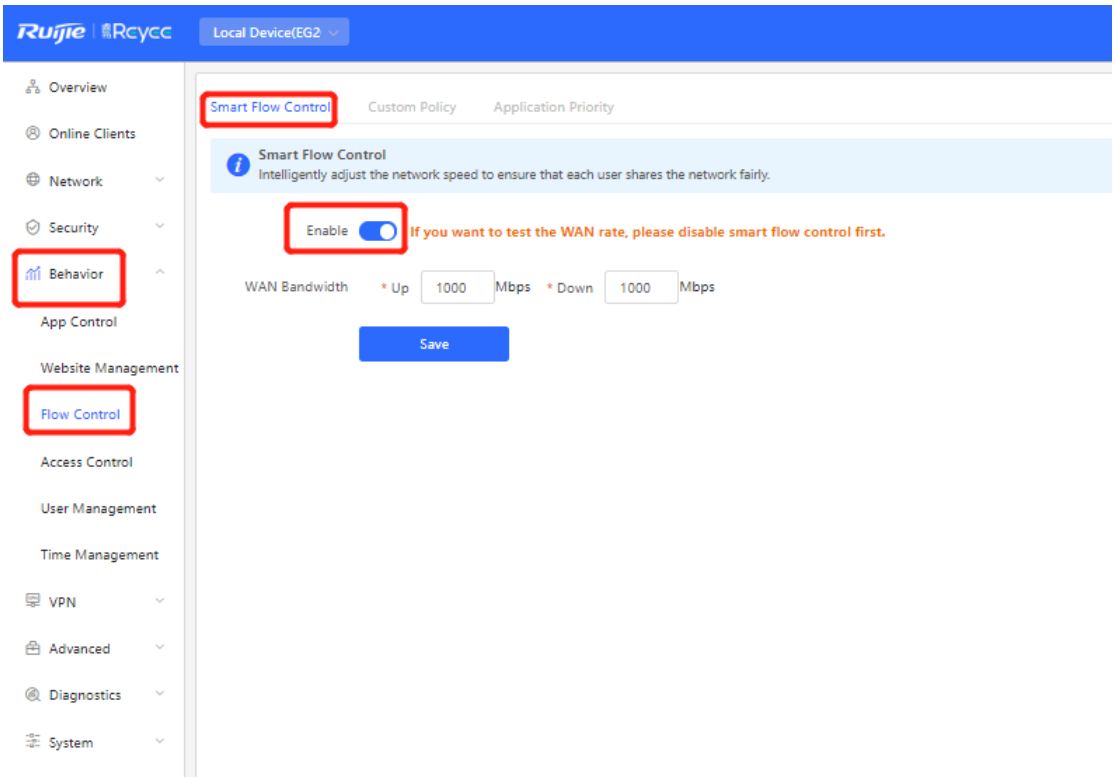
(3) Switch to the **Network** mode. Choose **Network** > **Wi-Fi** > **Wi-Fi Settings**, configure the SSID named **Reyee_test**, and associate VLAN 6 with this SSID.



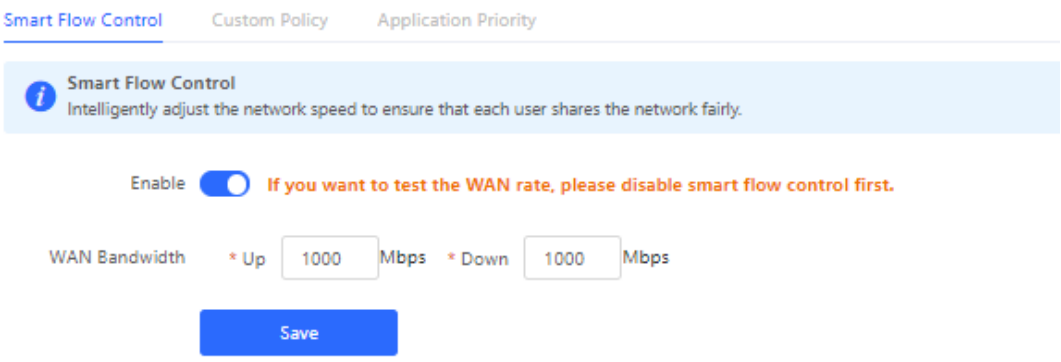


(4) Configure smart flow control.

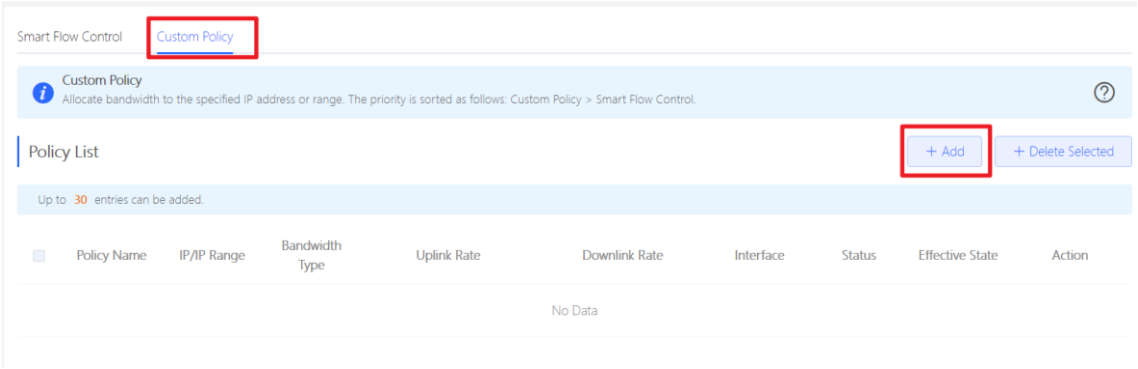
a Switch to the **Local** mode. Choose **Behavior** > **Flow Control** and enable **Smart Flow Control**.



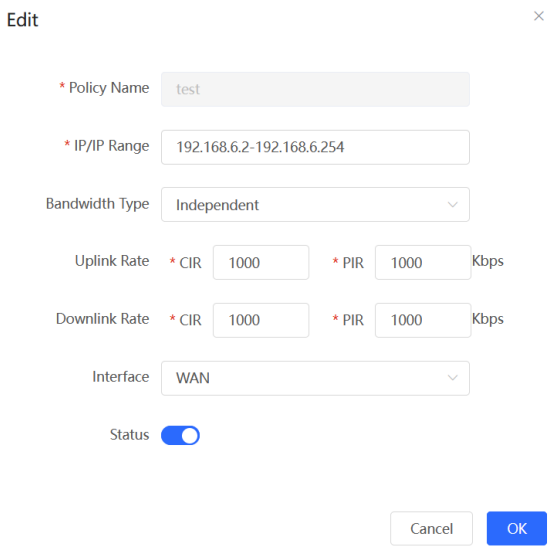
b Fill in the uplink and downlink WAN bandwidth as 100 Mbit/s and click **Save**.

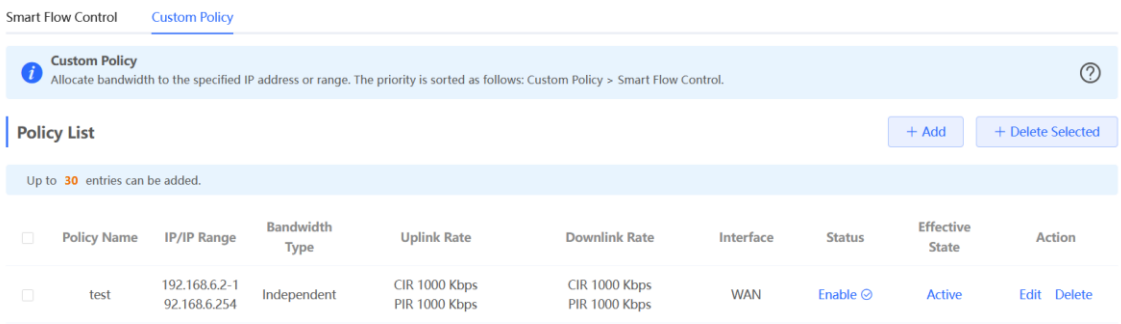


c After Step 2 is performed, **Custom Policy** will be displayed. Click **Add** to add a policy.



Set Policy Name, IP Range, Bandwidth Type, Rate, and other parameters.

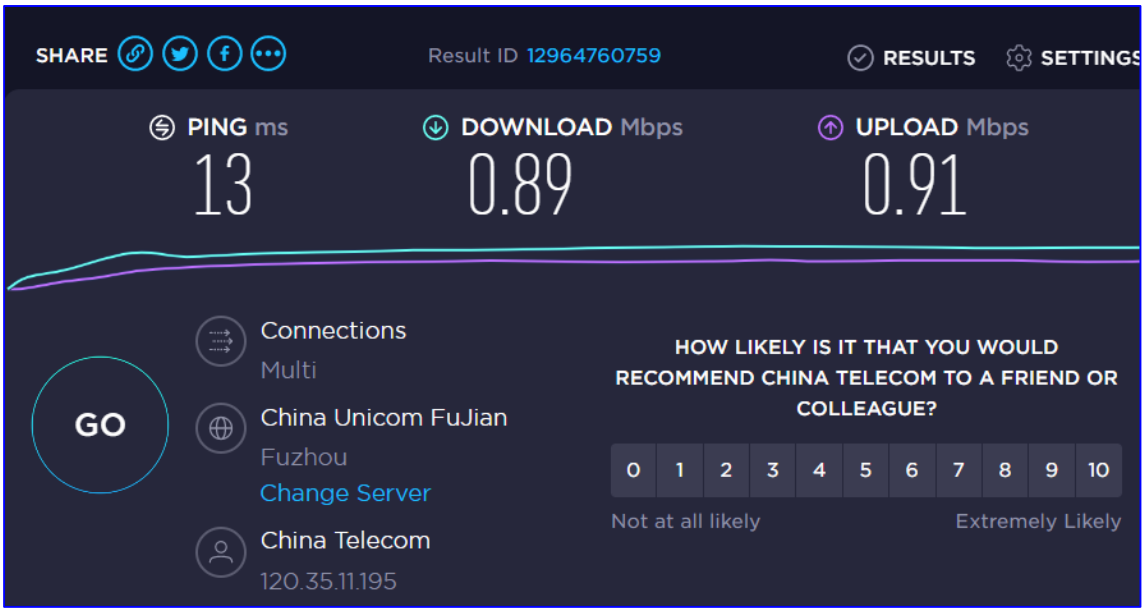




- **Bandwidth Type**
  - **Shared**: indicates that the total bandwidth is shared by all IP addresses.
  - **Independent**: indicates that the rate limit is set for each IP address.
- **CIR**: indicates the committed information rate.
- **PIR**: indicates the peak information rate.

5.1.3 Configuration Verification

Use Speed test tool to check that each user is limited up to 1 Mbit/s.



5.2 Reyee Cloud Authentication Solution

5.2.1 Working Principle

Cloud authentication allows you to control users' access to the wireless network. The configuration will be synchronized from Ruijie Cloud to the local EG. In portal authentication, all the clients' HTTP requests are redirected to an authentication page first. The clients are required for authentication, payment, acceptance of the end-user license agreement, acceptable use policy, survey completion, or other valid credentials, so they can visit the Internet after successful authentication.

5.2.2 Application Scenario

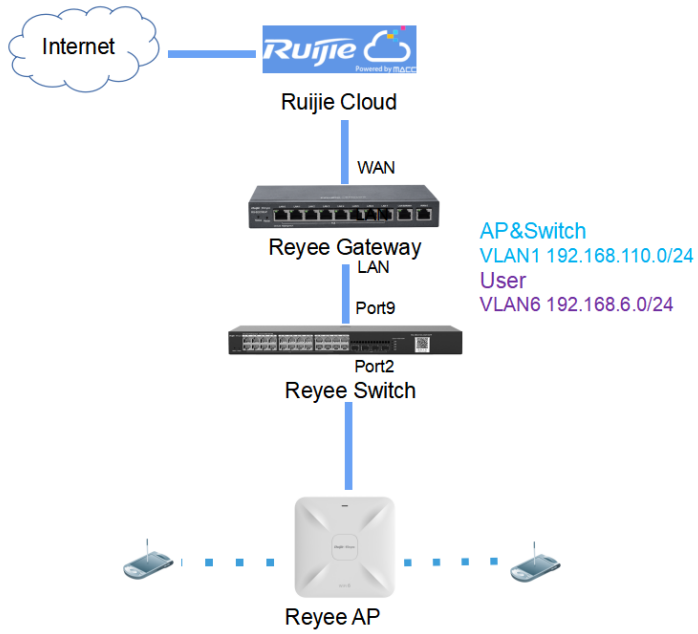
Portal authentication, also known as web authentication, is usually deployed in a guest-access network (such as a hotel or a coffee shop) to control clients' Internet access.

5.2.3 Configuration Example

Requirement

Users toned to be authenticated before accessing the Internet. Reyee AP does not support cloud authentication, and Reyee EG needs to authenticate users.

Network Topology



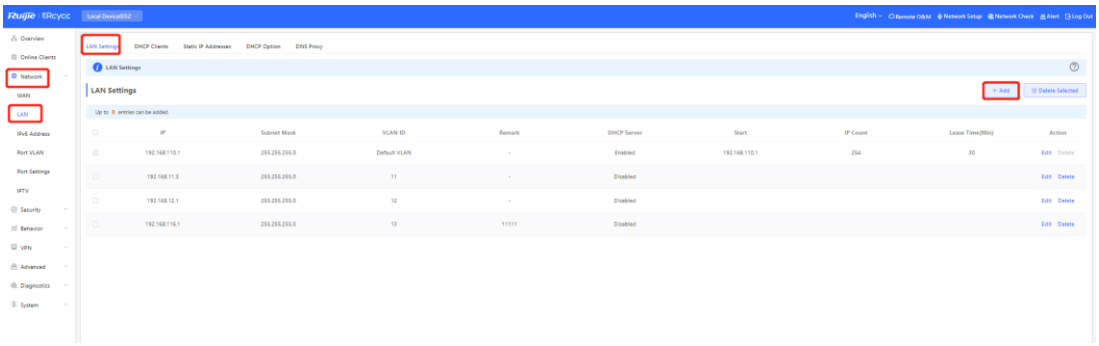
Network Description

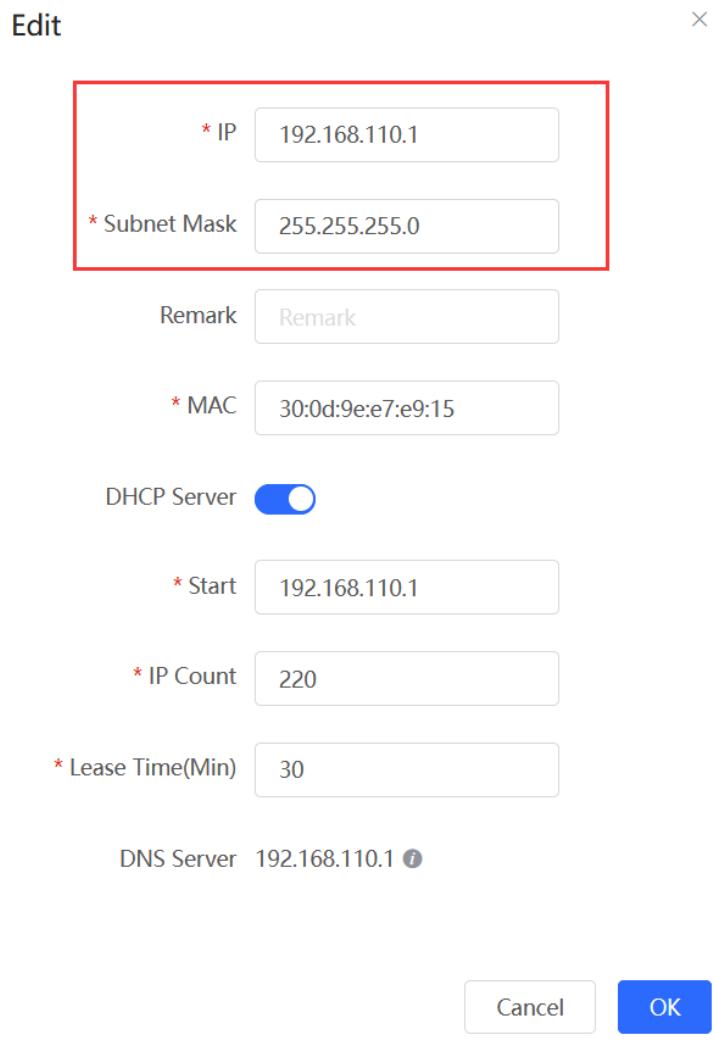
- The EG works as a DHCP server to assign IP addresses to users, Reyee AP, and Reyee switch.
- The Reyee AP and switch obtain the IP address 192.168.110.0/24 on the network segment of VLAN 1 for Internet access.
- Users obtain the IP address 192.168.6.0/24 on the network segment of VLAN 6 for Internet access.
- Ruijie Cloud manages and monitors the device and client status and provides captive authentication for clients.

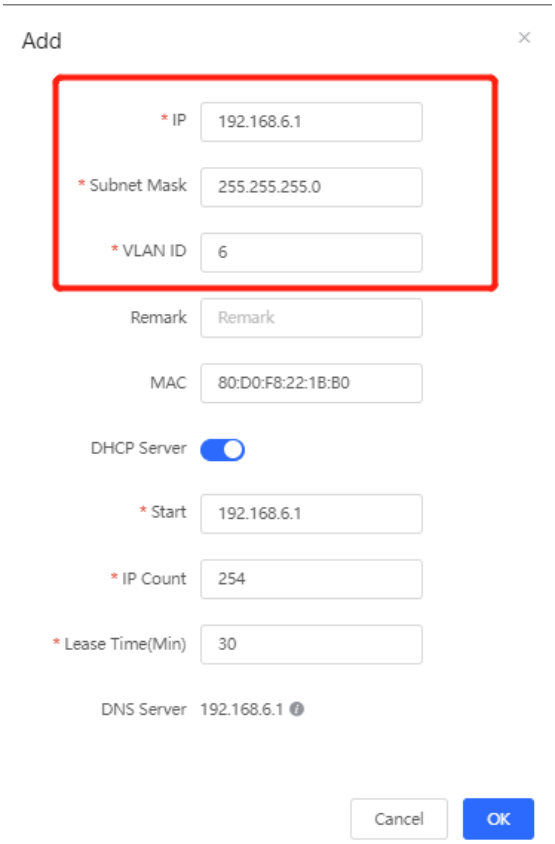
Configuration Steps

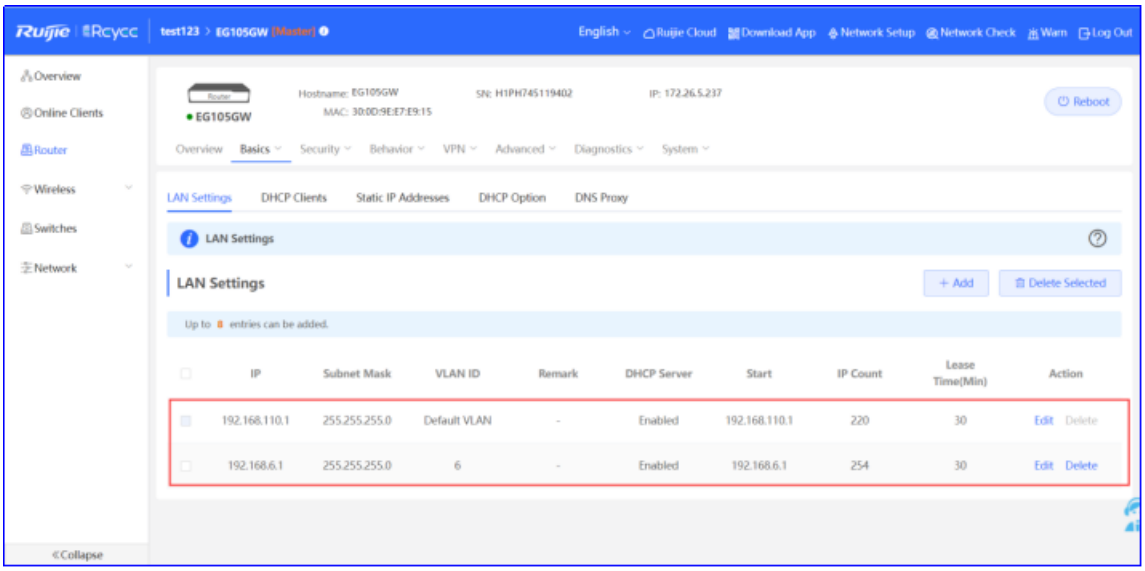
(1) Configure the basic network.

a Switch to the **Local** mode. Choose **Network** > **LAN** > **LAN Settings** > **Add**, and configure LAN settings and DHCP pool of VLAN 1 and VLAN 6 on the router.




Edit
* IP
192.168.110.1
* Subnet Mask
255.255.255.0
Remark
Remark
* MAC
30:0d:9e:e7:e9:15
DHCP Server
* Start
192.168.110.1
* IP Count
220
* Lease Time(Min)
30
DNS Server
192.168.110.1
Cancel
OK





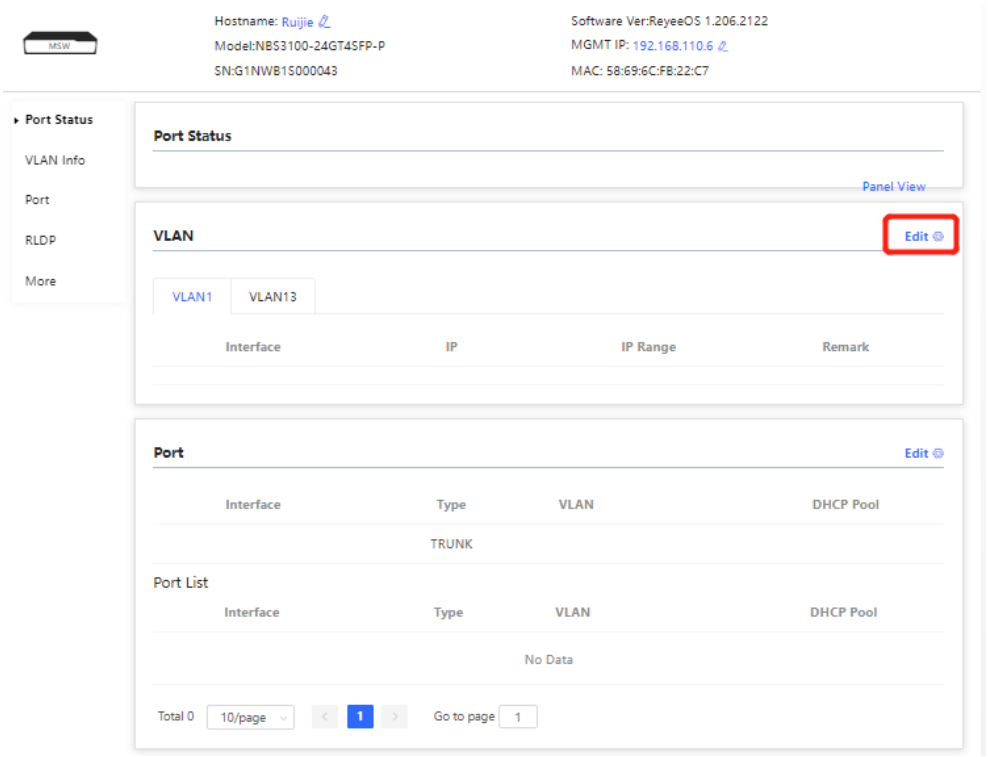
Caution

The network segment 192.168.110.0/24 is configured for VLAN 1.

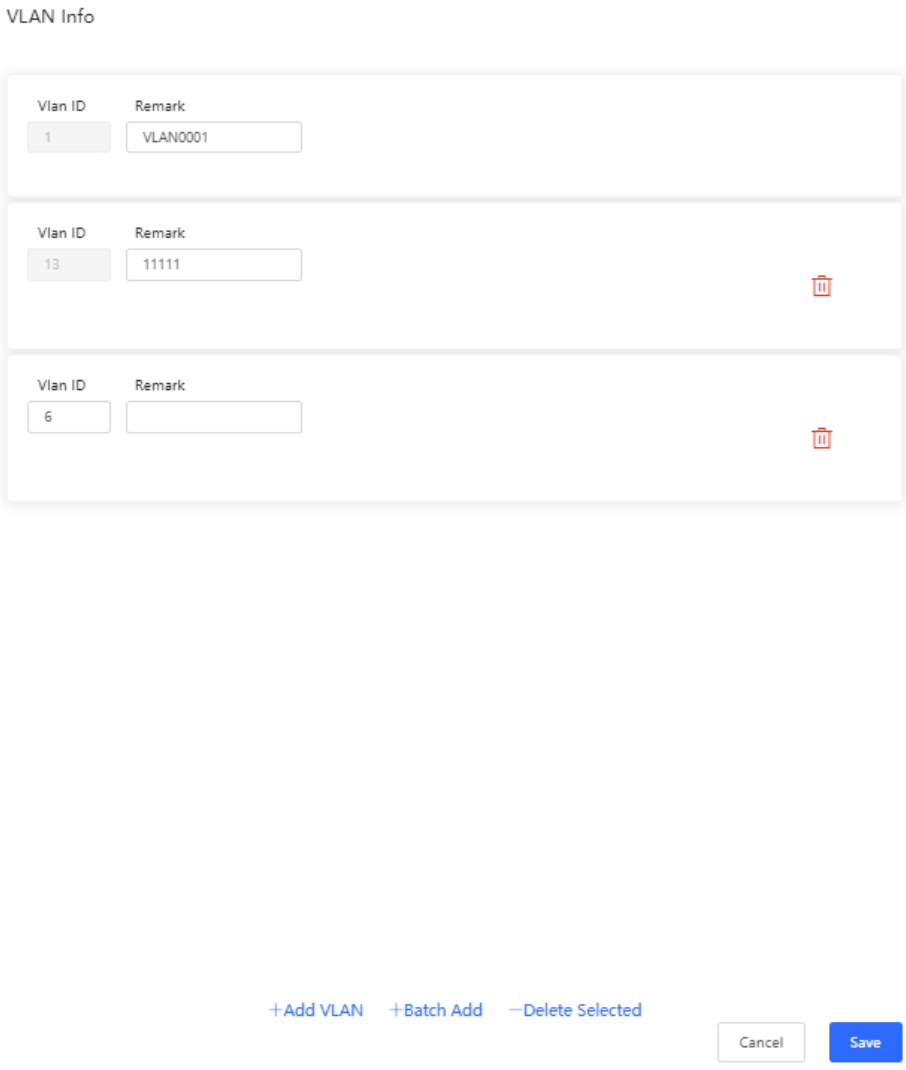
(2) Switch to the **Network** mode. Choose **Device** > **Switch**.

a Select a device from **Device List** and access the configuration page.

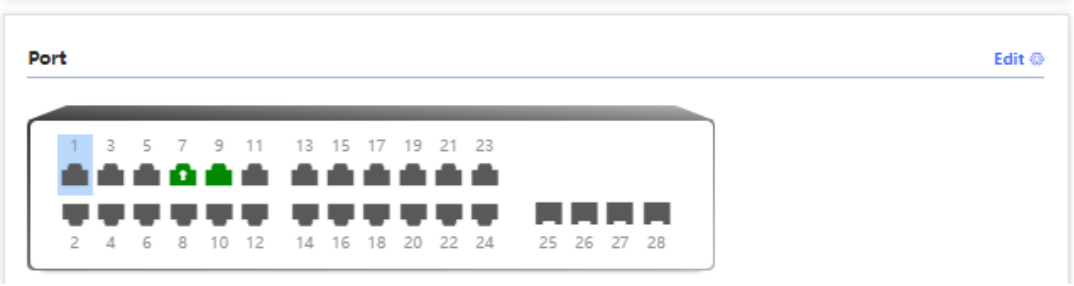
b In the **VLAN** pane, select a VLAN and click **Edit** to configure the VLAN.

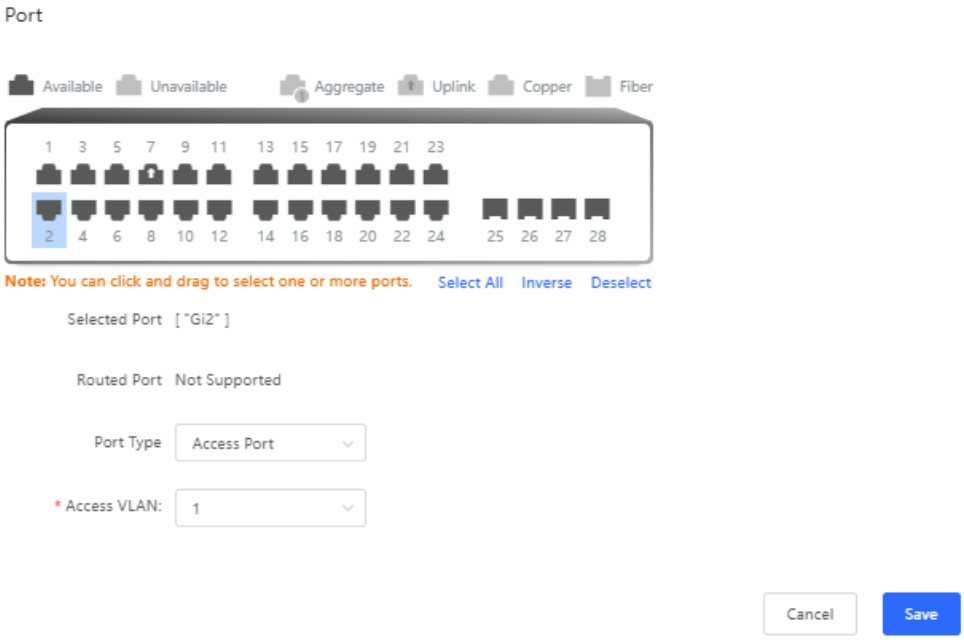


c Click **Add VLAN** to create VLAN 6 on the switch.

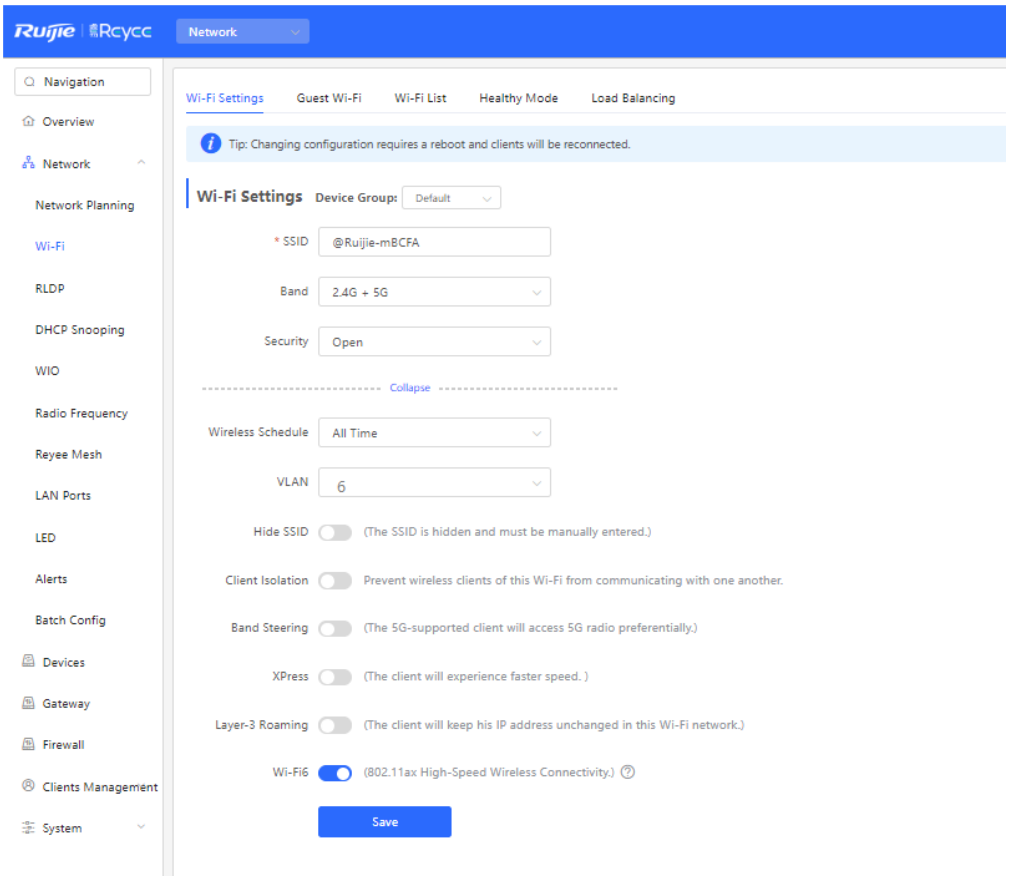


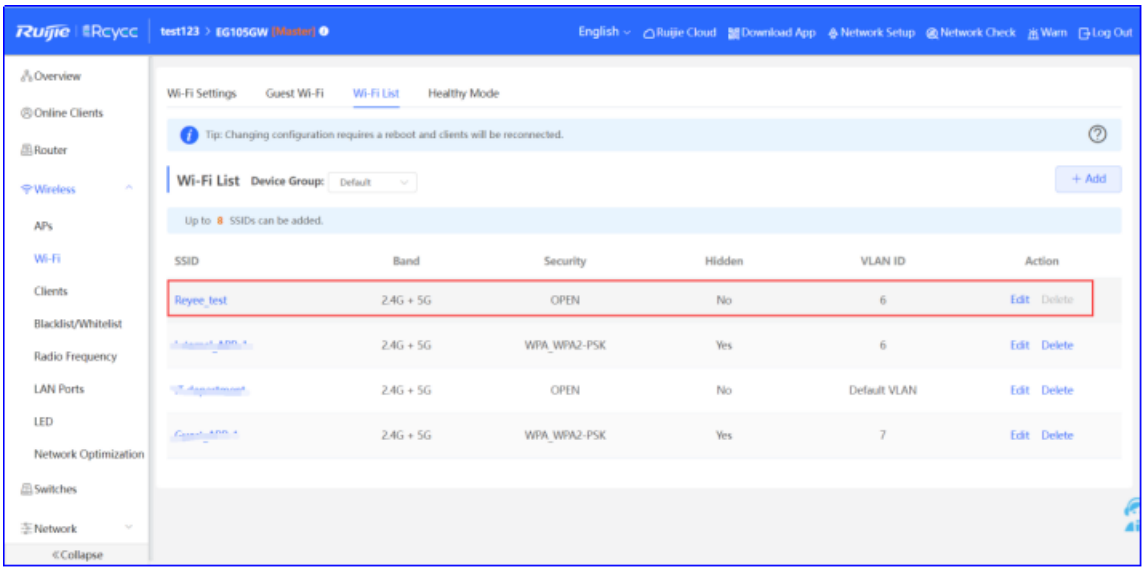
d In the **Port** pane, click **Edit**, configure port2 and port9 connected to the AP and EG as trunk ports and configure them to allow packets from VLAN 1 and VLAN 6 to pass through, and check port settings on the device.





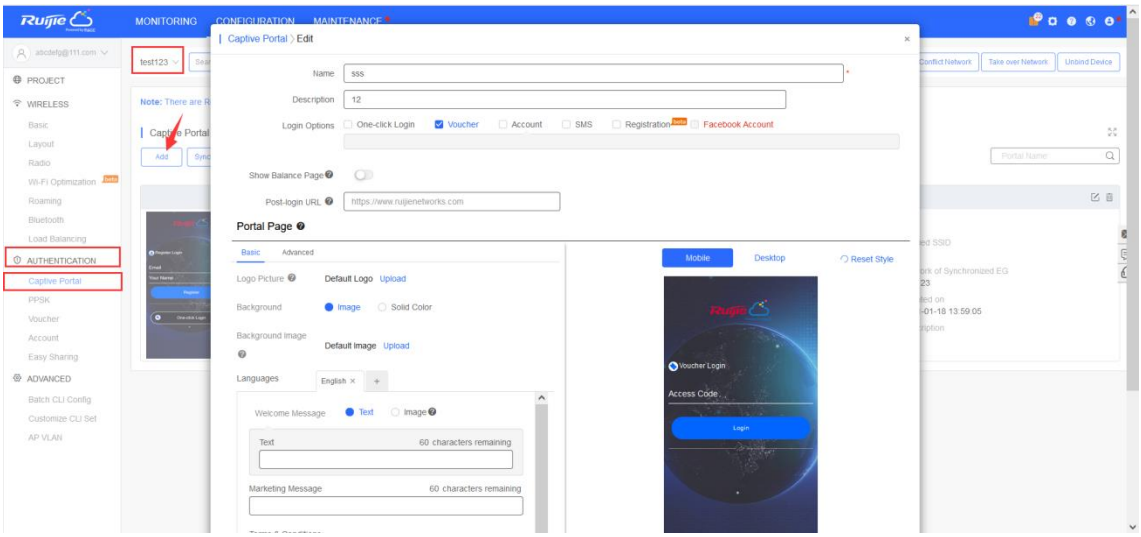
(3) Switch to the **Network** mode. Choose **Network> Wi-Fi > Wi-Fi Settings**, and configure the SSID named **Reyee_test** and associate VLAN 6 with this SSID.

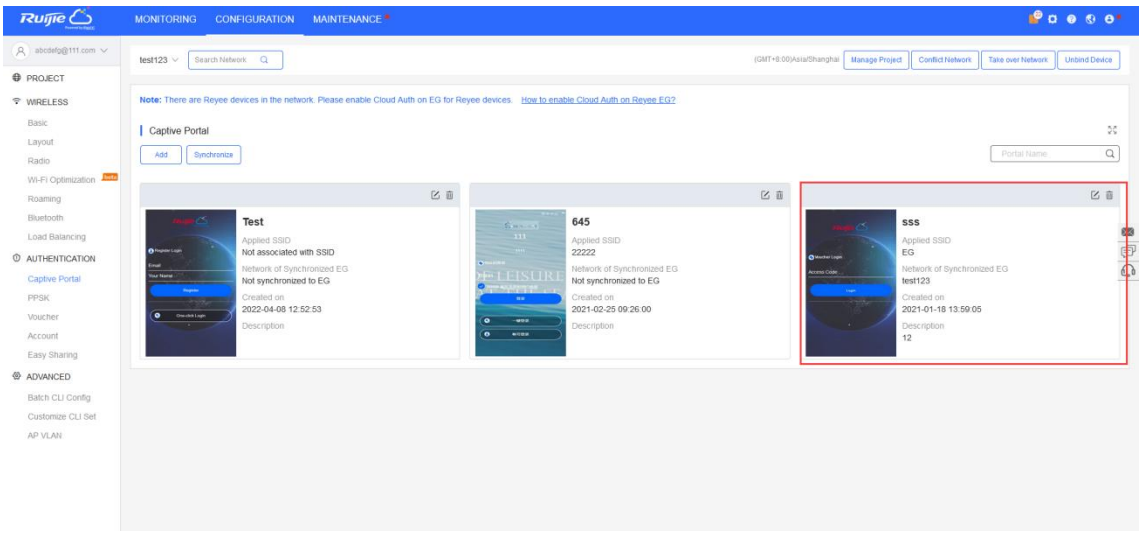




(4) Configure cloud authentication.

a Choose **CONFIGURATION** > **AUTHENTICATION** > **Captive Portal** to access the captive portal page, and click **Add** to create a portal template and edit the captive portal template.





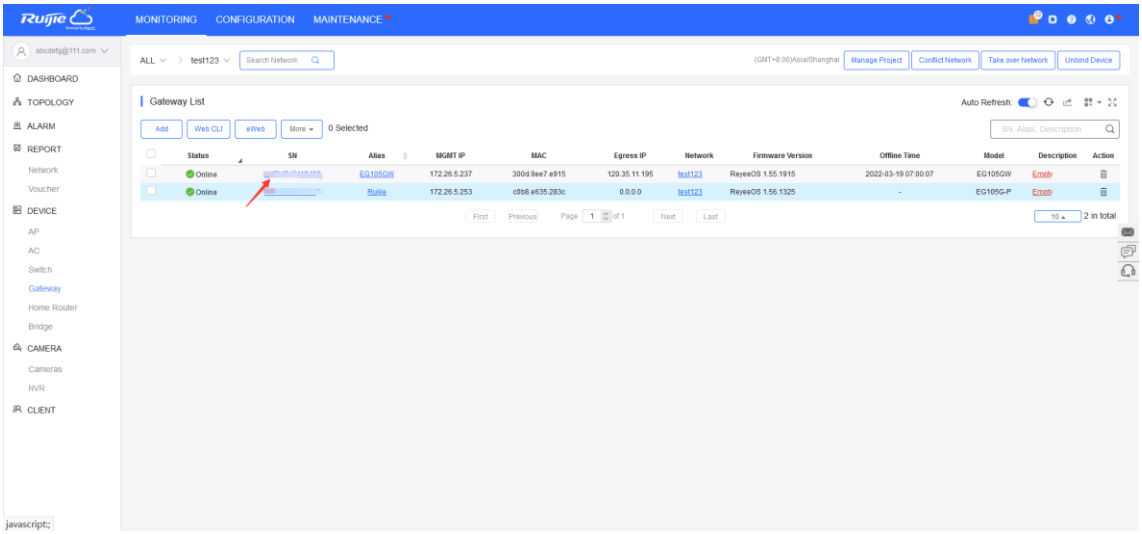
Note

One-click Login: indicates login without the username and password. **Access Duration** and **Access Times per day** can be configured.

Voucher: indicates login with a random eight-digit password.

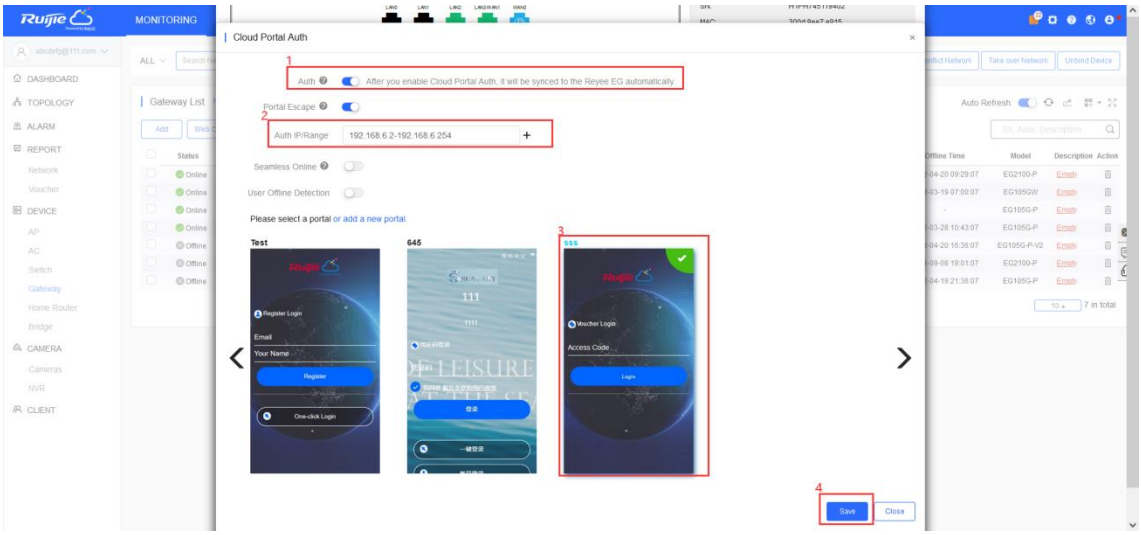
Account: indicates login with the account and password.

b Make sure that the Reyee EG is online on Ruijie Cloud. Click its SN in the list to access the configuration page.



c Click **Cloud portal Auth** to configure authentication on Ruijie Cloud.

d Enable **Auth**, and set **Auth IP Range** to **192.168.6.2-192.168.6.254** for authentication, and select a portal template to be used. Then click **Save** to save all configurations.

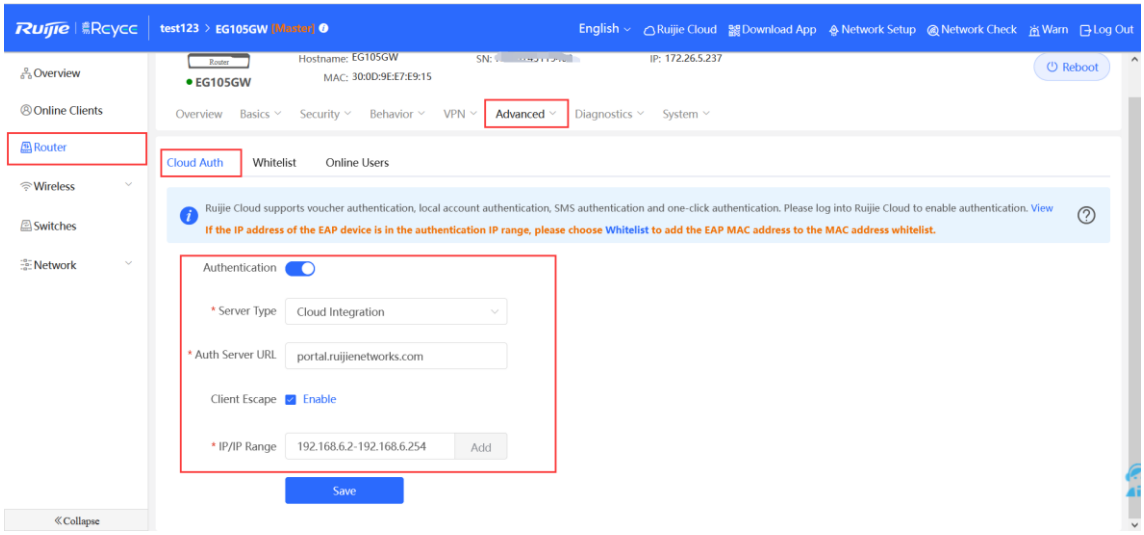


Note

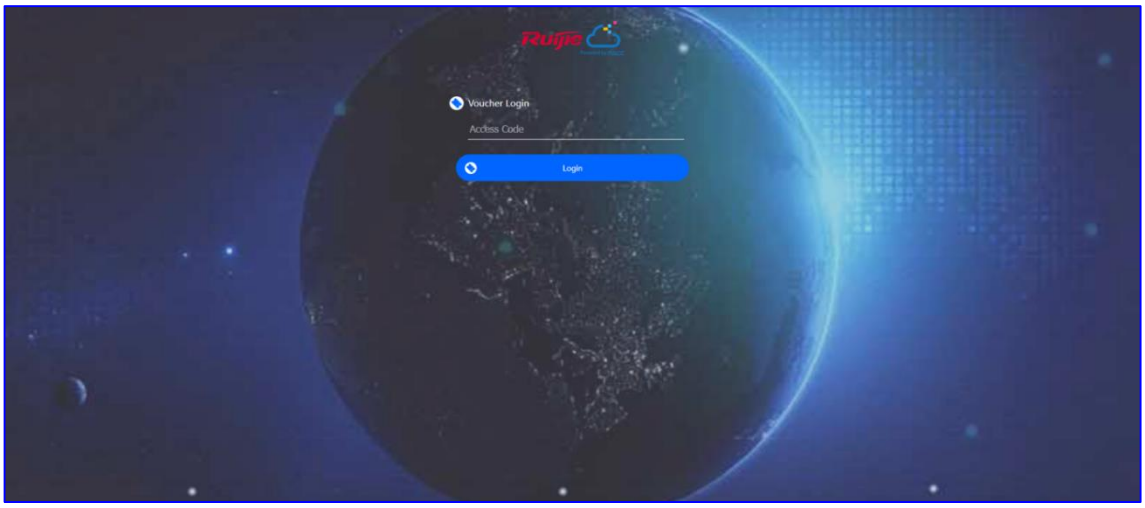
IP addresses of the EG, switch, and AP need to be excluded; otherwise, the switch cannot access the Internet.

5.2.4 Configuration Verification

(1) Choose **Advanced** > **LAN** > **Authentication** > **Cloud Auth** to check whether the configuration has been synchronized to the EG.



(2) Users whose IP addresses are in the range of 192.168.6.2 to 192.168.6.254 need to be authenticated before accessing the Internet.



5.3 Reyee Guest Wi-Fi Solution

5.3.1 Working Principle

A single Internet entrance is created by using guest Wi-Fi. The devices that are allowed to access guest Wi-Fi can access the Internet but cannot access the home Wi-Fi.

5.3.2 Application Scenario

Guest Wi-Fi provides a secured Wi-Fi access for guests to share your home or office network. When someone visits your house, apartment, or workplace, you can enable the guest Wi-Fi for them. You can set different access options for guest users, which is very effective to ensure the security and privacy of your main network.

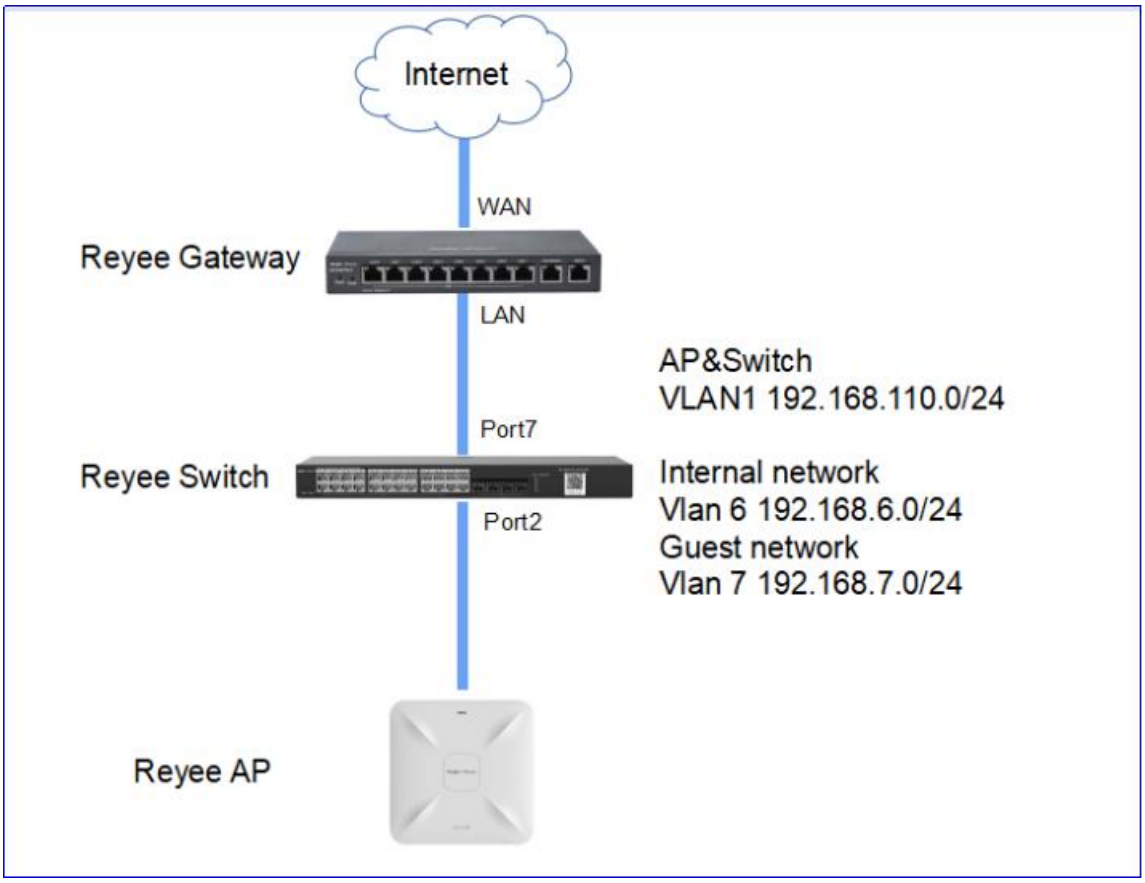
5.3.3 Configuration Example

1. Configuration Through EG's Eweb

Requirement

Guest Wi-Fi is configured for guests on the network segment of VLAN 7 and the guests are not allowed to access the internal network on the network segment of VLAN 6.

Network Topology



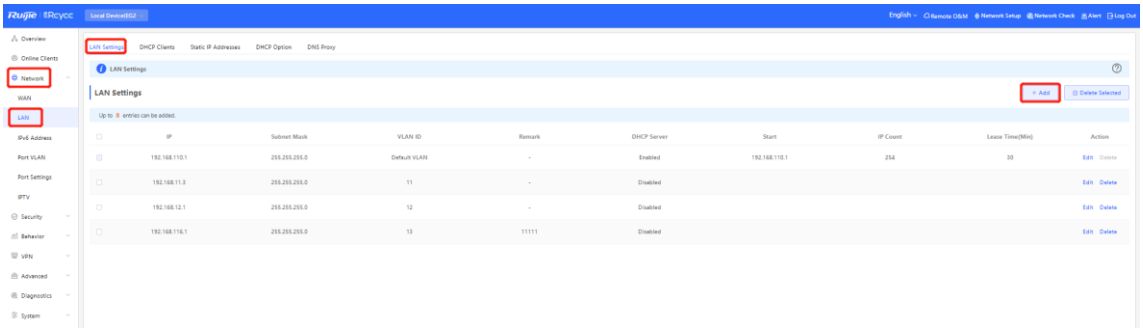
Network Description

- The EG works as a DHCP server to assign IP addresses to users, Reyee AP, and Reyee switch.
- The Reyee AP and switch obtain the IP address on the network segment of VLAN 1 for Internet access.
- Internal users obtain IP addresses in the network segment of VLAN 6 for Internet access and guests obtain IP addresses on the network segment of VLAN 7 for Internet access

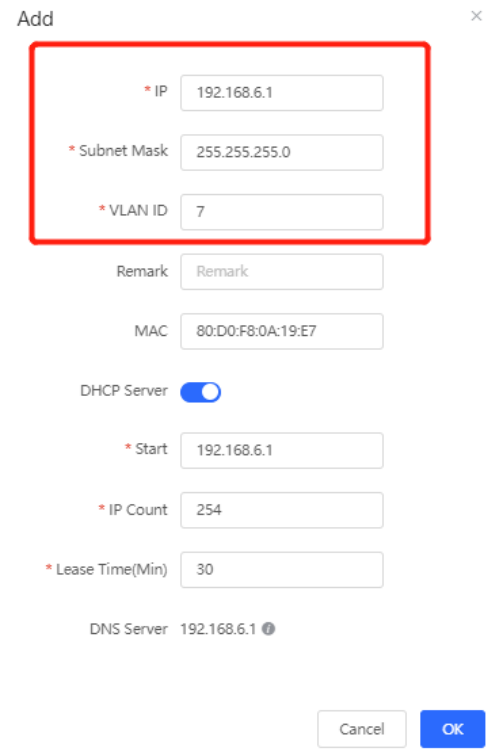
Configuration Steps

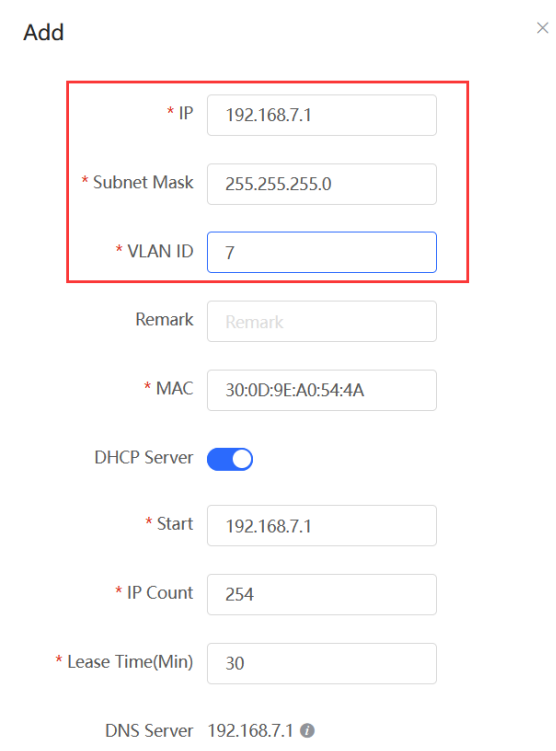
(1) Configure VLAN 6 and VLAN 7 on the router.

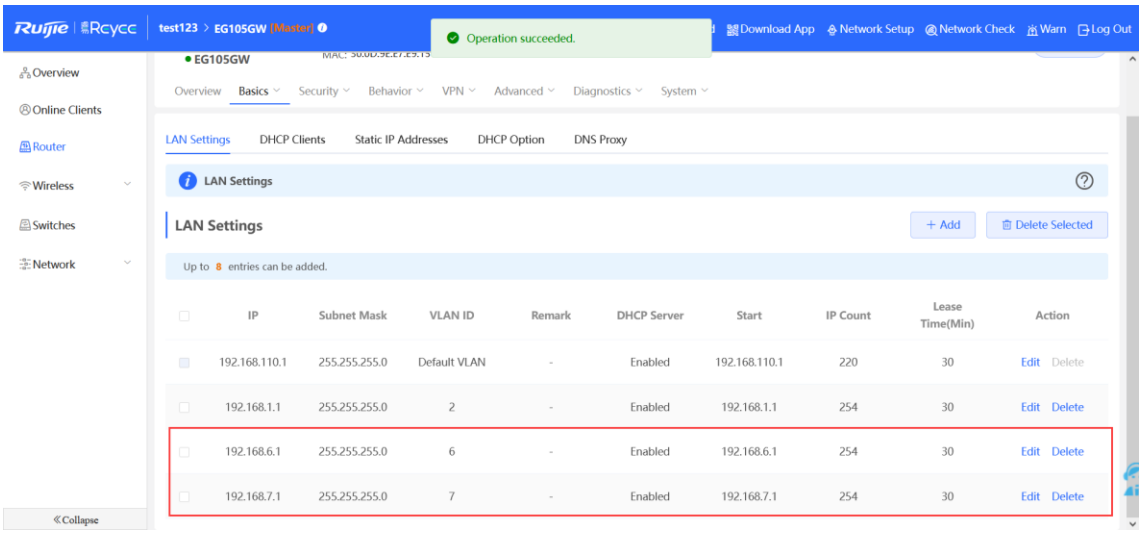
a Switch to the **Local** mode. Choose **Network** > **LAN** > **LAN Settings** >**Add**.



b Perform LAN settings and configure DHCP address pools of VLAN 6 and VLAN 7 on the router.


Add
* IP
192.168.6.1
* Subnet Mask
255.255.255.0
* VLAN ID
7
Remark
Remark
MAC
80:D0:F8:0A:19:E7
DHCP Server
* Start
192.168.6.1
* IP Count
254
* Lease Time(Min)
30
DNS Server
192.168.6.1
Cancel
OK


Add
* IP
192.168.7.1
* Subnet Mask
255.255.255.0
* VLAN ID
7
Remark
Remark
* MAC
30:0D:9E:A0:54:4A
DHCP Server
* Start
192.168.7.1
* IP Count
254
* Lease Time(Min)
30
DNS Server
192.168.7.1

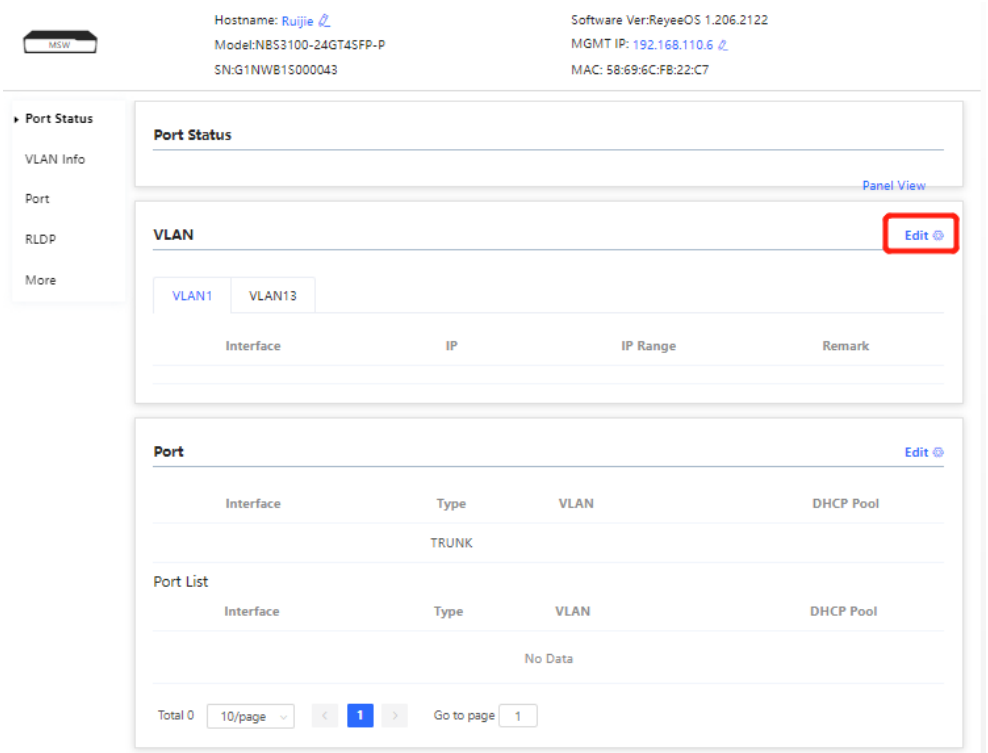


(2) Configure VLANs for a switch.

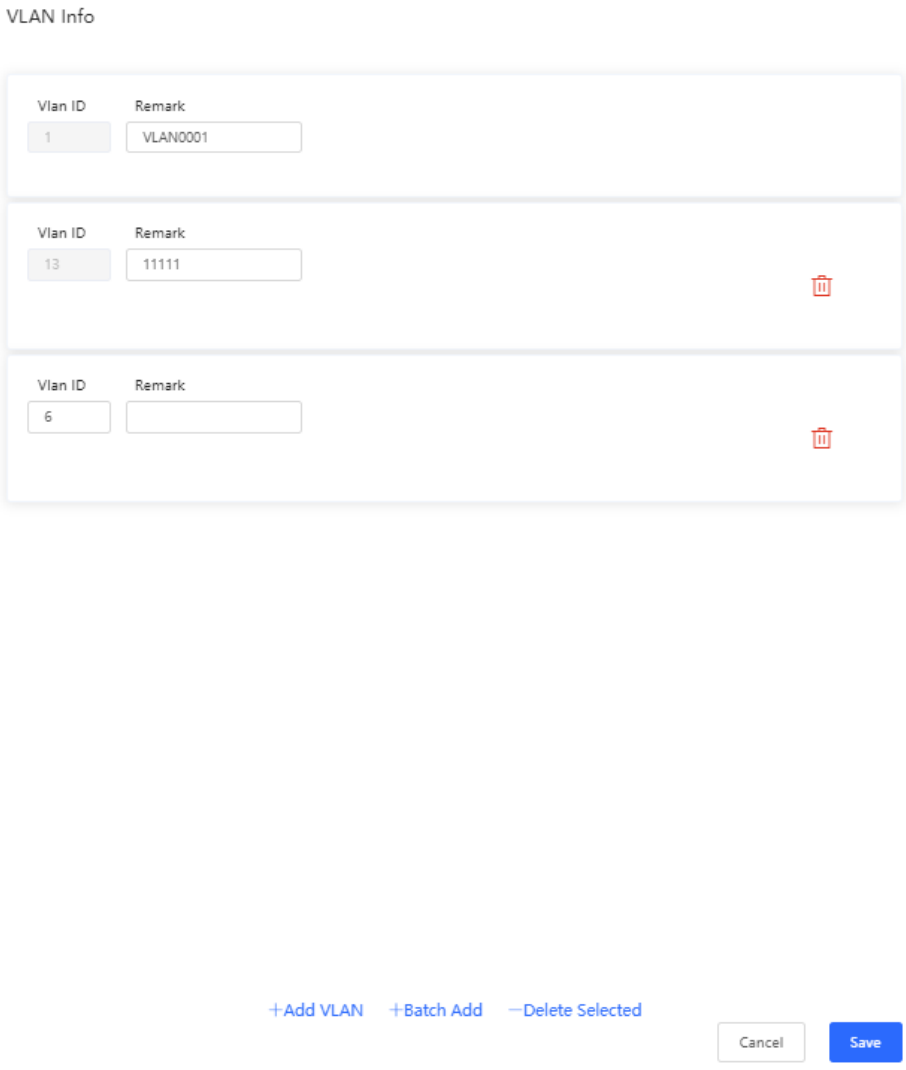
a Switch to the **Network** mode. Choose **Device** > **Switch**.

b Select a device from **Device List** and access the configuration page.

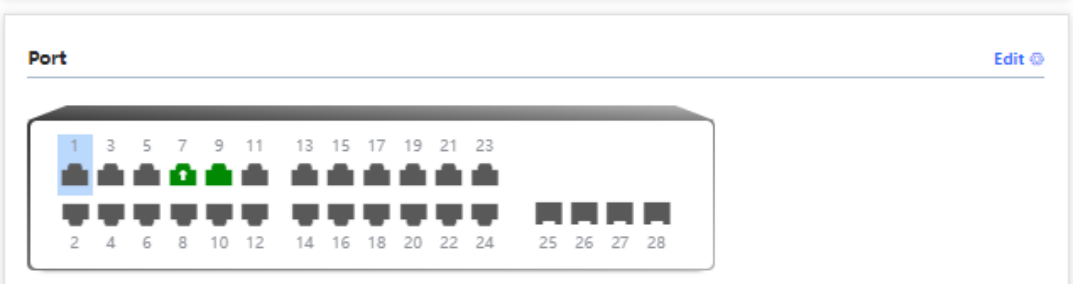
c In the **VLAN** pane, select a VLAN and click **Edit** to configure the VLAN.

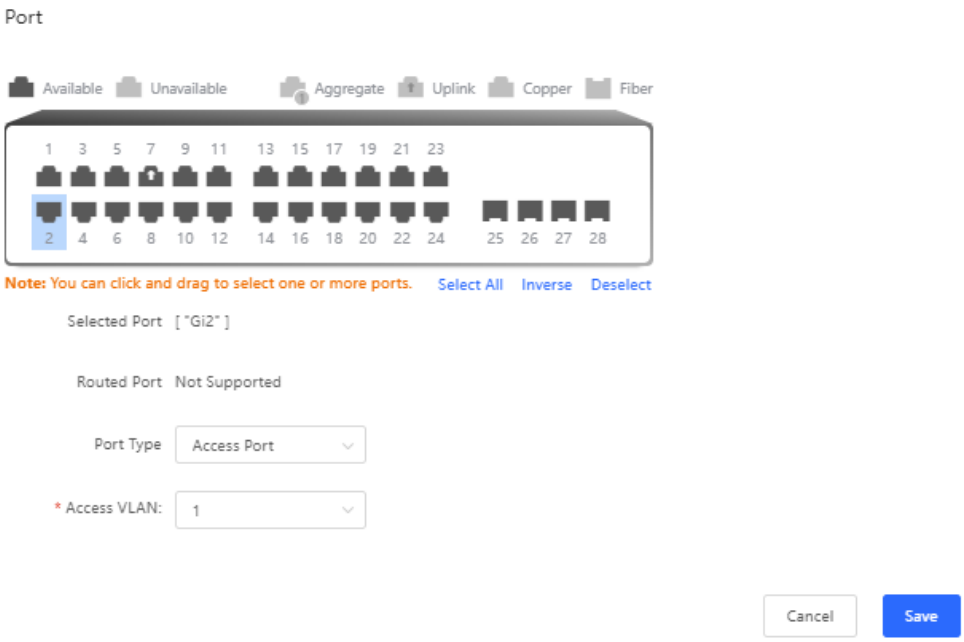


d Click **Add VLAN** to create VLAN 6 on the switch.

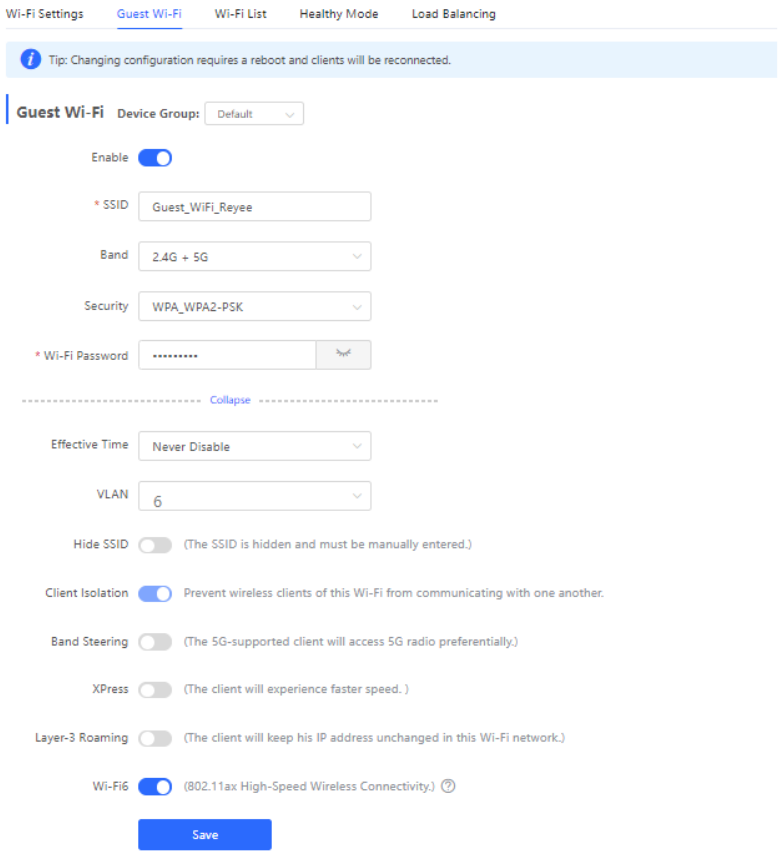


e In the **Port** pane, click **Edit**, configure port2 and port9 connected to the AP and EG as trunk ports and configure them to allow packets from VLAN 1 and VLAN 6 to pass through, and check port settings on the device.

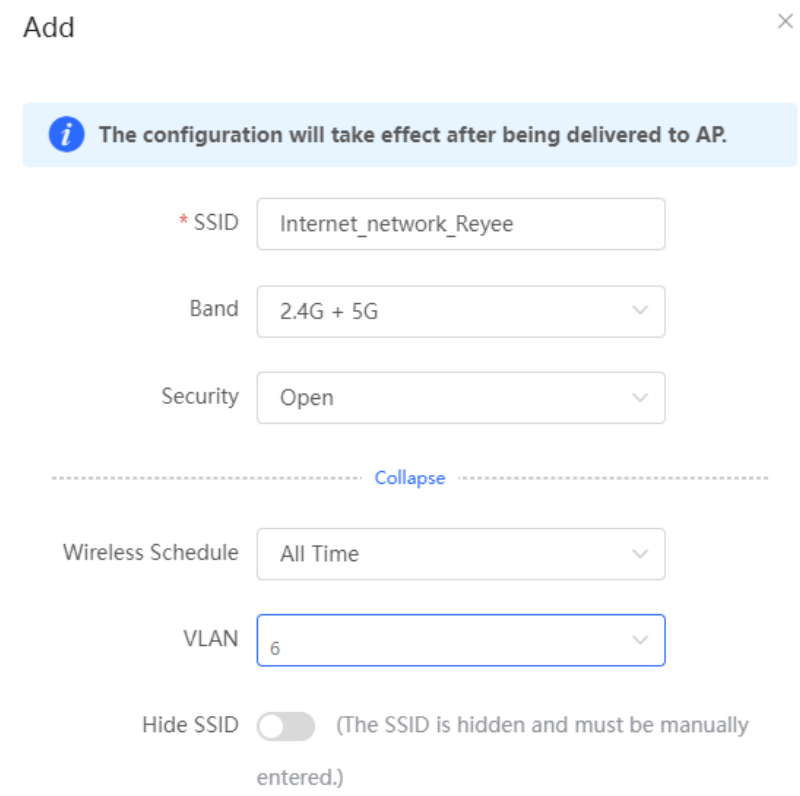


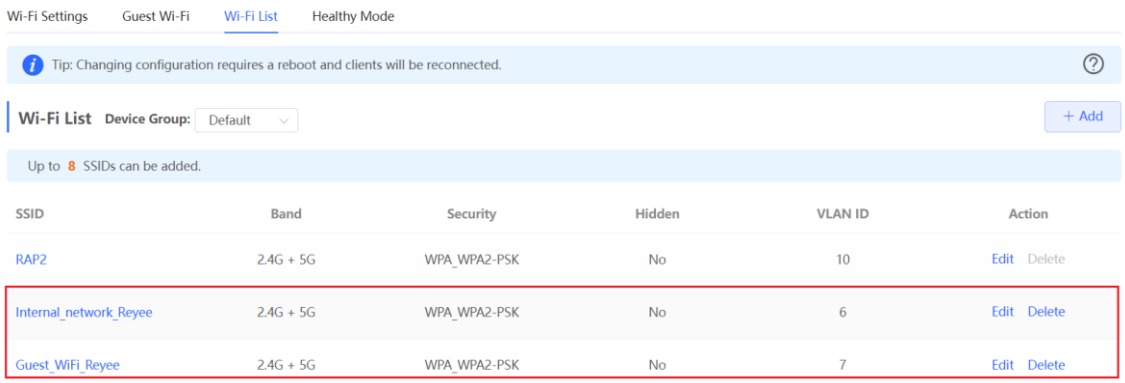


(3) Switch to the **Network** mode. Choose **Network > Wi-Fi > Guest Wi-Fi**, and configure a guest Wi-Fi SSID named **Guest_Wi-Fi_Reyee** and associate VLAN 7 with this SSID.

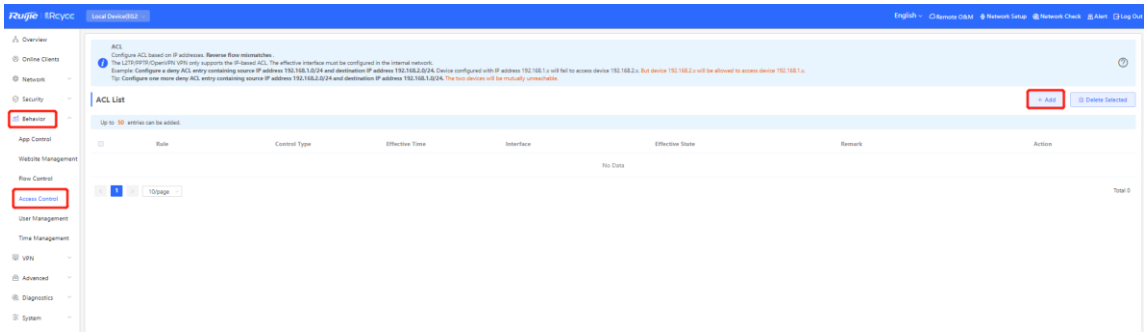


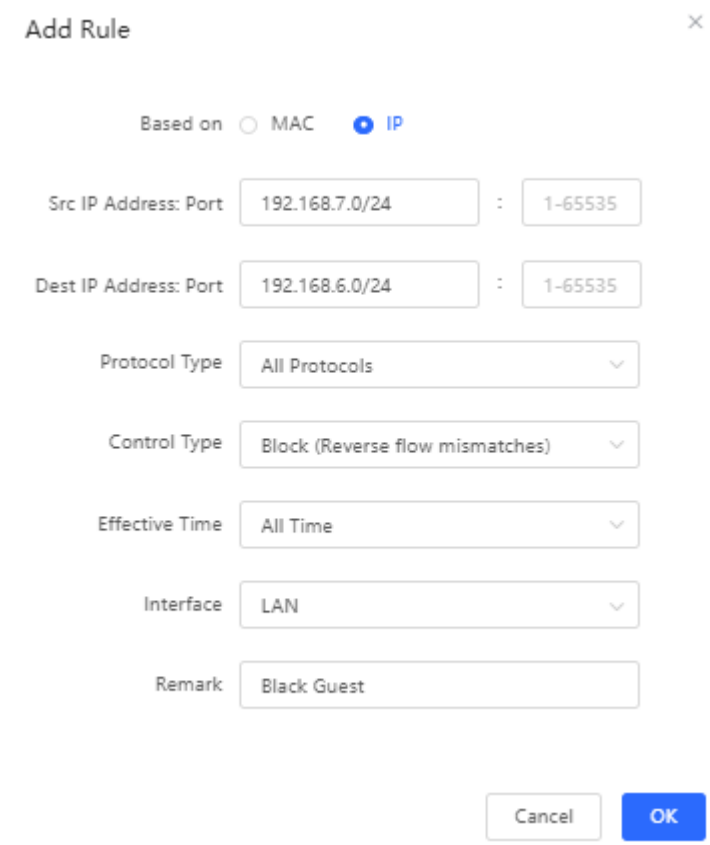
(4) Choose **Network** > **Wi-Fi** > **Wi-Fi List** > **Add**, configure the internal user SSID named **Internal_network_Reyee**, associate VLAN 6 with this SSID, and check Wi-Fi settings in the Wi-Fi list.

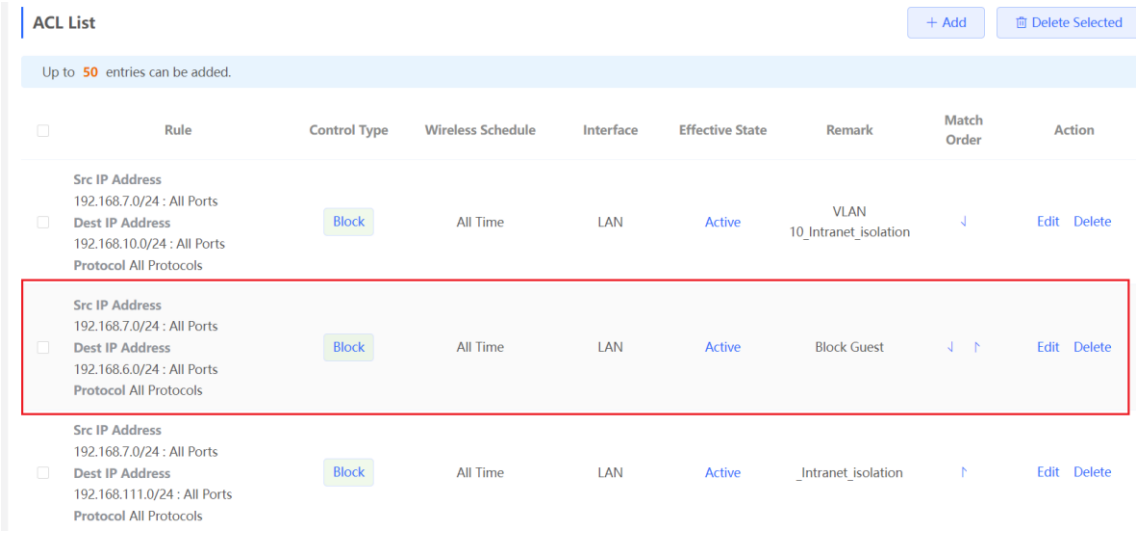




(5) Switch to the **Local** mode. Choose **Behavior** > **Access Control**, configure an ACL to block traffic from guests on the network segment 192.168.7.0/24 of VLAN 7 to internal users on the network segment 192.168.6.0/24 of VLAN 6, and apply the ACL rule to the LAN interface on the EG.







Configuration Verification

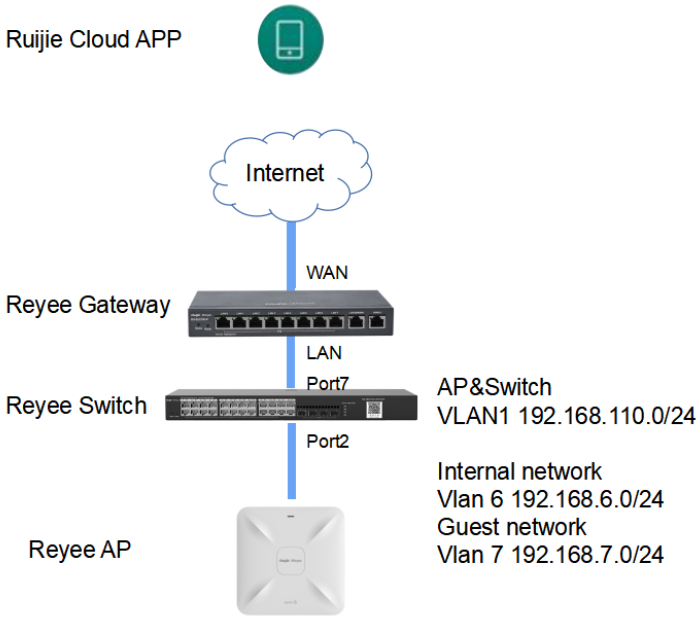
A guest at 192.1687.2 cannot access the internal network user at 192.168.6.2.

2. Configuration Through Ruijie Cloud APP

Requirement

Guest Wi-Fi through Ruijie Cloud App is configured for guests on the network segment of VLAN 7, who cannot access the internal network on the network segment of VLAN 6. Ruijie Cloud App will deliver the corresponding configuration to the device automatically.

Network Topology

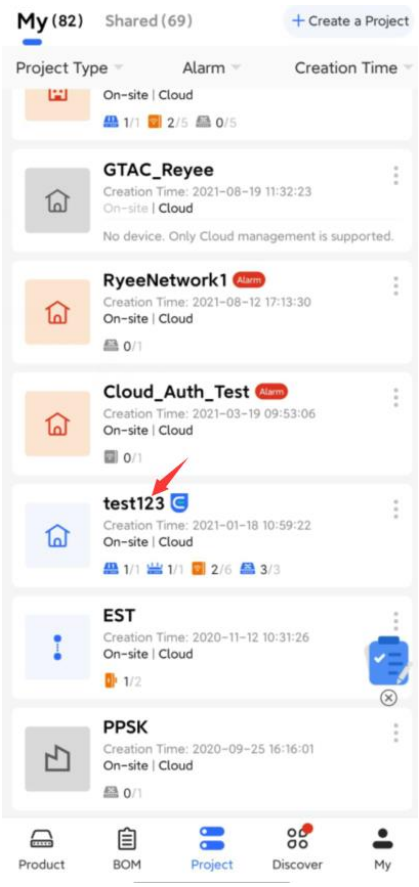


Network Description

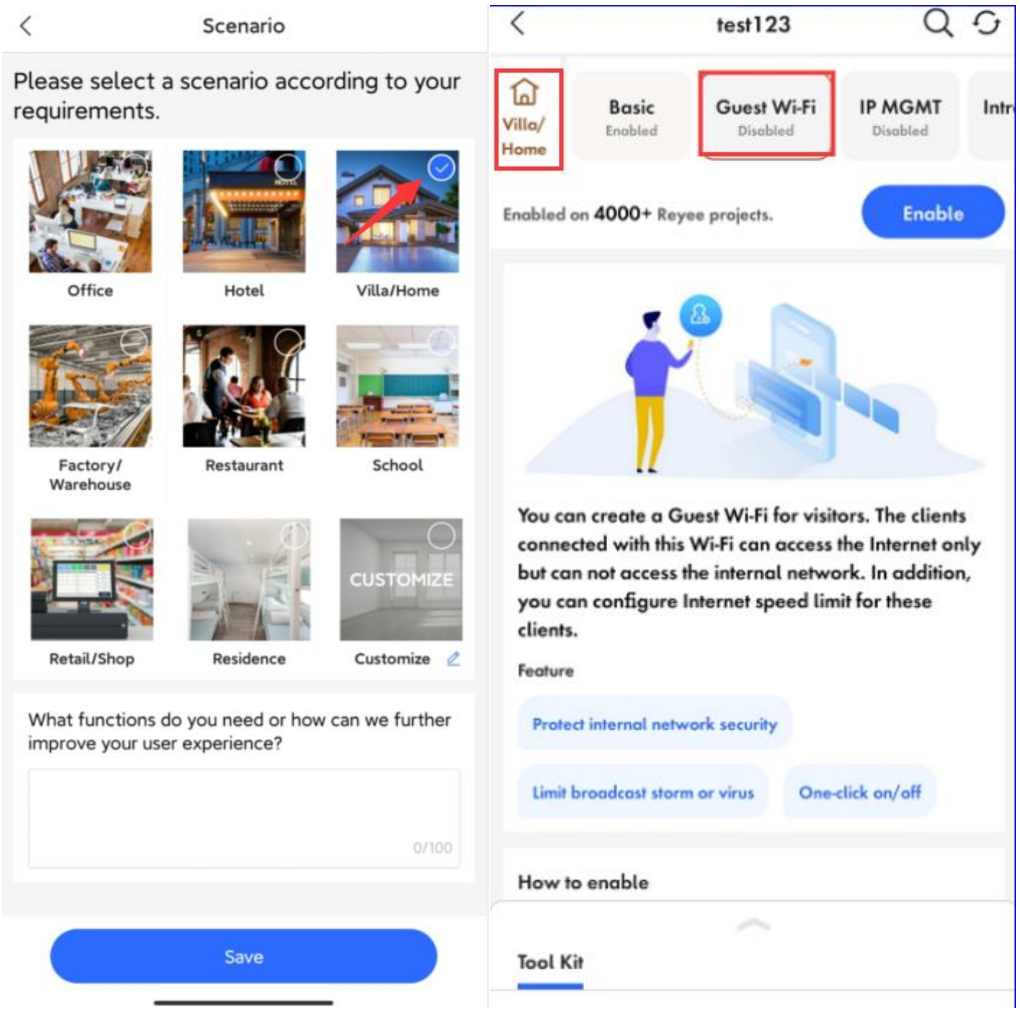
- The EG works as a DHCP server to assign IP addresses to users, Reyee AP, and Reyee switch.
- The Reyee AP and switch obtain IP addresses on the network segment of VLAN 1 for Internet access.
- Internal users obtain IP addresses on the network segment of VLAN 6 for Internet access and guests obtain IP addresses on the network segment of VLAN 7 for Internet access.

Configuration Steps

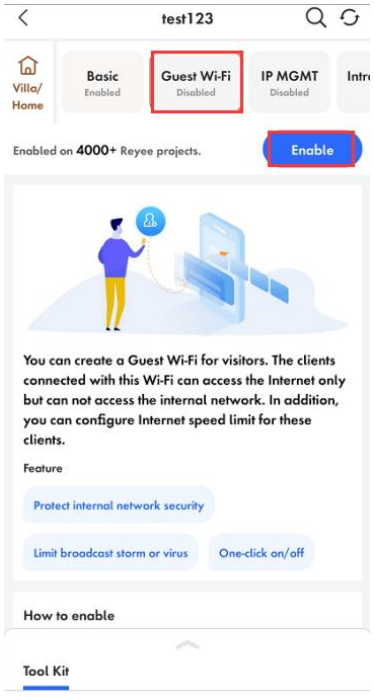
(1) Log in to your Ruijie Cloud App on the smartphone and access the project with Reyee router and RAP.



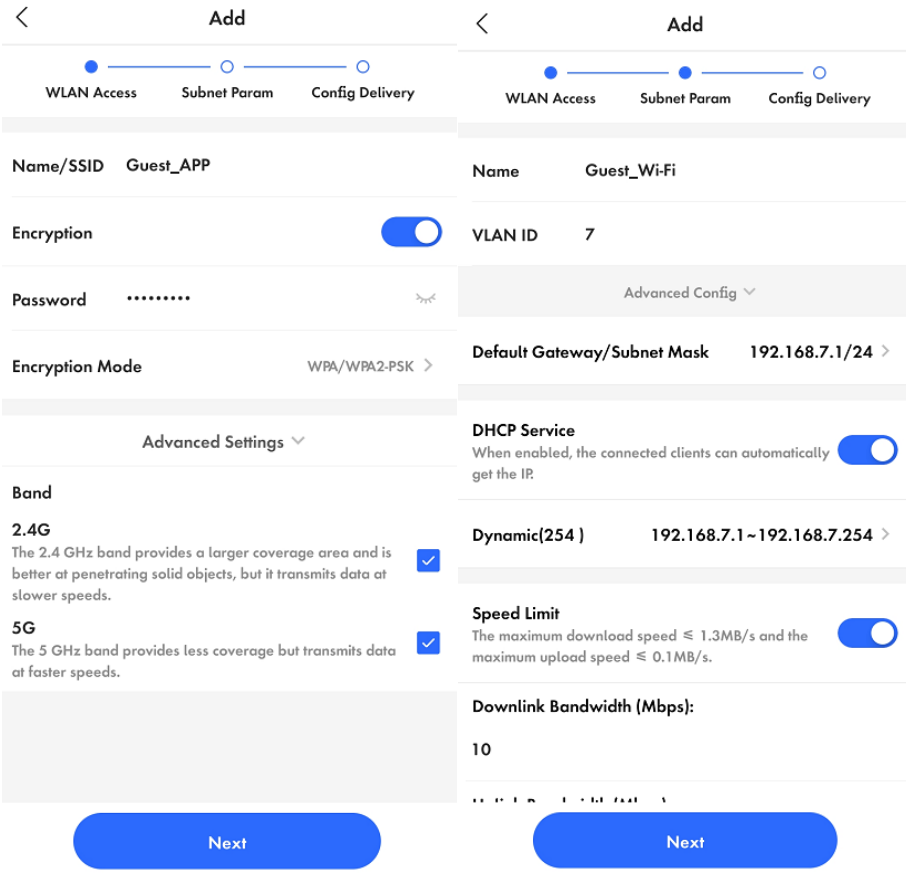
(2) Select **Villa/Home** under **Scenario**. You can see the **Guest Wi-Fi** button.



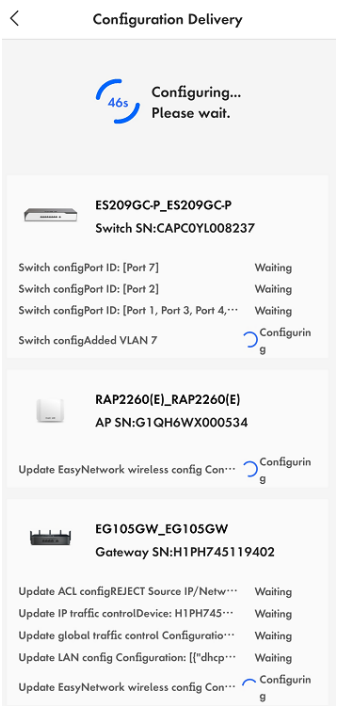
(3) Select **Guest Wi-Fi** and click **Enable** button.

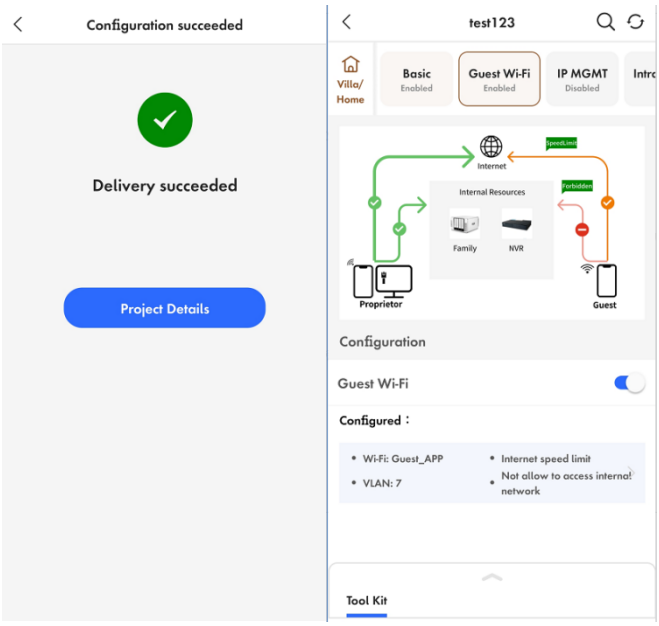


(4) Modify gest Wi-Fi information, configure an Internal user SSID named **Guest_APP** and associate VLAN 6 with this SSID, and configure a guest Wi-Fi SSID named **Guest_Wi-Fi** and associate VLAN 7 with this SSID. Then Click **Save** to save your configuration.



(5) Wait around 1 minute for the system to deliver the configuration to the device.





Configuration Verification

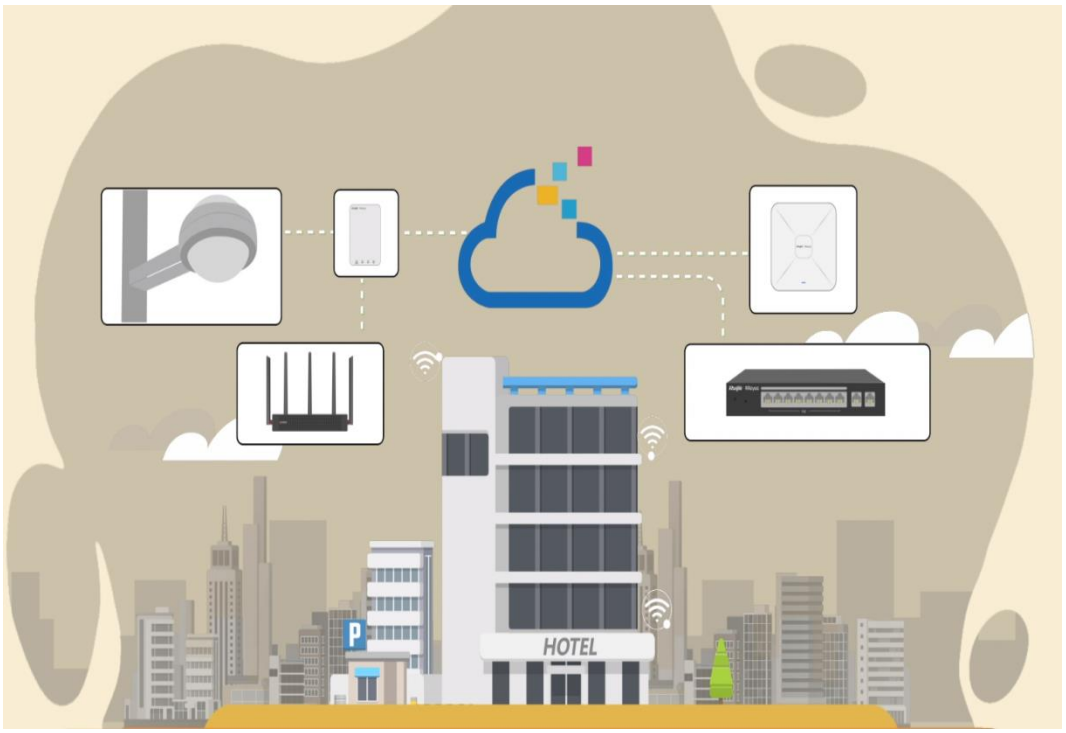
A guest at 192.168.7.97 cannot access the internal user at 192.168.6.147.

5.4 Reyee Economic Hotel Network Solution

5.4.1 Application Scenario

Reyee economic hotel network solution provides an affordable 5-star Wi-Fi for clients. It can operate concurrently at 2.4 GHz and 5 GHz, providing high-speed wireless access of 574 Mbit/s at 2.4GHz, 1201 Mbit/s at 5 GHz,

and up to 1775 Mbit/s per AP. The wall AP provides a LAN port at the front to facilitate the expansion of IPTV terminals, IP phones, and other terminals.

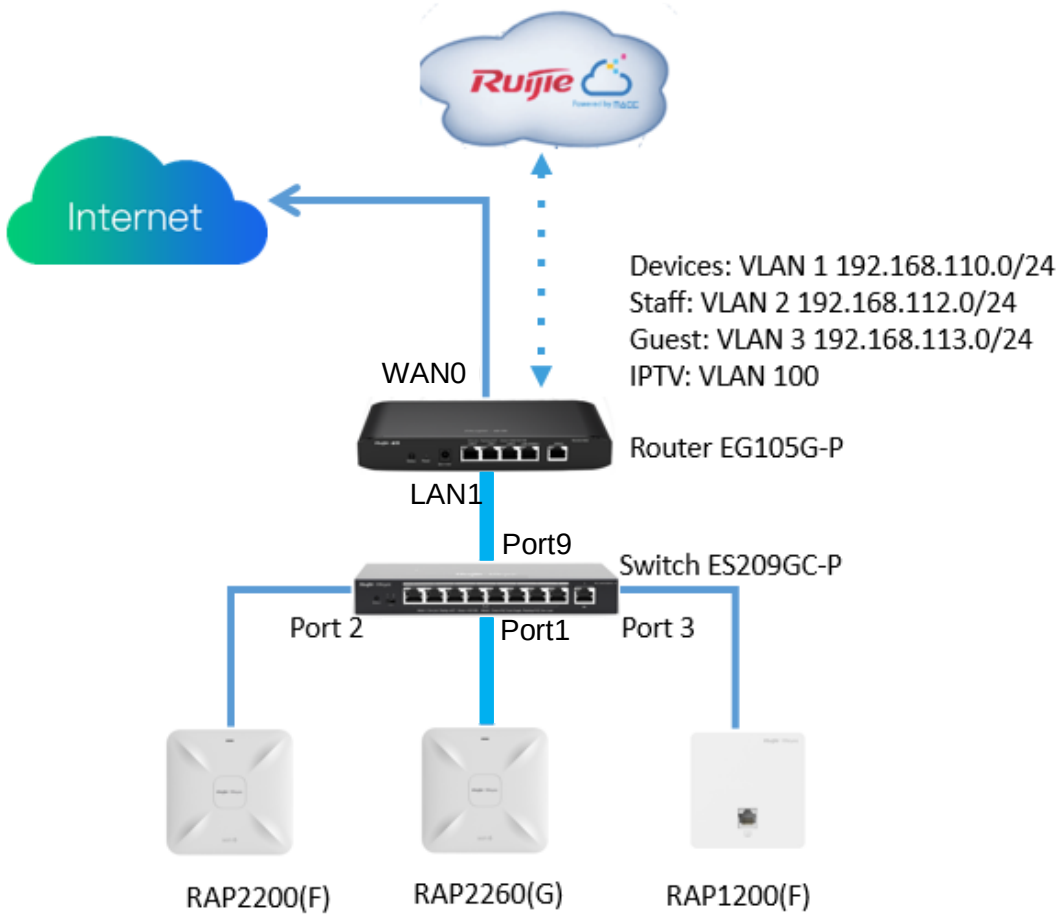


5.4.2 Configuration Example

Requirement

- A wireless network needs to be built for the hotel, and guests need to pass voucher authentication before accessing the Internet and are not allowed to access the internal network of the hotel.
- Wired connections are configured for IPTV.

Network Topology



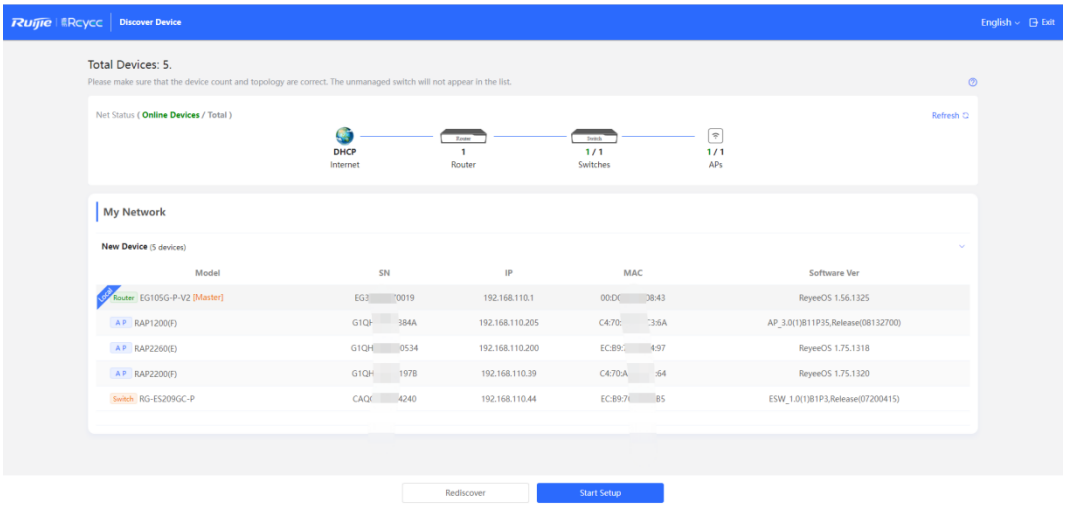
Devices List

Type	Model	Function
Router	EG105G-P	● Connects to the Internet and works as the DHCP server for downlink devices and clients. ● Manages the AP and switch locally. ● Supports voucher authentication with Ruijie Cloud.
Switch	ES209GC-P	Provides wired and PoE connections.
Wall AP	RAP1200(F)	Provides wireless connections for rooms. Provides a wired connection for IPTV.
Indoor AP	RAP2200(F)&RAP2260(G)	Provides wireless connections for the hall and corridor.

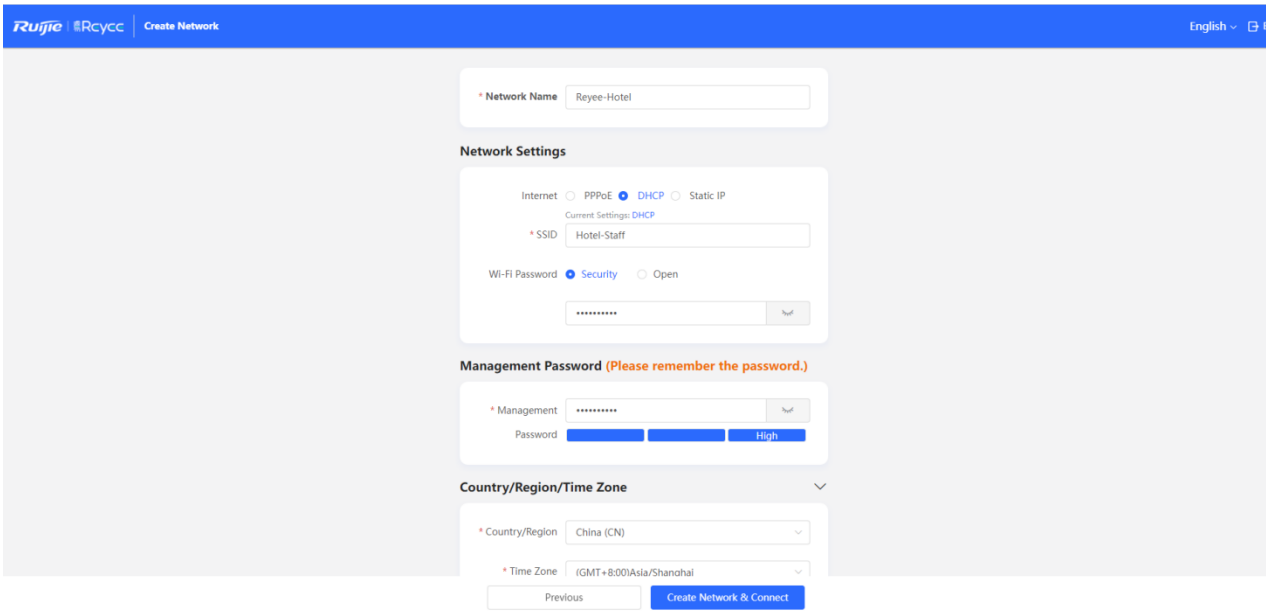
Configuration Steps

(1) Power on and connect the device according to the topology.

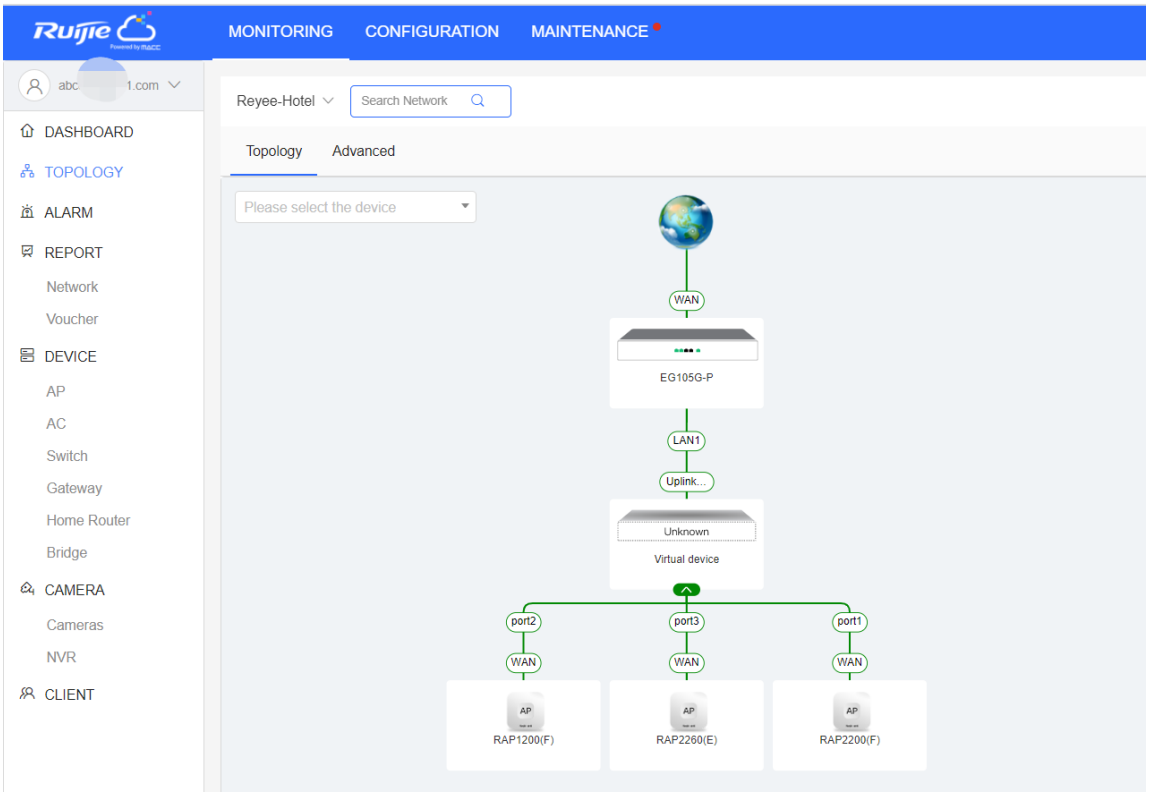
(2) By default, the IP address of the router is 192.168.110.1. Click **Start Setup** to perform basic network setting.



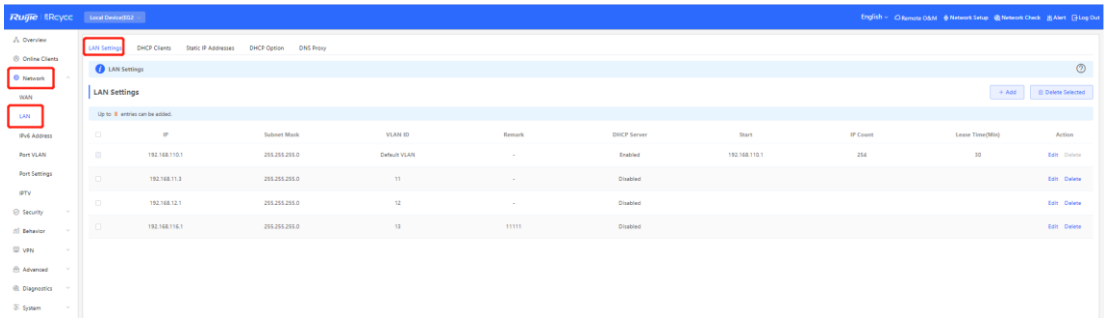
a Set **Network Name**, **Network Settings**, **SSID** for staffs, and **Management Password**.



b Click **Create Network & Connect** to active the configuration and add the devices to Ruijie Cloud.

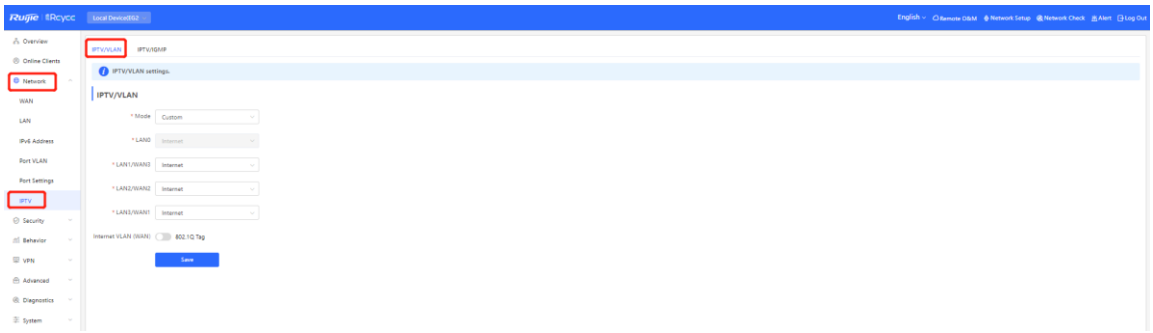


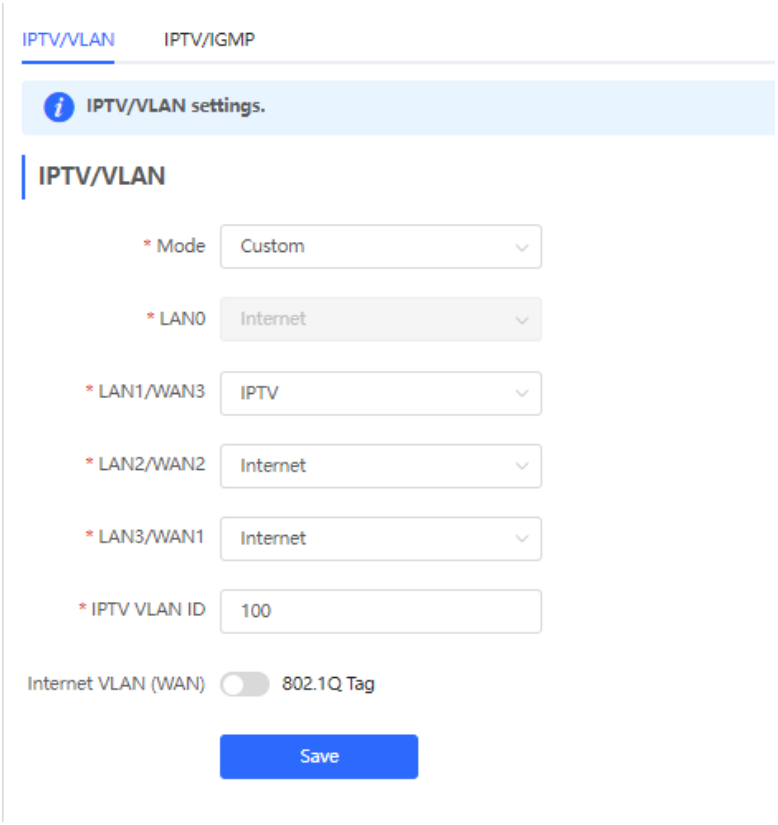
(3) Switch to the **Local** mode. Choose **Network > LAN** > **LAN Settings** to create VLAN 2 and VLAN 3 for staffs and guests.



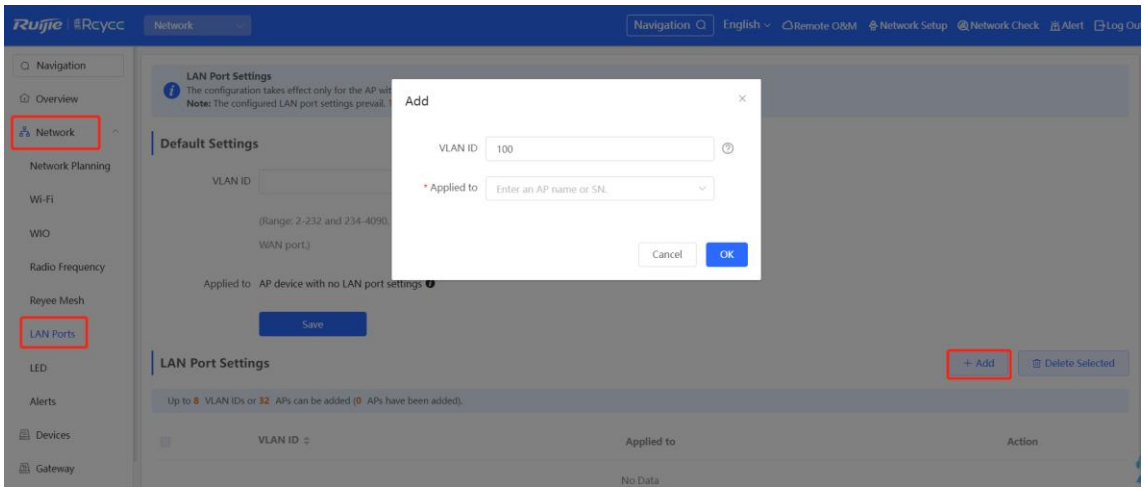
(4) Switch to the **Local** mode. Choose **Network > IPTV** to perform IPTV settings obtained from the ISP.

For example, the VLAN ID for IPTV is 100.

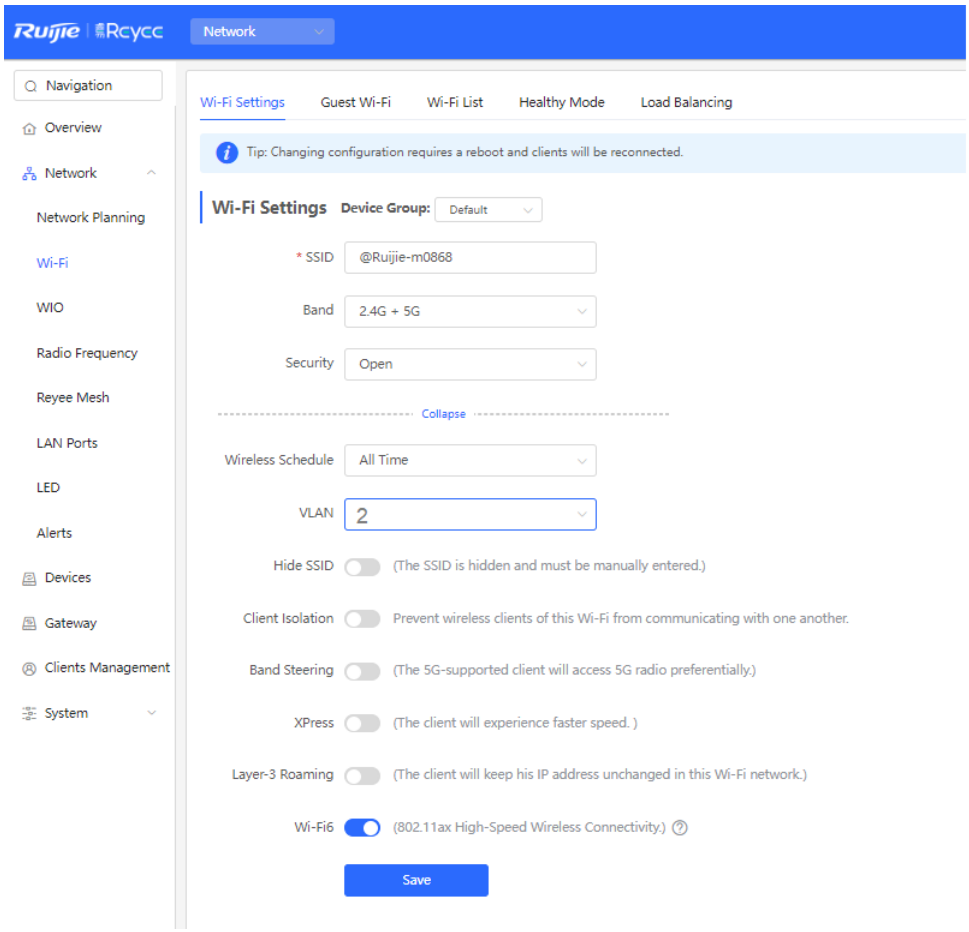




(5) Choose **Network > LAN Ports > Add** and configure VLAN 100 for IPTV. If the default VLAN 1 is used, ignore this step.

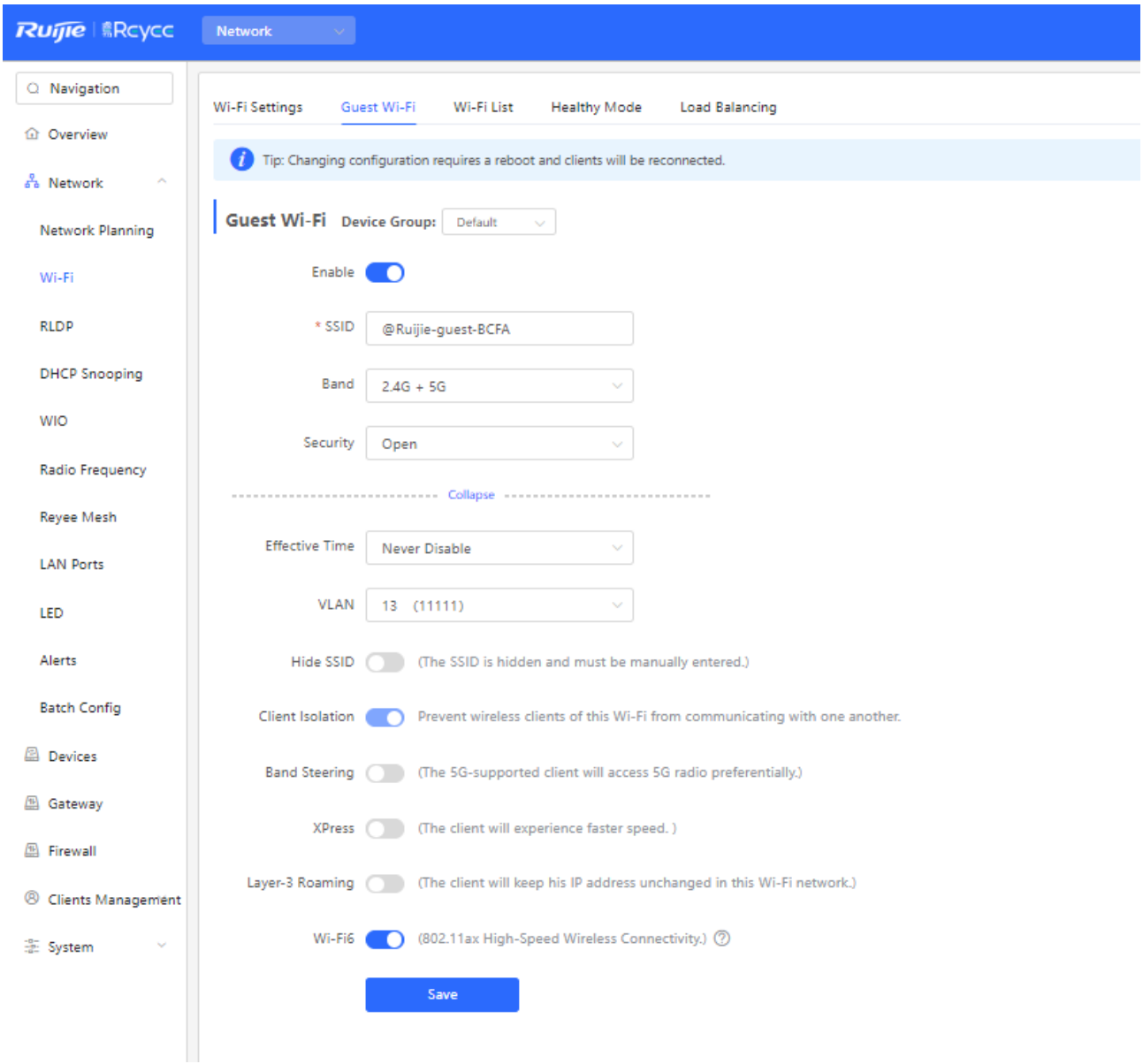


(6) Choose **Network >Wi-Fi** > **Wi-Fi Settings**, configure Wi-Fi for staffs and guests, and select VLAN 2 for staffs.



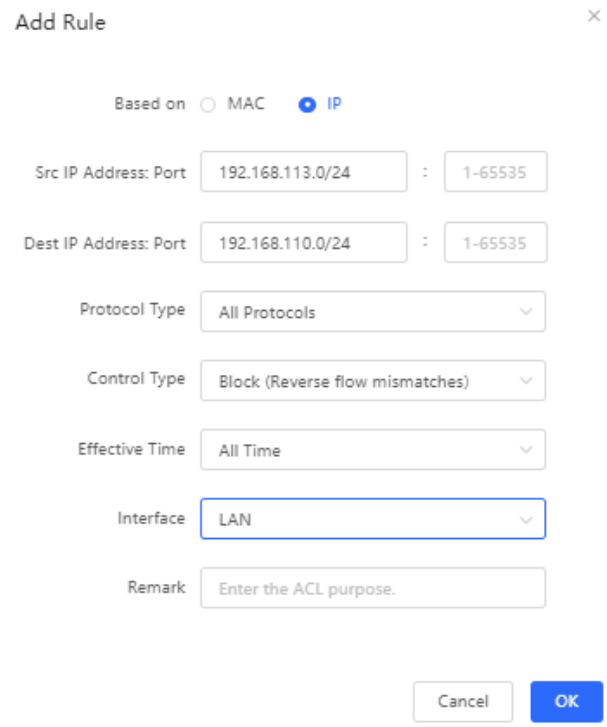
(7) Enable the guest Wi-Fi and select VLAN 3 for it.

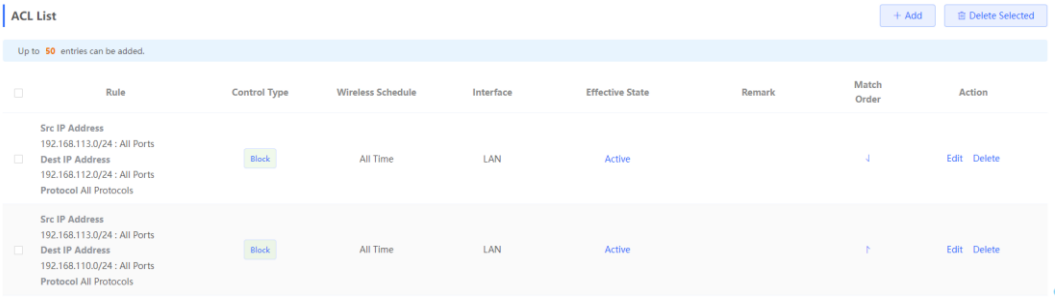
Switch to the **Network** mode. Choose **Network** > **Wi-Fi** > **Guest Wi-Fi**.



(8) Switch to the **Local** mode. Choose **Behavior > Access Control** and configure an ACL to prevent guests from accessing the internal network.

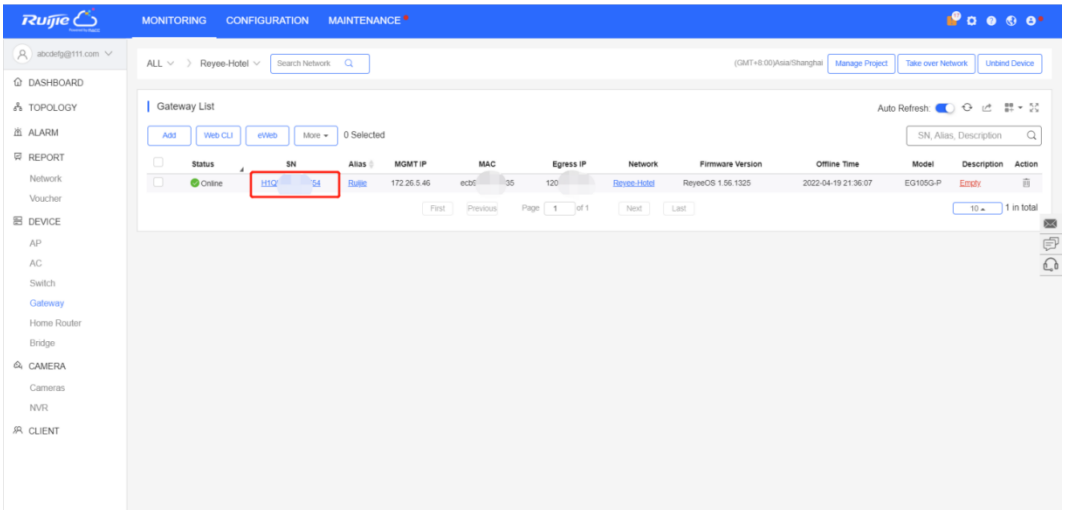
Add two ACL rules to prevent hosts in VLAN 3 from accessing hosts in VLAN 1 and VLAN 2, and apply them to the LAN port.



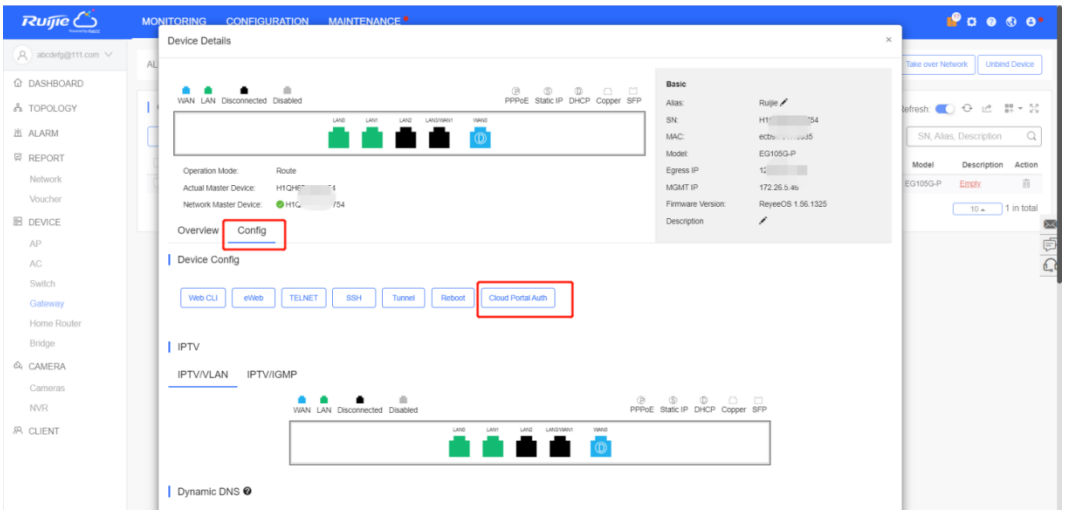


(9) Log in to Ruijie Cloud to configure cloud voucher authentication for guests.

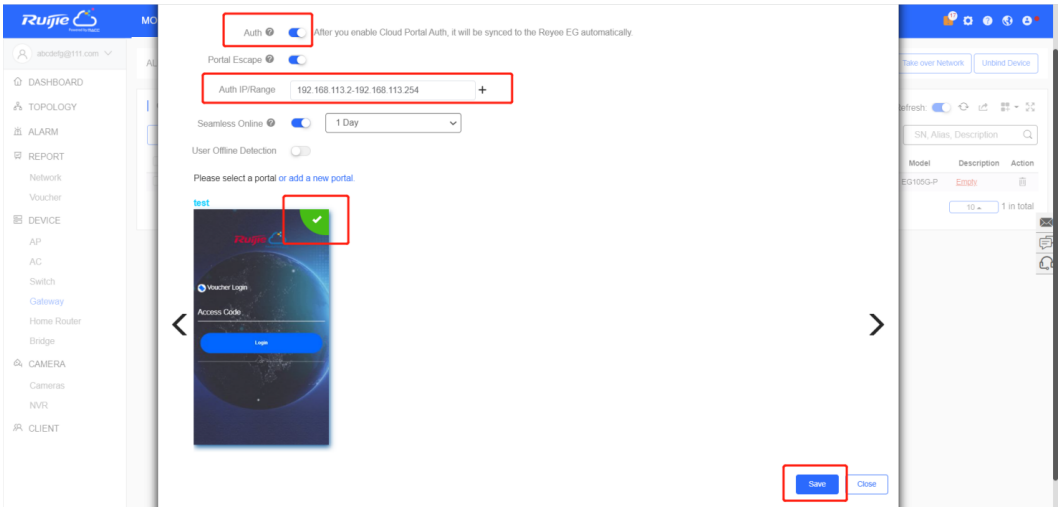
a Click the SN of the EG to access the page of device details.



b Choose **Config** > **Cloud Portal Auth**.

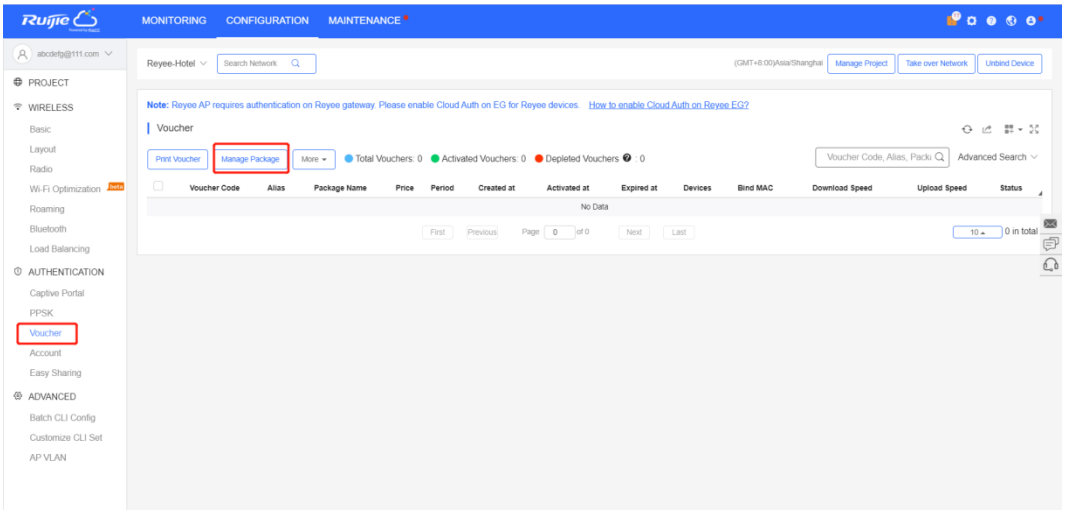


c Enable authentication and configure IP addresses of guests in the range from 192.168.113.2 to 192.168.113.254.

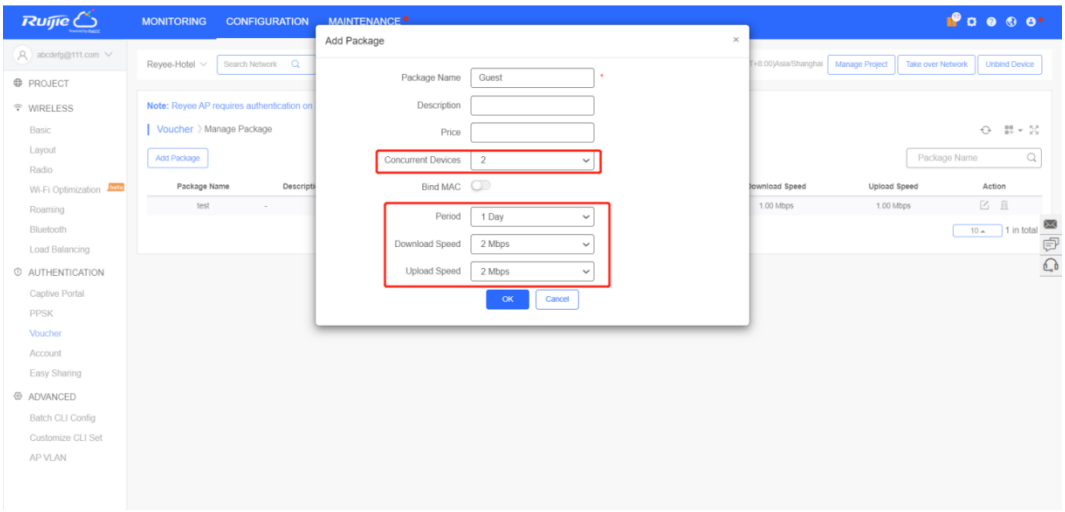


d Add the voucher package for guests.

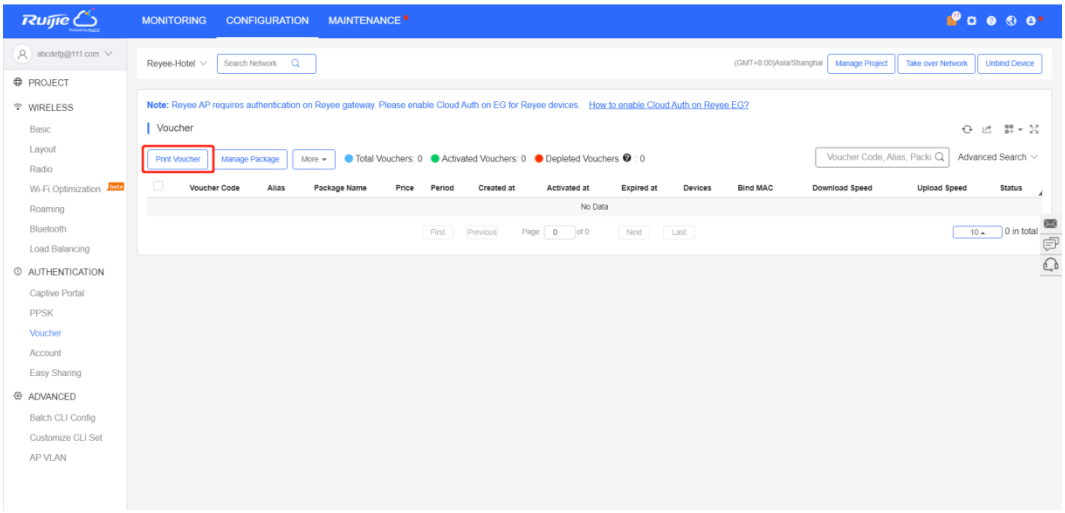
Choose **Voucher > Manage Package > Add Package** and add a voucher package for guests.

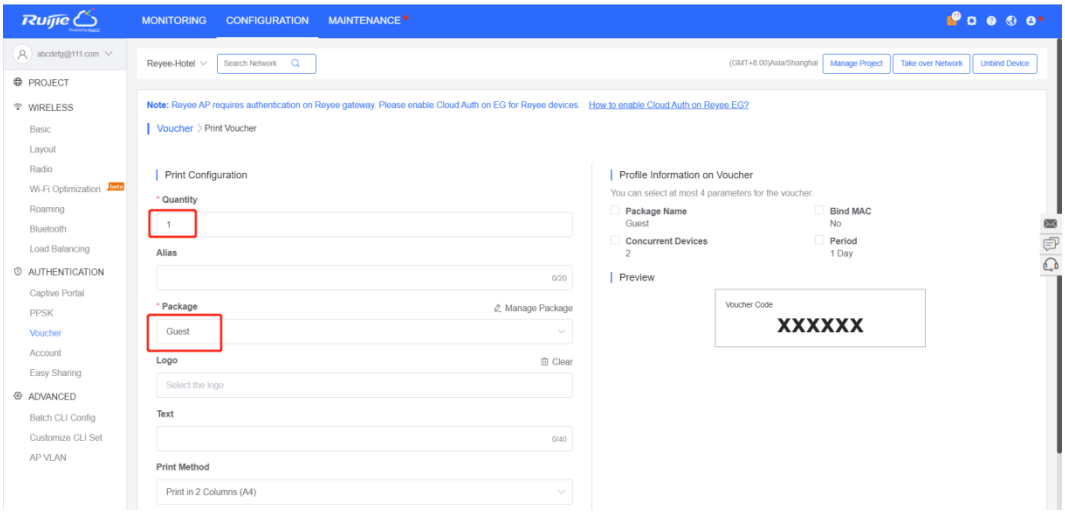


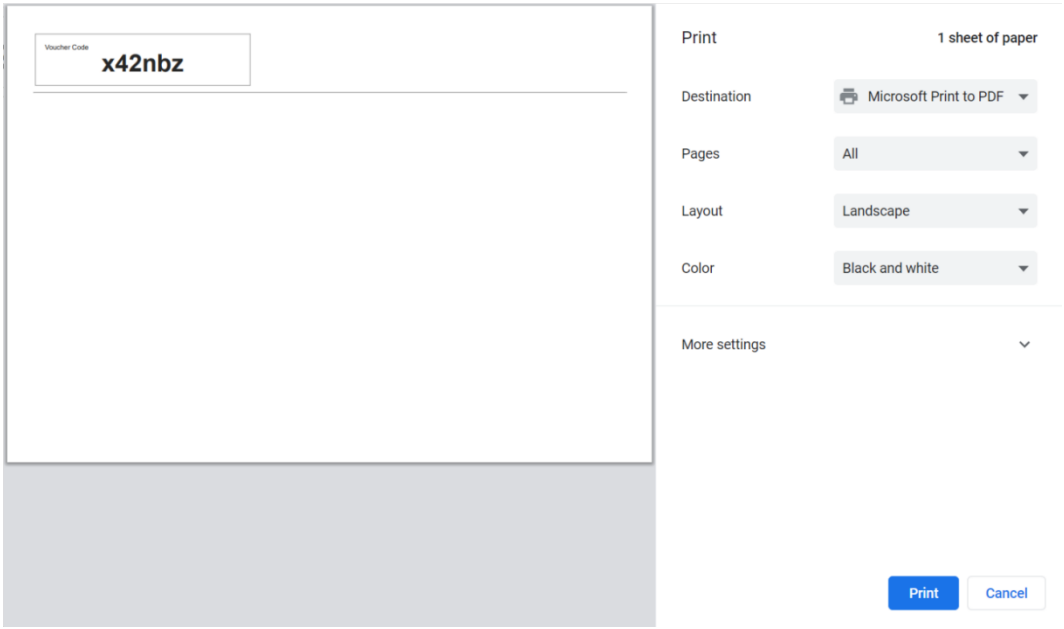
Example: Set Concurrent Devices to 2, Period to 1 Day, and Upload Speed and Download Speed to 2 Mbit/s.



e Click **Print Voucher** to obtain the code for guests.

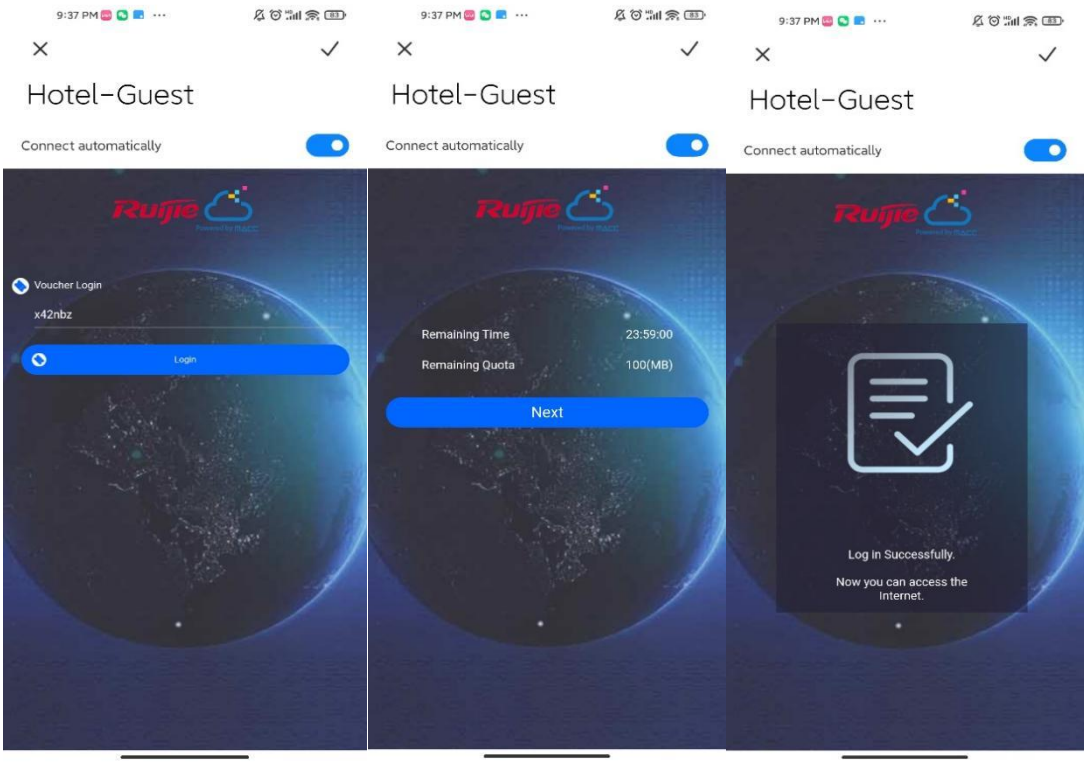






5.4.3 Configuration Verification

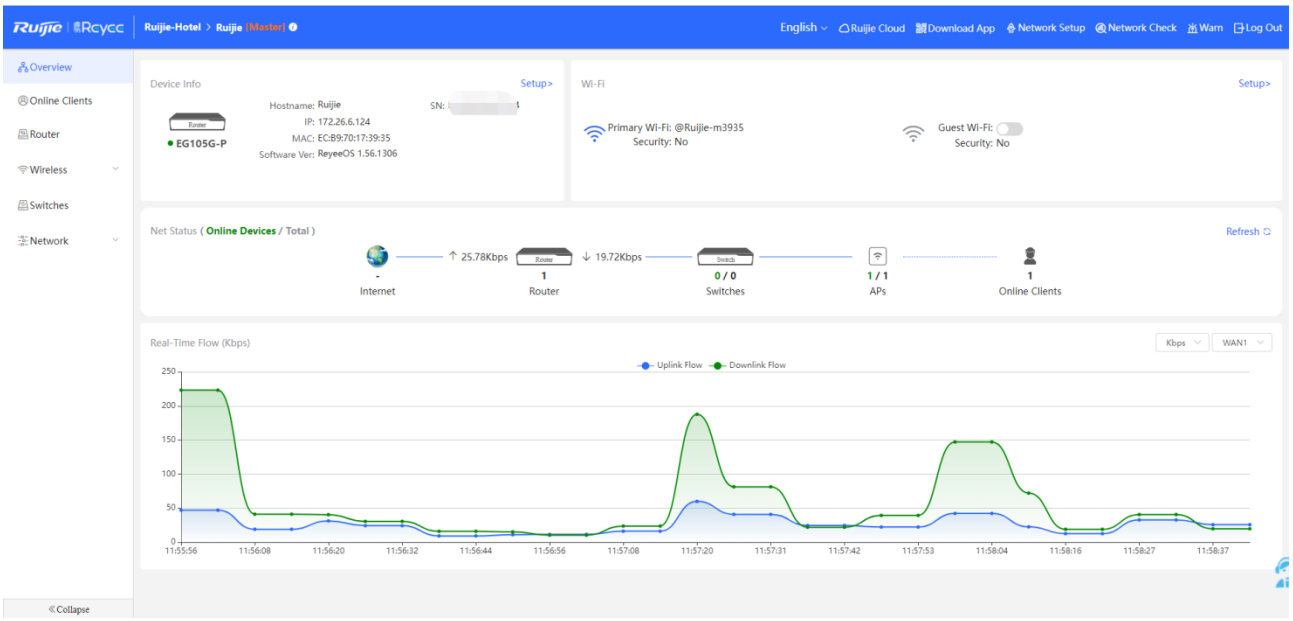
Connect guest Wi-Fi. You can see that the internal IP address 192.168.110.1 cannot be accessed.



6 FAQ

7 Appendix: Surveillance

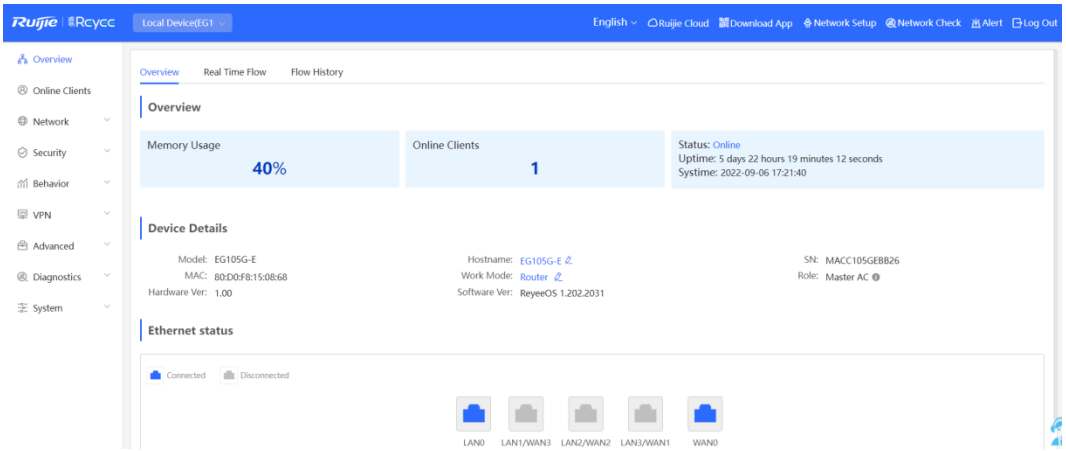
The overview page displays **Device Info**, **Wi-Fi**, **Network Status**, and **Real-Time Flow**.



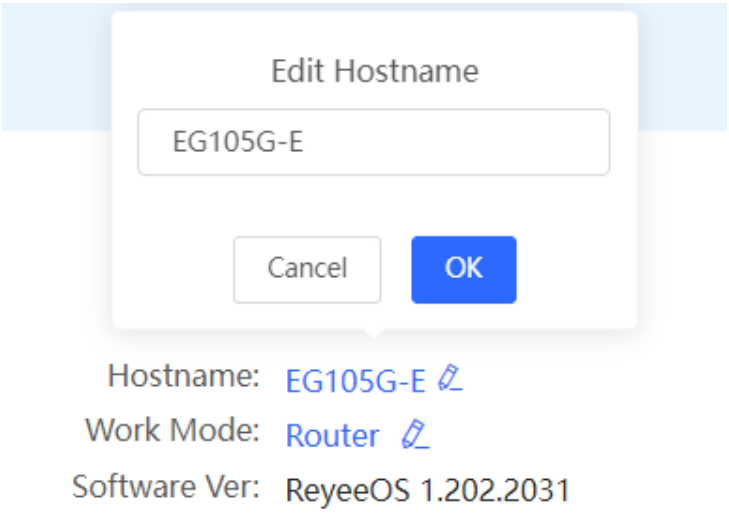
7.1 Device Info

Choose **Overview > Overview**. One the **Device Info** page, the model, host name, IP address, MAC address, software version, and SN of the router are displayed.

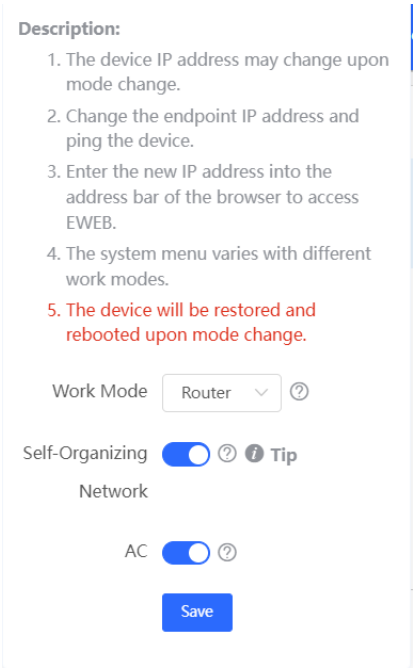
In the **Overview** pane, the memory usage, online client count, status, uptime, and system time are displayed.



- The **Online** status indicates the SON status of the Reyee devices but not Ruijie Cloud.
- You can click **Hostname** to modify the device name.



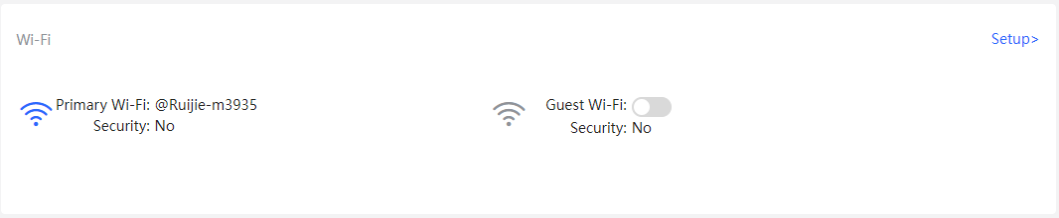
- Click **Work Mode** to switch the device mode. Two modes are available: **Router** and **AC** modes. The default mode is **Router**.



  - **Router Mode:** indicates NAT forwarding.
  - **AC Mode:** indicates bridge forwarding.
  - SON:
    - -If SON is enabled, the device role is displayed.
    - -If SON is disabled, the device works in standalone mode.
    - - SON is enabled by default in AC mode.
  - AC:
    - -It is enabled by default. The device works as a virtual AC to manage downlink devices.
    - -When it is disabled, the device must be elected as the AC before managing downlink devices.

7.2 Wi-Fi Information

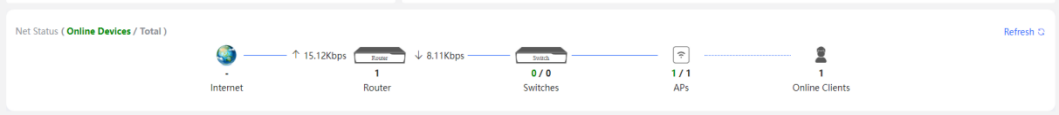
You can name the Wi-Fi of the network and enable guest Wi-Fi.



Setup: Go to the Wi-Fi setting page.

7.3 Network Status

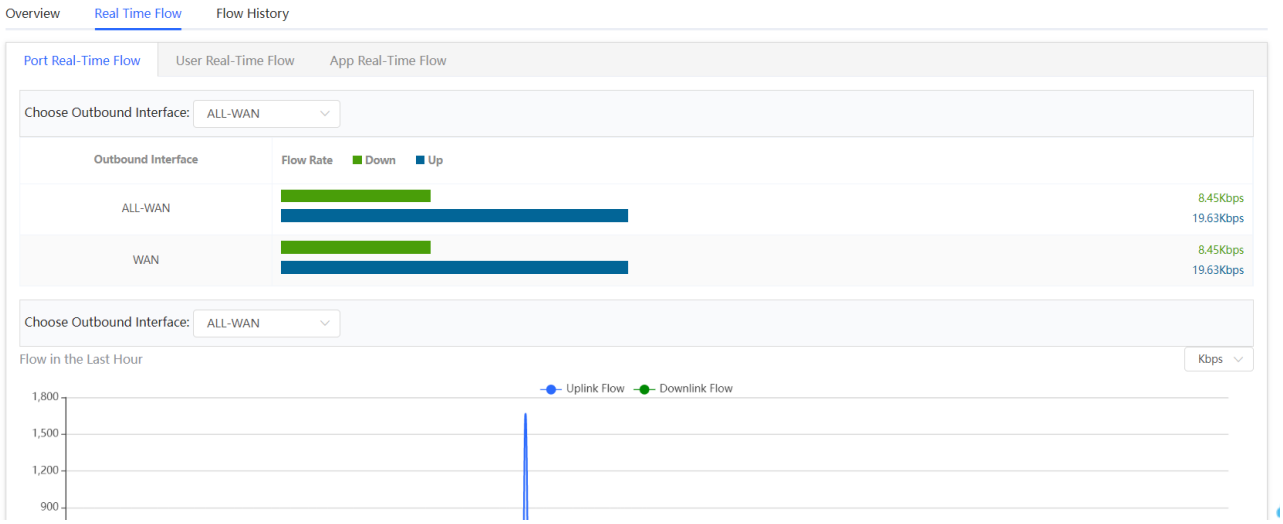
The **Network Status** page displays the topology and connected status of the network.



7.4 Real-Time Flow

Choose **Gateway > Overview > Real Time Flow**. The **Real-Time Flow** page appears.

Check real-time traffic flows based on ports, users, and apps, including uplink and downlink flows. The default unit is kbit/s. You can change it to be bit/s and Mbit/s.



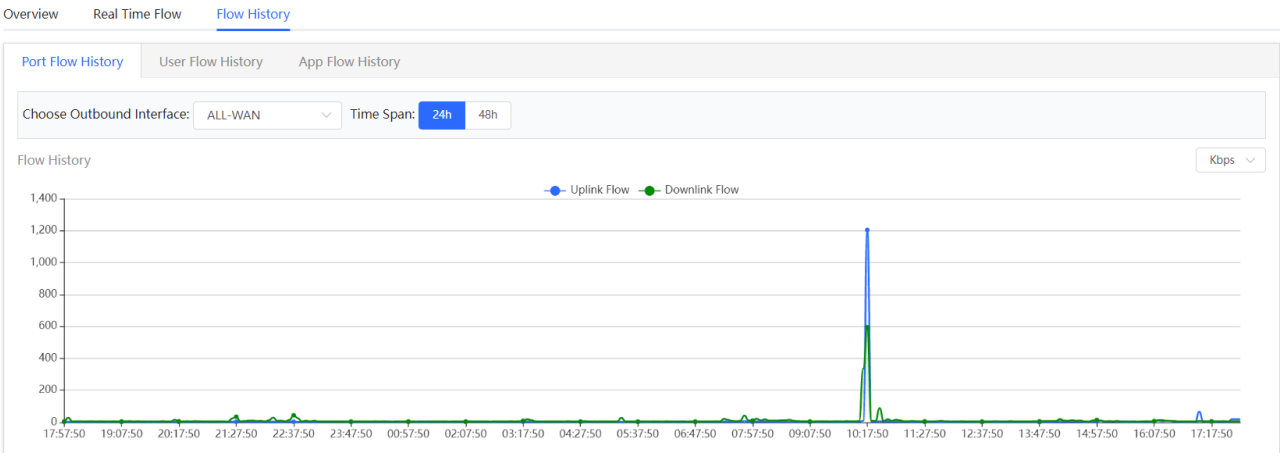
7.5 Flow History

Note

This feature is supported by R202 and later versions.

Choose **Overview** > **Flow History**. The **Flow History** page appears.

Check historical traffic flow based on ports, users, and apps, including uplink and downlink flows.



7.6 URL Logs

URL logs are URL access records of devices on the internal network, including the URL, access count, and audit result.

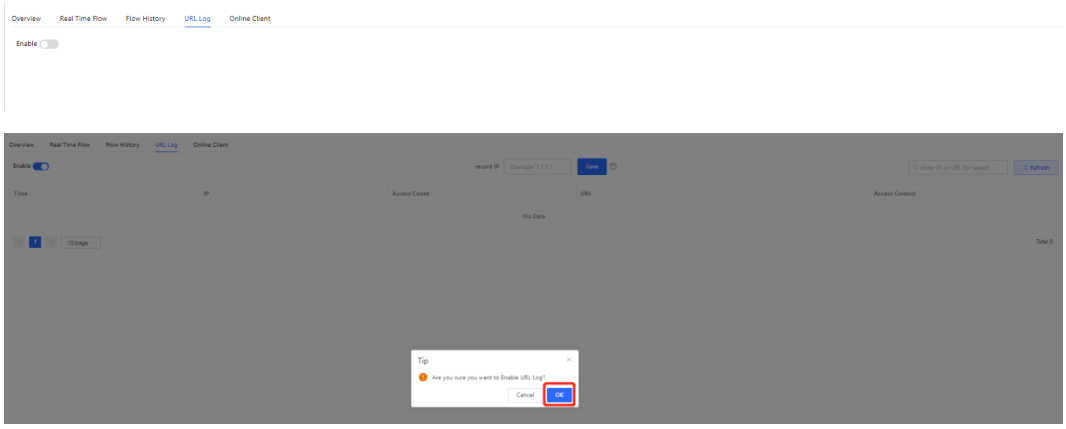
Note

This feature is supported by only EG3 series routers such as EG310G-E.

(1) Choose **Overview** > **URL Log**.

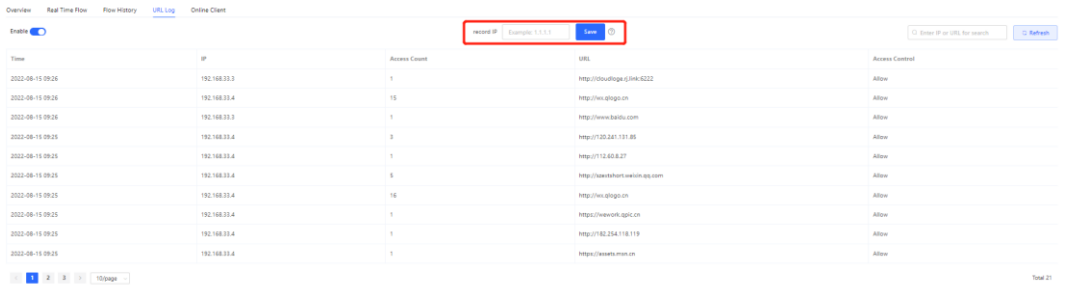
(2) Enable URL logging.

Toggle the switch to **Enable** and click **OK** in the dialog box.



(3) (Optional) Configure an IP address to view its URL access records.

The system logs URL access records of all devices on the internal network by default. To view URL access records of a specific device, configure an IP address in the **record IP** text box and click **Save**.



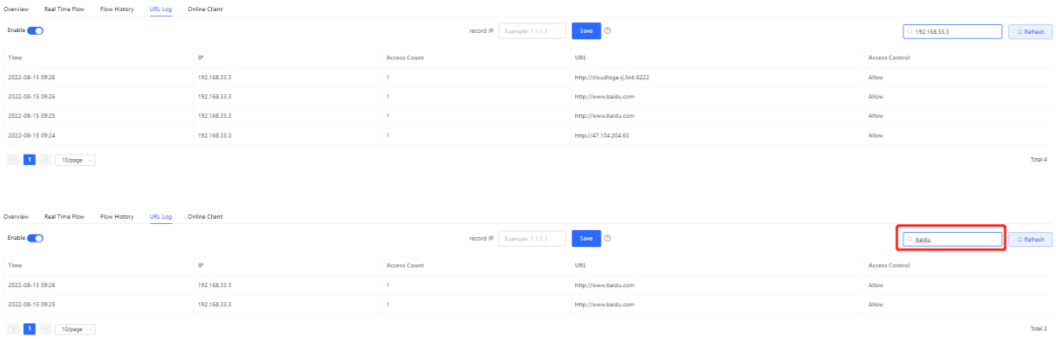
Note

To restore URL access records of all devices on the internal network, clear the **record IP** text box and click **Save**.

(4) Check URL log details.

A log includes the access time, IP address, and access count.

You can search logs by IP address or URL.



7.7 Online Clients

Choose **Gateway** > **Overview** > **Online Clients**. The **Online Clients** page appears.

Select a client from the client list and click **View Details**. You can find the client's username, type (wired/wireless), IP address, MAC address, current rate, connected Wi-Fi name, and access control status.