GL·iNet

AMAROK

GL-X1200 is a 3G/4G wireless router with high-performance and stability, to meet with the requirements of wireless network connection for industrial users. Based on OpenWRT OS, it also offered an integrated platform of functions extension for developers, Makers, IoT integration and development.

GL-X1200 User Manual

Customers shall comply with all applicable export or import laws and regulations. Customers must obtain all necessary governmental permits and licenses to export, re-export or import the product (Including but not limited to software and technical data in products) mentioned in this manual.

Contact

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Catalogue

Chapter 1 General Product Introduction

1.1 Brief Product Introduction

GL-X1200 is an industrial grade wireless router which offers a solution for 4G network connection with cable or wirelessly. It is equipped with high-performance QCA9563, @775MHz SoC, with dual 4G/3G/2G modules as well as dual SIM card slots. It has 4 gigabit LAN ports and 1 gigabit WAN port, dual band, 2x2 MIMO, IEEE802.11b/g/n and IEEE802.11ac compliable offering up to 1166Mbps Wi-Fi speed(11n 300M+11ac 866M). It supports 60 devices online at the same time.

It has four full-band external 4G antennas, and two high-gain external Wi-Fi antennas, one built-in GPS/BDS module and one external antenna accordingly, and one built-in watchdog chipset to ensure a stable operation of the device.

GL-X1200 is widely applied in fields like Smart Traffic, Smart Manufacturing, Smart business, offering highly reliable data transmission.

4G Features:

- Support dual 4G LTE modules
- Support CAT4 (download 150Mbps, upload 50Mbps) or CAT6 (download 300Mbps, upload 50Mbps)

WIFI Features:

- Dual band 2.4G & 5G
- 11n 2x2 + 11ac 2x2，300Mbps（2.4G）+866Mbps（5G）
- High-gain dual-band external antennas

Software and Hardware Features:

- Built-in dual 4G LTE CAT4 or CAT6 modules
- eSIM is supportable
- Built-in 128MB NAND-Flash for user’s storage
- 1*USB2.0, support external USB modem
- 1*Micro SD/TF card, maximum 128GB storage
- Built-in GPS/BDS module
- Built-in Watchdog chipset

- Built-in RTC module
- Support RS232 or RS485 serial port (RJ45 port type).
- Powered by 12V or 48V DC power supply, or with POE power input (802.3at).
- Support 802.3af POE-Out (using 48V DC power in).
- Automatically shifting between wireless 4G connection and Ethernet cable connection to keep devices always online.

Other Features:

- Iron enclosure supports stable operation under a temperature from -20 to 55 °C.
- Powered by Qualcomm chipset, which has high performance and reliability, low failure rate.
- Flexible installation, on desk, wall mounting or DIN-rail mounting (equipped with 35mm rail buckle to match a 35mm rail).

1.2 Technical Specifications

Items	Description
Model No.	GL-X1200
CPU	Qualcomm QCA9563，@755MHz
WiFi Chipset	Qualcomm QCA9563 (2.4G) + Qualcomm QCA9886 (5G)
Flash	16MB Nor-FLASH 128MB NAND-FLASH
RAM	128MB DDR
3G/4G module	Support 2x 4G LTE CAT4 or CAT6 ） 2x micro SIM(3FF) card slot, e-SIM is optional
4G antenna	External full-band antenna (700M ~ 2.7GHz)
WiFi	2.4G+5G dual-band concurrent 802.11b/g/n 2x2 MIMO + 802.11a/n/ac2x2 MU-MIMO
WiFi wireless transmit	2.4GHz 300Mbps 5GHz 866Mbps
WIFI antenna	External dual-band high gain antennas
Wi-Fi Power Output	2.4GHz: 19dBm (11n MCS7 HT40) Max 5GHz: 19dBm (11ac MCS9 HT80) Max (Output power of the antenna interface, excluding antenna gain)
Wi-Fi Receive Sensitivity	-94dBm((Maximum)
Global Positioning System	Built-in GPS/(BDS) module, external antenna
Watchdog	Internal Watchdog chip
RTC	Internal RTC Module
Ethernet Port	5x 10/100/1000Mbps Ethernet port (1x WAN + 4x LAN)
Console	RS232 or RS485 serial console port (RJ45 connector)
USB port	1x USB2.0 Type-A

MicroSD	1x MicroSD (TF) Slot, support maximum 128GB
LED Indicator	Power, PoE output, System, WAN, LAN, 2.4G Wi-Fi, 5G Wi-Fi, 4G Modem #1 signal strength、4G Modem #2 signal strength (Each 4G module has 3 LED indicate the signal strength)
Reset Button	Press the button more than 8 seconds to reset the device to factory settings.
Power Input	12V/3A or 48V/1A DC input or PoE input (802.3at)
Power Output	Support PoE output (802.3af) when 48V/1A input
Enclosure	Metallic housing case with ground-screws.
Dimension	240*145*40mm (L*W*H, exclude Antenna size)
Weight	1360g (net weight)
Power Consumption	Maximum 11W (Exclude power consumption of external device connected by USB port)
Temperature	Operation Temperature: -20~55°C ; **(**Support extended operating temperature: Powered by PSU -20~60°C; Powered by POE -40~70° Limited operation time and may cause performance degradation) Storage Temperature: -40 ~ 70°C

1.3 Appearance and dimension

Dimension:240*145*40mm（L*W*H，External Antenna not included）

Front view:

Back view:

1.4 Package list

Items	Qty
X1200	1
Dual-band WIFI antenna	2
4G antenna	4 or 2 (If selectCAT6module, it needs 4x External 4G antenna; If select CAT4 module, it needs 2x External 4G antennas)
GPS antenna	1
Power adapter	1
Ethernet cable	1
35mm DIN rail	1
19' Cabinet Handing Ear	2
User guide	1

- Dual-band WIFI antenna (inner hole)

- 4G antenna (inner needle)

- GPS antenna

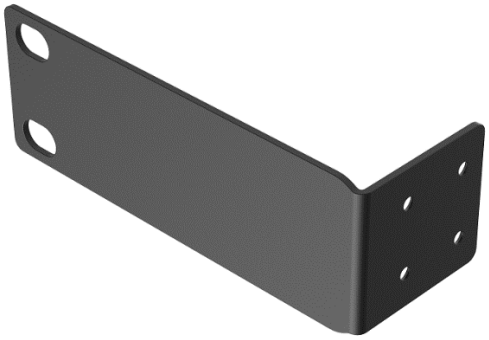
- Power adapter

This picture is for 48V/1A power adapter, 12V/3A power adapter is optional.

- Ethernet cable

- 35mm DIN rail buckle

- 机柜挂耳 (Optional component)



- Quick-start guide

  Product quick installation guide, including the download links to other documents or tools.

Note：If the items above are missing or damaged, please feel free to contact

sales@gl-inet.com

1.5 Optional Configuration

- **X1200-D2**

  4G module: 2 units

  Note: 2 * 4G modules are equipped before shipment.

  2 *SIM card slots match 2 * 4G modules respectively

- **X1200-D1**

  4G module: 1 unit

  Note: 1 * 4G module is equipped before shipment, user could add one more 4G module in necessary.

  2 * SIM card slots match 2* 4G modules respectively.

- **X1200-S**

  4G module: 1unit

  Note: 1 * 4G module is equipped before shipment.

  2 * SIM card slots match one 4G module, and user can choose SIM card either-or via web UI.

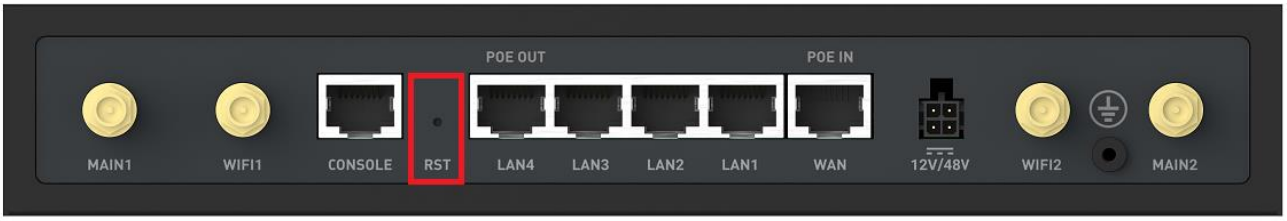
  Note: Bottom sticker will show device model.

Chapter 2 Hardware installation

2.1 LED light indicator

Item	Mark	Color	Description
Power	PWR	Green	Off: Powered off On: Powered on
PoE output	PoE OUT	Green	Off: No PoE output On: LAN4 port provides PoE output
System	SYS	Red	Off: System is running normally. Blinking: Operation System fault (E.g. both WAN port and 4G are not connected)
Ethernet port	WAN LAN1~LAN4	Green	Off: No connection. On: Proper connection. Blinking: Port has data traffic.
2.4G WIFI	2.4G	Green	Off: WIFI is off. On: WIFI is on. Blinking: WIFI has data traffic.
5G WIFI	5G	Green	Off: WIFI is off On: WIFI is on. Blinking: WIFI has data traffic
4G signal status	SIM1 SIM2	Green * 3	Off: No signal 1 Green Light on: Poor signal 2 Green Light on: Medium signal 3 Green Light on: Good signal

2.2 Reset button

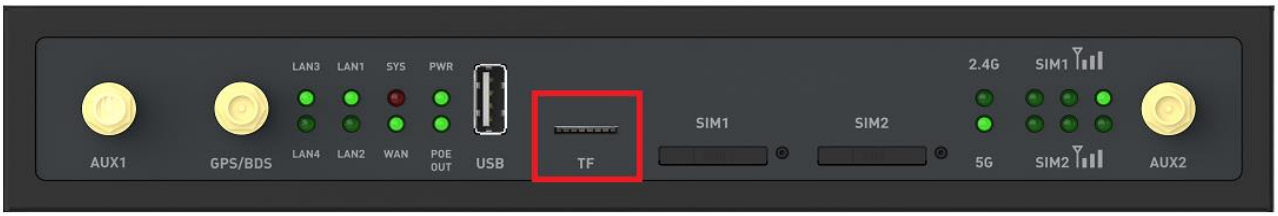


- Press and hold the reset button 8 seconds with a needle after powered on.
- The device will be restarted, and reset to factory settings.

2.3 USB port

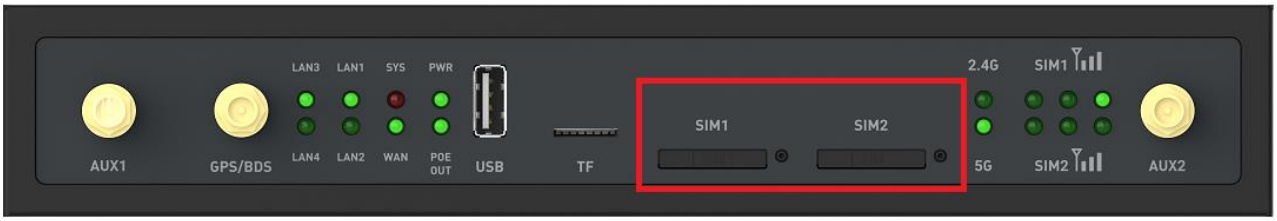
- USB2.0 Type-A port.
- Maximum transmission rate: 480Mbps
- Output voltage/current: 5V/500mA.

2.4 Micro-SD card slot



- Push-Push Micro SD（TF）card slot
- With foolproof setting.
- Size of Micro SD card: 15*11mm.
- Max 128GB Micro SD card supportable.

2.5 SIM card slot



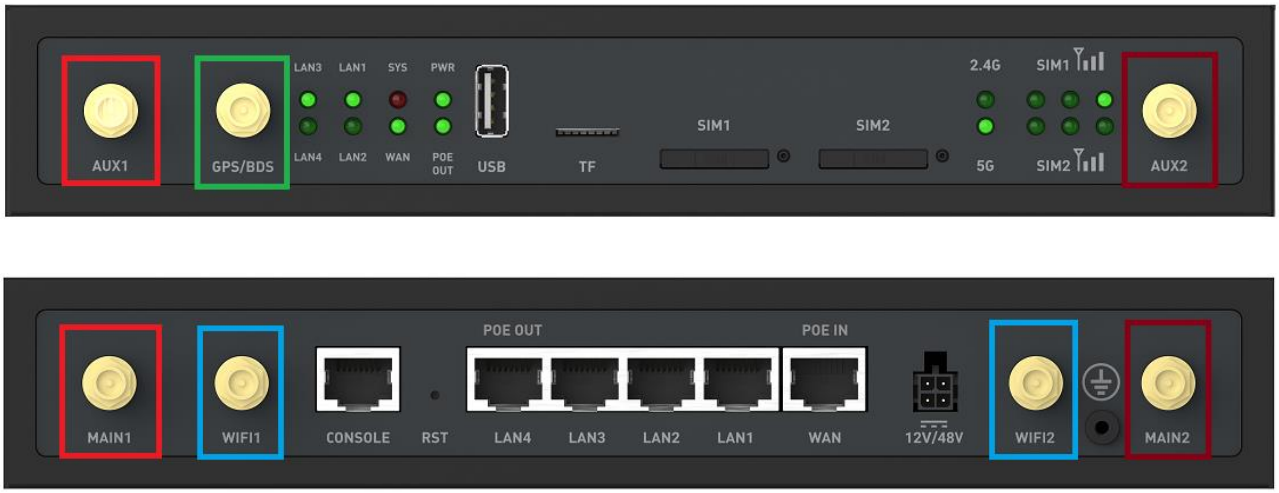
Insert or remove SIM card

- Press the button which next to the SIM card slot with a needle to pop up the SIM card tray.
- Insert or remove the SIM card.
- Standard size of SIM card should be 25*15mm.
- With foolproof setting.
- Press in the SIM card tray.
- Finished.

Note:

- Keep the SIM card away from electromagnetic field to avoid info. damaging of SIM card.
- Do not bend or scratch SIM card.
- Make sure to power off device when insert or remove SIM card.

2.6 Install antennas



Install 4G antennas.

- SMA type (inner needle), full-band antenna, support 700MHz to 2.7GHz.
- Install external 4G antenna on the 4G antenna interface and tighten it.
- MAIN1 and AUX1 antennas (marked red in above picture) match 4G module 1. MAIN2 and AUX2 antennas (marked deepred in above picture) match 4G module 2.

Install WiFi antennas.

- SMA type (inner hole), dual-band antenna, supports 2.4GHz and 5GHz
- Install external WIFI antenna on the WIFI antenna interface (marked blue in above picture) and tighten it.

Install GPS/BDS antenna optional.

- SMA type (inner needle).
- Install GPS/ BDS antenna on the GPS/BDS antenna interface (marked green in above picture) and tighten it.

2.7 Install the device

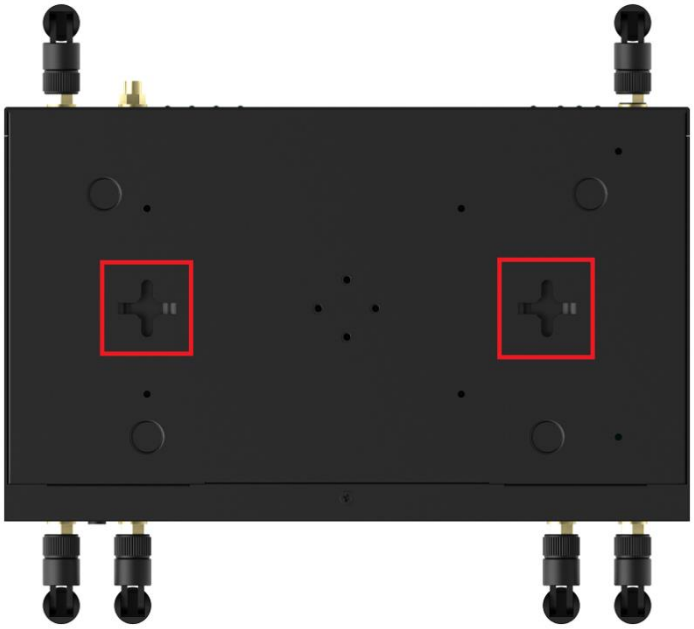
It supports placing on desk, wall-mounted and 35mm DIN-rail installation

2.7.1 Place on desk

- Place device on clean and flat desktop

- Adjust the position of device and ensure that the left and right sides have a more than 20mm space to radiate heat.

2.7.2 Wall Mounting



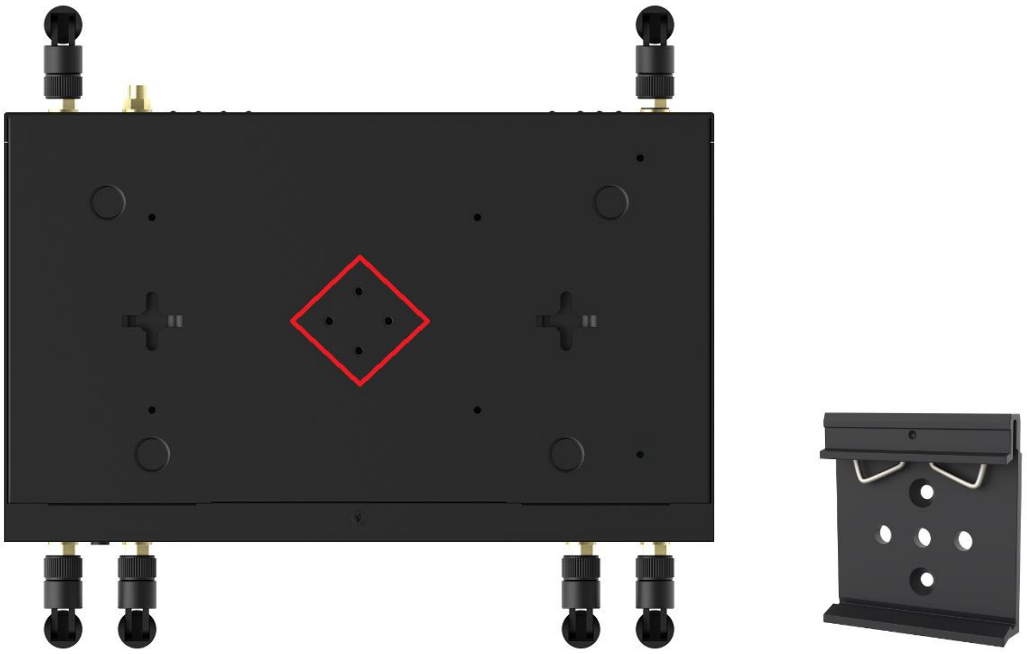
Steps as below:

- Install two fixing screws on the load plane (wall or cabinet).
- The distance of two wall mounting holes is 140mm, and the head diameter of fixed screw isϕ5-ϕ7.3mm. It is recommended to use M3~M3.5 self-tapping countersunk screw.
- Hang the wall hole (on the back of device) in the two fixing screws.

Note:

- Select firm and smooth load plane which could support the weight of the device and its related accessories.
- Ensure good stability and ground connection of wall-mounted carrier.
- Do not place the device in humid environment to prevent water vapor or moisture.

2.7.3 DIN-Rail Mounting



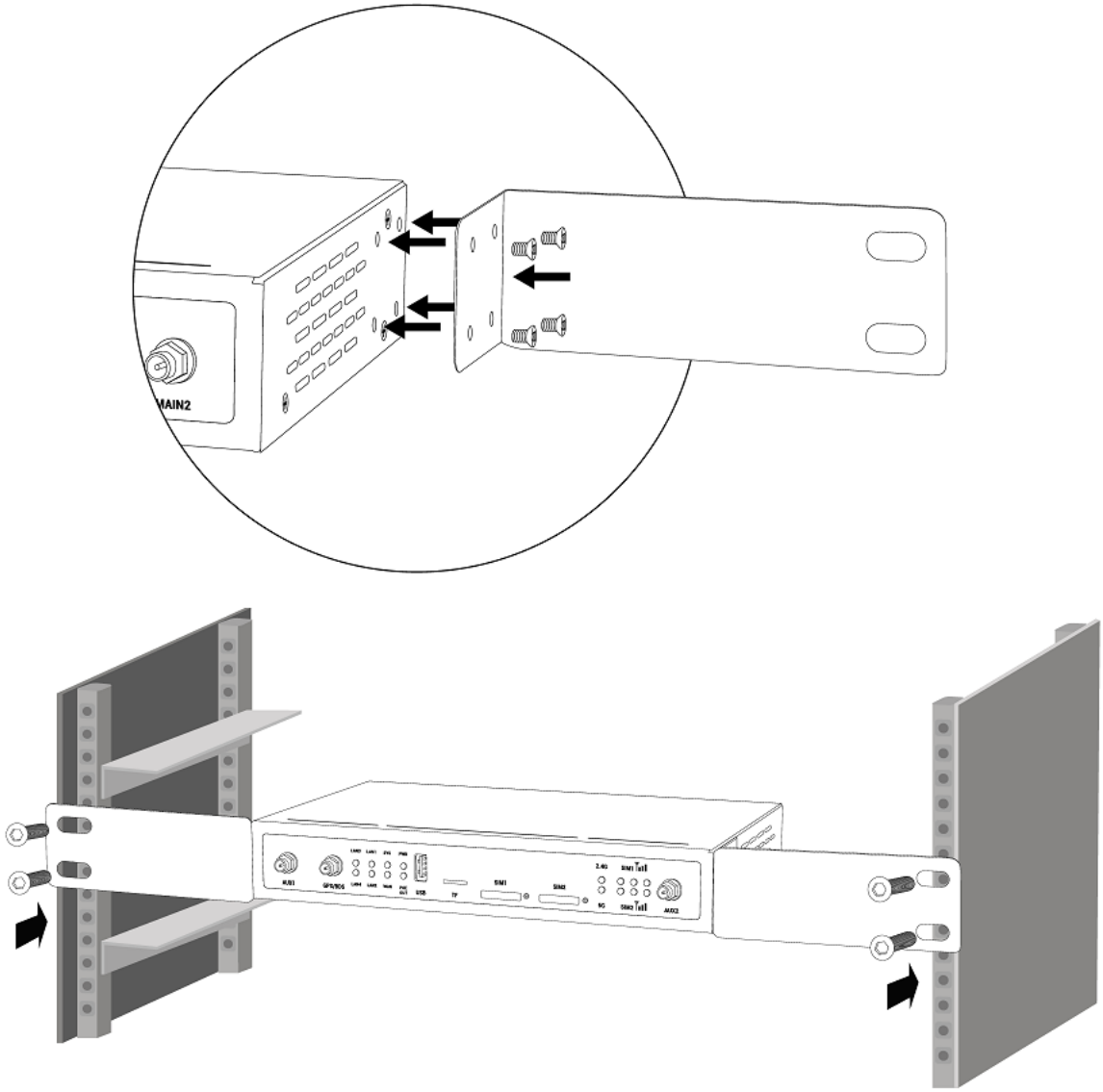
Steps as below:

- Fix the 35mm rail buckle on the bottom of device by using 4pcs M3*5mm countersunk screws.
- Then install the device on the 35mm DIN rail.

Note:

- Select standard DIN rail bracket.

2.7.4 Cabinet Installation



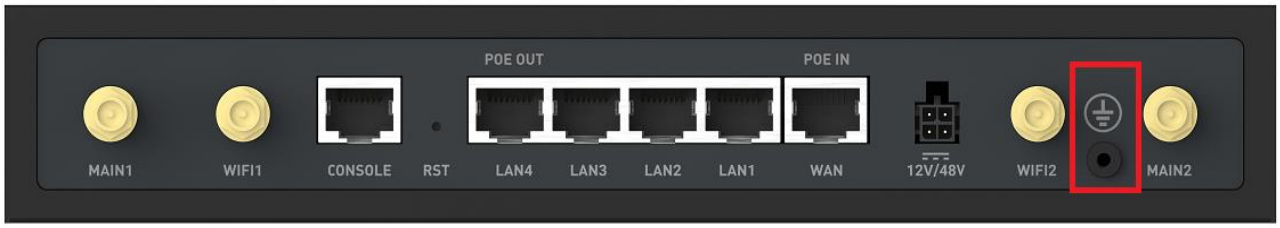
Steps as below:

- Fix the two Hanging Ears on the two sides of the device by using 8pcs M3*5mm countersunk screws.
- Then install the device on the 19’ standard cabinet.

Note:

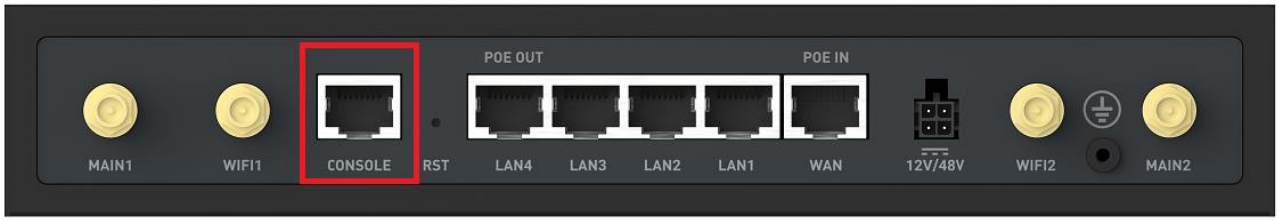
- The Handing Ears and screws are optional accessories, please contact with our sales team.

2.8 Ground wire installation

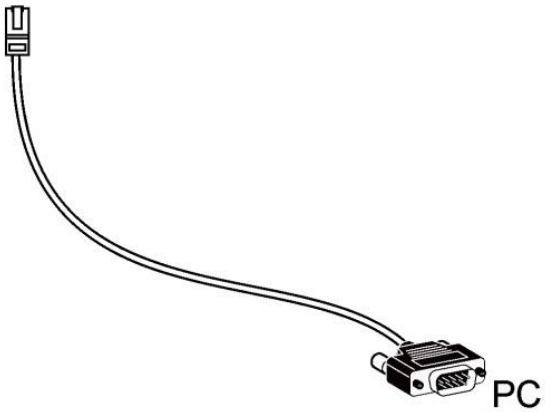


- Ground wire of the device helps prevent the effects of electromagnetic interference.
- Connect the device with ground wire before powering on.
- Remark: Ground wire should be installed on the well-grounded surface such as metal plates.

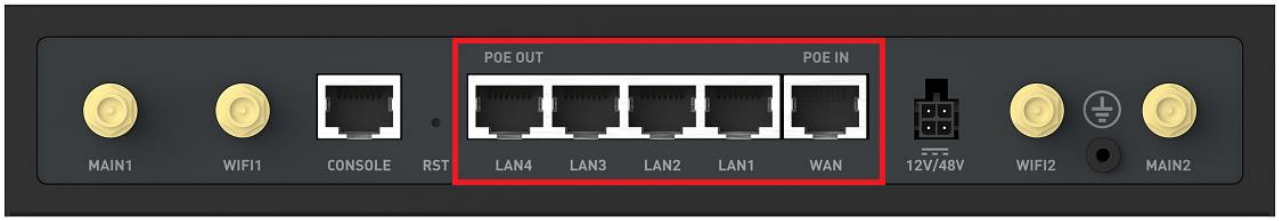
2.9 Console port connection



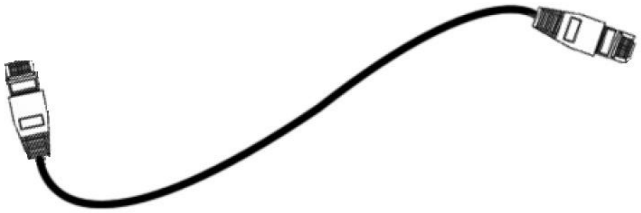
- The device could be debugged through console port.
- Using the following serial cable, one end is RJ45 connector for console port.
- The other end is 9-pin RS232 port for serial part of PC.



2.10 Ethernet cable connection



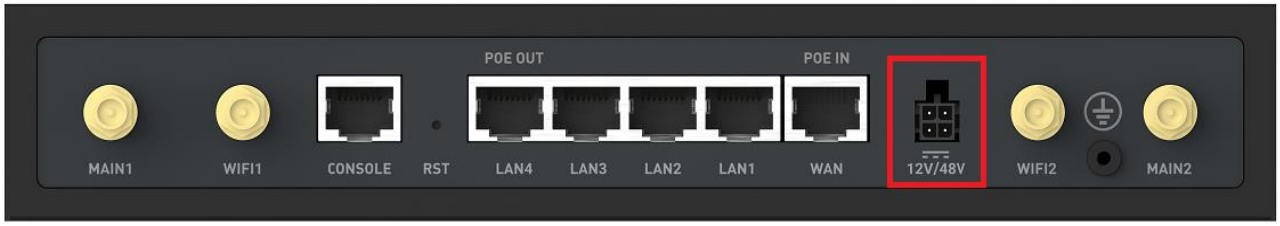
- There are 1 WAN port and 4 LAN ports of the device.
- WAN port is connected to the main router or modem, LAN port is connected to LAN devices.
- Plug the Ethernet cable to LAN port and PC by using the Ethernet cable in accessory box.



2.11 Power Supply connection

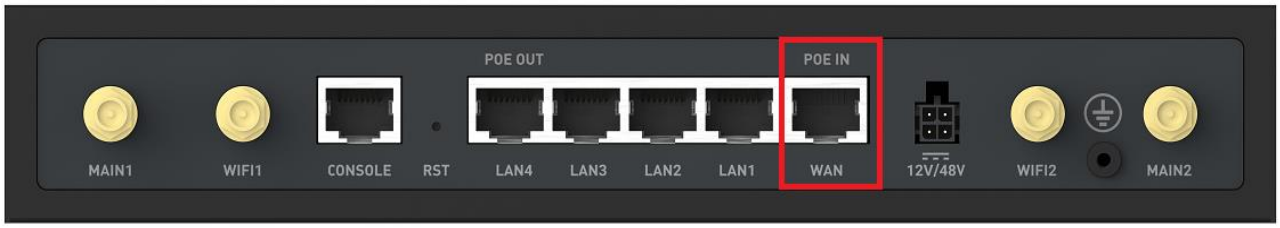
The device could be powered in 2 methods. Powered by DC power adapter or PoE Ethernet cable.

2.11.1 Powered by DC adapter



- There are two options of power adapter: 48V/1A or 12V/3A
- The AC port of power adapter is plugged into power outlet, 90~264V AC input supportable.
- The DC port of power adapter is plugged into DC power port.
- The port of DC power is 4 pin (1 and 2 are ground, 3 and 4 are power).

2.11.2 Powered by PoE Ethernet cable

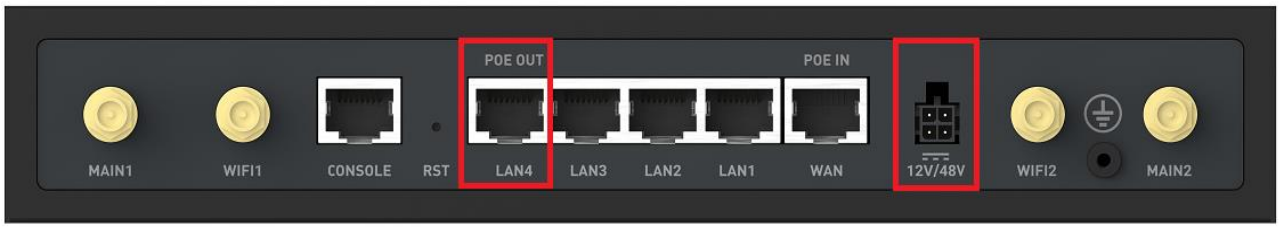


- WAN port supports POE power supply
- Support 802.3at standard protocol, max receiving power is 25.5W.

Note:

- Please use standard PoE power-supply equipment to avoid insufficient or instable power supply.

2.11.3 POE output



- When using 48V/1A DC power adapter, LAN4 port supports PoE output to LAN device.
- Support 802.3af standard protocol with 15.4W output.

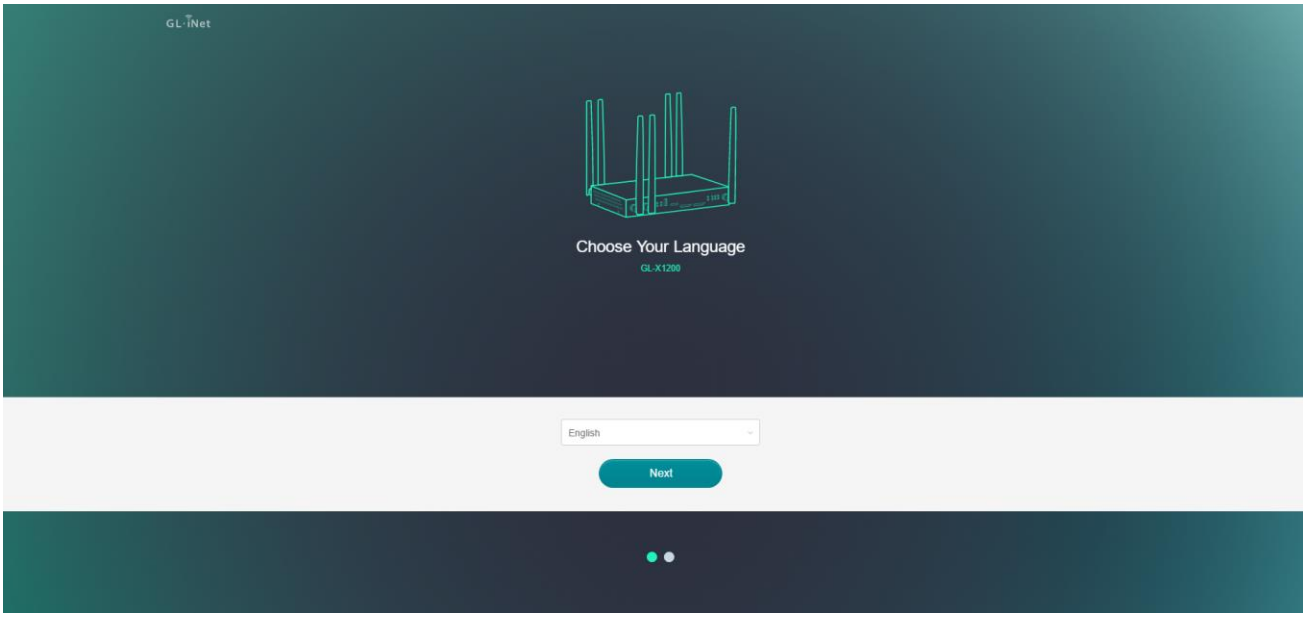
Note:

- When using 12V/3A DC power adapter or PoE power supply via WAN, the device can’t support LAN4 PoE output due to the limitation of power capacity.

Chapter 3 Login Web UI

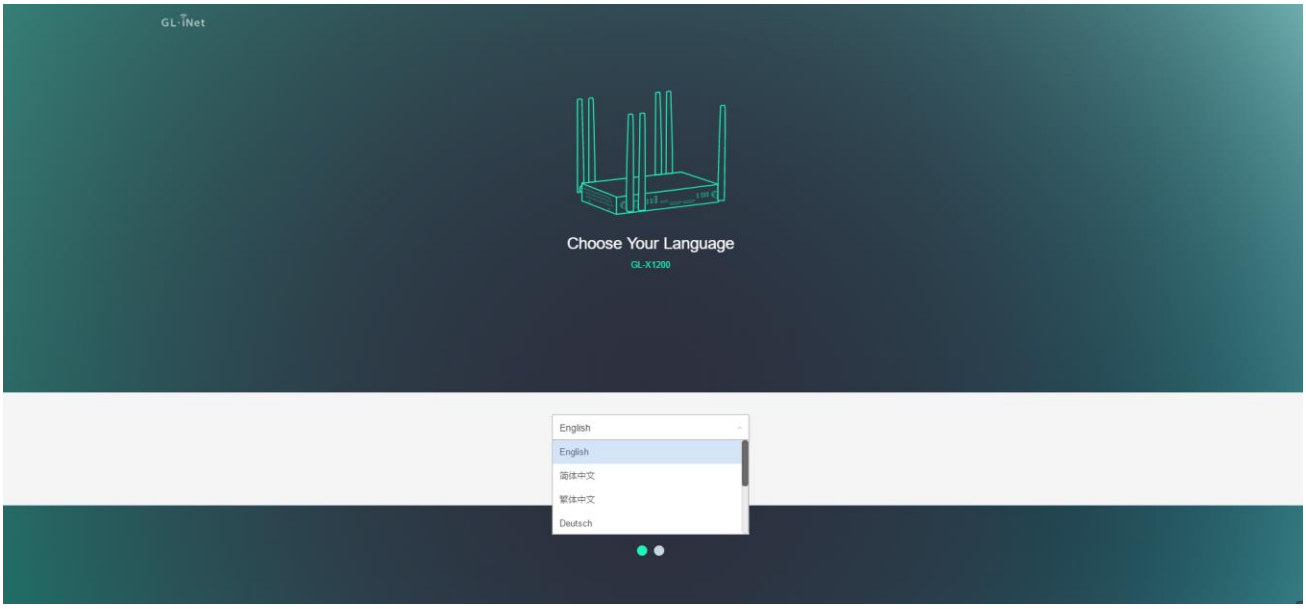
3.1 Login

Connect PC to device LAN port and it will get IP address automatically assigned by the device. Input IP adress(Factory default IP address is 192.168.8.1) into browser, then it will show as follow.



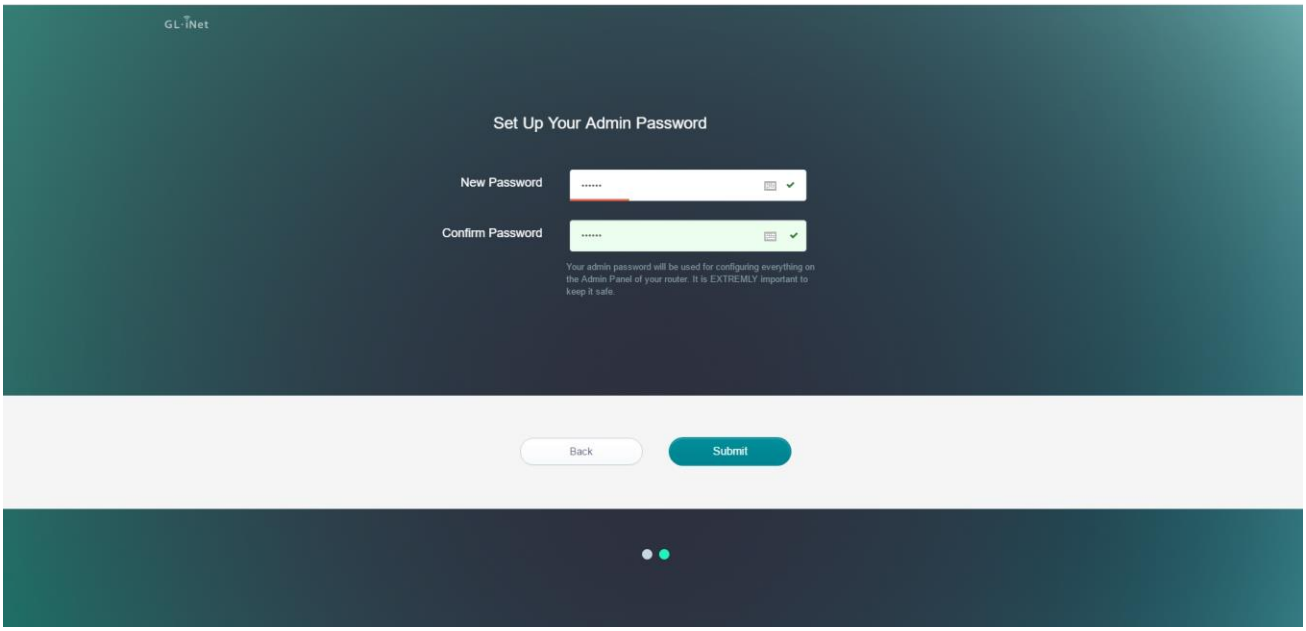
3.2 Language Setting

Select the Web language, you can choose Chinese, English and other languages, click Next to access the administrator password setting interface:



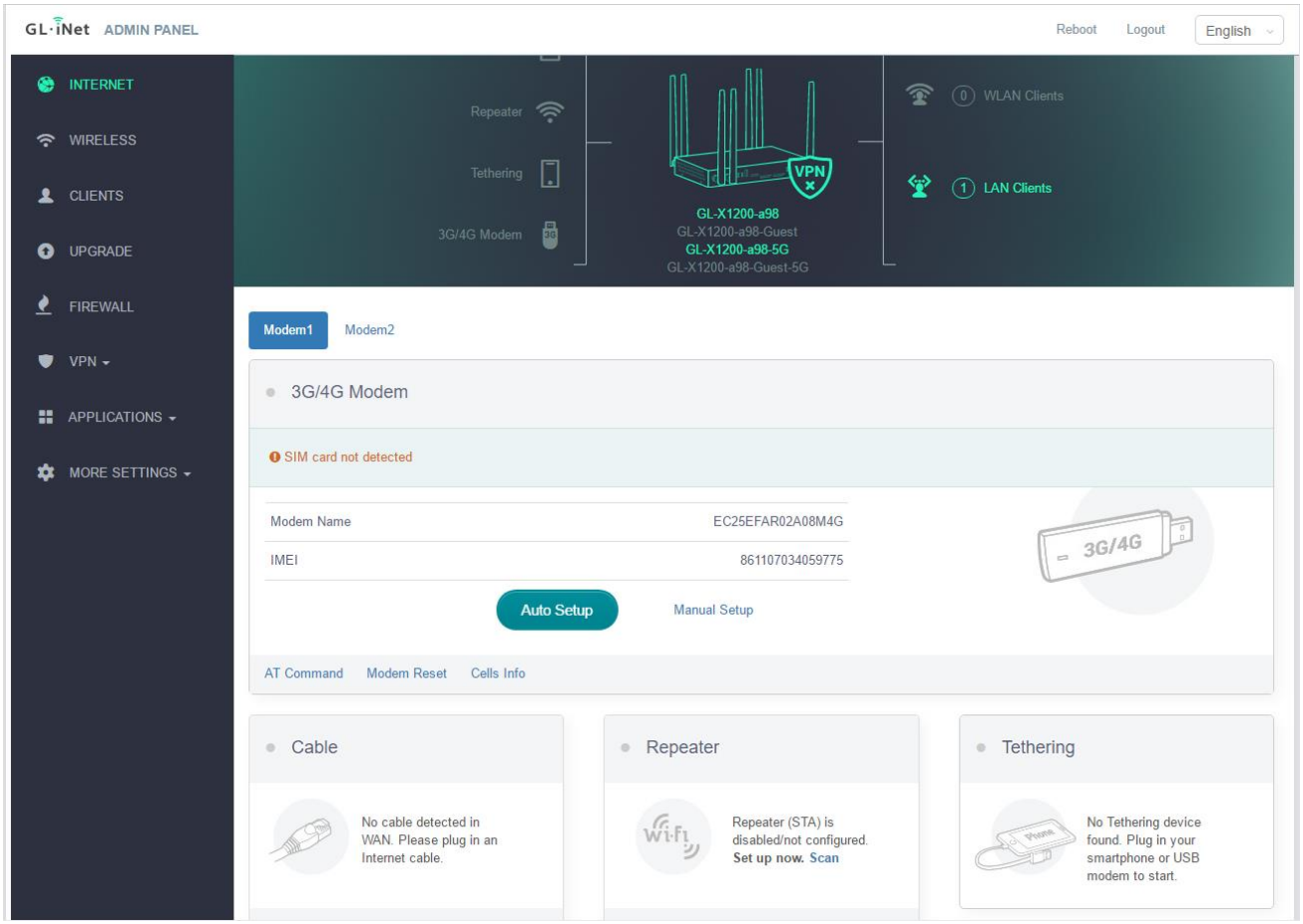
3.3 Set Admin Password

Set the admin password, showing as below:



3.4 Admin Panel

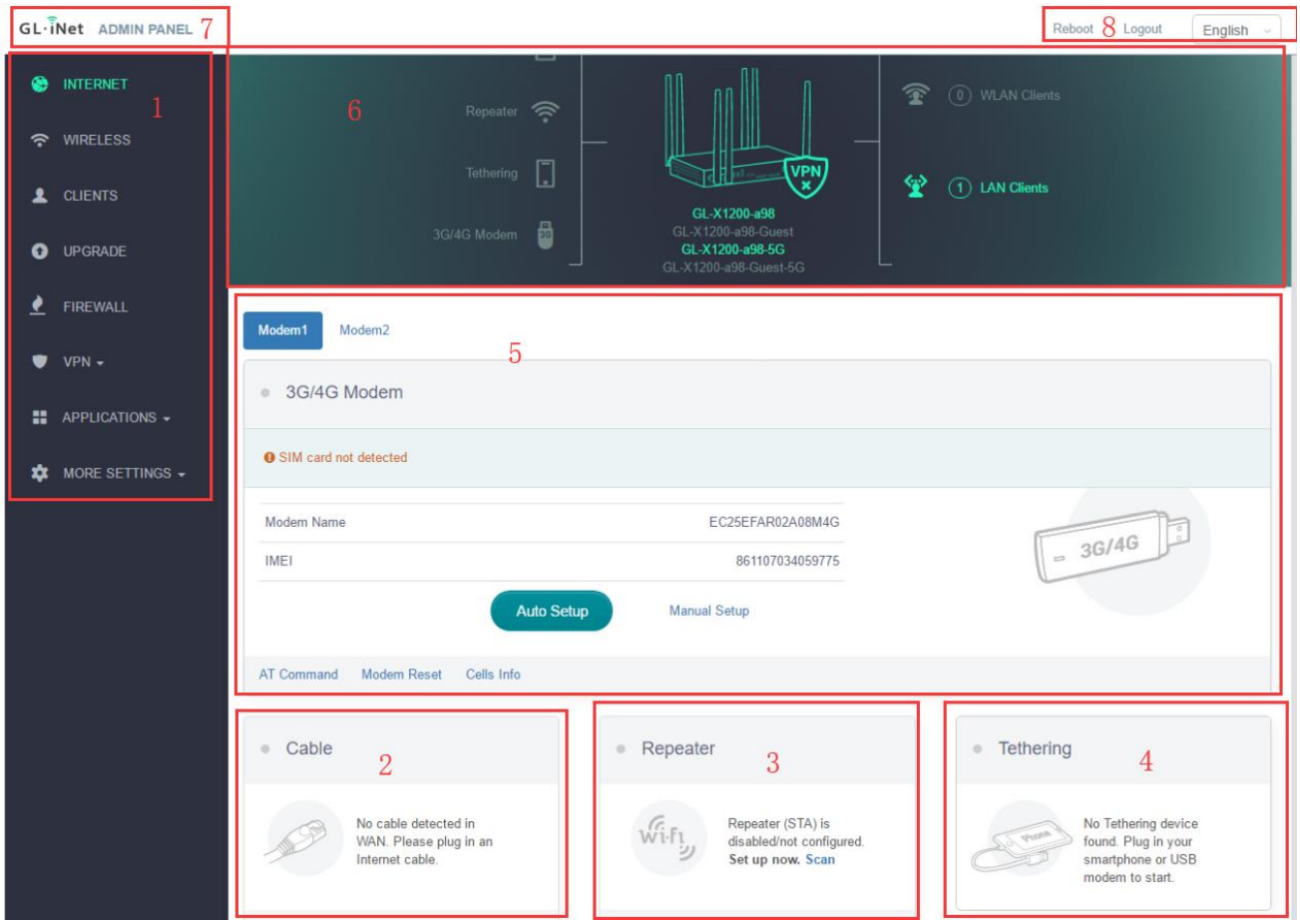
Enter and submit the admin password, then access to the main page of the device, showing as below:



Chapter 4 Device Configuration

4.1 Network

4.1.1 Brief introduction



1: Menu bar

2: Cable

3: Repeater

4: Tethering

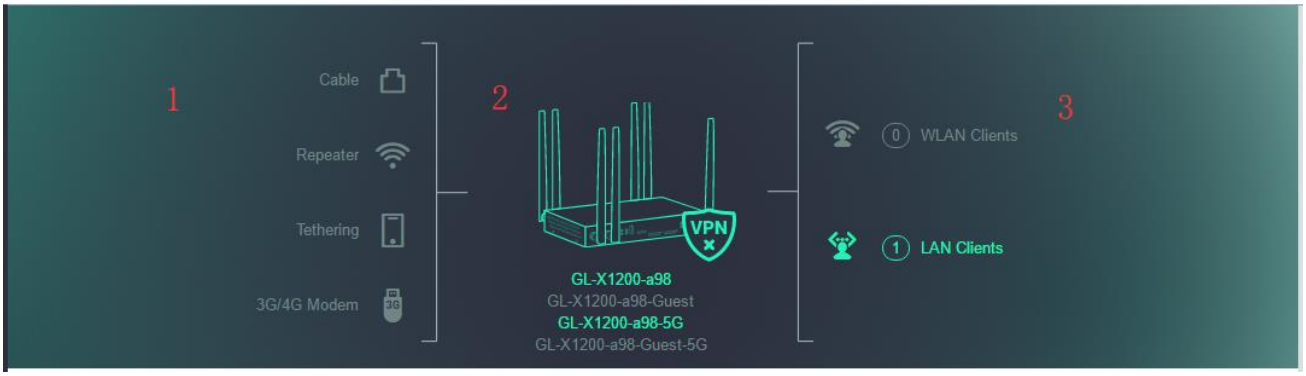
5: 34/4G Modem

6: Status display bar

7: Click GL-iNet to jump to GL-iNet official website

8: Restart/logout/language selection

4.1.2 Status



1. Networking status

   Cable, Repeater, Tethering, 3G/4G Modem networking.
   Gray indicates no connection.
   Highlighting indicates successful connection.

2. VPN connection status

3. Wireless SSID status

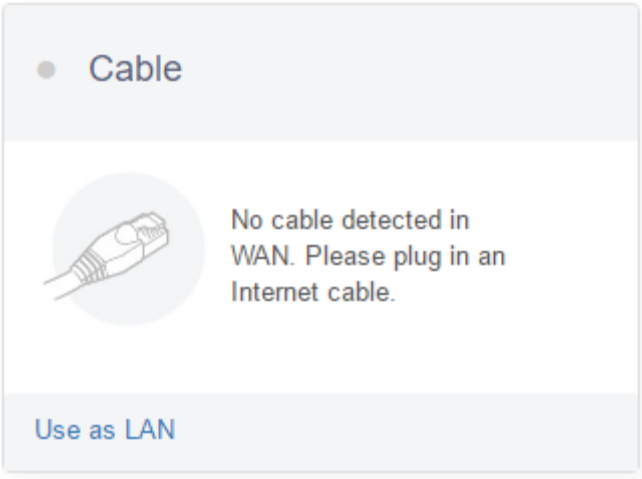
   2.4G/5G SSID/ Guest SSID are displayed, gray indicates disable, and highlighted indicates enable.

4. Number of terminals

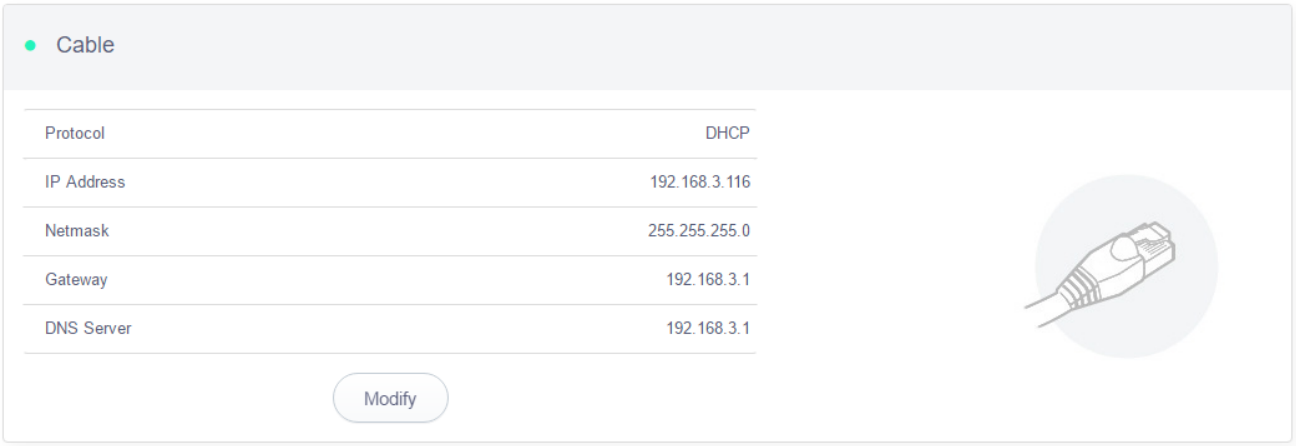
   Displays the number of wireless and wired terminals online.

4.1.3 Cable

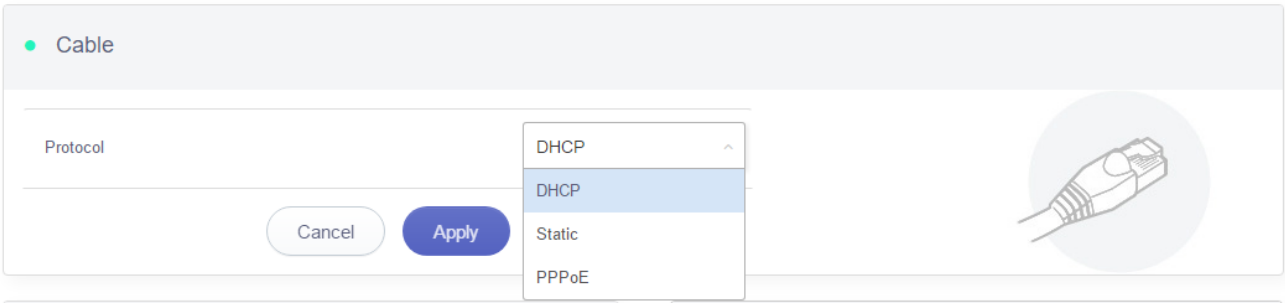
Before setting cable connection, it will show as below:



Plug Ethernet cable, showing as below:

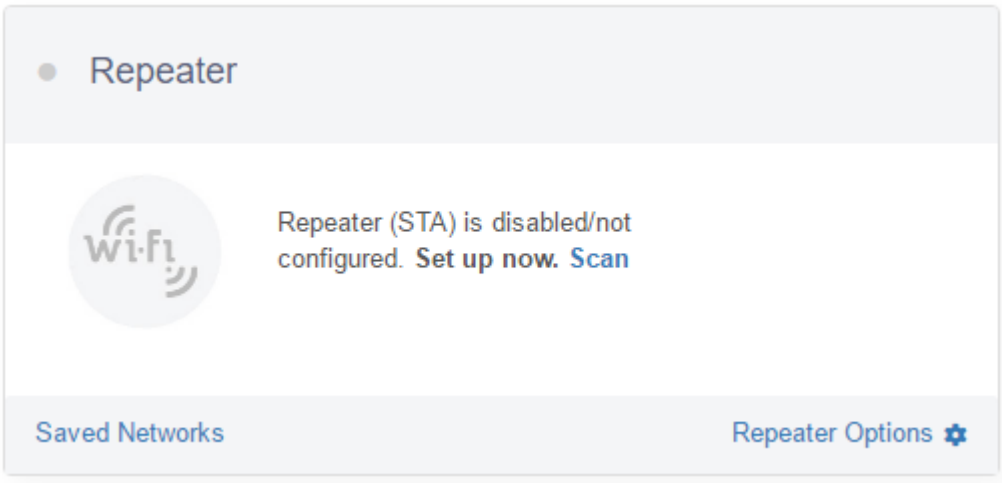


Click ‘modify’ to change the way of network connection, DHCP/Static/PPPOE as below:



4.1.4 Repeater

Before setting, it will show as below:



Scan: Scan the surrounding hot spots

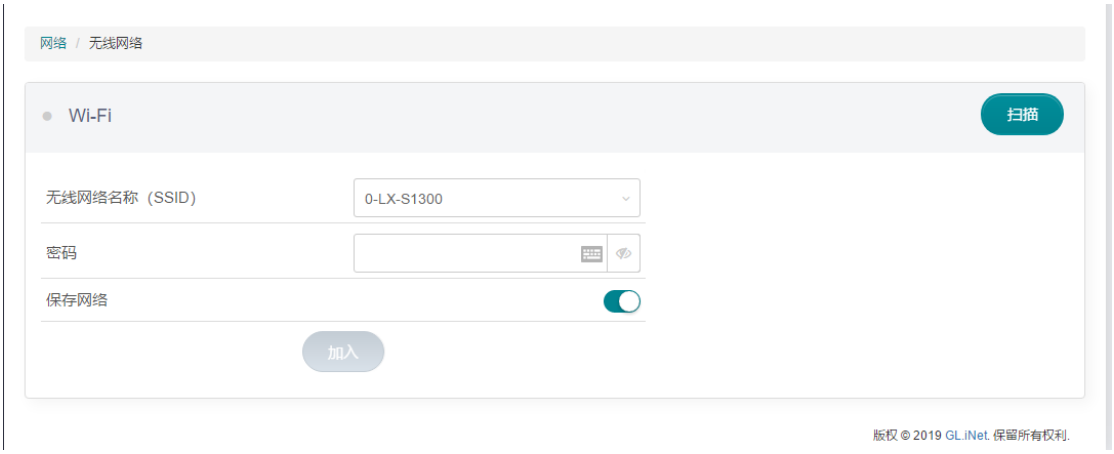
Existing network: It will save wireless hot spots connected previously

Repeater Options: Turn on or off its auto connection function

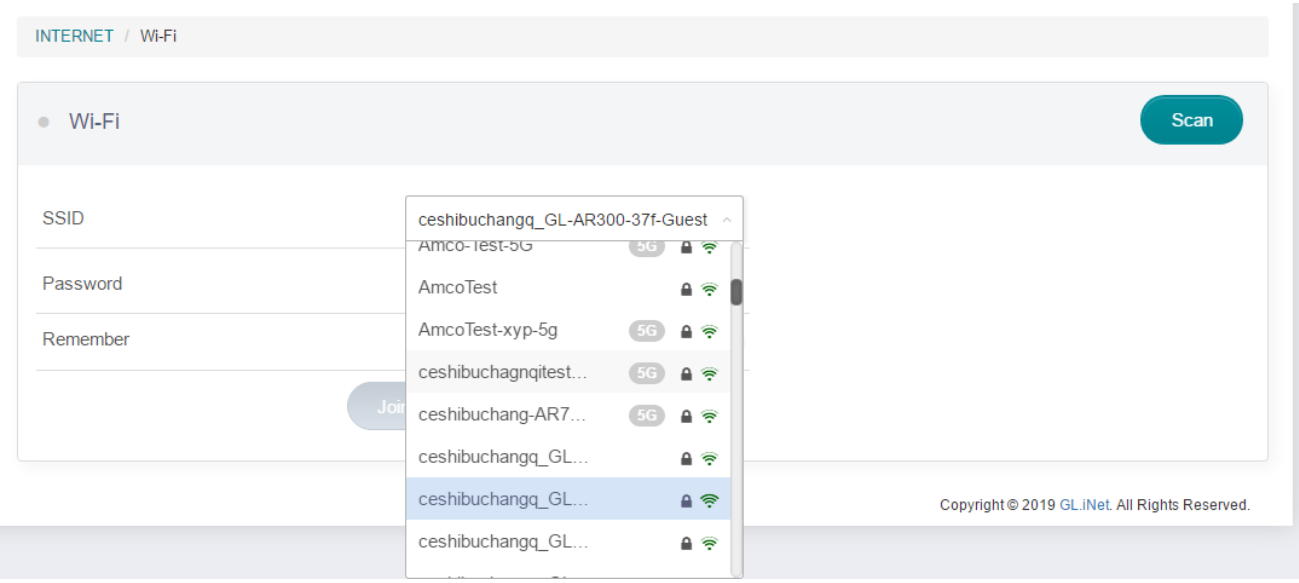
4.1.4.1 Scan

Click‘Scan’and it will show as below:

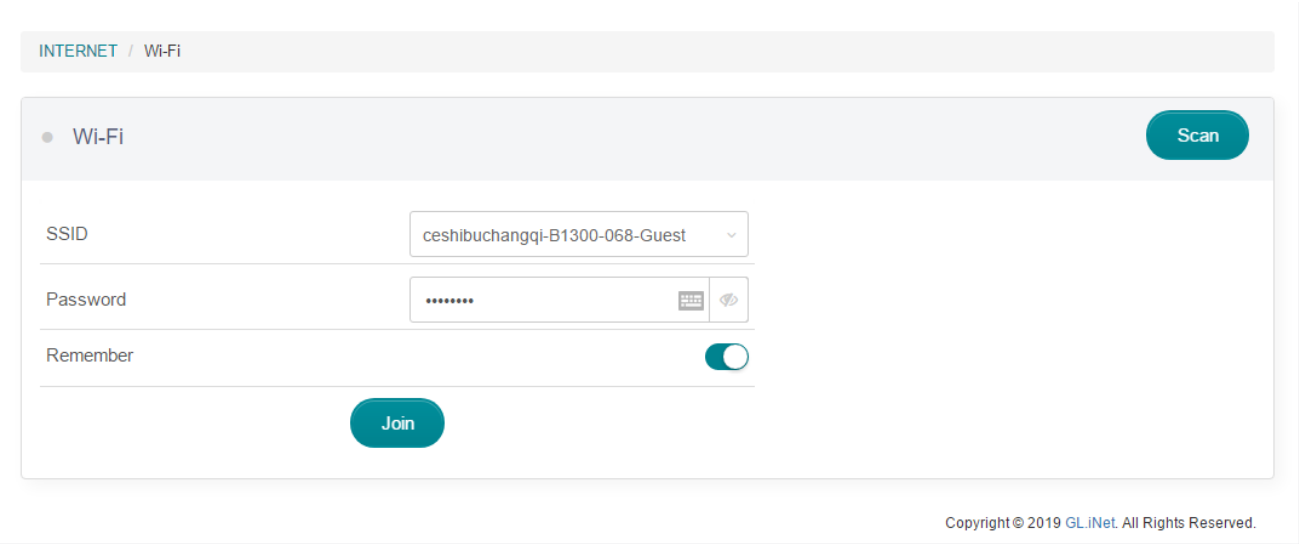
Finish scan it will show as below:



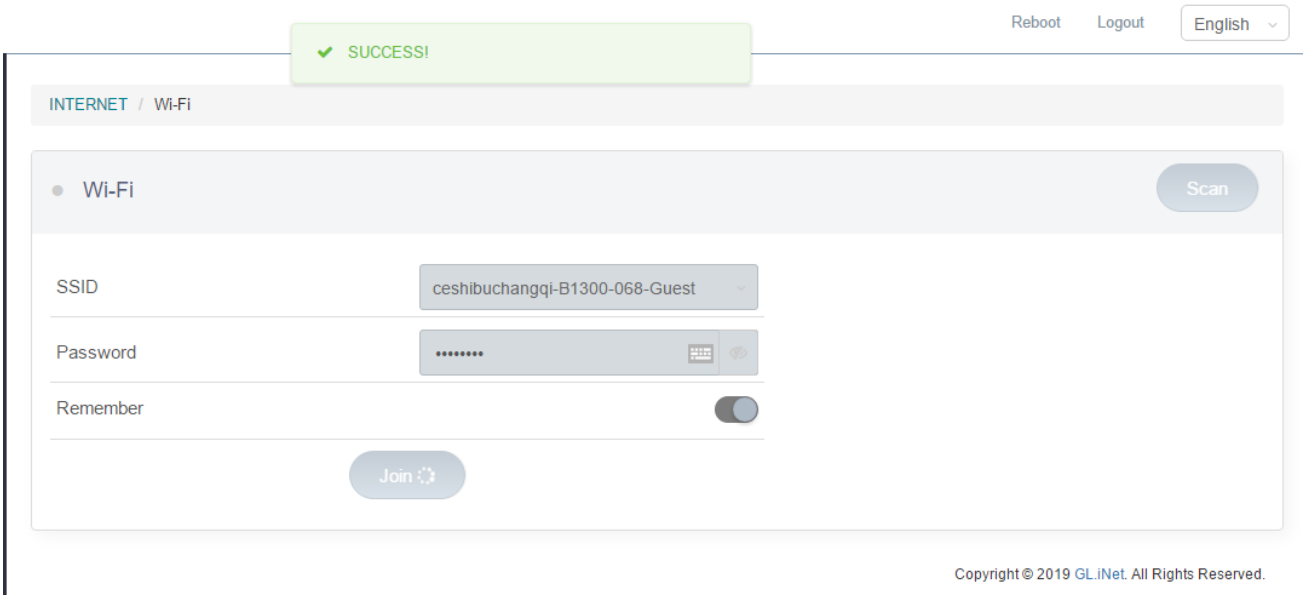
Click drop-down arrow to choose SSID, showing as below:



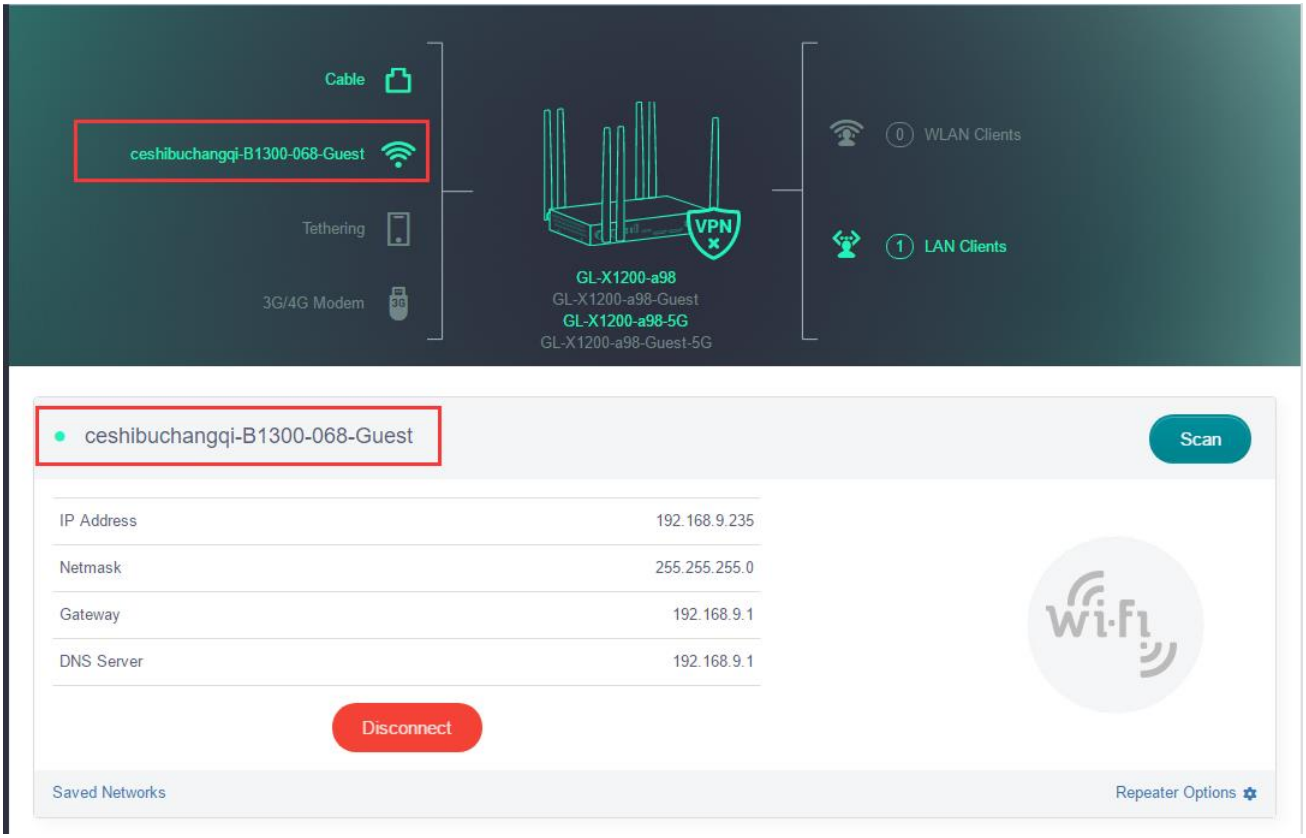
Choose the SSID, input password, turn on network saving function, then add, showing as below:



After successful connection it will pop-up as below:



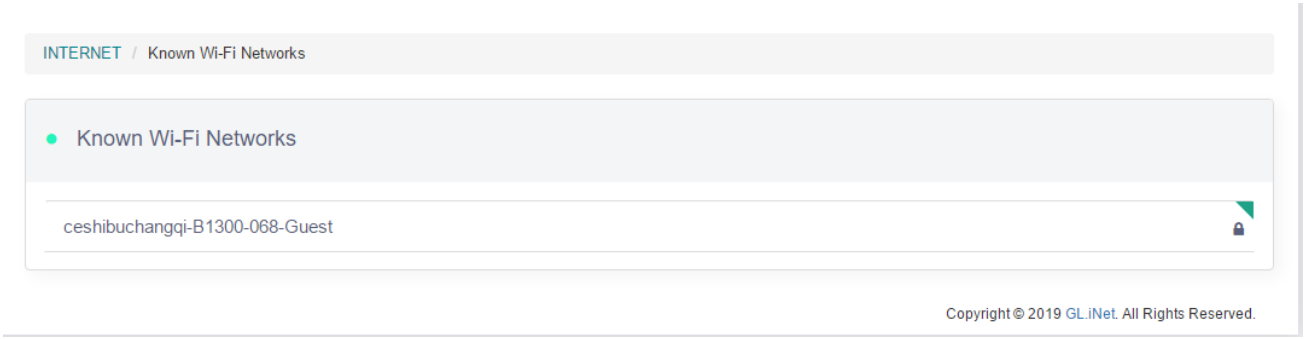
Wait 5s， it will enter into admin panel. Status bar will show the SSID connected, showing as below:



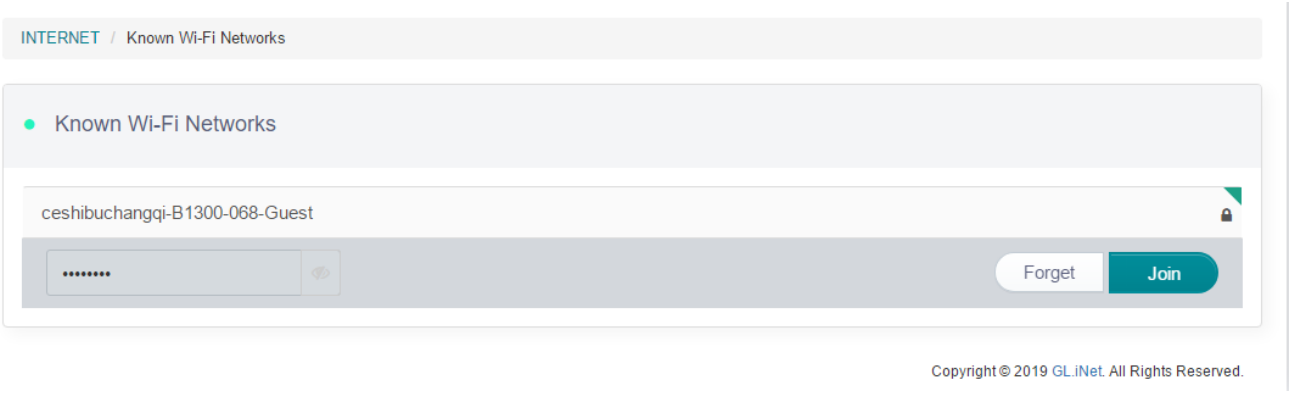
SSID, IP address, subnet mask, gateway, DNS server will be displayed.

4.1.4.2 Existing Network

Click existing network, it will display the list as below:

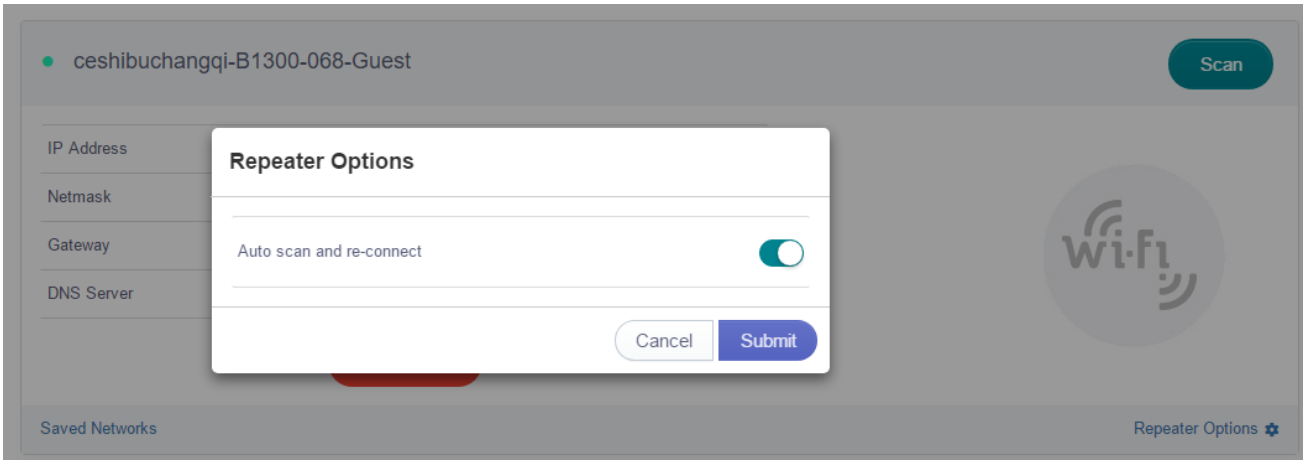


Click SSID, user can click forget or add to re-connect this SSID, showing as below:



4.1.4.3 Repeater Options

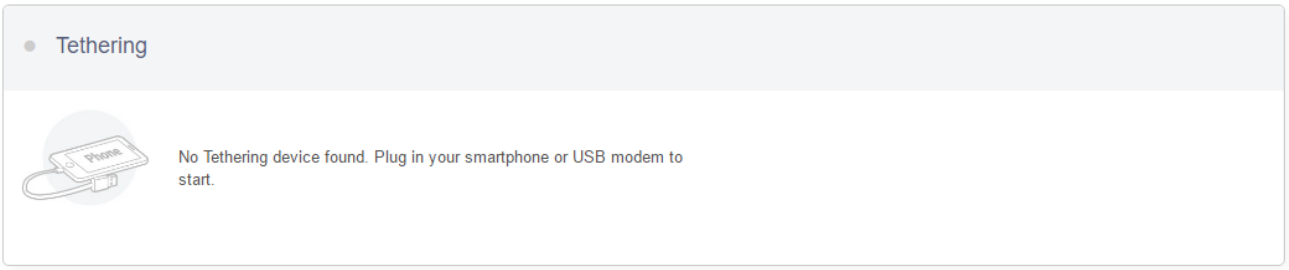
Click ‘Repeater options’, it will pop-up below page. User can turn on or off the function of auto scan and connection.



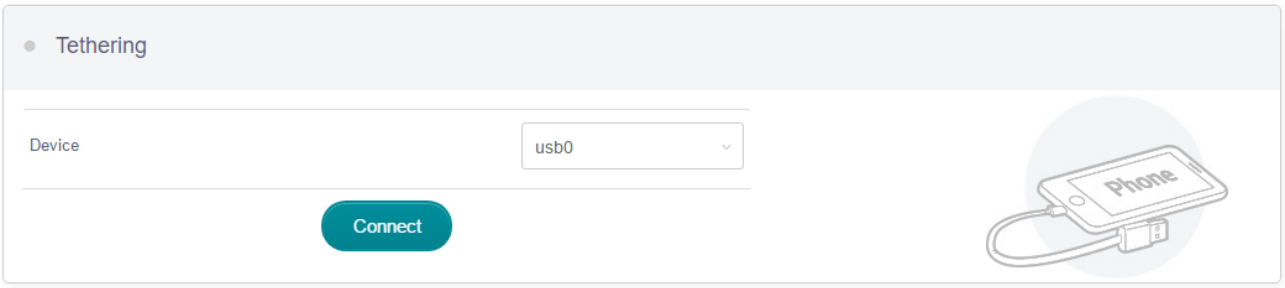
Auto scan and connection: It enables auto switching to available SSID.

4.1.5 Tethering

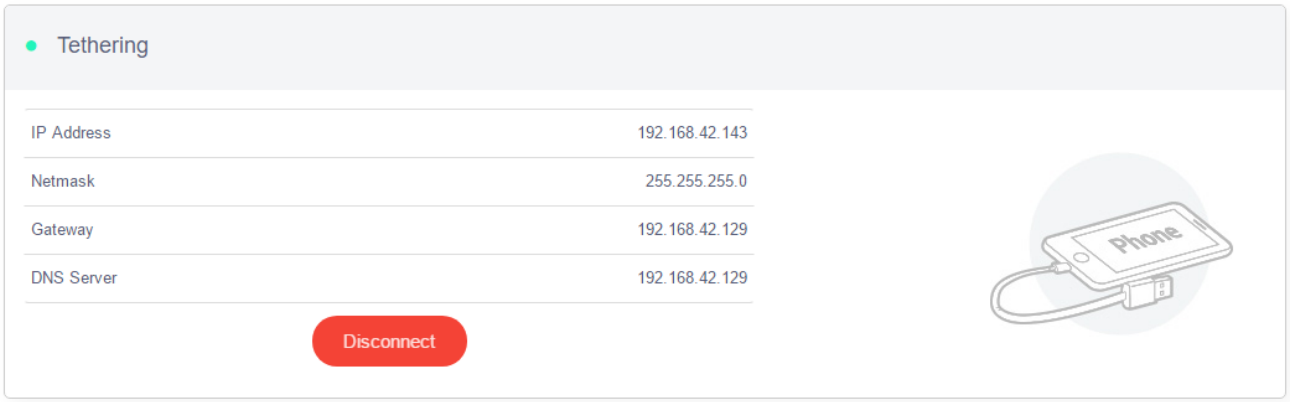
Disconnection will display as below:



Use original USB cable to connect phone and the device, then turn on USB network sharing of the phone, showing as below:

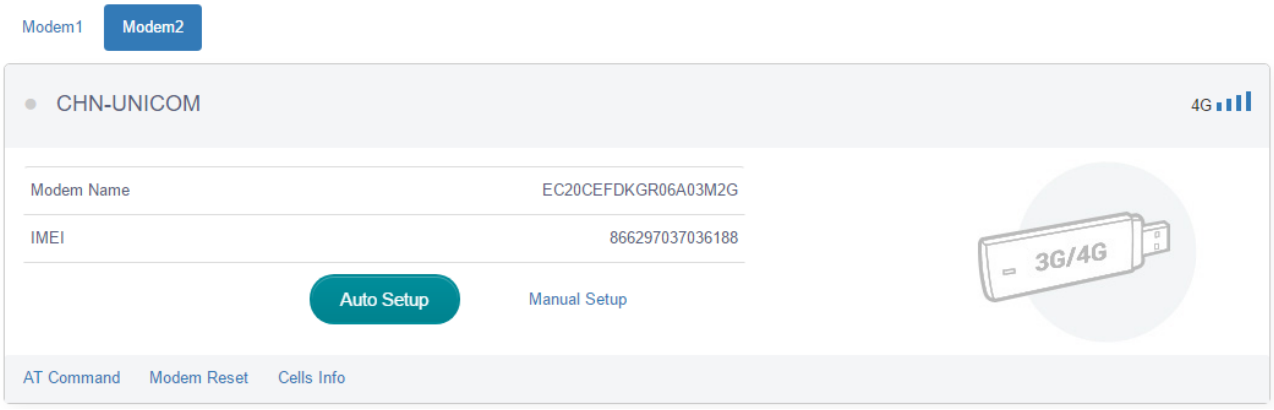


It will display as below after successful connection:

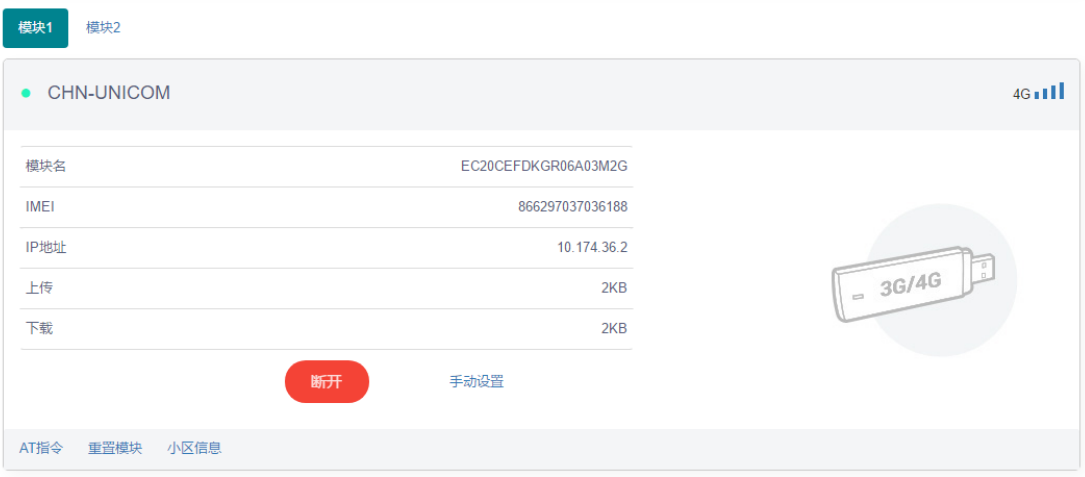


4.1.6 3G/4G Modem

Before 4G module setting, it will show as below:

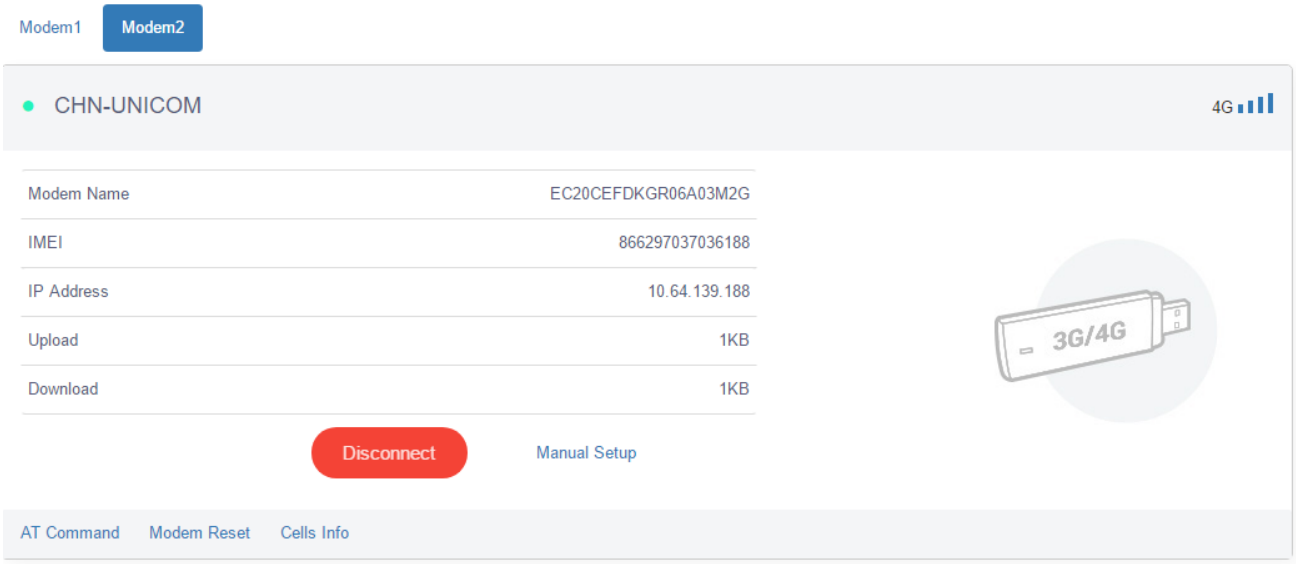


Click ‘Auto setting’, after successful connection it will show as below:

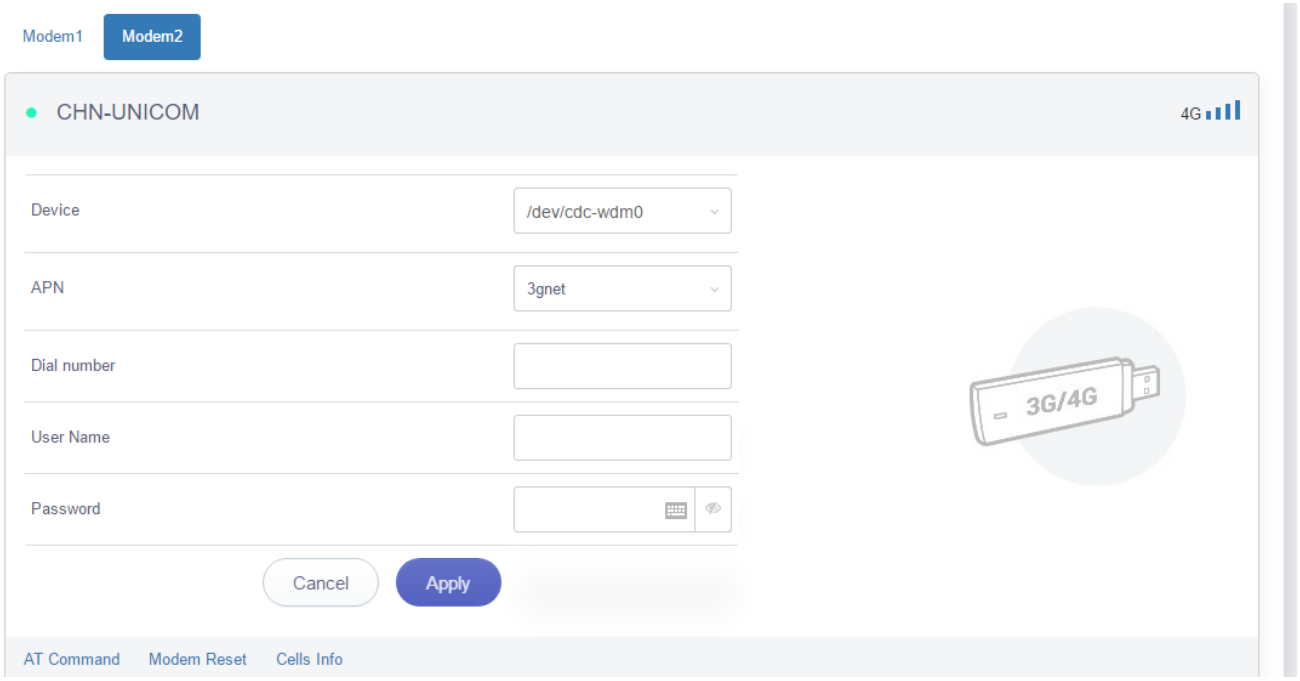


4.1.6.1 Manual Setting

Click ‘Manual setting’ to choose dialing device and APN, showing as below:

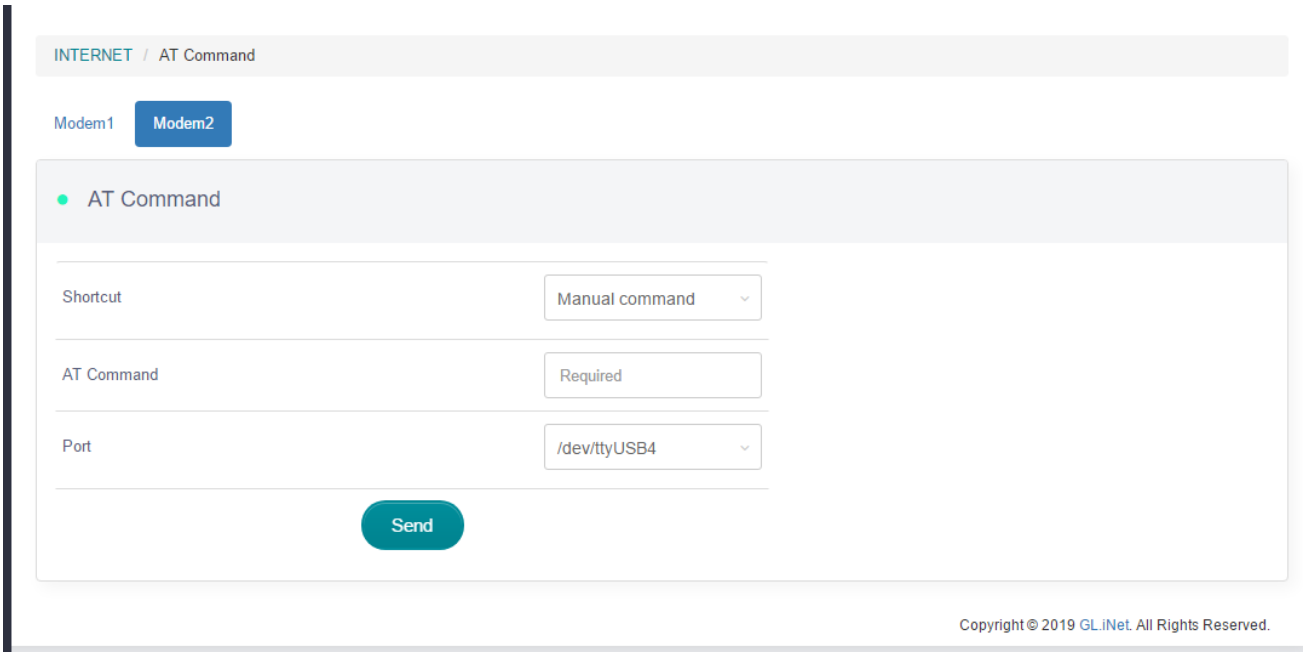


Click ‘More’ to get more setting options as follows:

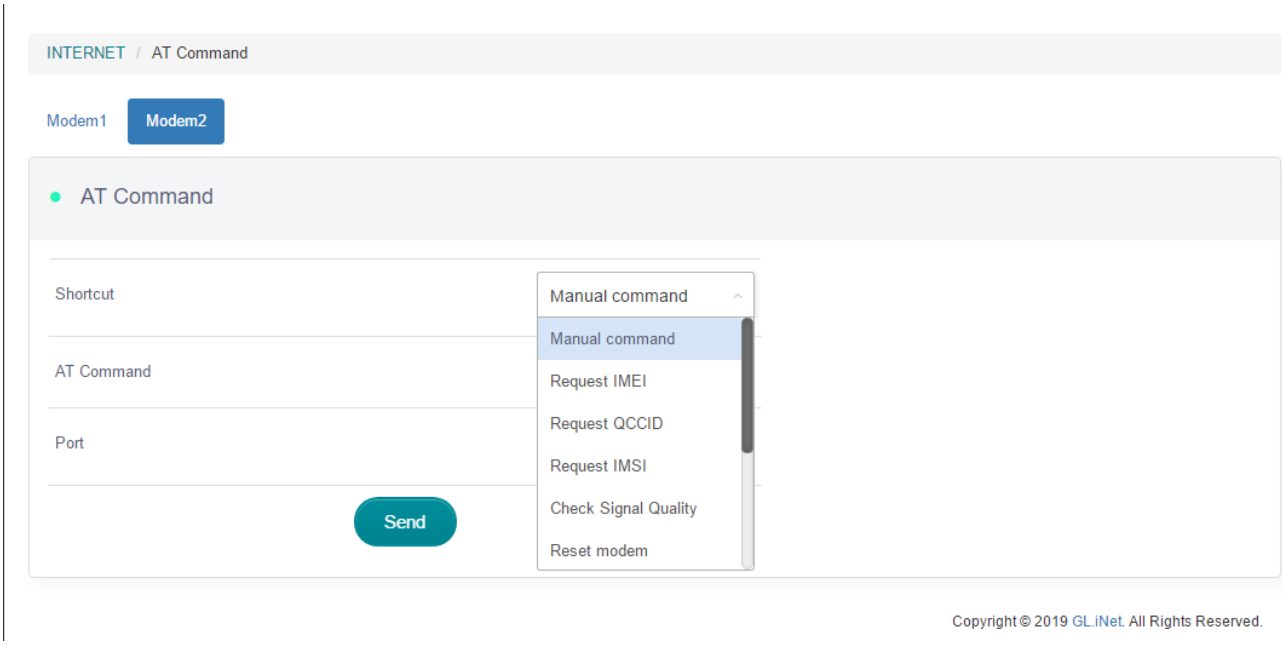


4.1.6.2 AT command

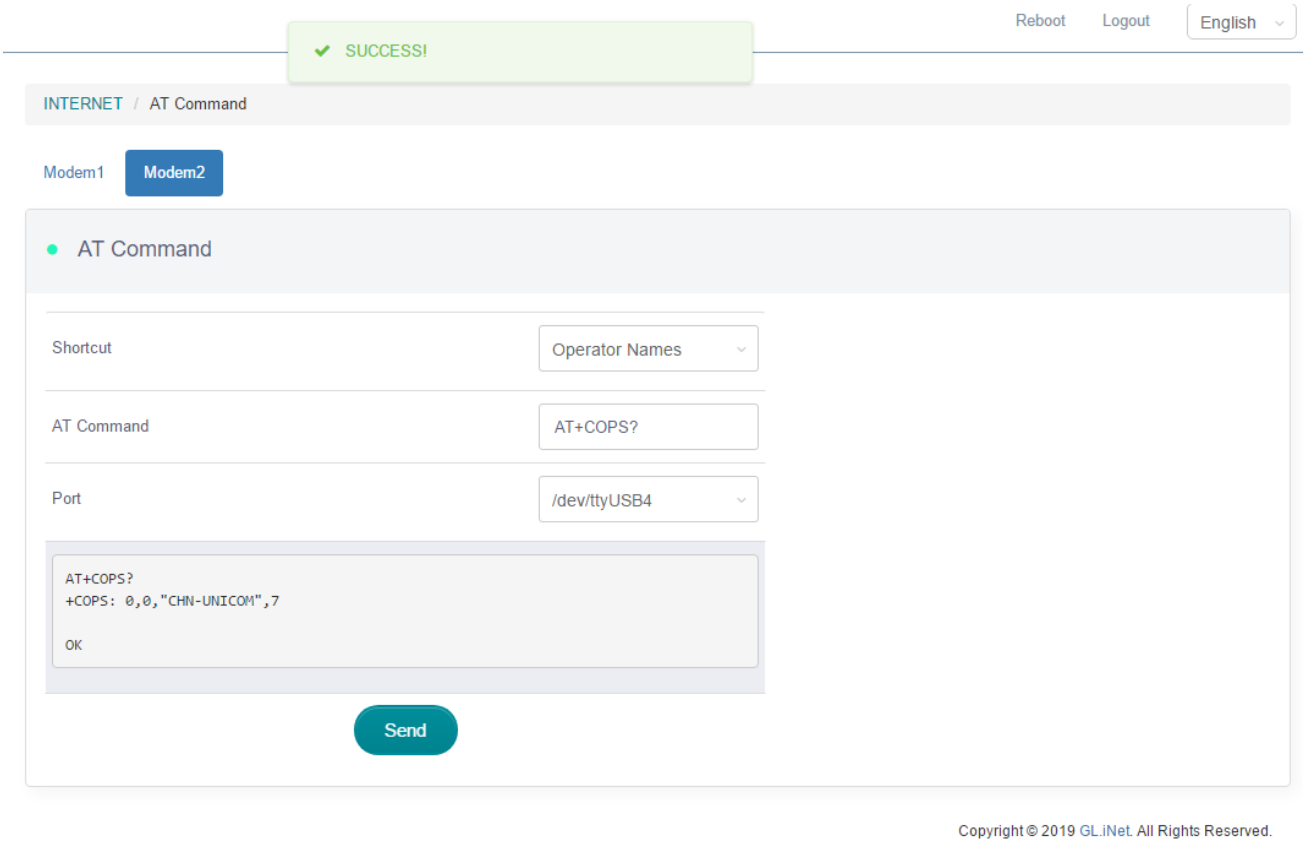
Click ‘AT command’ and enter into interface as follows:



Click on the drop-down menu to display the packaged instructions as follows:

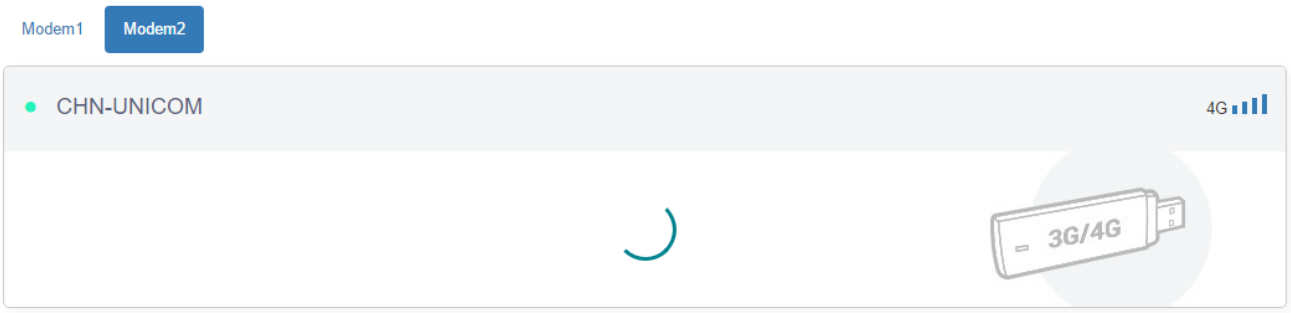


Select Request IMEI and click send, successfully read as follows:



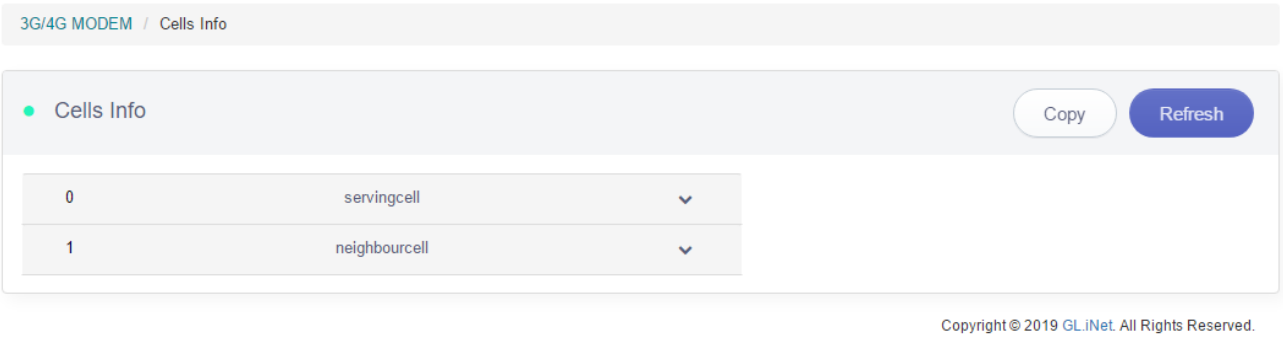
4.1.6.3 Reset Module

Clicking ‘Reset module’ to proceed reset. It will take about 25s, showing as below:



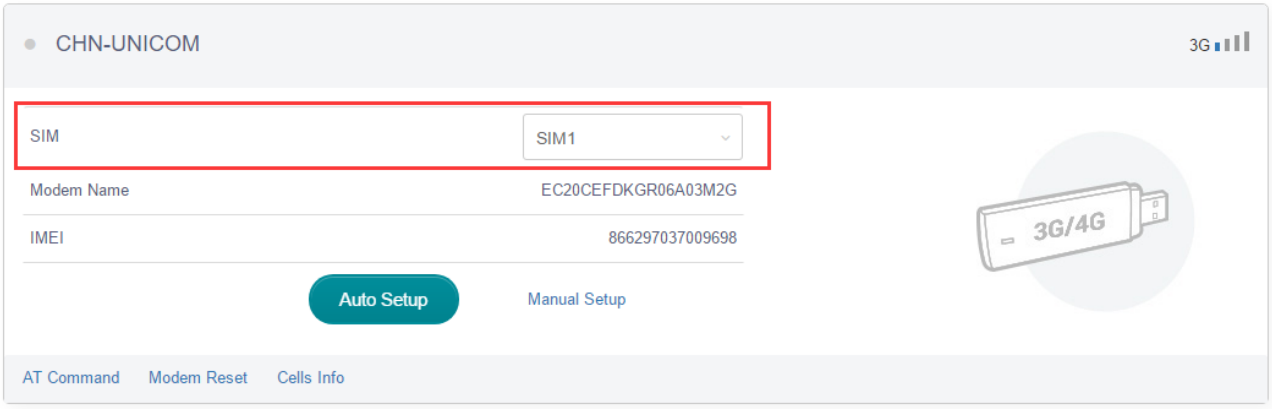
4.1.6.4 Community Information

Click ‘Community information’ to view the modem community information. It supports copy and refresh functions, showing as below:

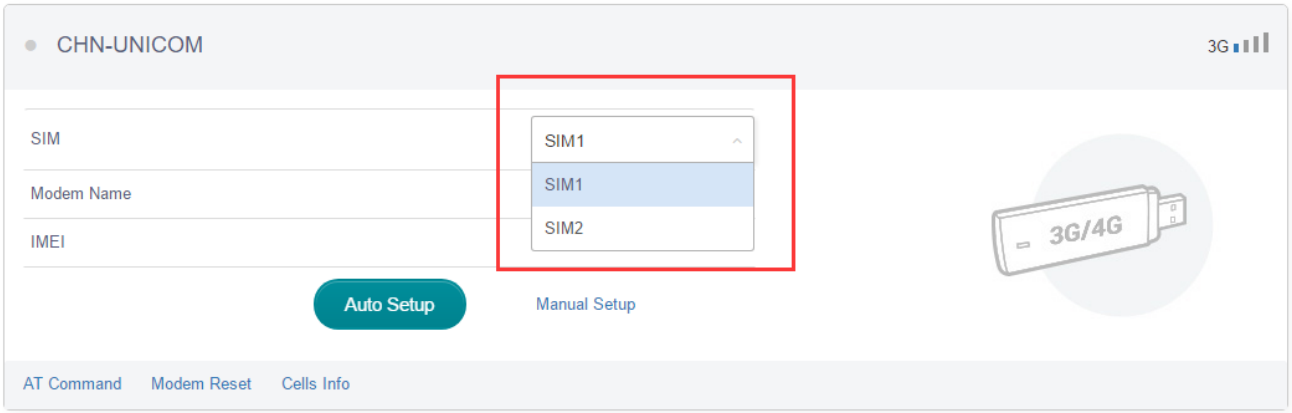


4.1.6.5 Single Module with Dual SIM Card

If the product is single 4G module with dual SIM card (limited to product type ‘**X1200-S**’), this function supports switching SIM cards as follows:



Click the drop-down arrow to switch SIM card as follows:

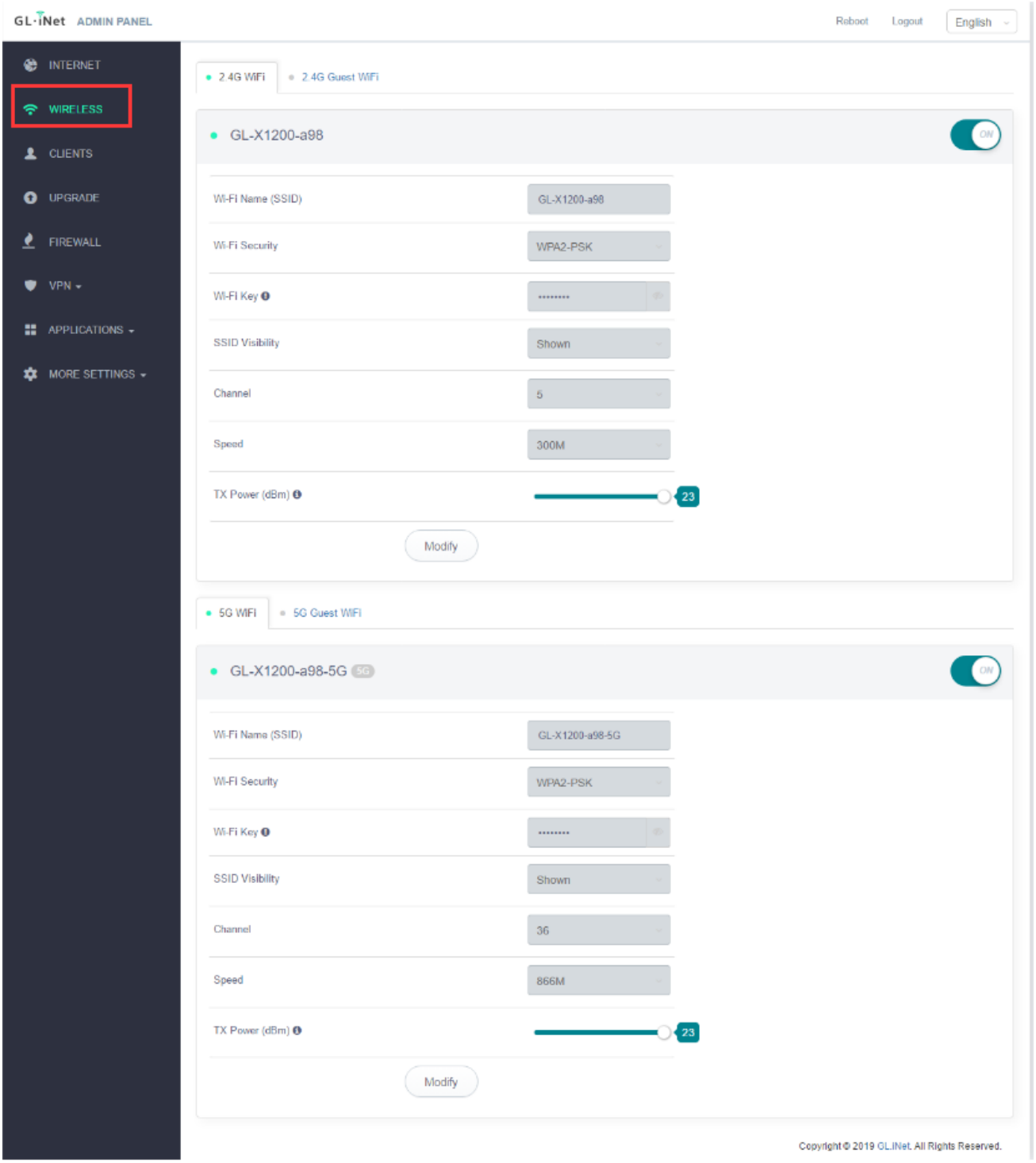


Note:

Modem2 has the same setting way as Modem1. Two modems could be applied at the same time to offer network connection.

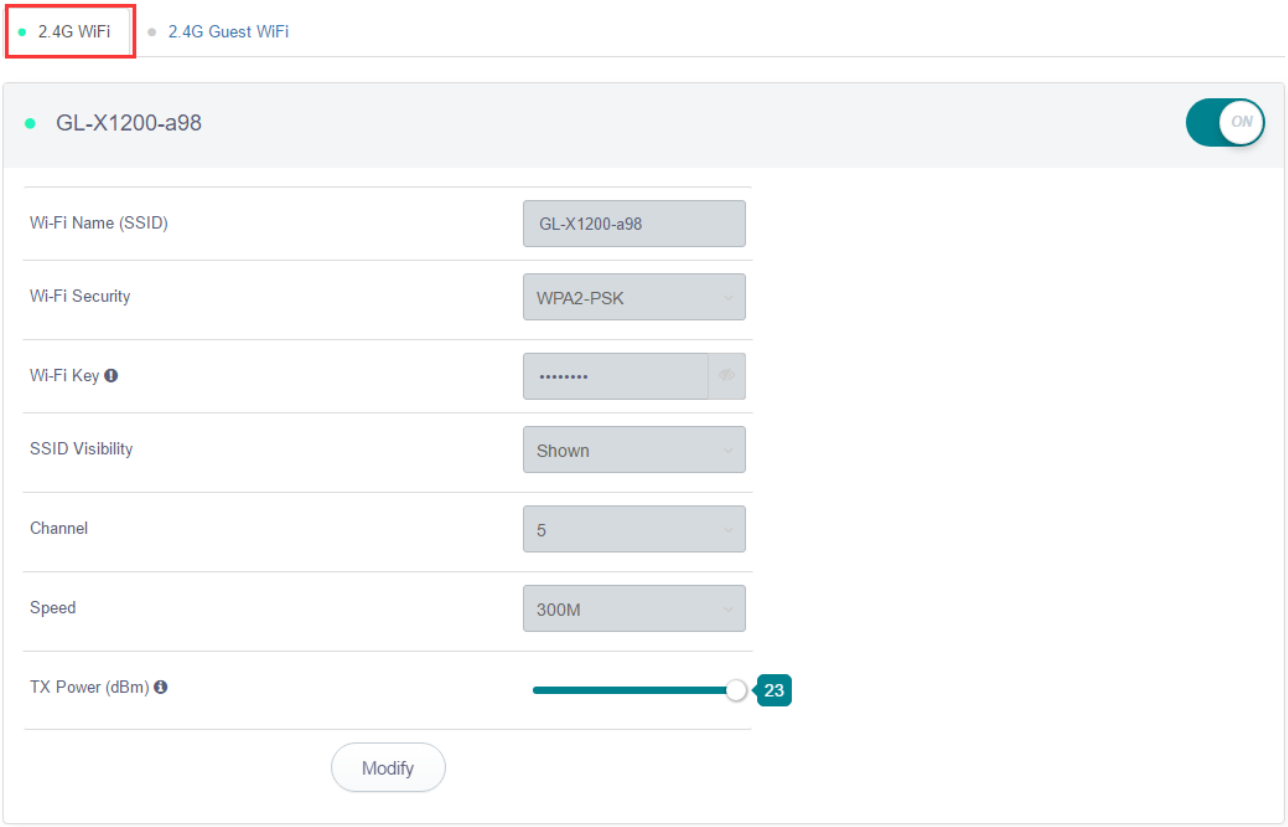
4.2 Wireless

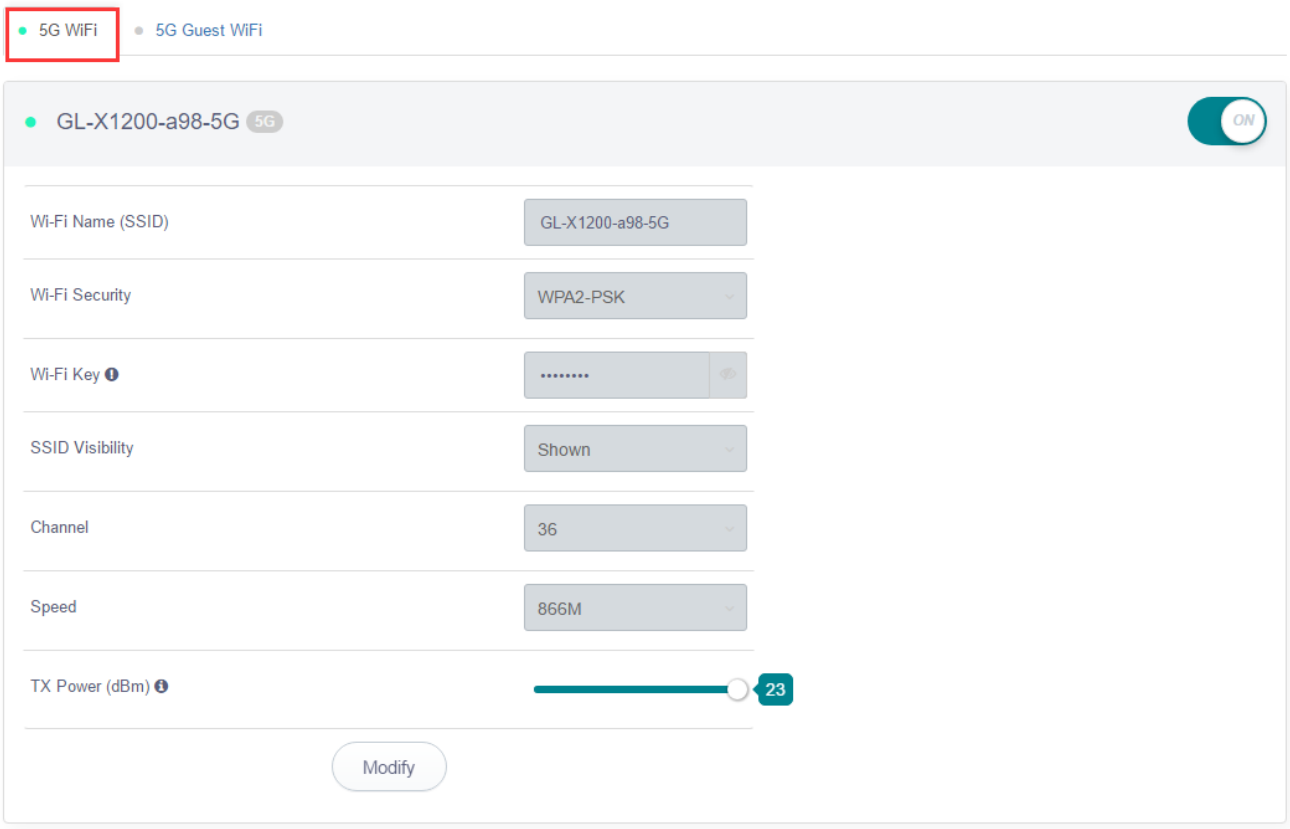
Click ‘Wireless’ to enter into Wi-Fi management interface as follows:



4.2.1 2.4G & 5G WiFi

Click ‘Wireless’ and enter into 2.4G/5G Wi-Fi management interface in default as follows:





Wireless Network Name (SSID): Wireless SSID

Wireless network security: wireless encryption method

Wireless network password: wireless password

SSID visibility: whether to hide the SSID or not

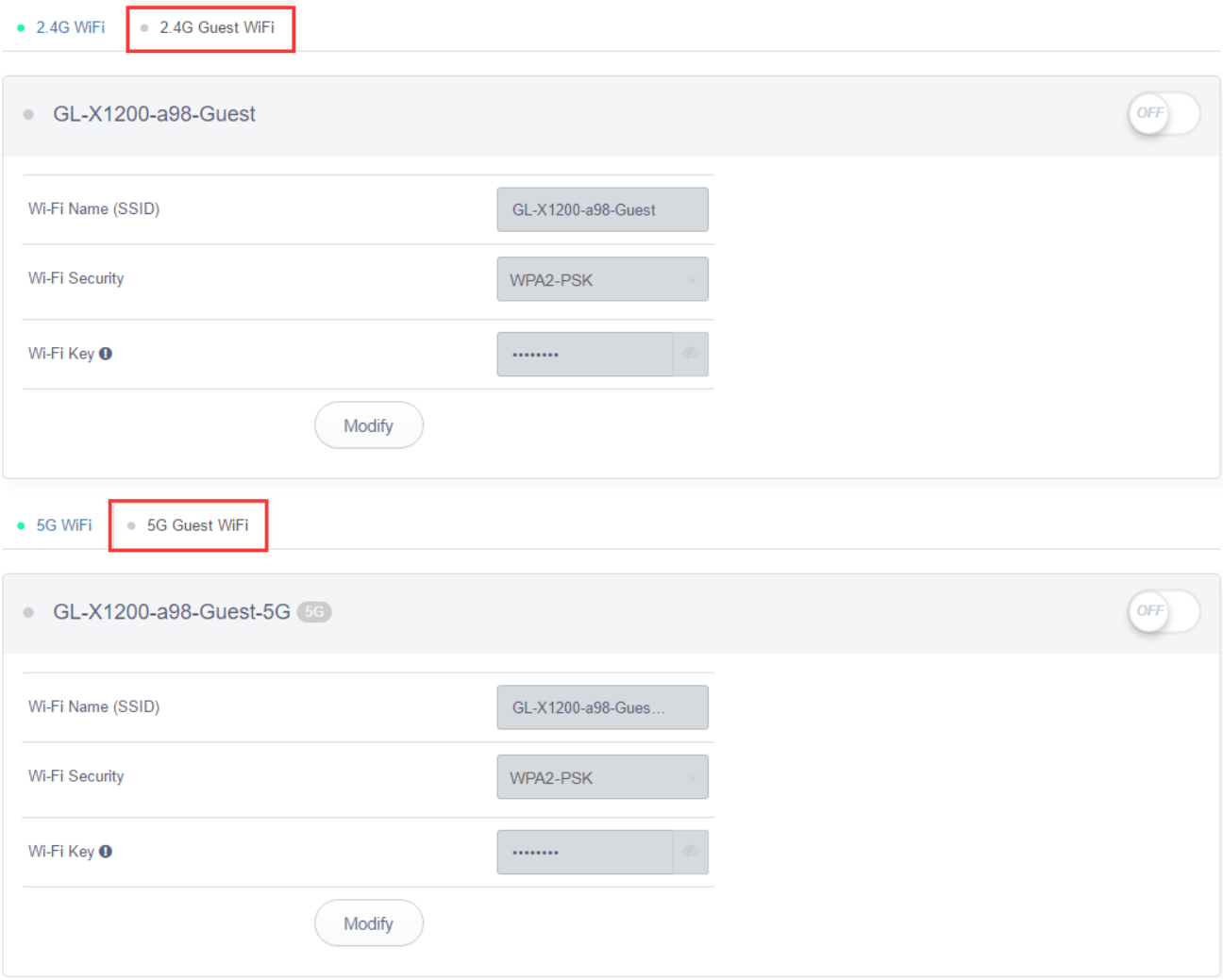
Channel: channel settings

Rate: Rate settings

Transmit power: transmit power settings

4.2.2 2.4G & 5G Guest WiFi

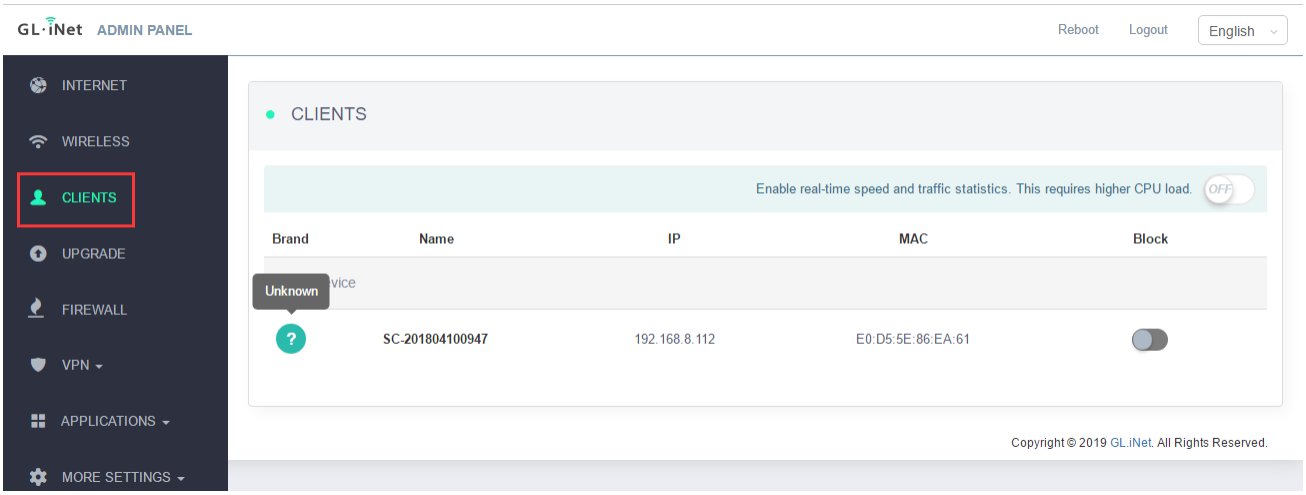
Click '2.4G Guest WiFi' to display as follows:



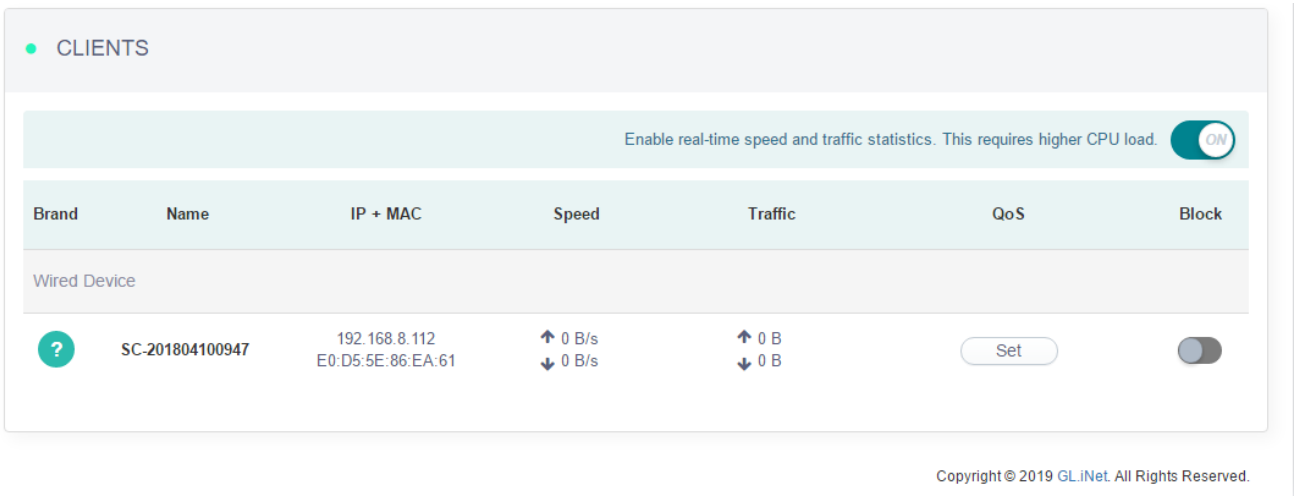
Guest WiFi is turned off in default. Modification of wireless network name, wireless network security, and wireless network password is supportable.

4.3 Client

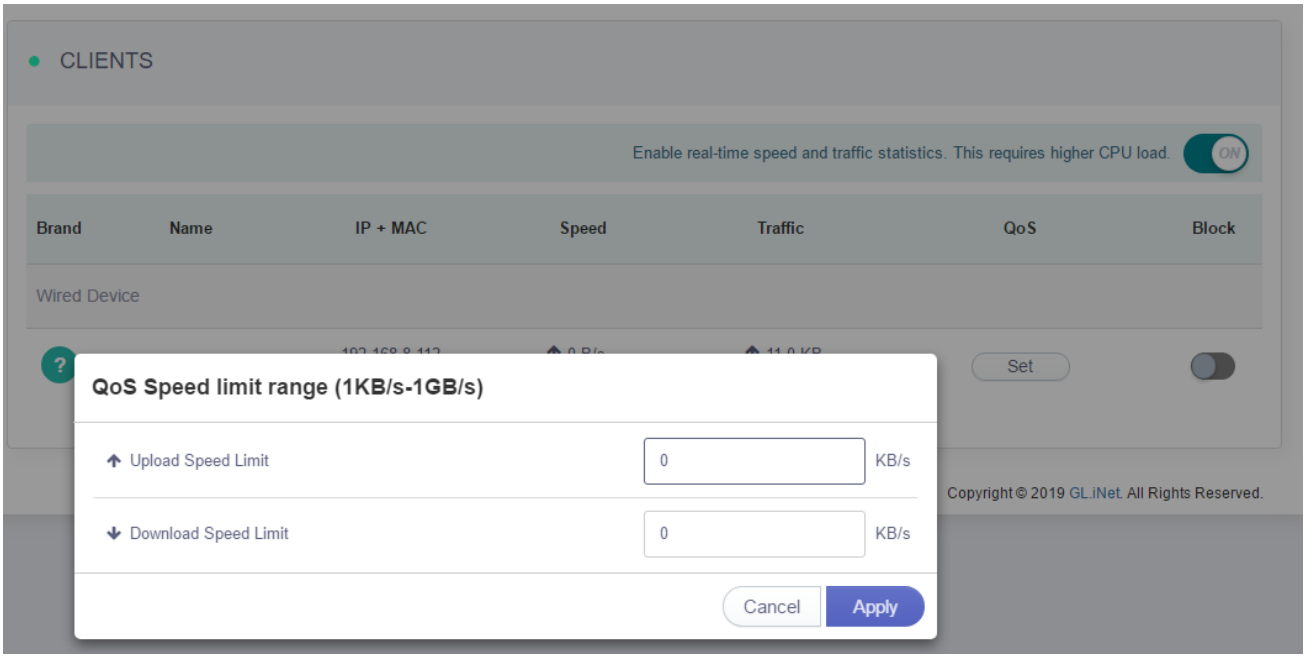
Click ‘Client’ and it will display the turn-off of traffic statistics as below:



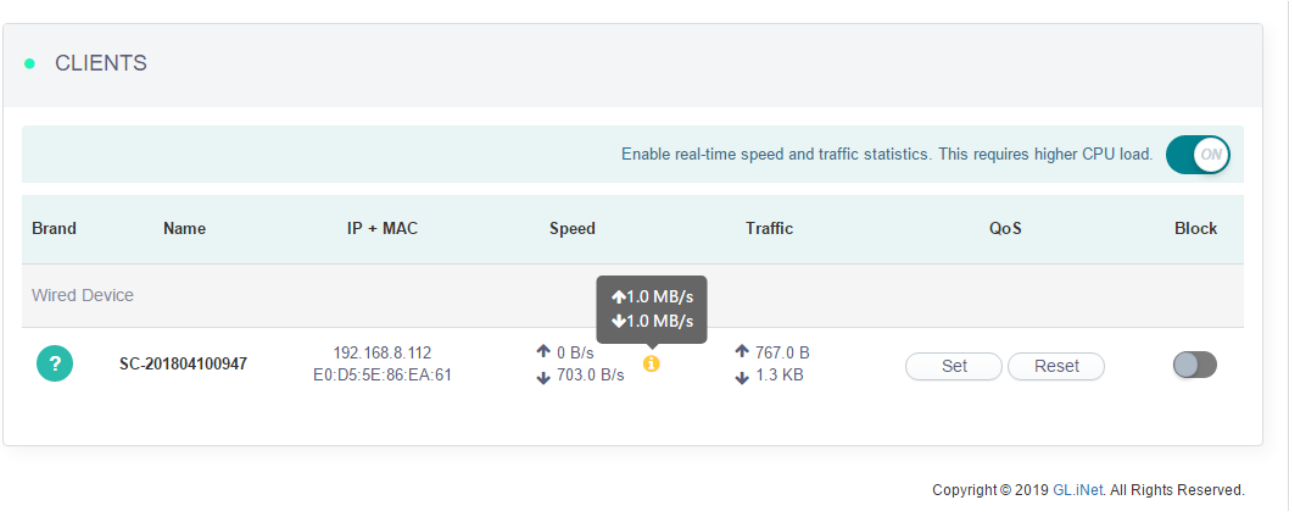
Turn on traffic statistics which supports QoS as follows:



Click "Settings" to QOS settings page. Upload and download rate can be limited, showing as below



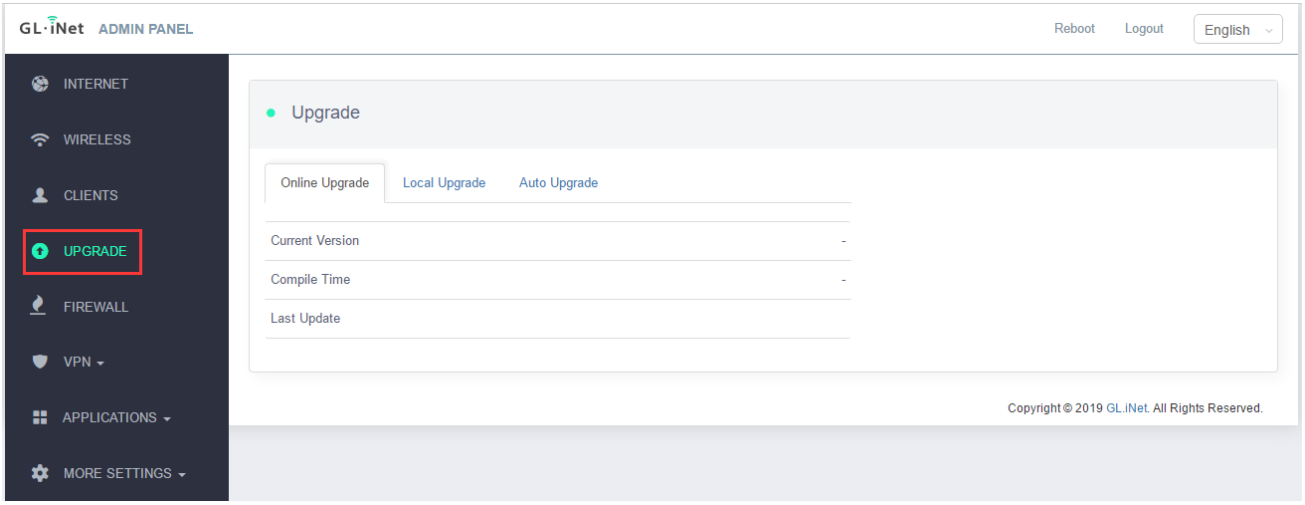
The speed limit value can be checked. Click Reset to cancel speed limit, showing as below:



Note: It is not recommended to keep traffic statistics on as it will increase CPU load.

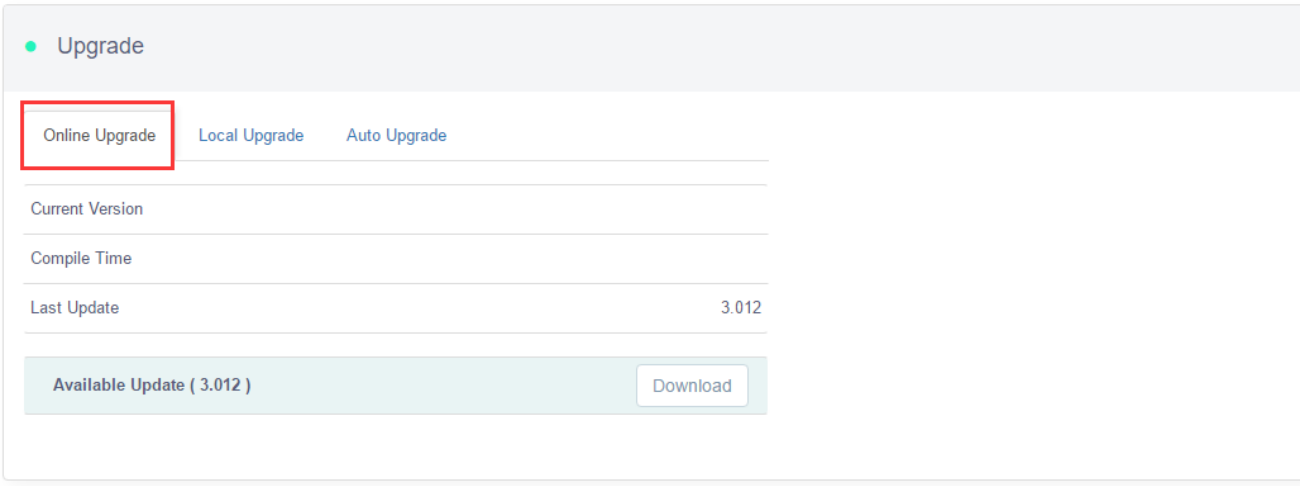
4.4 Upgrade

Click ‘Upgrade’，showing as below:



4.4.1 Online Upgrade

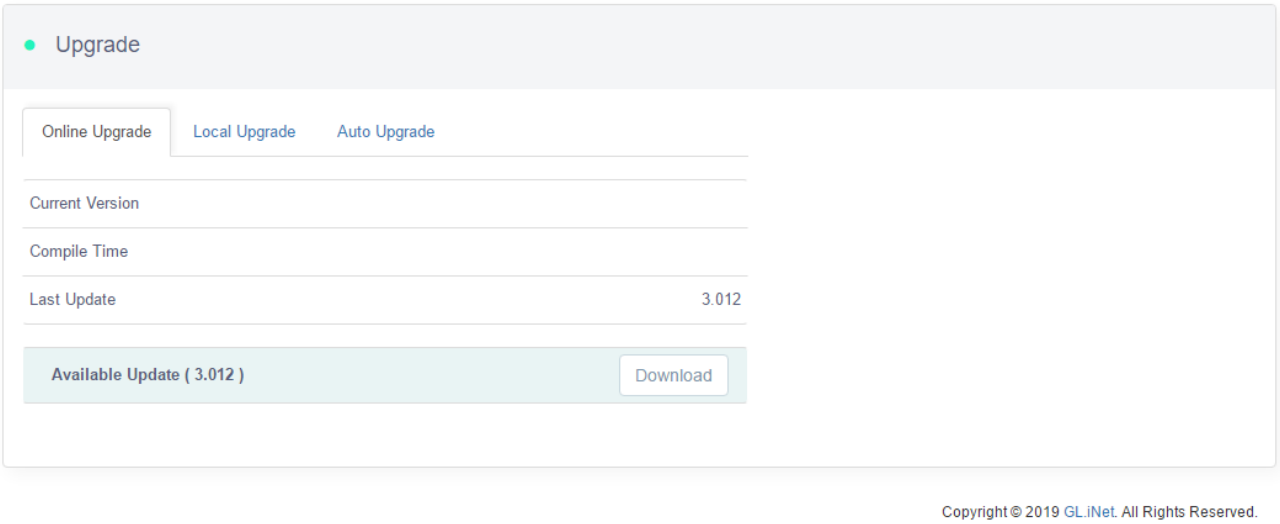
Click ‘Upgrade’, then enter into online upgrade interface in default, showing as below:



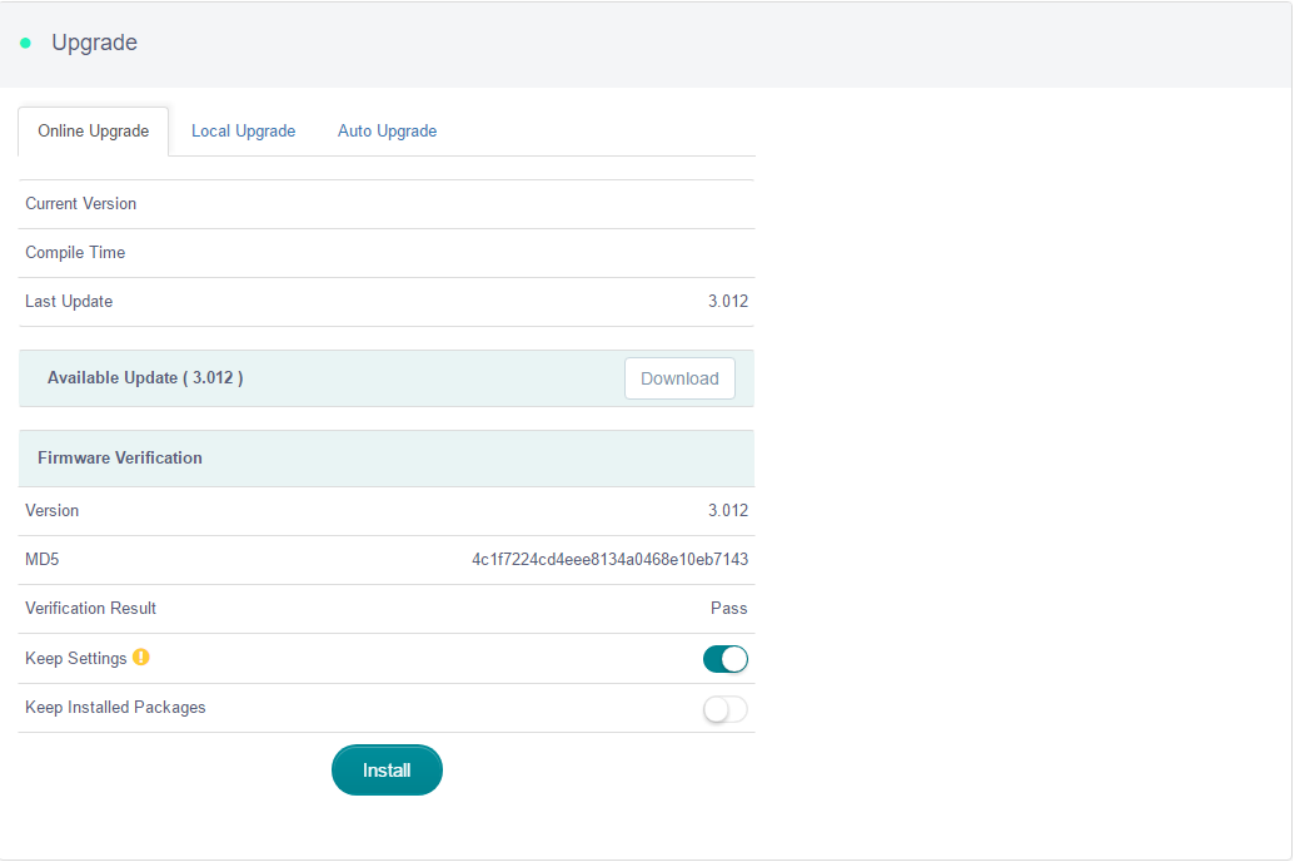
Current Version: Current firmware version

Compile Time: Firmware compilation time

Latest Update: The latest firmware version of the server. Only if the current software version is lower than the server firmware version then it will indicate ‘Upgrade’, showing as below:



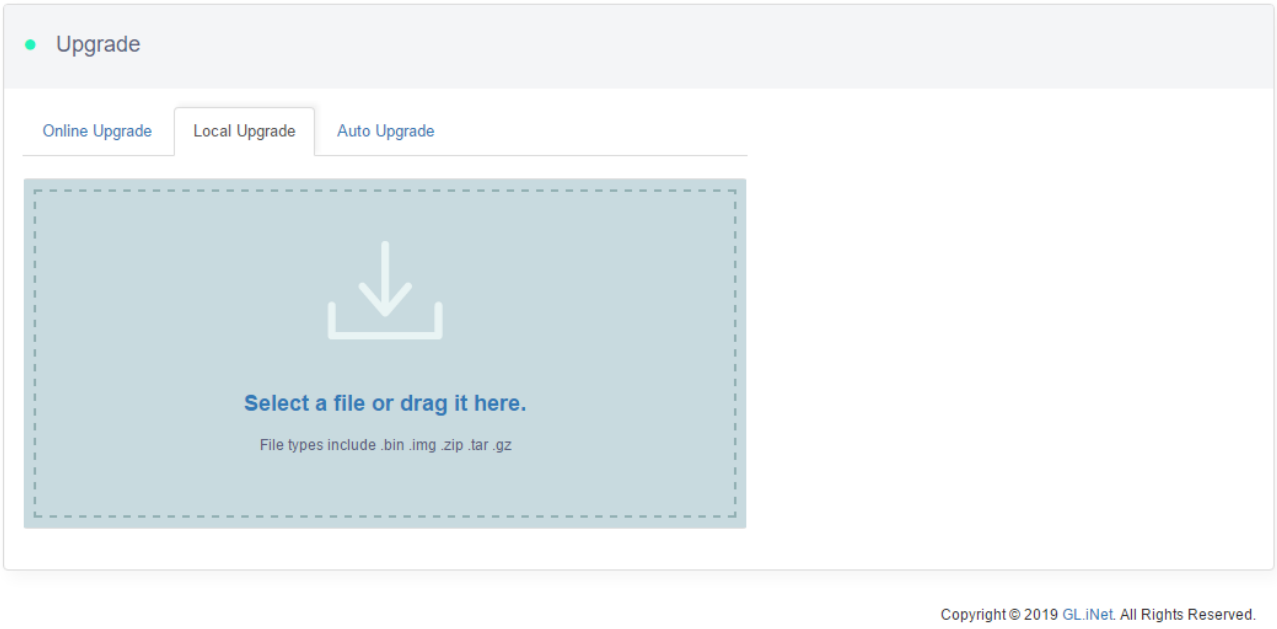
Click ‘Download’ to get the firmware, it will show as below when complete:



Configuration upgrade is kept in default. Click ‘Install’ to start updating firmware. Please do not cut off power during the process, otherwise the device is unable to start.

4.4.2 Local Upgrade

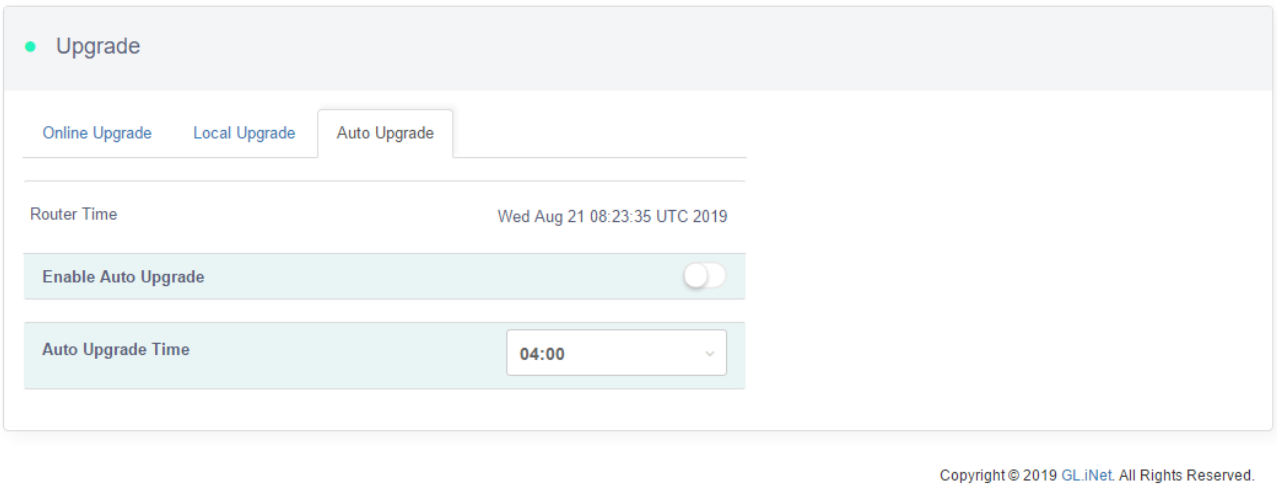
Click ‘Local Upgrade’, enter into local upgrade interface, showing as below:



Click to select a file to upload or drag it to this location. After uploading, click "Install" to start updating firmware. Upgrade process is the same as online upgrade.

4.4.3 Automatic Upgrade

Click ‘Automatic upgrade’, then access to the interface, showing as below:

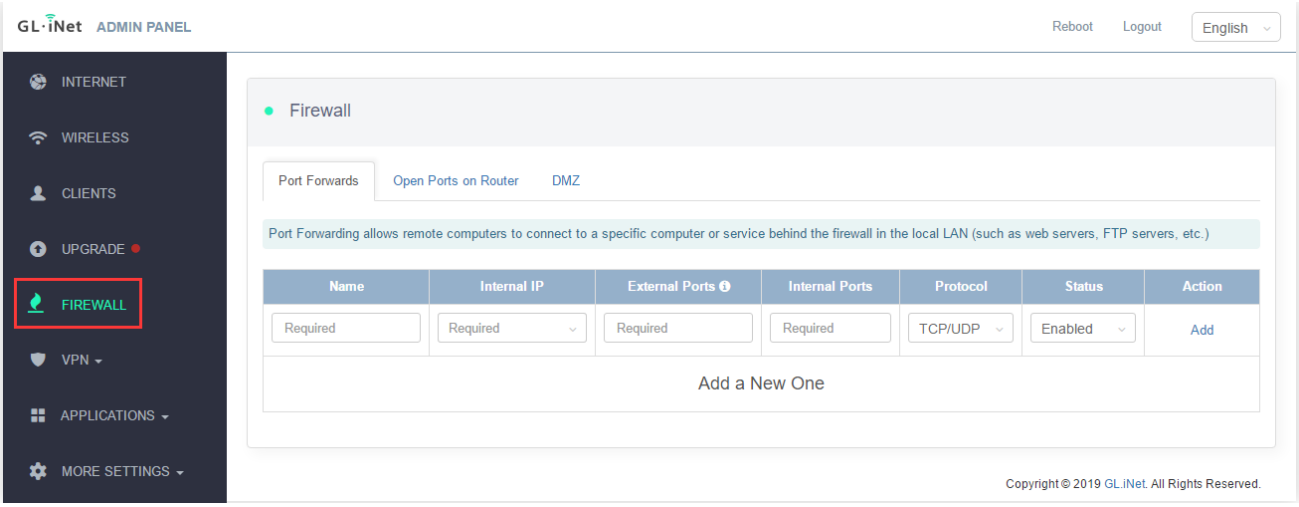


Upgrade time is optional and upgrade could be executed in definite time.

Notes: Automatic upgrade requires a higher version of the server than local device version.

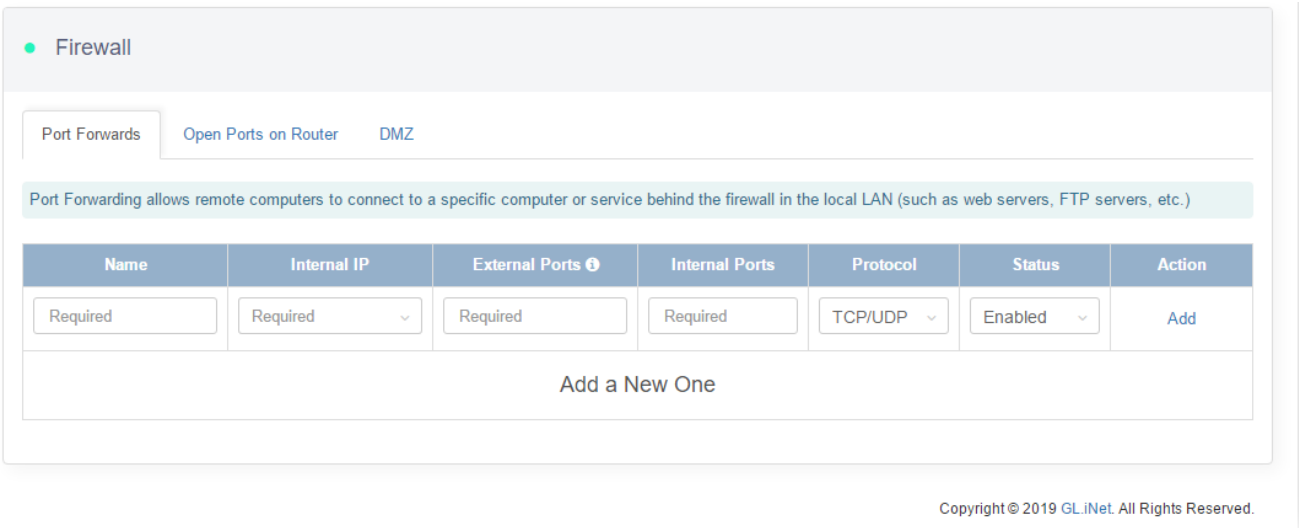
4.5 Firewall

Click ‘Firewall’, showing as below:



4.5.1 Port Forwarding

Click ‘Firewall’, then access to port forwarding interface in default, showing as below:



Name: The rule name

Internal IP: IP address assigned by LAN device

External Ports: Support to input a range

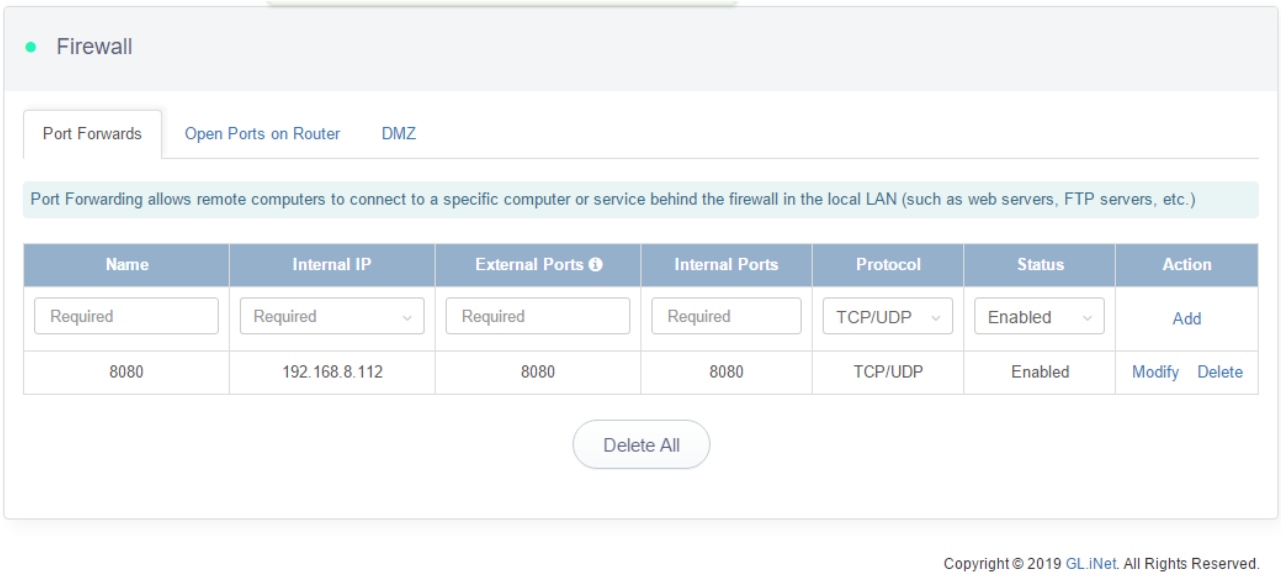
Internal Ports: The listening port of LAN device

Protocols: TCP, UDP, TCP/UDP

Status: Rule status, supports enable and disable

Operation: Add the rules set currently

Following operations are supportable:



Add: Add rules set currently

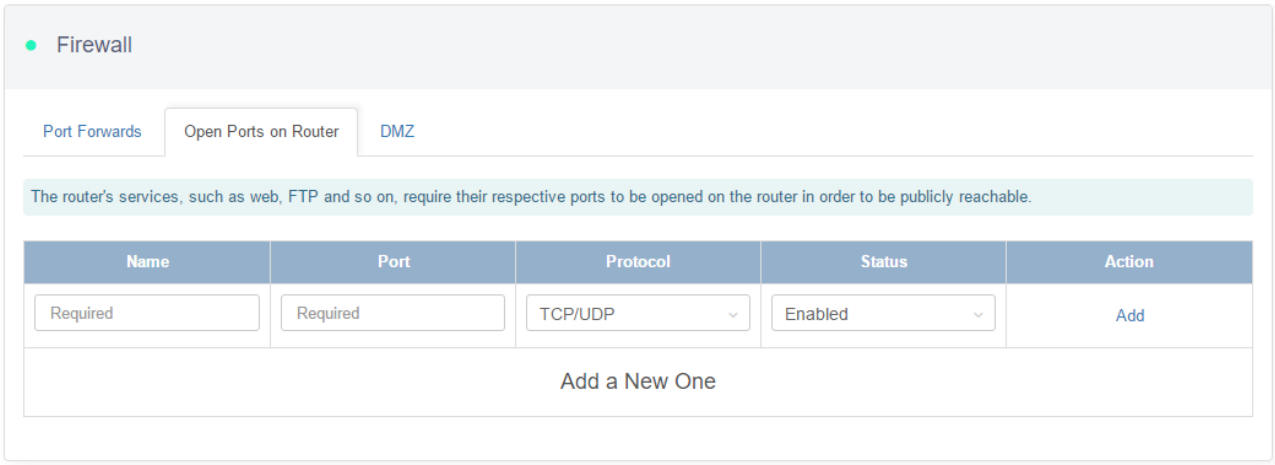
Modify: Modify the rules

Delete: Delete the current rules

Delete All: Delete All Rules

4.5.2 Turn on Ports

Click ‘Turn on router ports’, then enter into management interface, showing as below:



Name: The rule Name

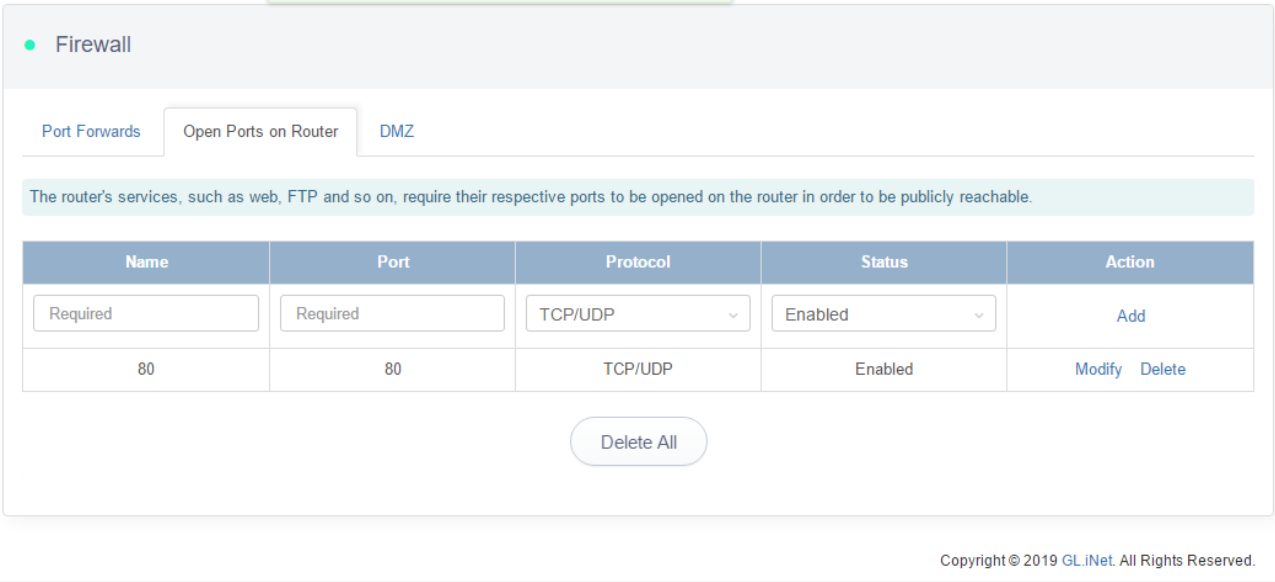
Port: Router ports to be turn on

Protocols: TCP, UDP, TCP/UDP

Status: Rule status, supports enable and disable

Operation: Add the rules set currently

Following operations are supportable:



Add: Add rules set currently

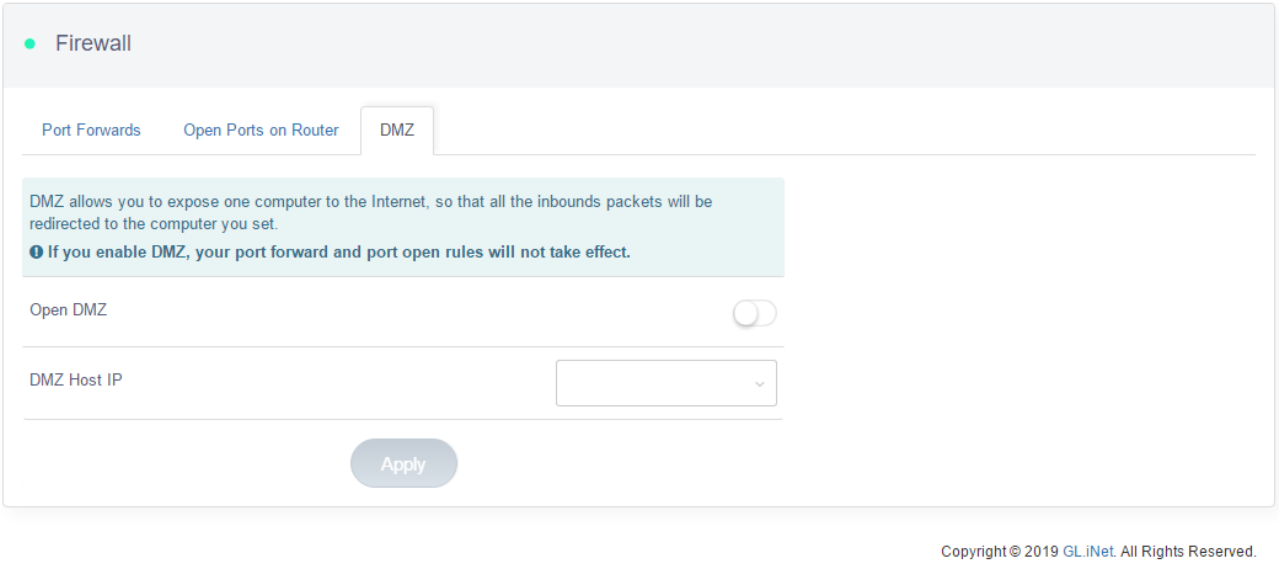
Modify: Modify the rules

Delete: Delete the current rules

Delete All: Delete All Rules

4.5.3 DMZ

Click 'DMZ', then enter into DMZ setup interface, showing as below:

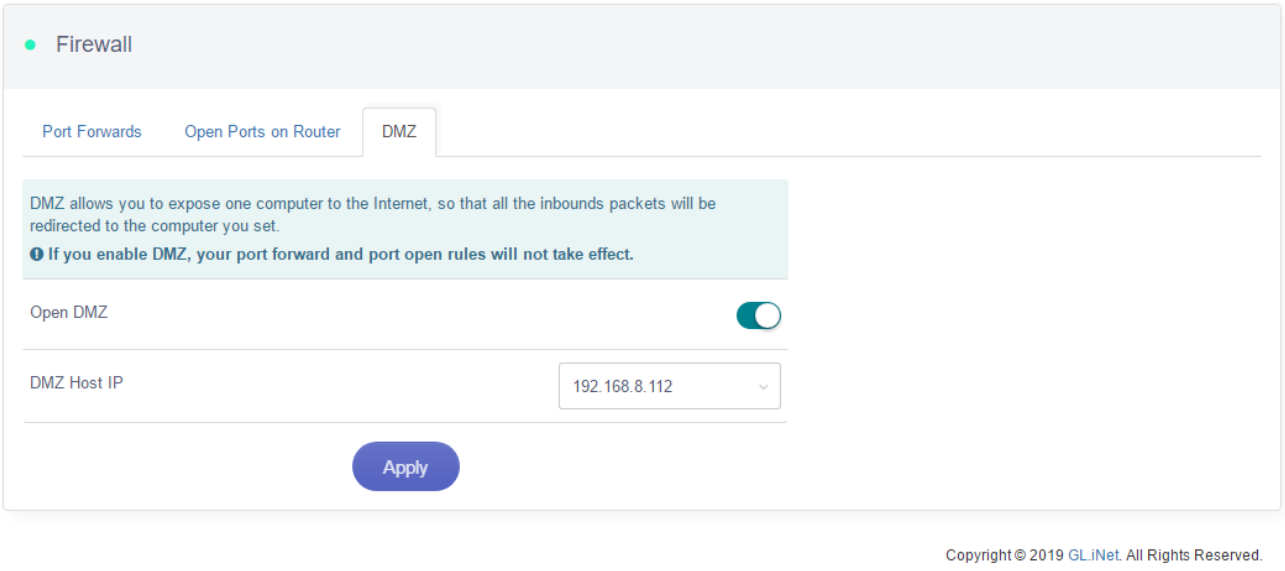


Turn on DMZ: The switch is turned off in default

DMZ host IP: Support manual input and select existing IP, just click the drop-down arrow

Turn on DMZ, showing as below:

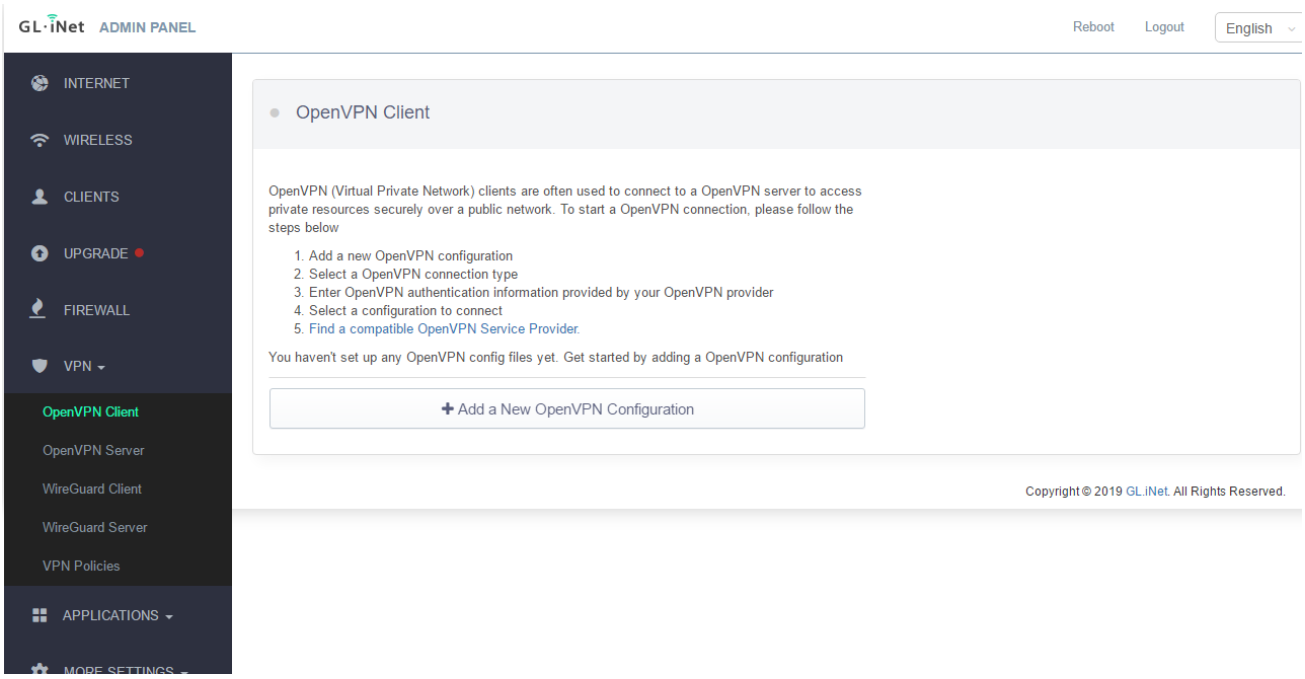
Turn on the switch, input or select the DMZ host IP, then click on application.



4.6 VPN（No Chinese Version）

4.6.1 OpenVPN Client

Click ‘OpenVPN Client’ under VPN menu, showing as below:

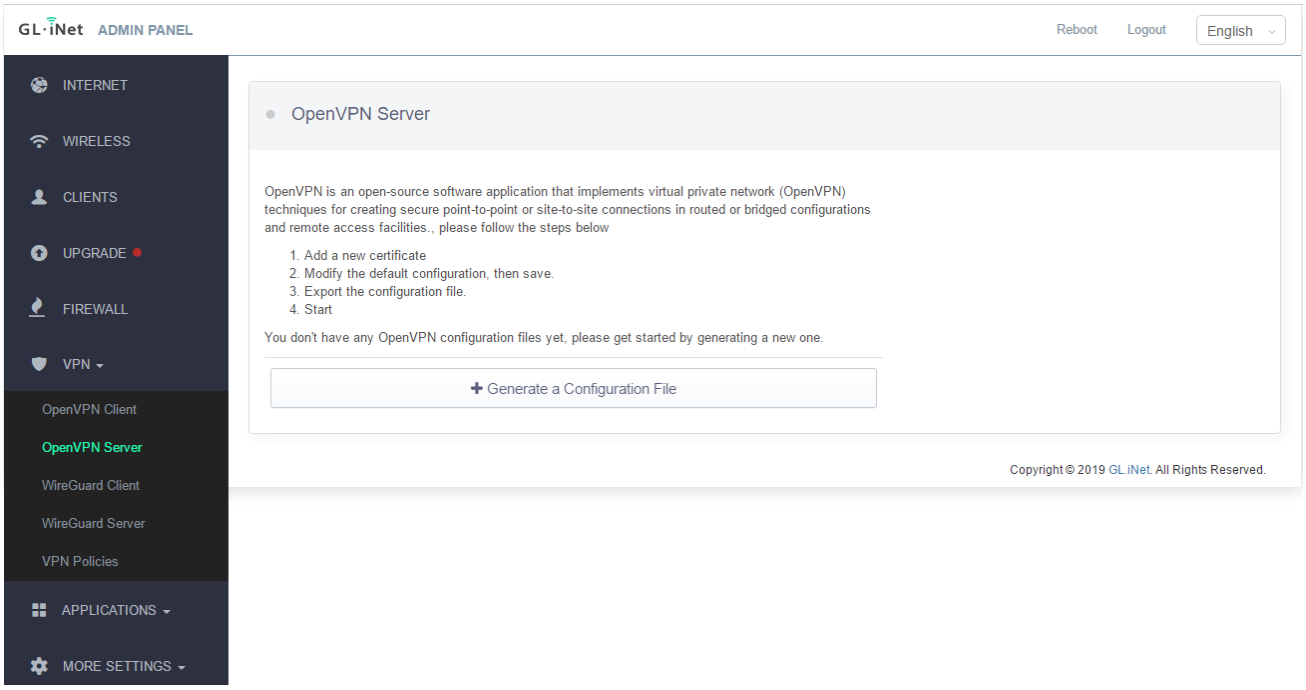


For instructions, please refer to the following link to the OpenVPN Client chapter

https://docs.gl-inet.com/en/3/app/openvpn/

4.6.2 OpenVPN Server

Click ‘OpenVPN Server’ under VPN menu, showing as below:

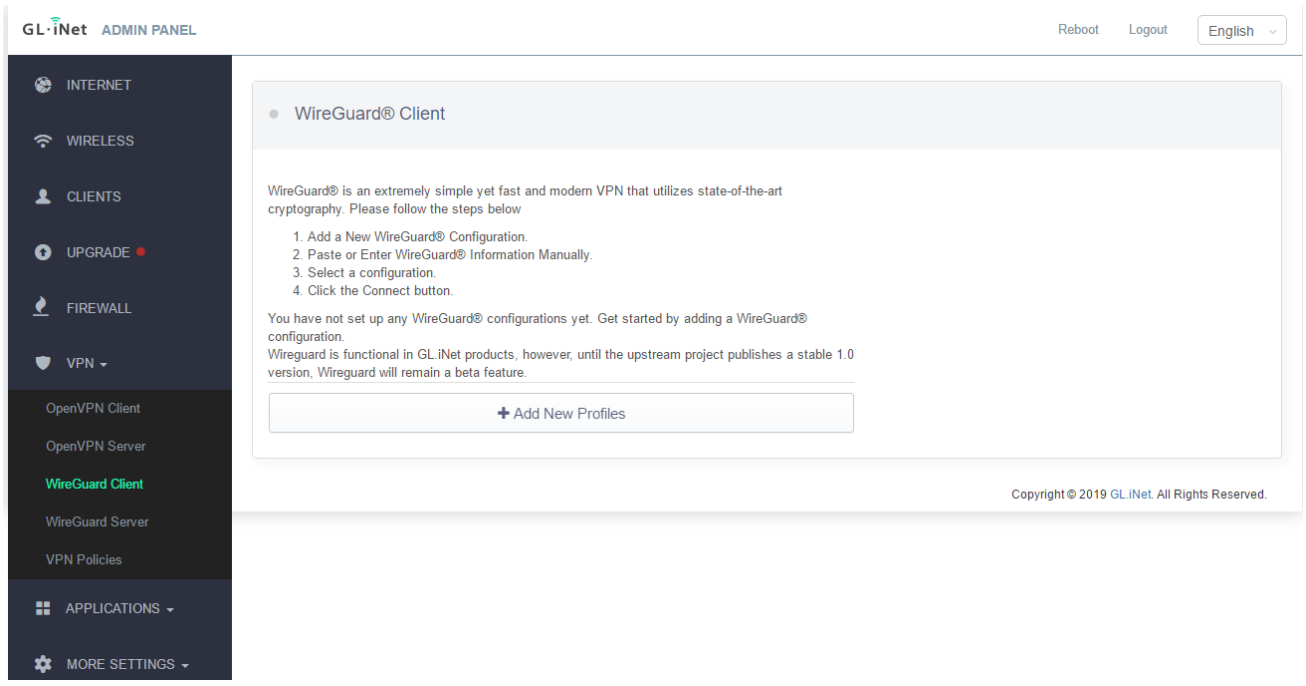


For instructions, please refer to the following link to the OpenVPN Server chapter

https://docs.gl-inet.com/en/3/app/openvpn/

4.6.3 Wireguard Client

Click 'Wireguard Client' under VPN menu, showing as below:

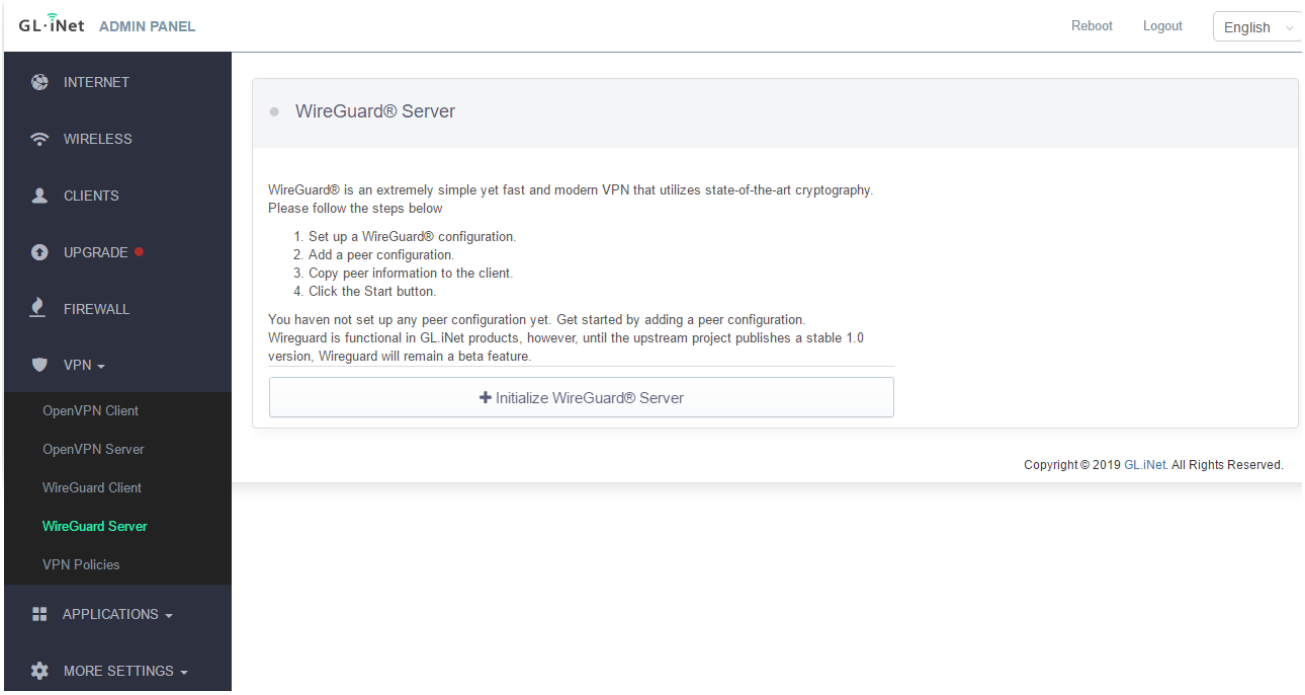


For instructions, please refer to the following link to the Wireguard Client chapter

https://docs.gl-inet.com/en/3/app/wireguard/

4.6.4 Wireguard Server

Click ‘Wireguard Server’ under VPN menu, showing as below:

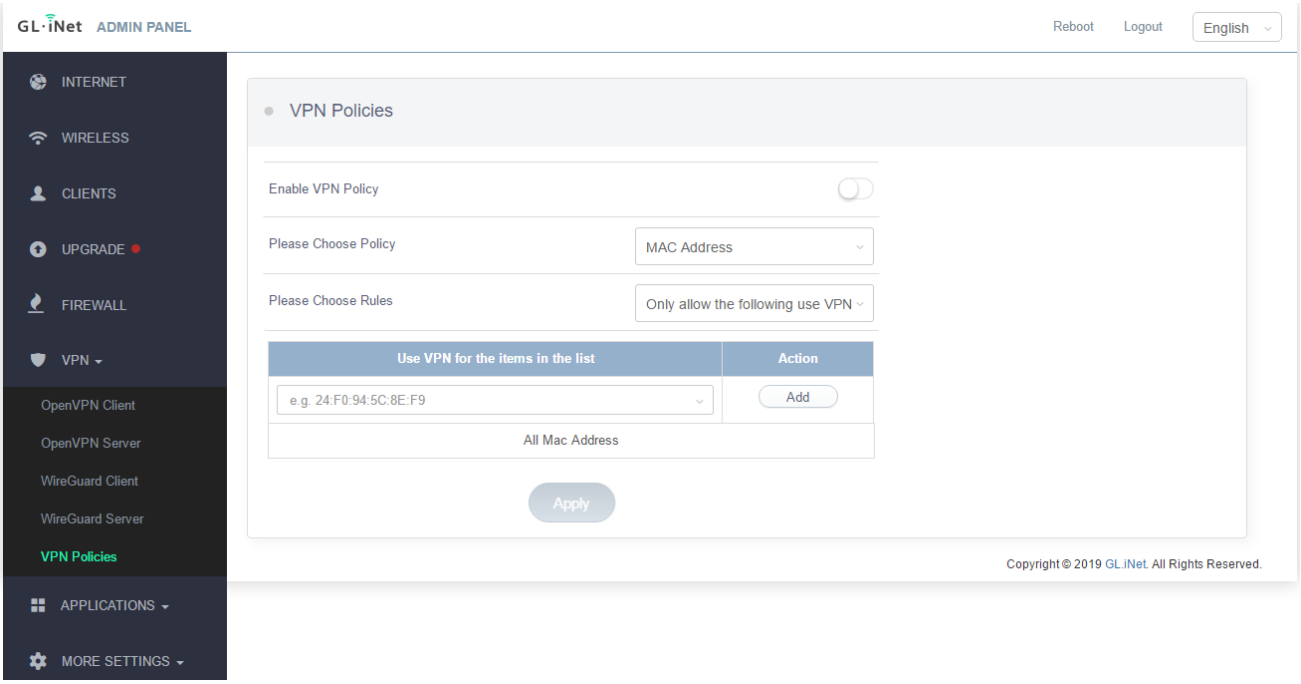


For instructions, please refer to the following link to the Wireguard Servers chapter

https://docs.gl-inet.com/en/3/app/wireguard/

4.6.5 VPN Policies

Click ‘Wireguard Policies’ under VPN menu, showing as below:



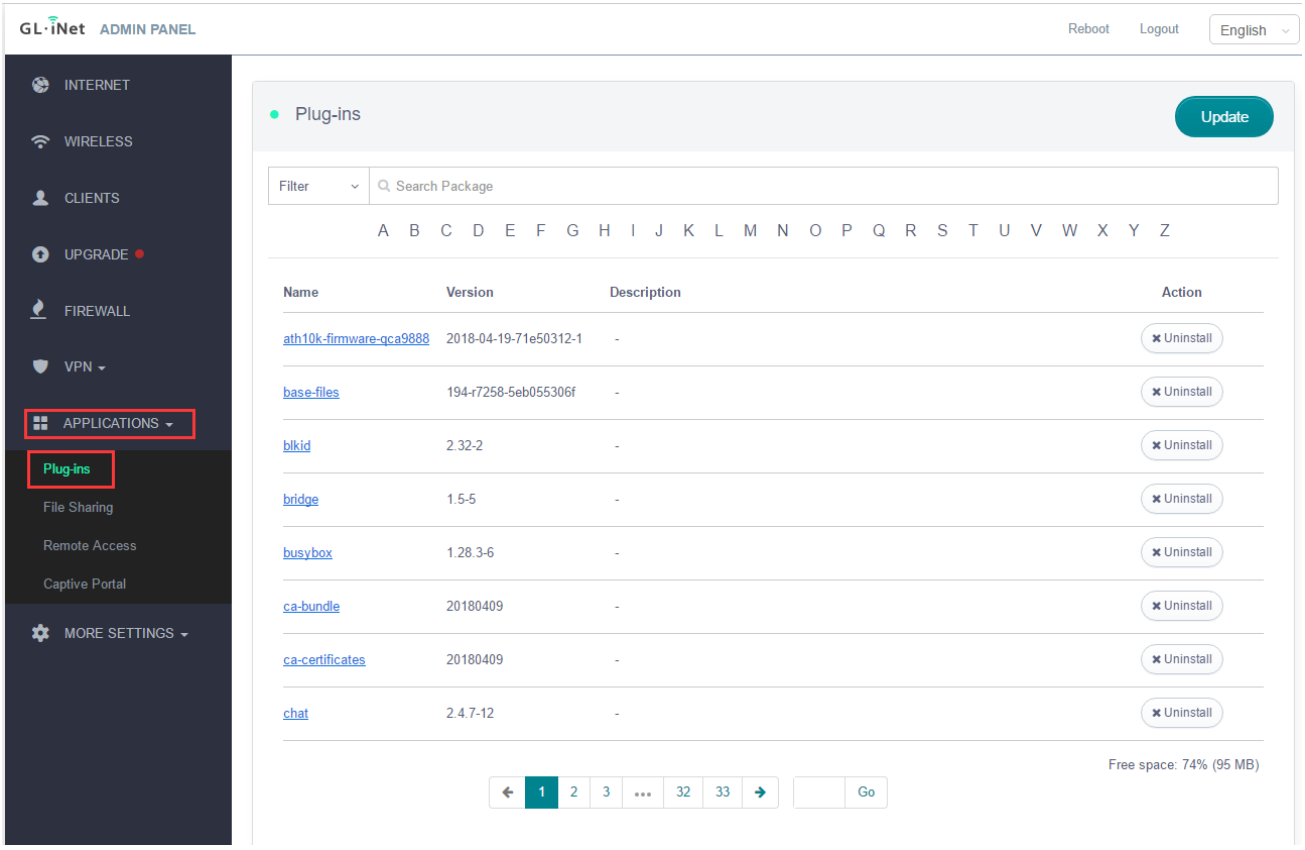
For instructions, please refer to the following link to the Wireguard Policies chapter

https://docs.gl-inet.com/en/3/app/vpn_policies/

4.7 Application Program

4.7.1 SDK

Click ‘application program’, select SDK, showing as below:



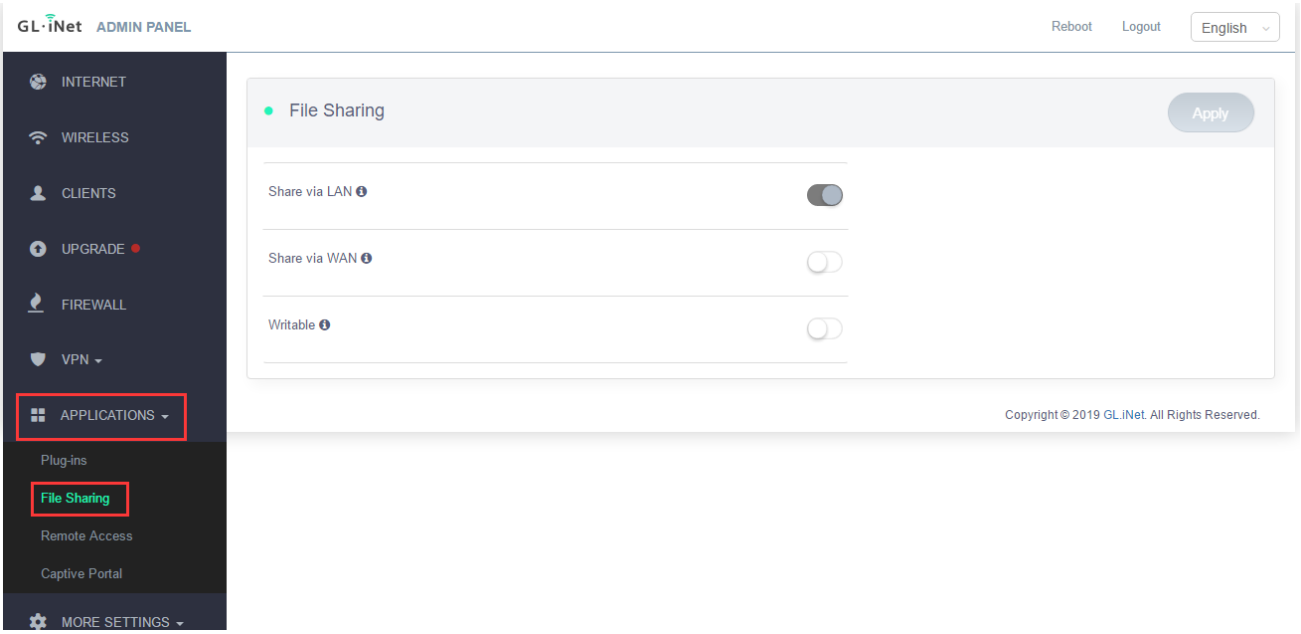
Upgrade: Upgrade the package to get a list of software for routing support

Filter: Support software package filter and keyword search.

Free space: It means the remaining space of Flash. When the space is less than 5%, no more installation of software packages, otherwise the system may get failure.

4.7.2 File sharing

Click ‘application program’, then select File sharing and enter into setting interface, showing as below:



File sharing by LAN: Share to LAN in default, USB flash disk and SD card can be accessed through LAN IP.

File sharing by WAN: Share to WAN in default, U disk and SD card can be accessed through WAN IP.

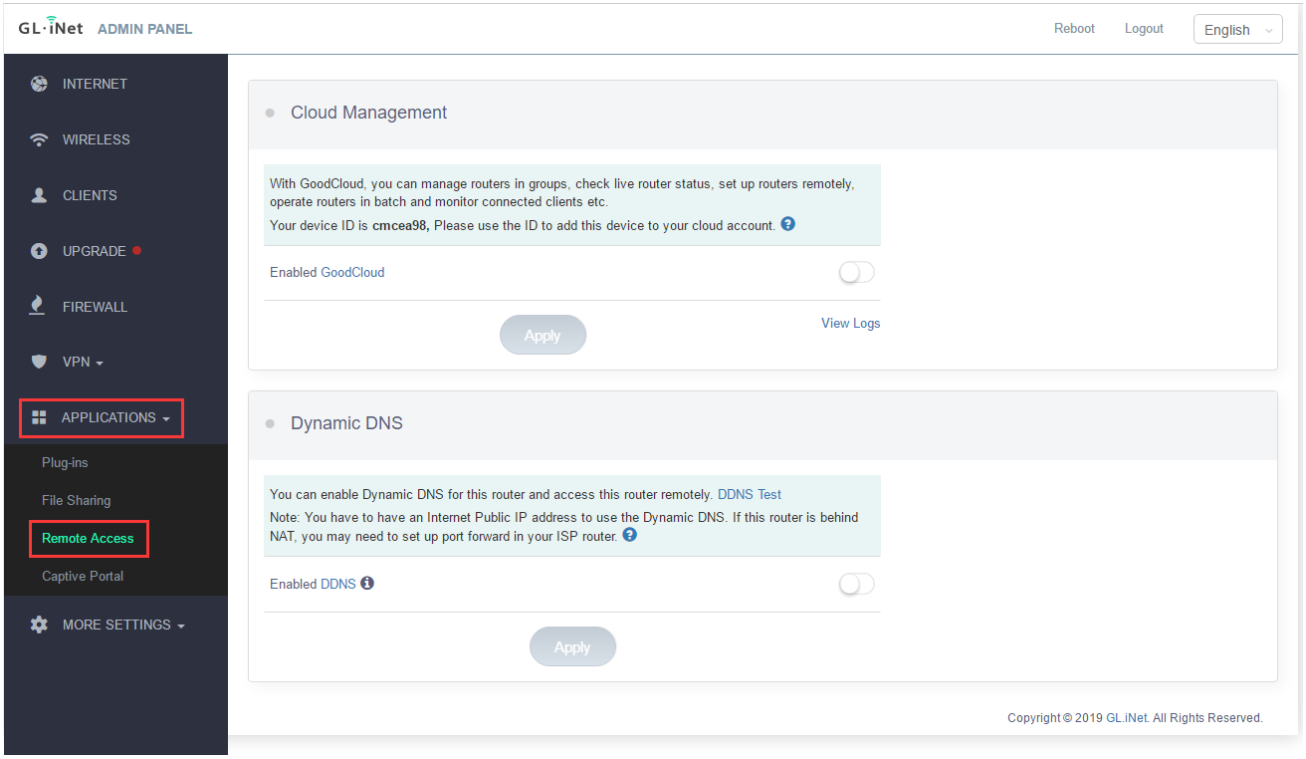
Writable: USB flash disk and SD card is not writable in default. This function should be used carefully, it is easy to write the USB flash disk disabled.

Please refer to the following link for detailed usage:

https://docs.gl-inet.com/en/3/app/file_sharing/

4.7.3 Remote Access

Click ‘More settings’, then select Remote Access to enter managing interface, showing as below:



Detailed usage of cloud management, please refer to below link

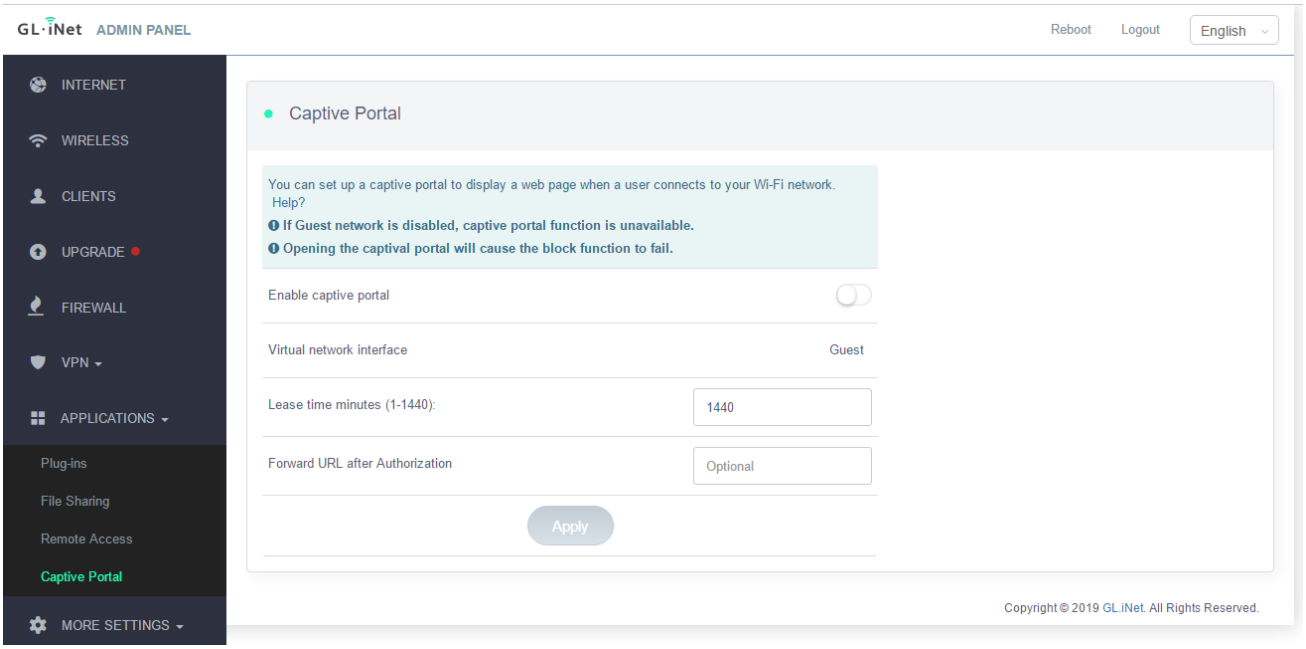
https://docs.gl-inet.com/en/3/app/cloud/

Dynamic DNS function, please refer to below link

https://docs.gl-inet.com/en/3/app/ddns/

4.7.4 Captive Portal

Click ‘application program’, then select ‘Captive Portal’ to enter into Management interface, showing as below:



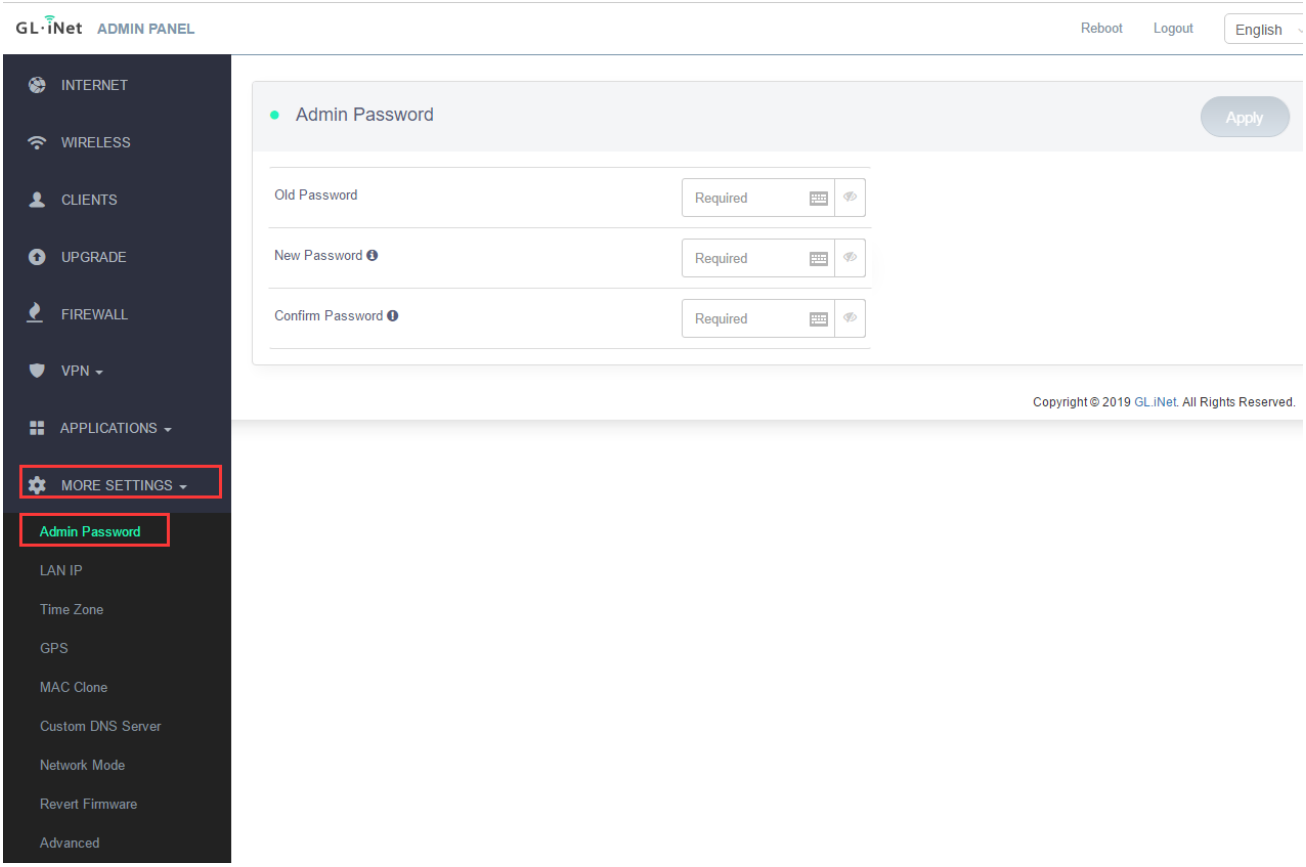
Detailed usage, please refer to below link,

https://docs.gl-inet.com/en/3/app/captive_portal/

4.8 More Settings

4.8.1 Admin Password

Click ‘More Settings’, then click ‘Admin Password’ and enter into setting interface, showing as below:



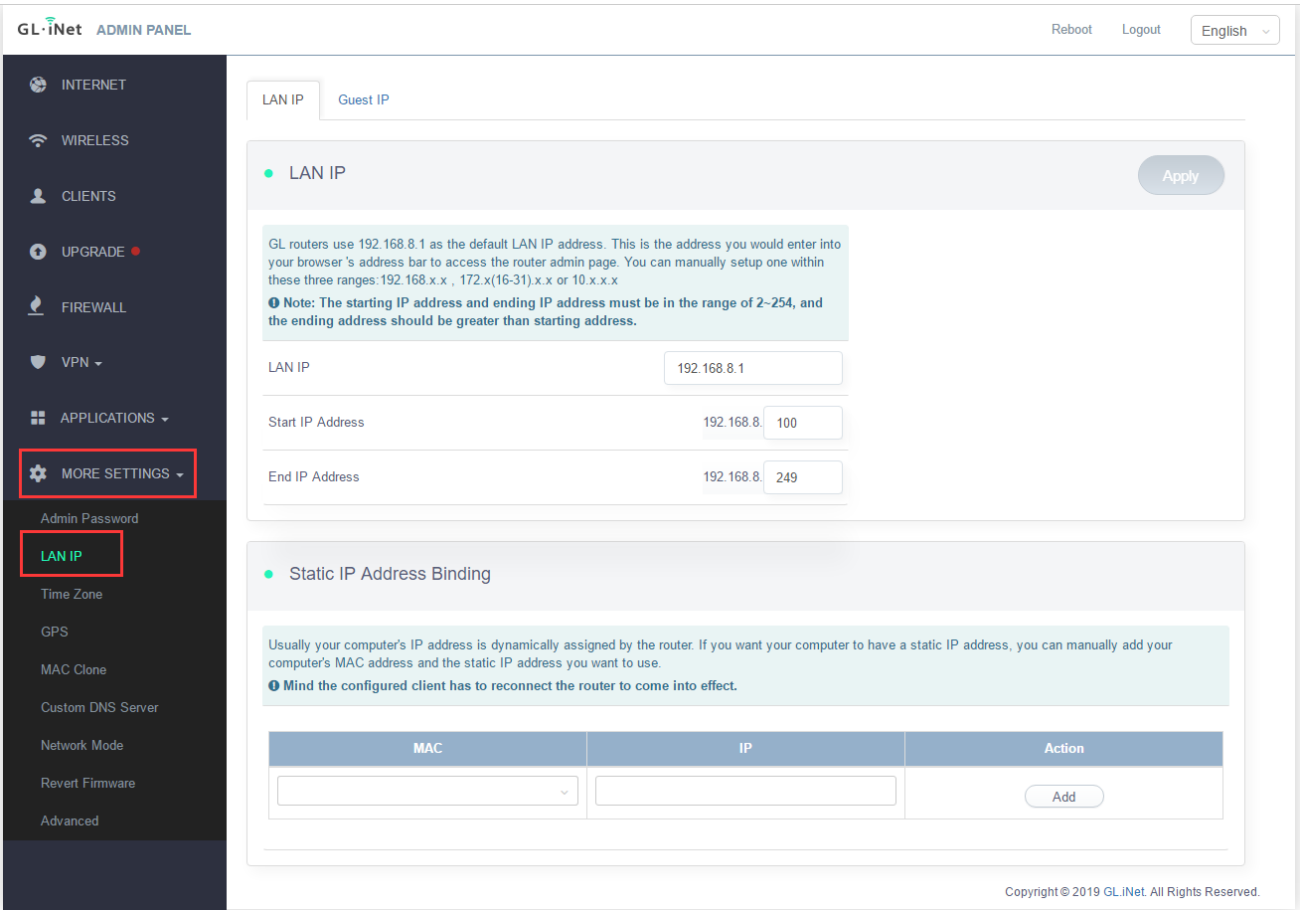
Old password： Please input old admin password.

New password: Please input new admin password

Confirm password: Please re-input new admin password.

4.8.2 LAN IP

Click ‘More Settings’, then select LAN IP and enter into Setting interface, showing as below:



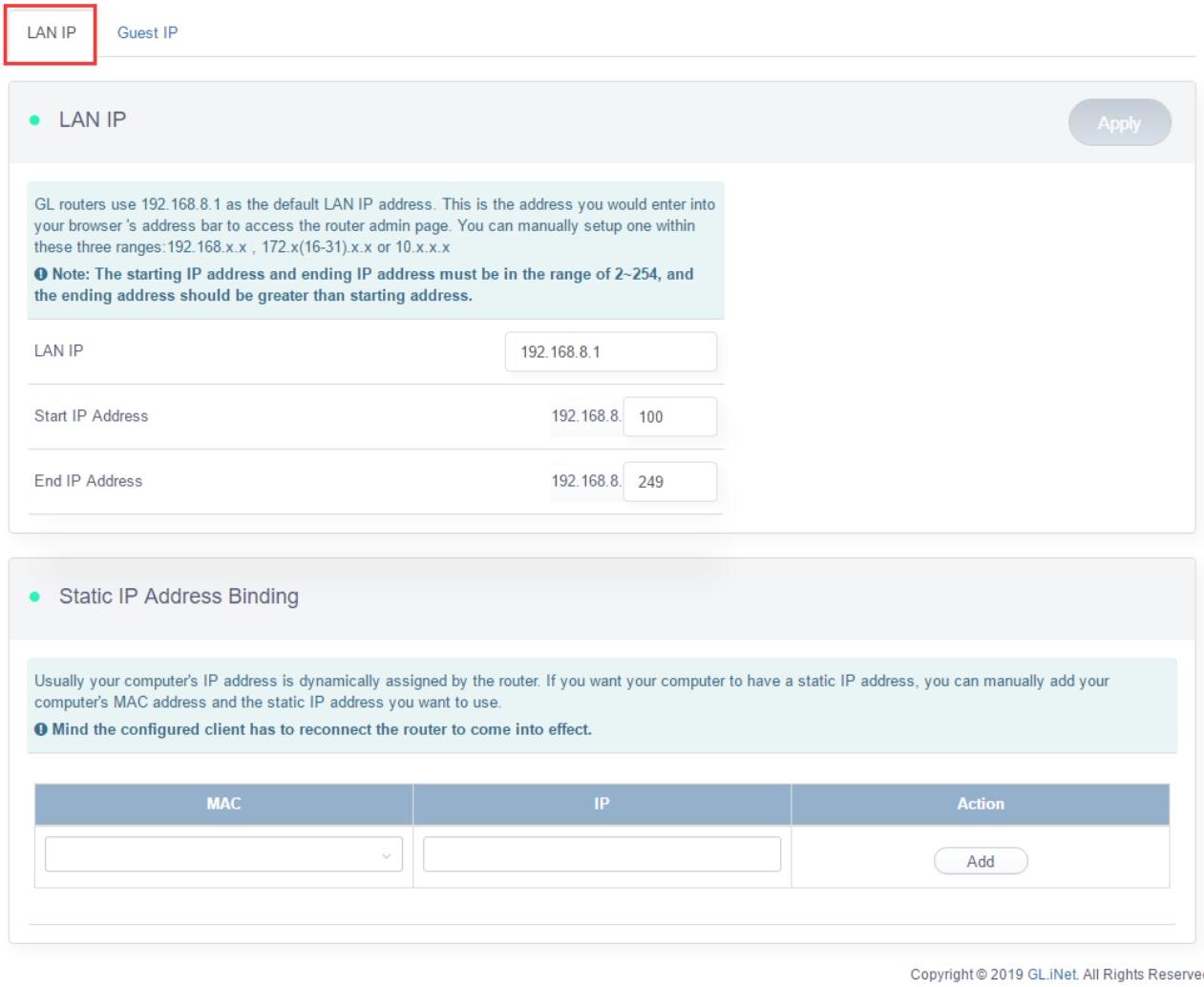
LAN IP: Set router LAN IP address

Guest IP: Set router guest network IP address

Static IP address binding: Static binding means IP bind with MAC address.

4.8.2.1 LAN IP

Click ‘More Settings’, then select LAN IP and enter into Setting interface, showing as below:



LAN IP: IP address of the router gateway

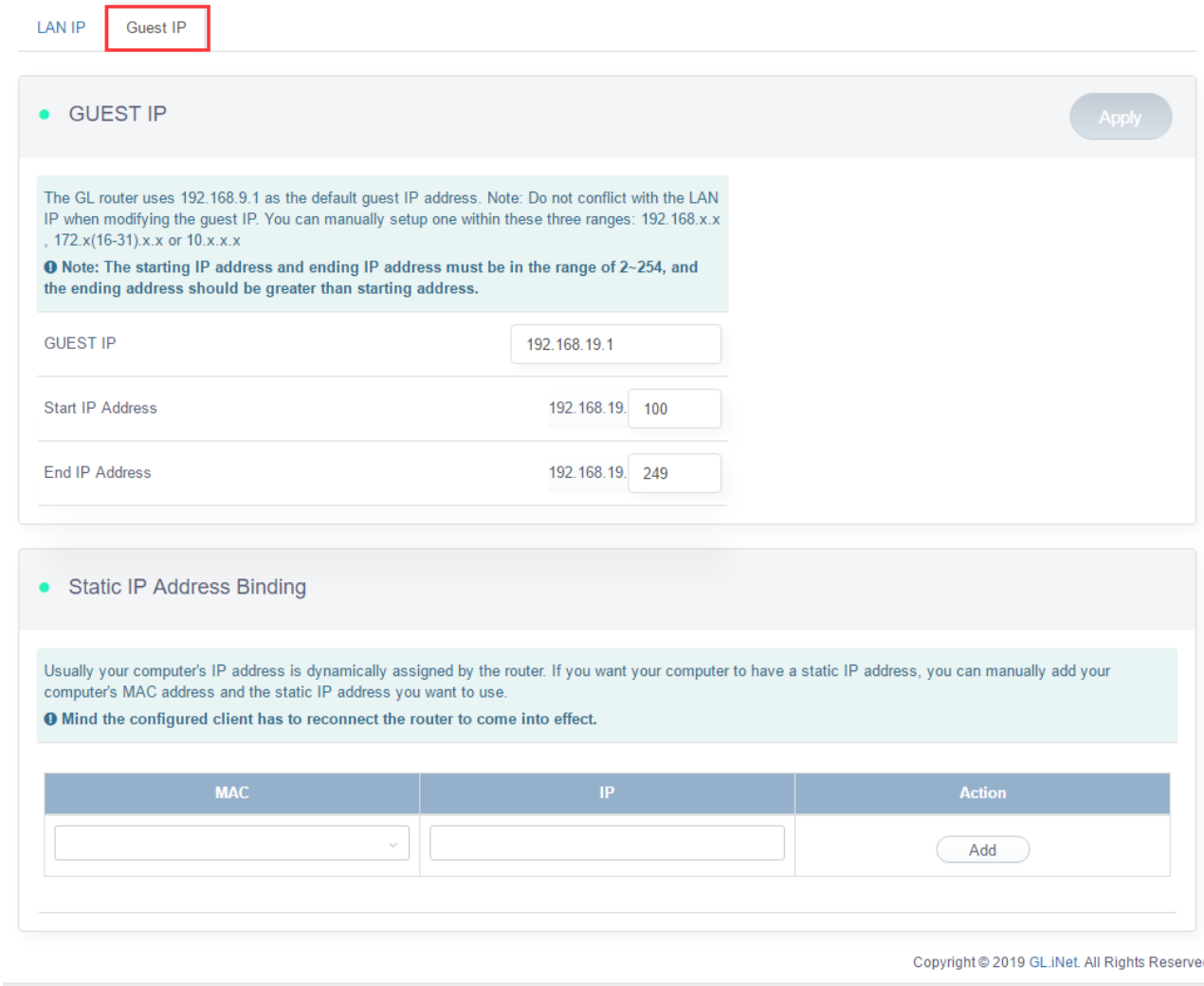
Starting IP address: DHCP server assigns starting IP address

Ending IP address: DHCP server assigns ending address

Note: Starting IP address need to be smaller than ending IP address.

4.8.2.2 Guest IP

Click ‘guest IP’ and enter into Setting interface, showing as below:



Guest IP: IP address of router's guest network

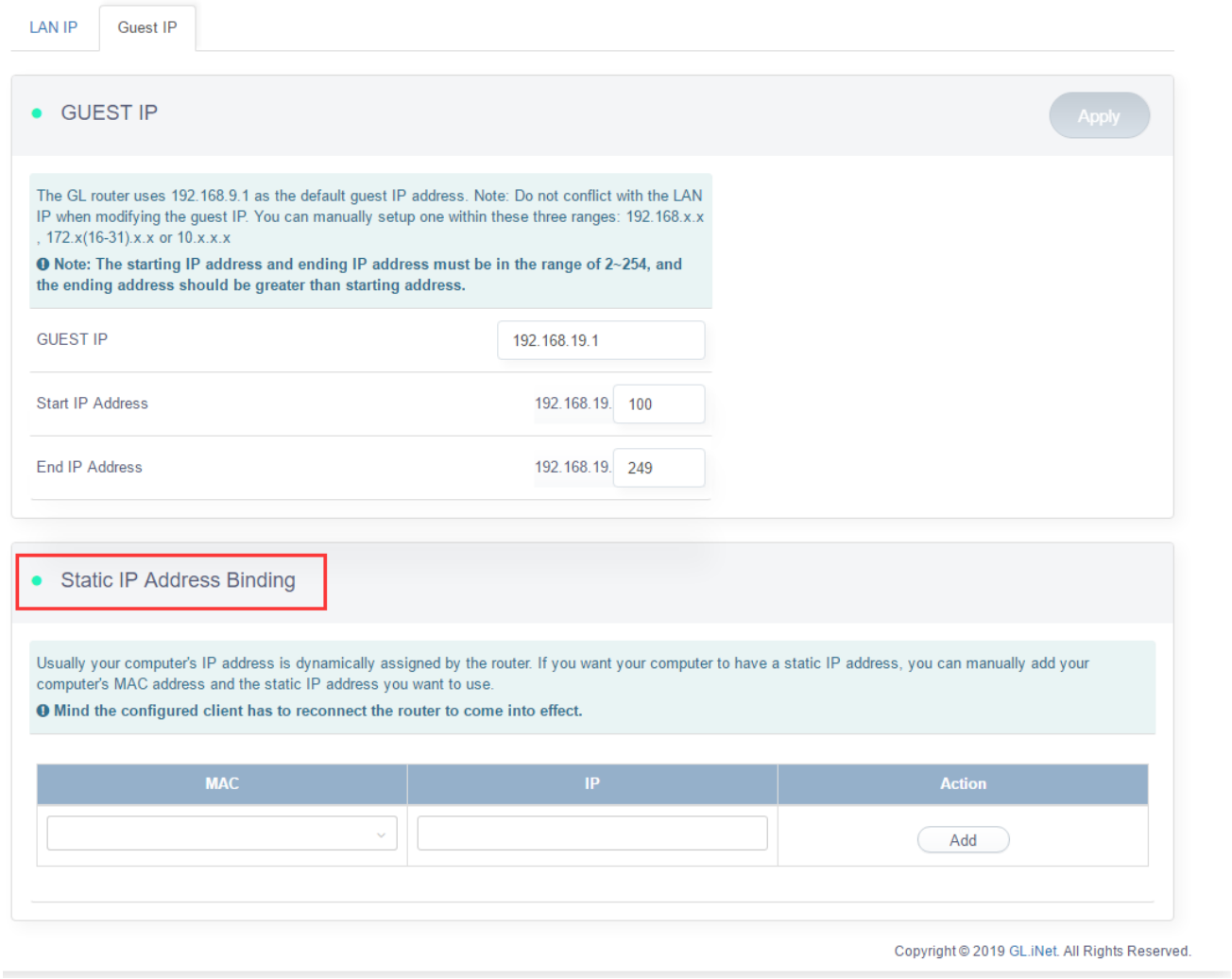
Starting IP address: DHCP server assigns starting IP address

Ending IP address: DHCP server assigns ending IP address

Note: Starting IP address need smaller than ending IP address.

4.8.2.3 Static IP address binding

Static IP address binding can bind IP with MAC address, showing as below,

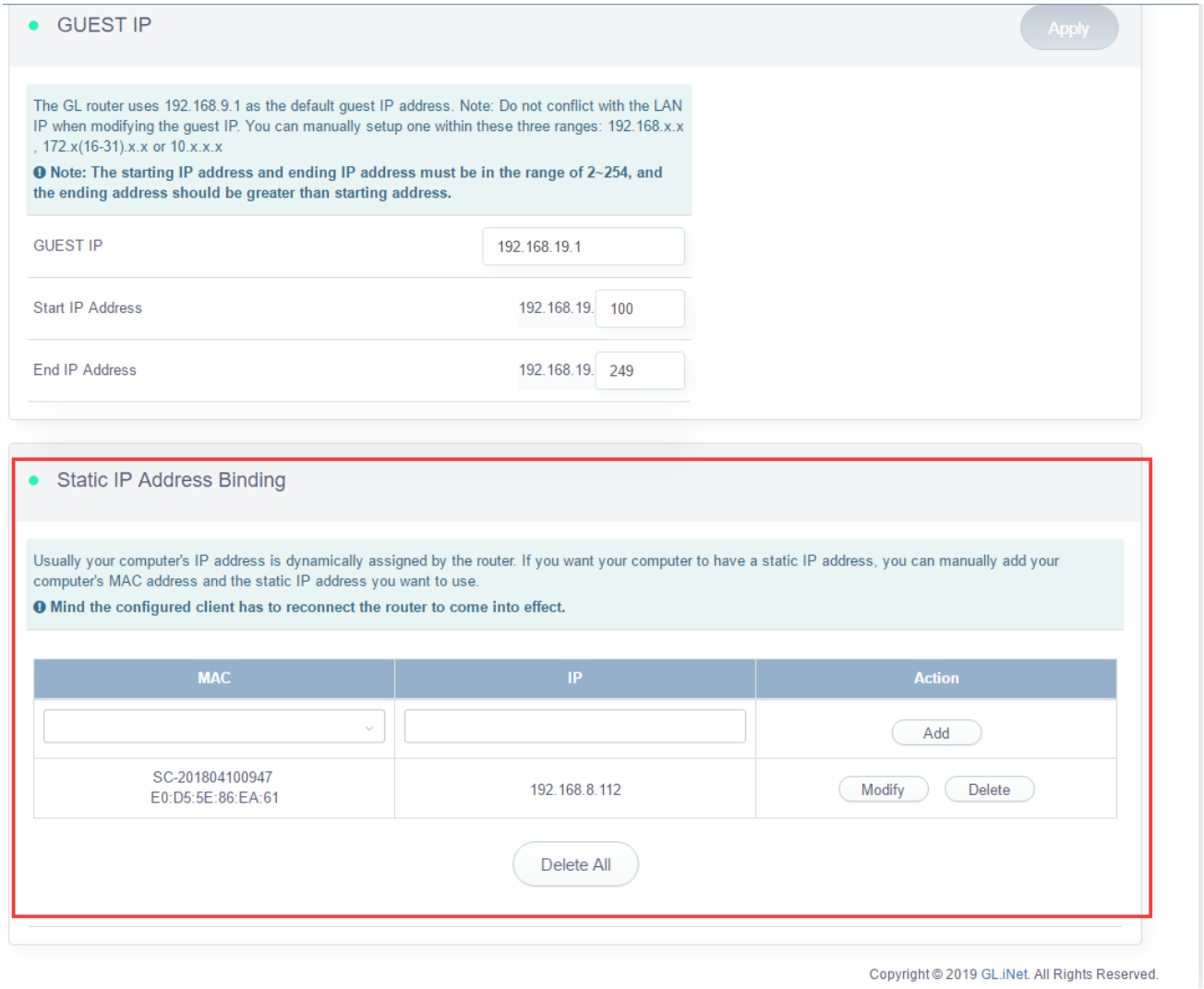


MAC: Client MAC list, support manual input or drop-down list selection

IP: IP address assigned to the client can be manually entered or selected from the drop-down list

Operation: Add the binding rules set currently

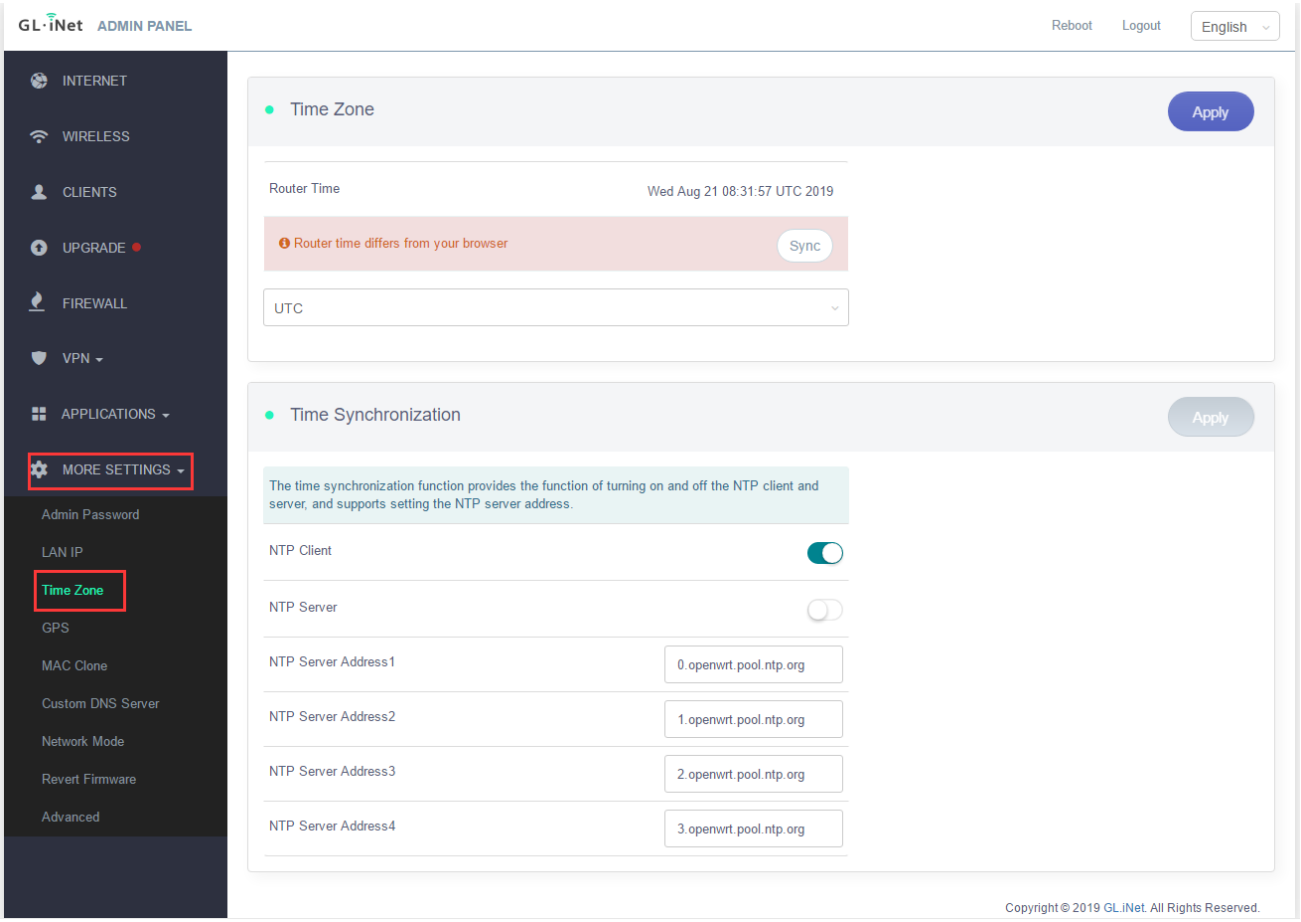
Select Mac address and IP address, then click to add, showing as below:



Note: Static binding requires client to retrieve IP.

4.8.3 Time Zone

Click “more setting”, then click “time zone” to enter into setting page, showing as below:



Time Zone: Time zone and time setting, time zone is optional

Sync: Synchronize Browser time

Time Sync: NTP Client and NTP server settings

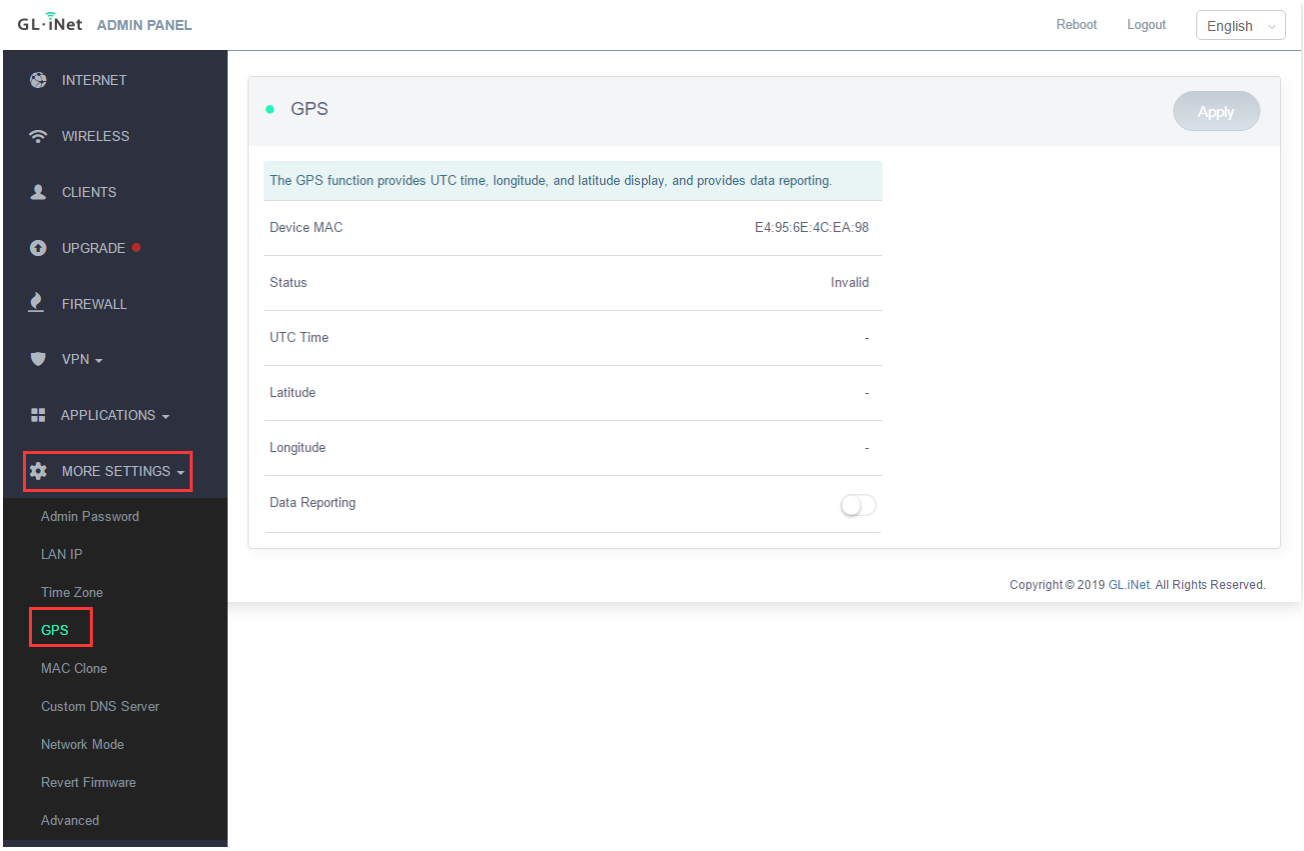
NTP Client: NTP Client switch, on and off is optional

NTP Server: NTP server switch, on and off is optional

NTP Server address: 1/2/3/4: can input NTP Server address 1/2/3/4

4.8.4 GPS

Click “more setting”, then click “GPS” to enter into setting page, showing as below:



Device MAC: Device WAN MAC address

Status: Whether Current orientation is valid

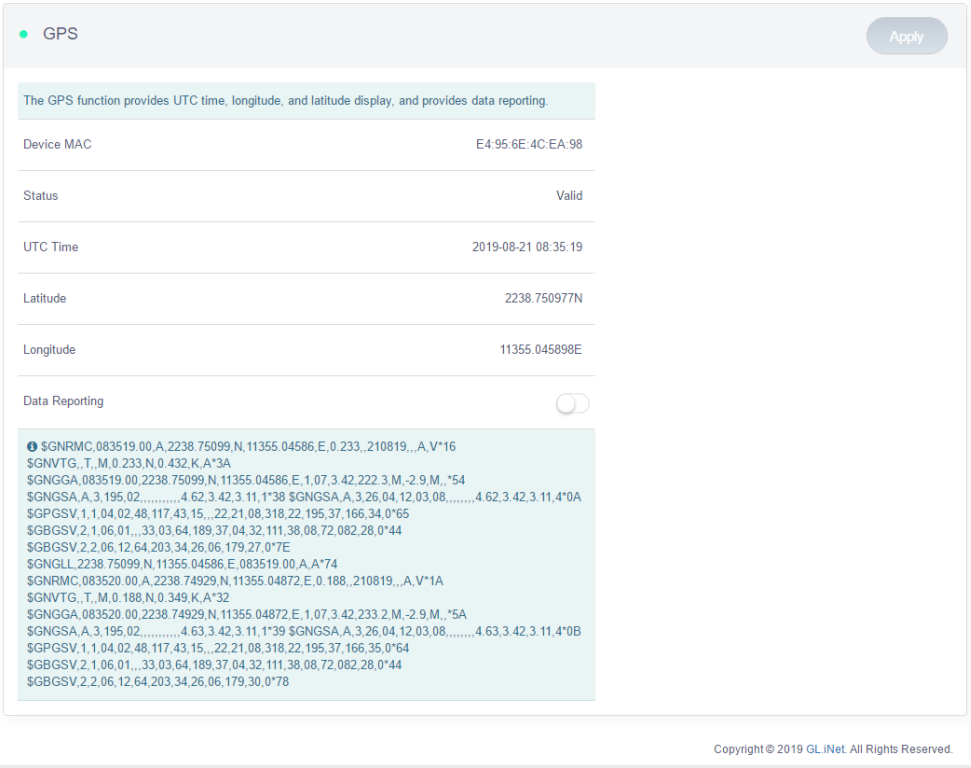
UTC time: UTC time

Latitude: Latitude

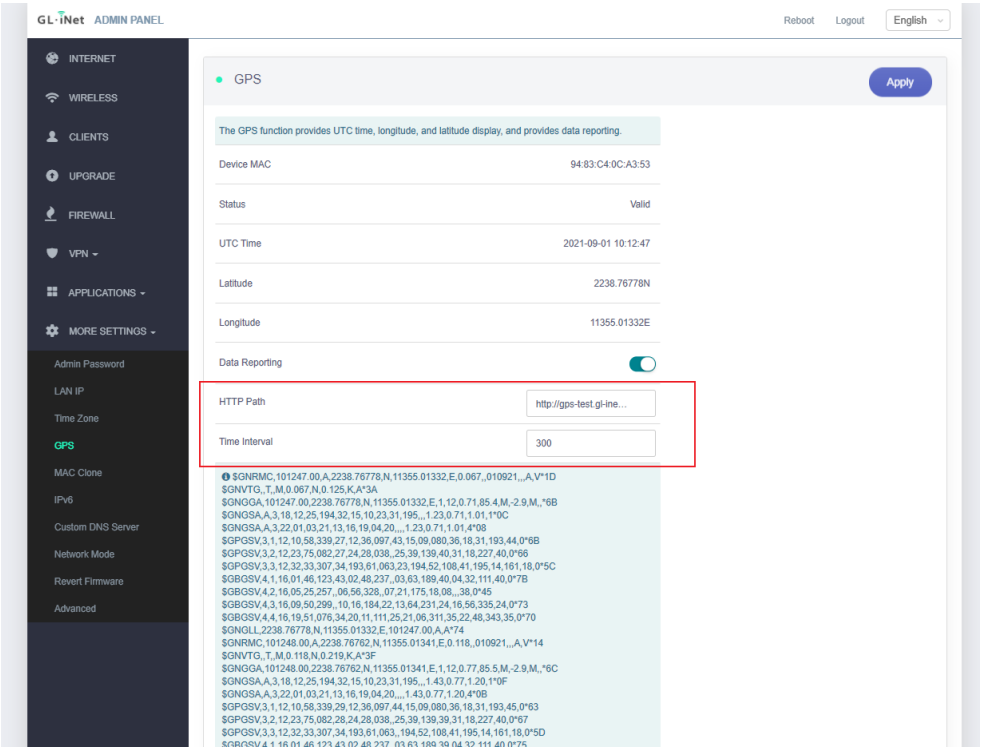
Longitude: Longitude

Data reporting: The GPS data reporting switch is off by default.

GPS locate to data, showing as below：



Enable data reporting function, showing as below：

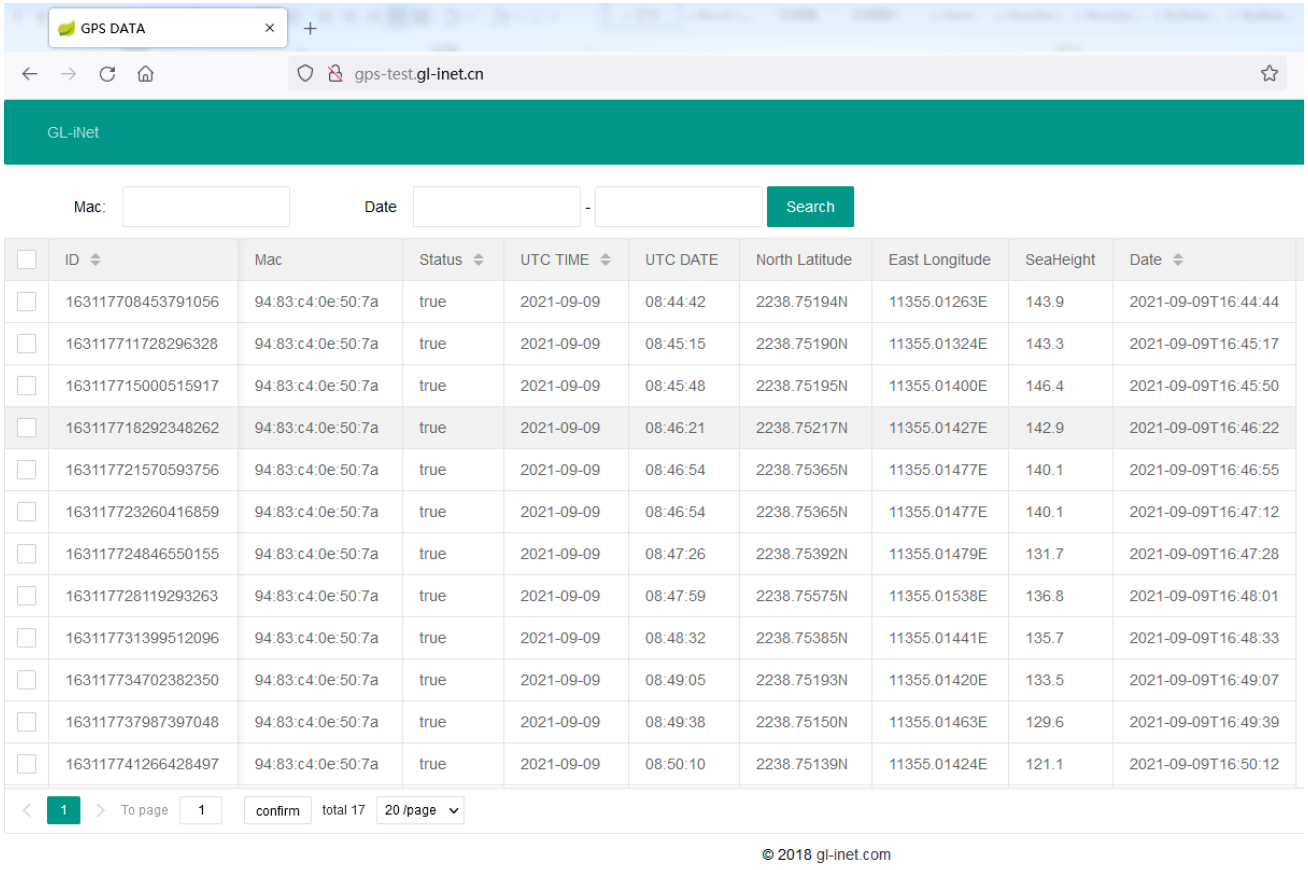


Enable to set reporting address and reporting circle

GL.iNet provides a gps test server, set the HTTP path in the figure to:

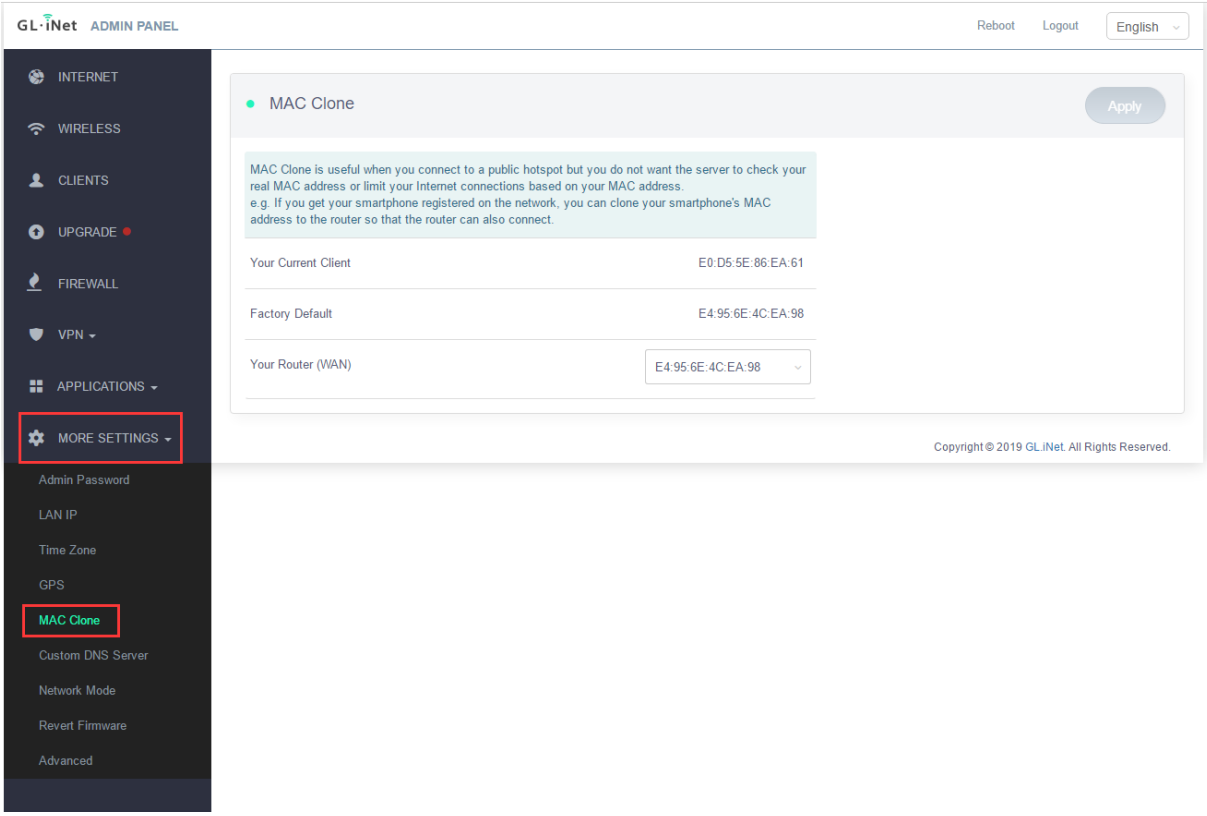
http://gps-test.gl-inet.cn/gps/upload

After setting the test server address, open http://gps-test.gl-inet.cn in the browser to view the gps data uploaded to the server (as shown in the figure below).



4.8.5 MAC address Clone

Click “more setting”, then click “MAC address clone” to enter into setting page, showing as below:

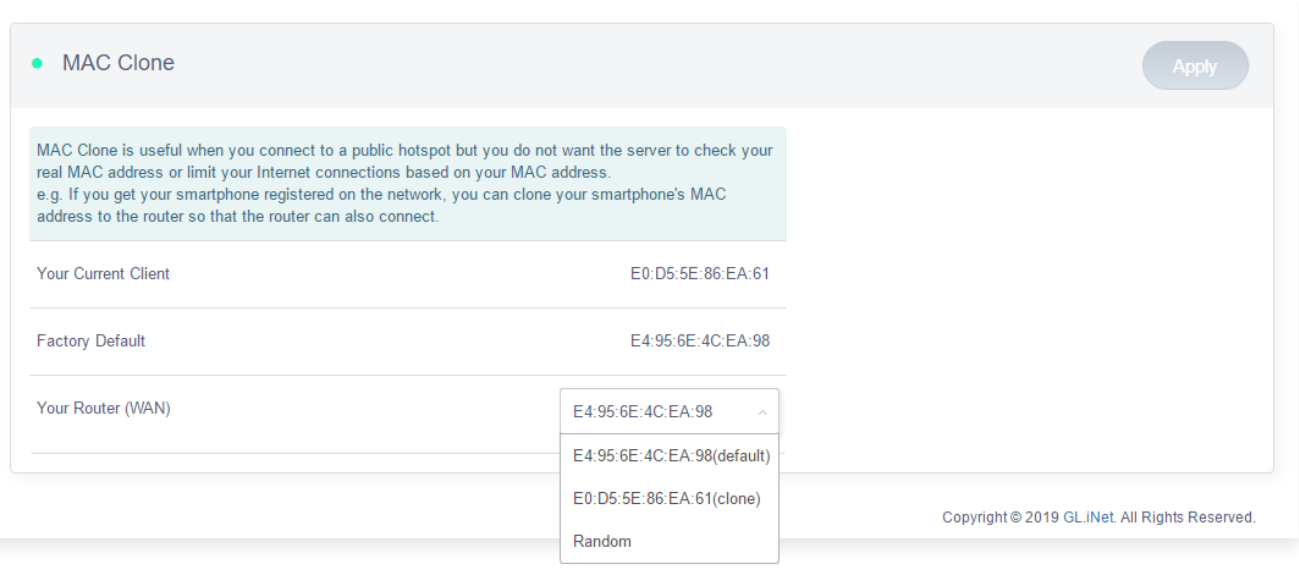


Current Client: current client MAC address

Factory Default: Factory default WAN port MAC address

Your device (WAN): Current device WAN MAC Address

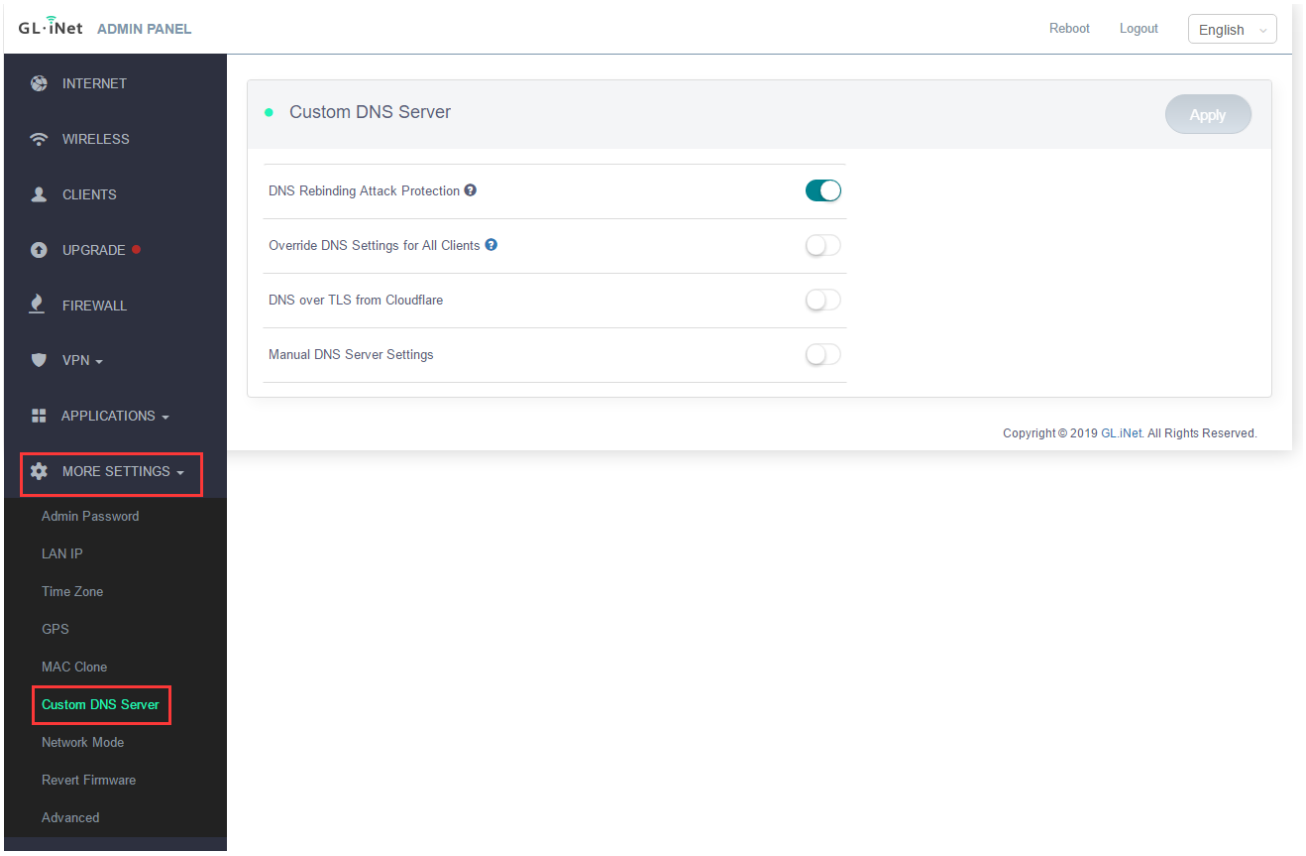
Click your device to choose clone MAC address, showing as below:



It is optional to choose clone client MAC or generate MAC randomly

4.8.6 Self-defined DNS server

Click ‘more setting’, then click “Self-defined DNS server”, showing as below:

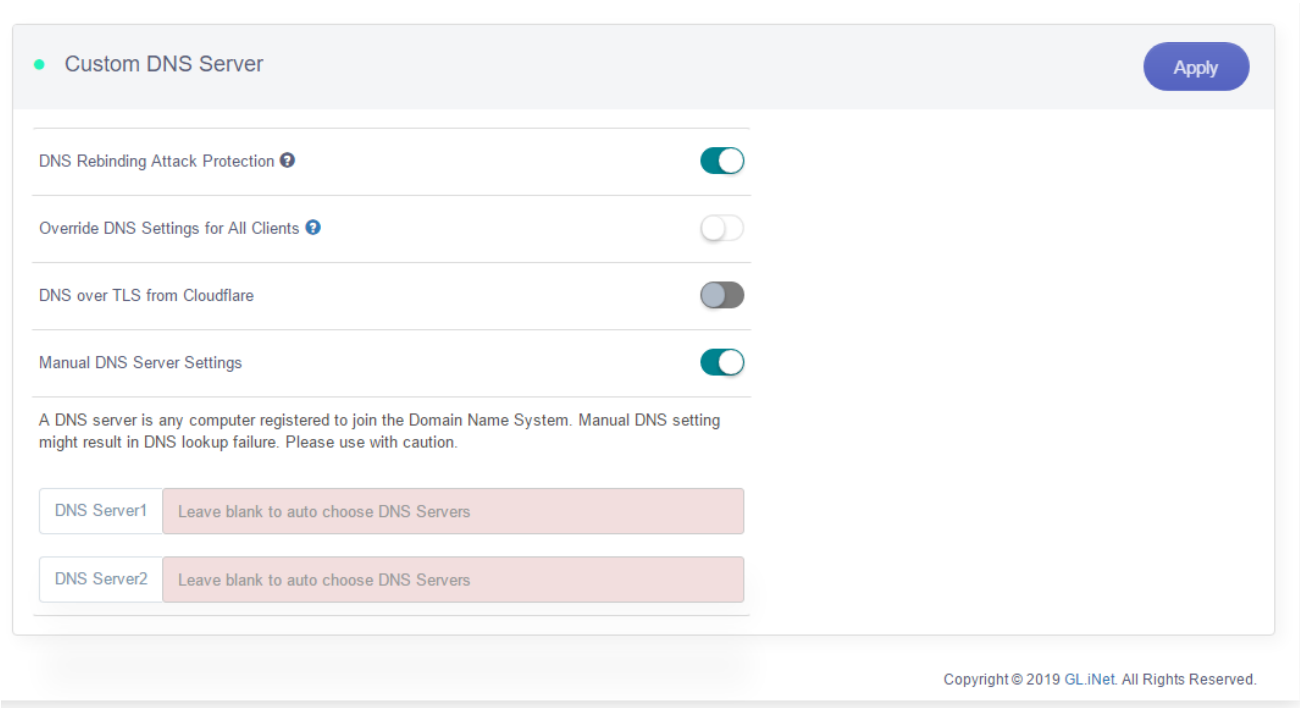


DNS re-binding attack protection: on/off is optional, default on

DNS settings for All Clients: on/off is optional, default off

DNS over TLS of Cloud flare: on/off is optional, default off

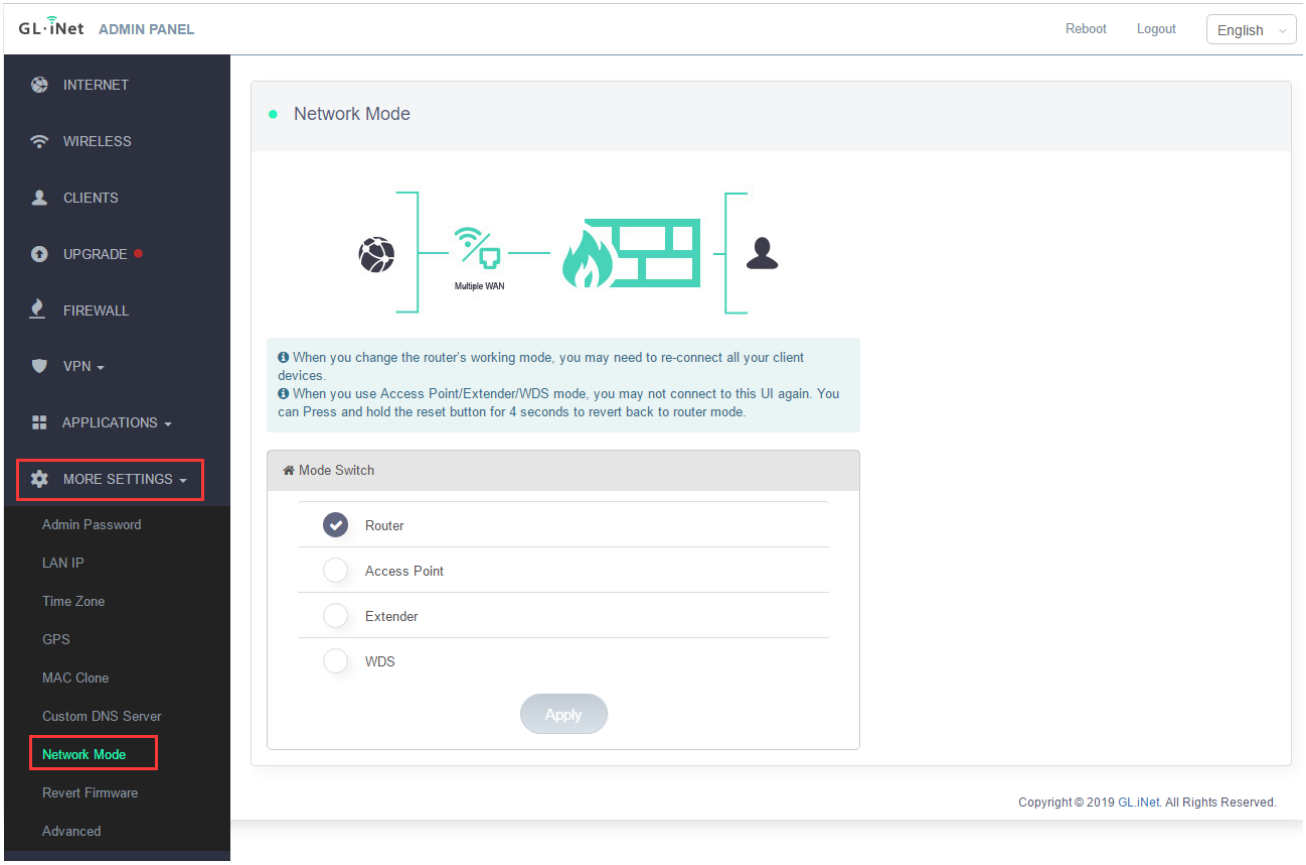
Manual DNS server setting: on/off is optional, default off



Note: Cloud flare and manual DNS conflicts, either-or

4.8.7 Network mode

Click “more setting”, then click “Network mode” to enter into setting page, showing as below:



Routing mode: The device connect to upper device by WAN Port, repeater, tethering or modem.

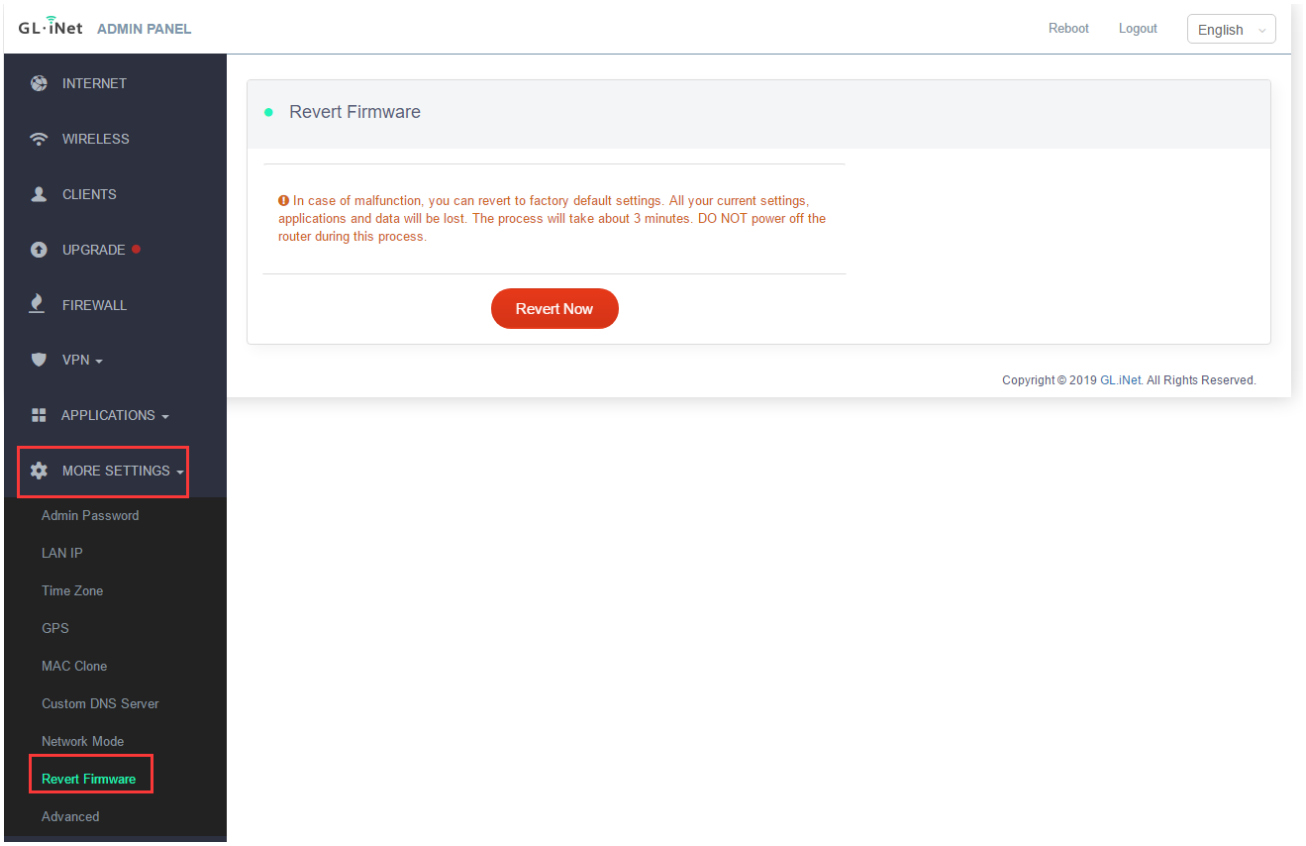
AP mode: The device connect to upper device by WAN Port.

Wireless extender mode: This device will be used as a repeater connects to the main router via wireless, it works on layer 3 in OSI model, and all its LAN devices will acquire IP address from the main router.

WDS mode: This device will be used as a repeater connects to the main router via wireless, it works on layer 2 in OSI model, all its LAN devices will acquire IP address from the m ain router.

4.8.8 Reset to factory setting

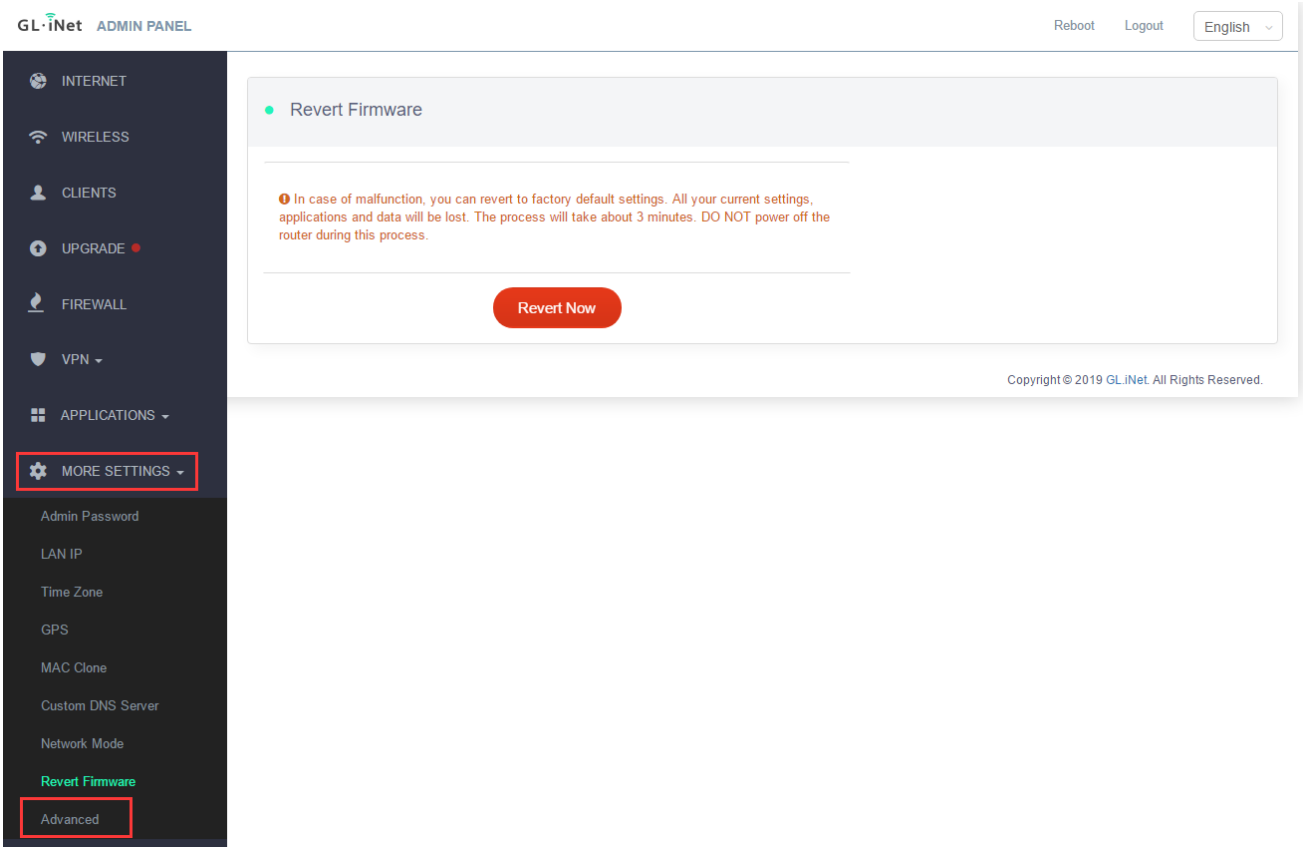
Click ‘more setting’, then click ‘Reset to factory setting’ to enter into setting page, showing as below:



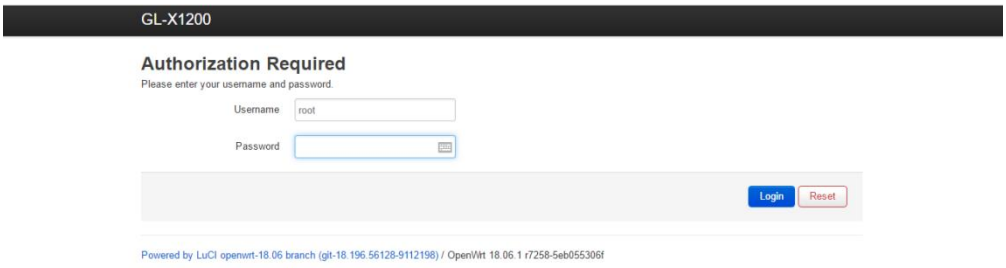
Note: Reset to factory setting will clear all the settings of the device, be cautious.

4.8.9 Advanced functions

Click ‘More settings’, then click ‘advanced function’ to enter into Luci management page, showing as below:



Default username is root, and password is admin password. Input and click ‘Login’ to enter into advanced page, showing as below:



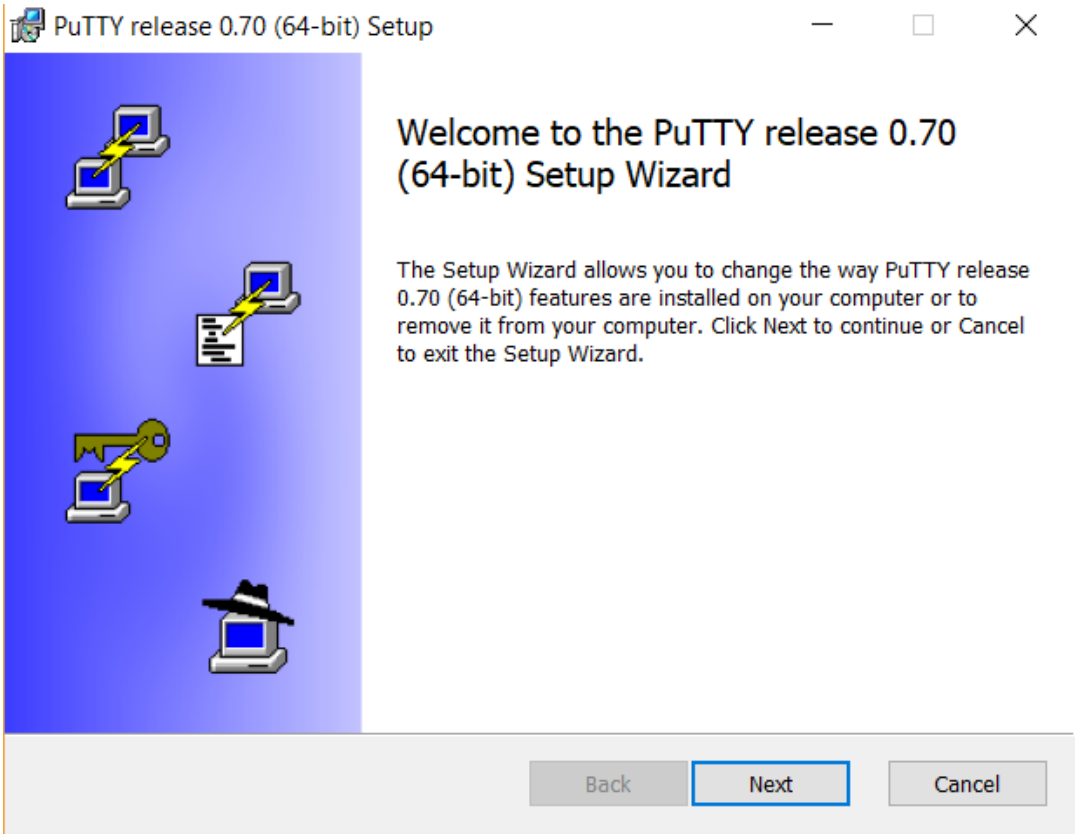
Chapter 5 Commands Introduction

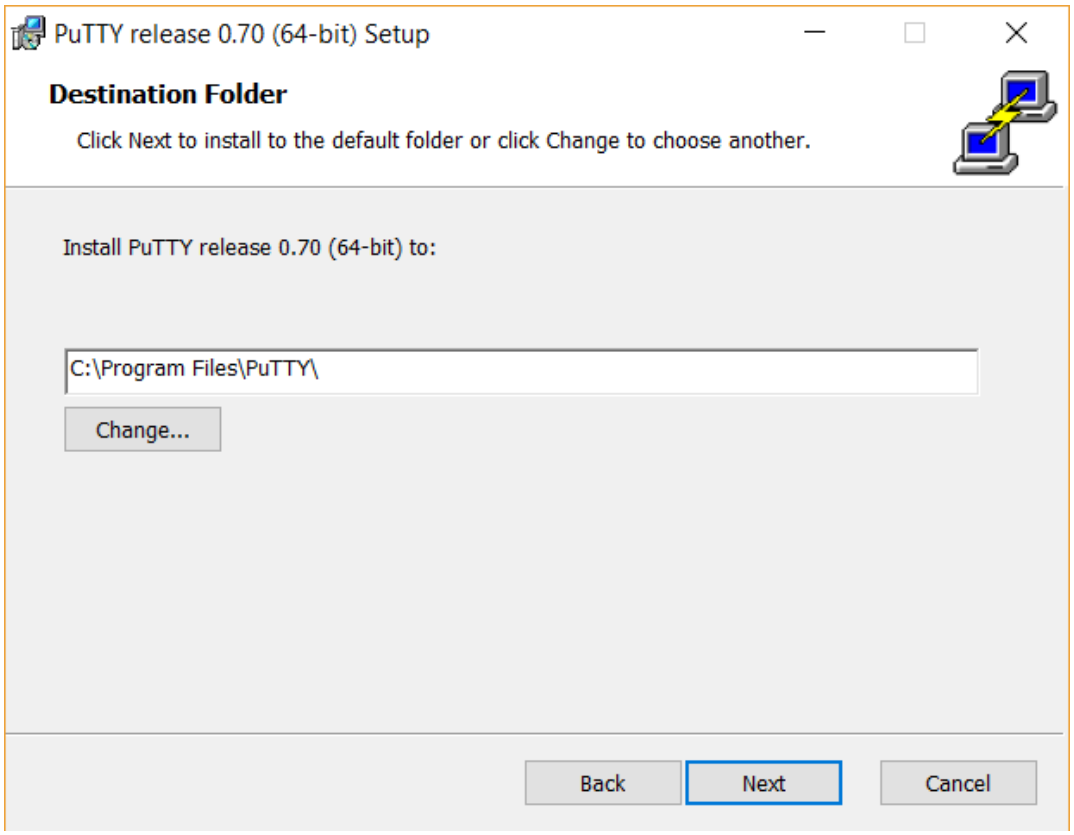
5.1 Login by SSH

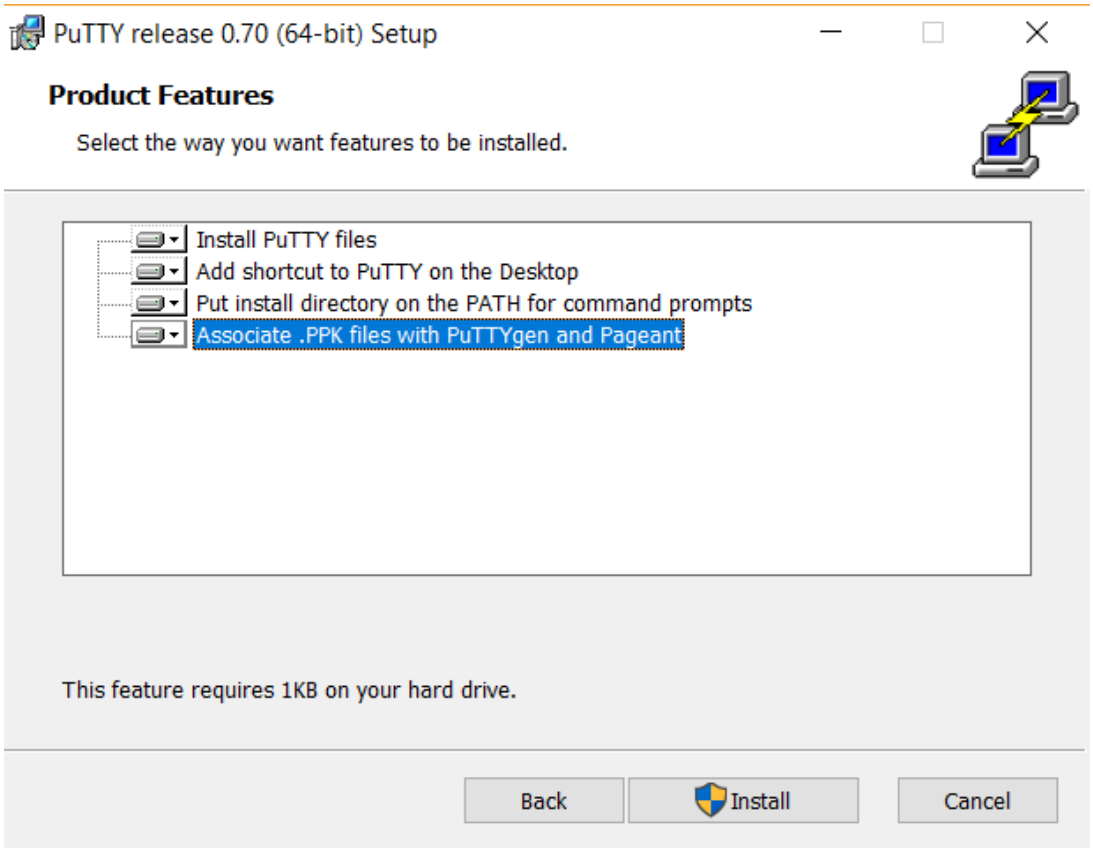
5.1.1 Download and install PuTTY

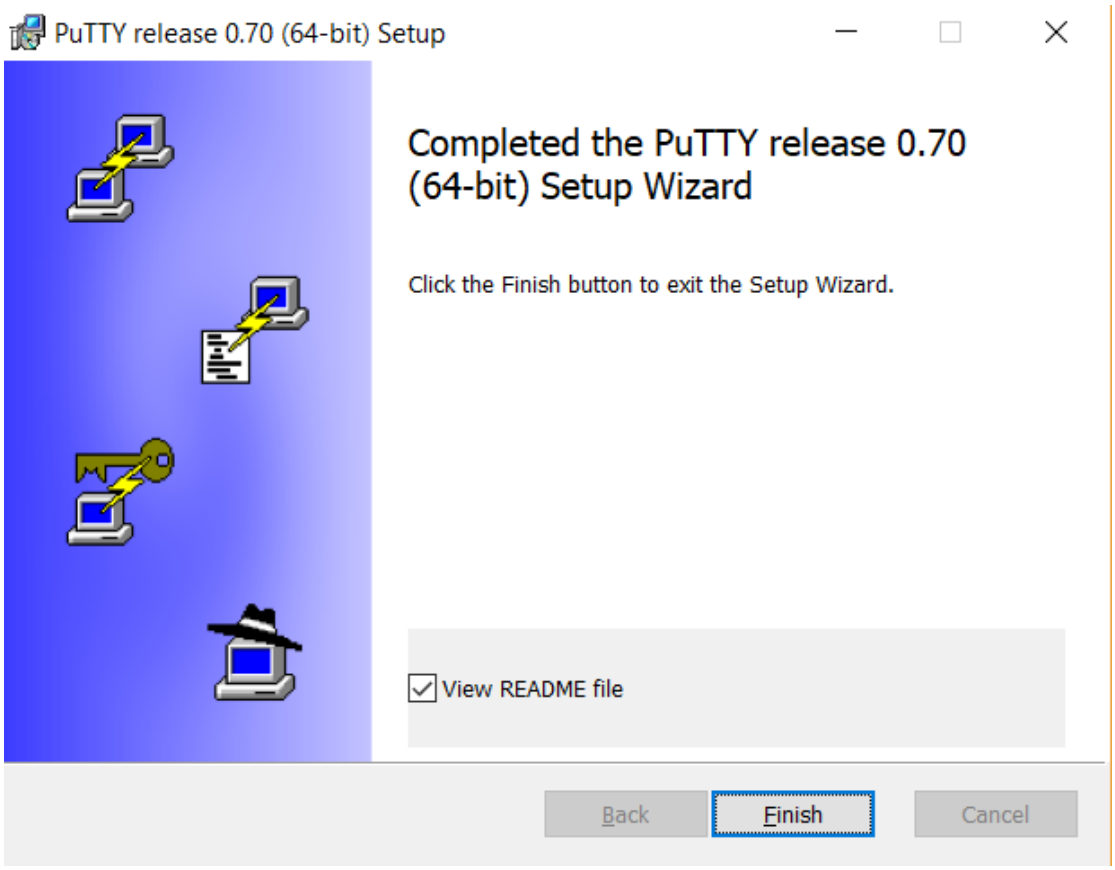
Download link as following: https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html

Install PuTTY



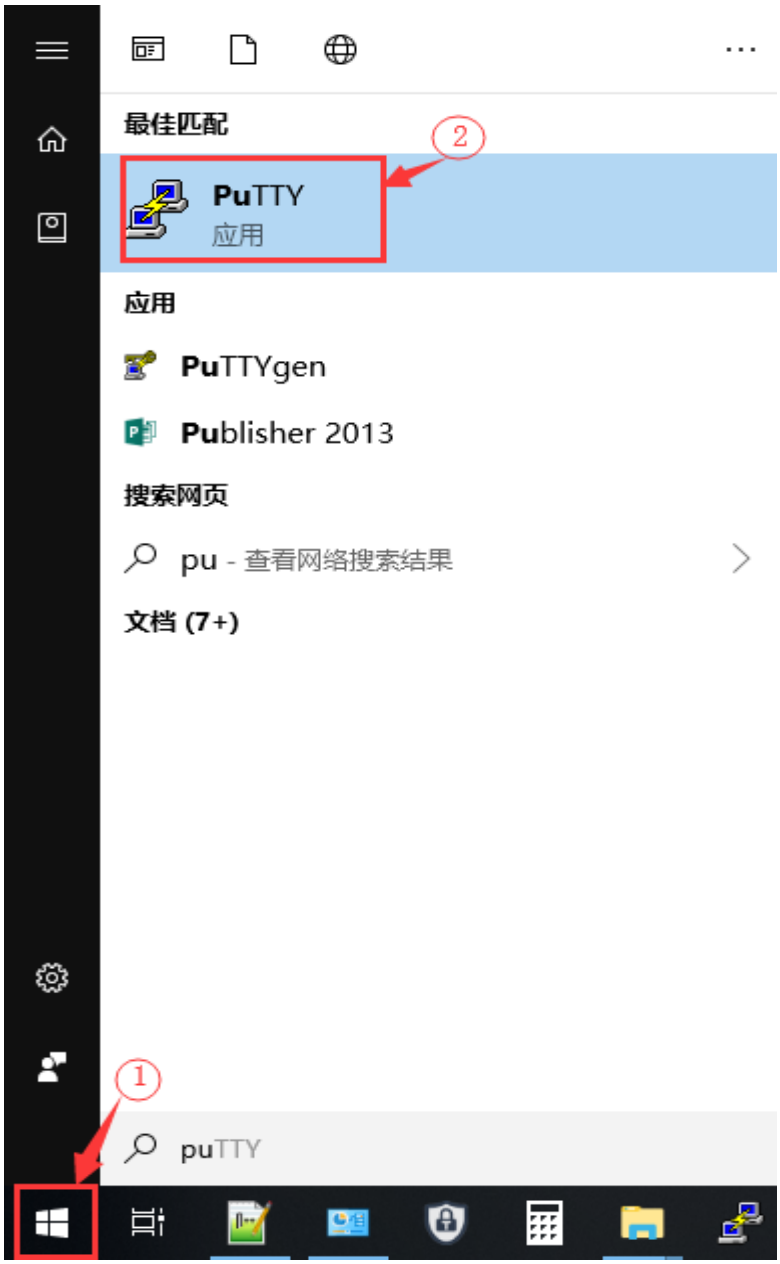

PuTTY release 0.70 (64-bit) Setup
Destination Folder
Click Next to install to the default folder or click Change to choose another.
Install PuTTY release 0.70 (64-bit) to:
C:\Program Files\PuTTY\
Change...
Back
Next
Cancel


PuTTY release 0.70 (64-bit) Setup
Product Features
Select the way you want features to be installed.
Install PuTTY files
Add shortcut to PuTTY on the Desktop
Put install directory on the PATH for command prompts
Associate .PPK files with PuTTYgen and Pageant
This feature requires 1KB on your hard drive.
Back
Install
Cancel

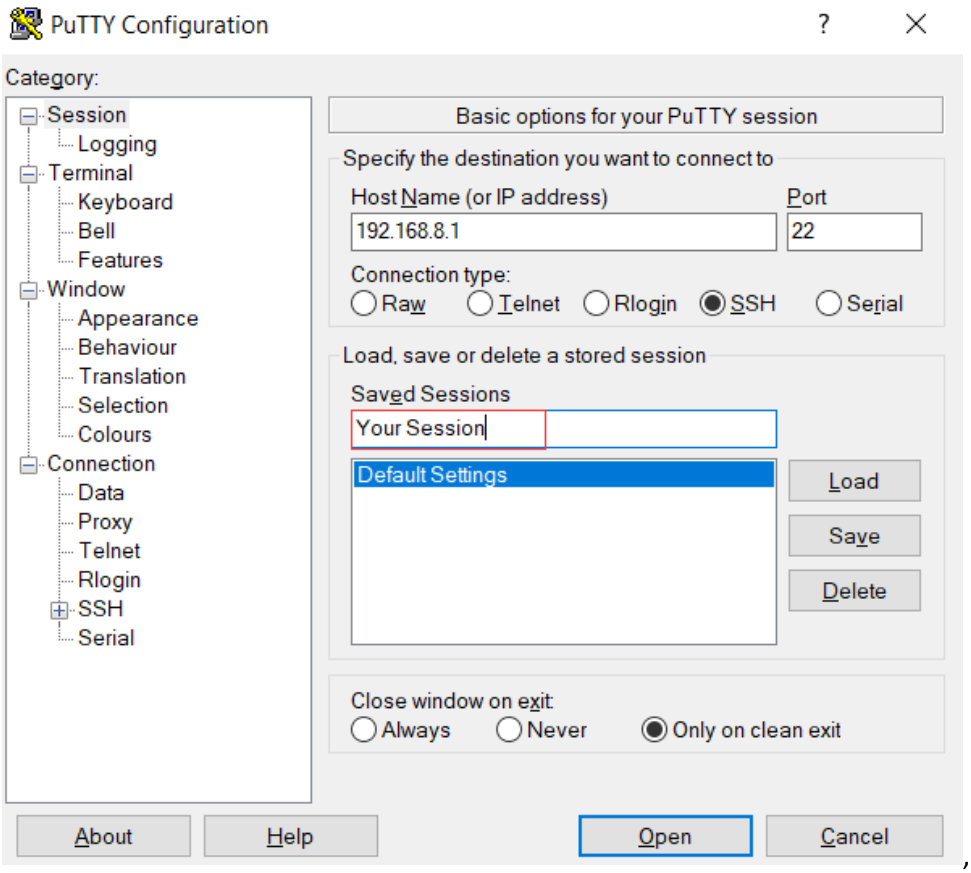

PuTTY release 0.70 (64-bit) Setup
Completed the PuTTY release 0.70 (64-bit) Setup Wizard
Click the Finish button to exit the Setup Wizard.
View README file
Back
Finish
Cancel

5.1.2 Login by PuTTY

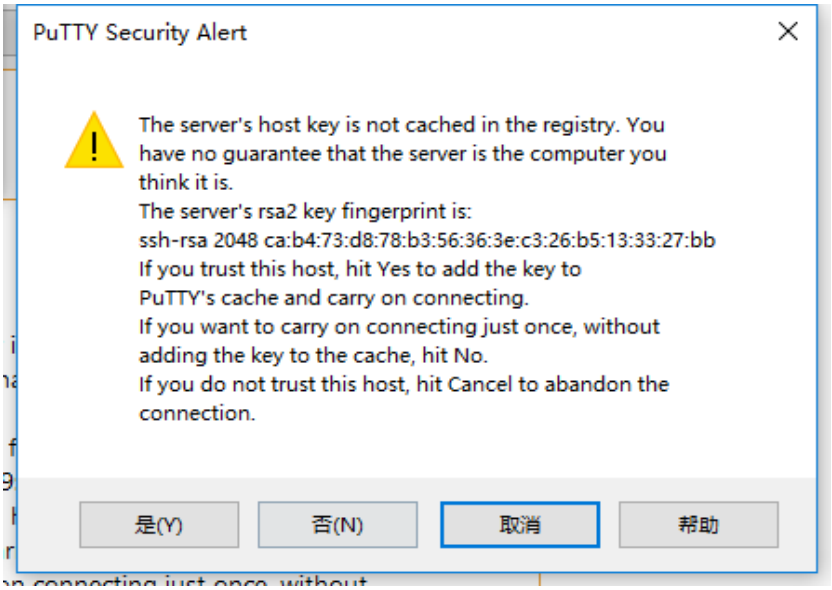
Follow below steps to open PuTTY:



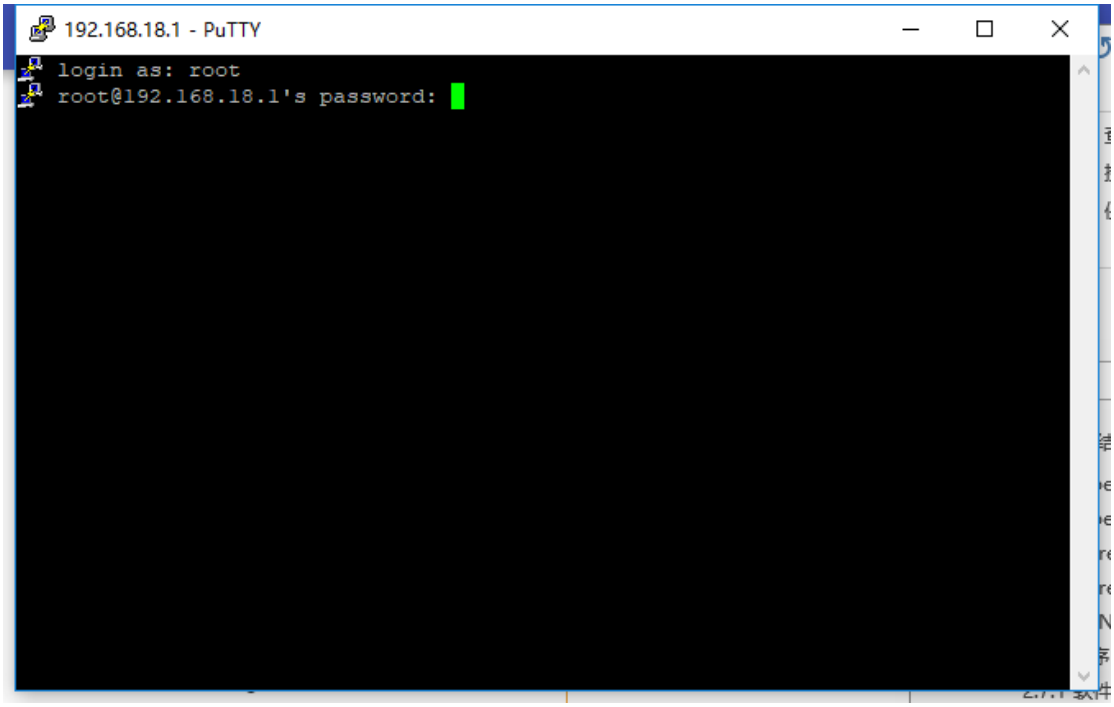
Set PuTTY. Default IP address is 192.168.8.1, default port is 22, and choose the connecting type SSH as below:



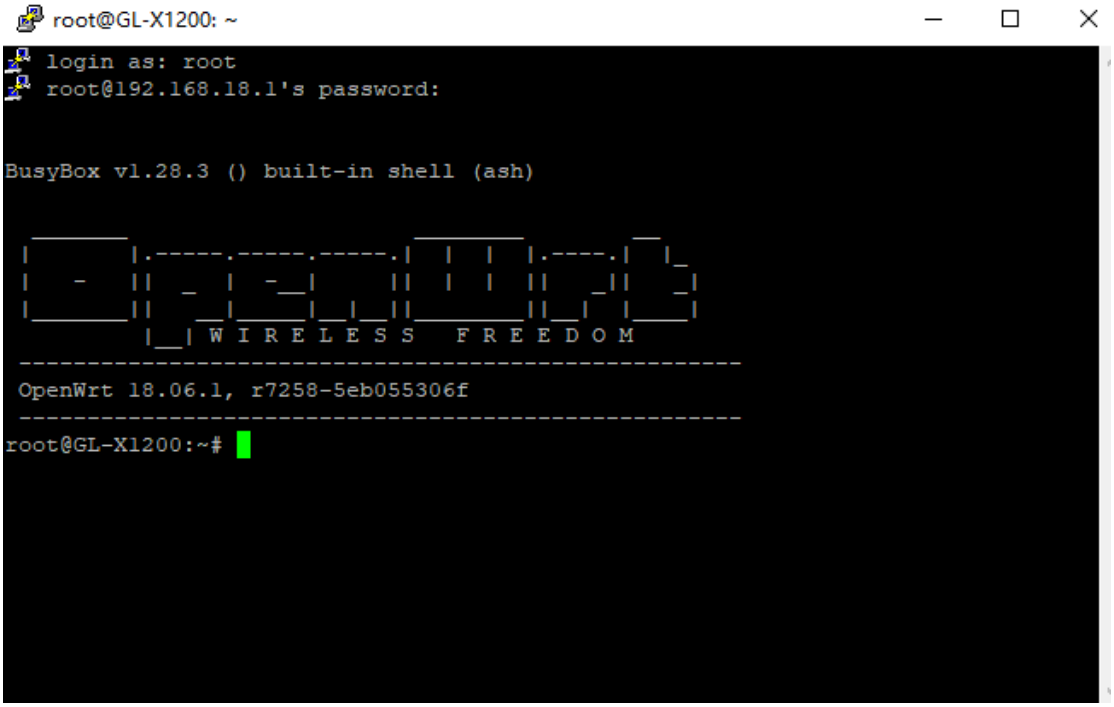
Click Open to pop up the interface as below, choose "Yes"



Enter default user name ‘root’, the password is the administrator password you set, as below:



After log in, the interface displays as below:



5.2 Commands introduction

5.2.1 ifconfig command

ifconfig command can check the basic status of network ports, steps asbelow:

```
root@GL-X1200:~# ifconfig --help
BusyBox v1.28.3 () multi-call binary.

Usage: ifconfig [-a] interface [address]

Configure a network interface

        [add ADDRESS[/PREFIXLEN]]
        [del ADDRESS[/PREFIXLEN]]
        [[-]broadcast [ADDRESS]] [[-]pointopoint [ADDRESS]]
        [netmask ADDRESS] [dstaddr ADDRESS]
        [hw ether ADDRESS] [metric NN] [mtu NN]
        [[-]trailers] [[-]arp] [[-]allmulti]
        [multicast] [[-]promisc] [txqueuelen NN] [[-]dynamic]
        [up|down] ...
root@GL-X1200:~#
```

Example of ifconfig command:

```
root@GL-X1200:~# ifconfig
br-guest  Link encap:Ethernet  HWaddr E2:95:6E:4C:9C:F7
          inet addr:192.168.9.1  Bcast:192.168.9.255  Mask:255.255.255.0
          inet6 addr: fd8d:ed2a:662::1/60 Scope:Global
          inet6 addr: fe80::e095:6eff:fe4c:9cf7/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:24 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:3216 (3.1 KiB)

br-lan    Link encap:Ethernet  HWaddr E4:95:6E:4C:9C:F4
          inet addr:192.168.18.1  Bcast:192.168.18.255  Mask:255.255.255.0
          inet6 addr: fd8d:ed2a:662:10::1/60 Scope:Global
          inet6 addr: fe80::e695:6eff:fe4c:9cf4/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:121050 errors:0 dropped:0 overruns:0 frame:0
          TX packets:201990 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:20292272 (19.3 MiB)  TX bytes:198877148 (189.6 MiB)

eth0      Link encap:Ethernet  HWaddr E4:95:6E:4C:9C:F4
          inet6 addr: fe80::e695:6eff:fe4c:9cf4/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:351706 errors:0 dropped:0 overruns:0 frame:0
          TX packets:341479 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:213554479 (203.6 MiB)  TX bytes:237941382 (226.9 MiB)
          Interrupt:4
```

5.2.2 ping command

ping command can check whether the network is normal

```
root@GL-X1200:~# ping
BusyBox v1.28.3 () multi-call binary.

Usage: ping [OPTIONS] HOST

Send ICMP ECHO_REQUEST packets to network hosts

        -4,-6           Force IP or IPv6 name resolution
        -c CNT          Send only CNT pings
        -s SIZE         Send SIZE data bytes in packets (default 56)
        -t TTL          Set TTL
        -I IFACE/IP     Source interface or IP address
        -W SEC          Seconds to wait for the first response (default 10)
                        (after all -c CNT packets are sent)
        -w SEC          Seconds until ping exits (default:infinite)
                        (can exit earlier with -c CNT)
        -q              Quiet, only display output at start
                        and when finished
        -p HEXBYTE      Pattern to use for payload
root@GL-X1200:~#
```

Example of ping command:

```
root@GL-X1200:~# ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8): 56 data bytes
64 bytes from 8.8.8.8: seq=0 ttl=52 time=13.525 ms
64 bytes from 8.8.8.8: seq=1 ttl=52 time=13.957 ms
64 bytes from 8.8.8.8: seq=2 ttl=52 time=13.898 ms
64 bytes from 8.8.8.8: seq=3 ttl=52 time=13.953 ms
64 bytes from 8.8.8.8: seq=4 ttl=52 time=13.843 ms
64 bytes from 8.8.8.8: seq=5 ttl=52 time=13.250 ms
^C
--- 8.8.8.8 ping statistics ---
6 packets transmitted, 6 packets received, 0% packet loss
round-trip min/avg/max = 13.250/13.737/13.957 ms
```

5.2.3 nslookup commmand

nslookup command can query IP according to domain name, and judge whether the DNS for current device is normal， steps as below:

```
root@GL-X1200:~# nslookup
BusyBox v1.28.3 () multi-call binary.

Usage: nslookup [HOST] [SERVER]

Query the nameserver for the IP address of the given HOST
optionally using a specified DNS server
root@GL-X1200:~#
```

Example of nslookup command:

```
root@GL-X1200:~# nslookup www.baidu.com
Server:         127.0.0.1
Address:        127.0.0.1#53

Name:      www.baidu.com
www.baidu.com   canonical name = www.a.shifen.com
Name:      www.a.shifen.com
Address 1: 14.215.177.38
Address 2: 14.215.177.39
www.baidu.com   canonical name = www.a.shifen.com
root@GL-X1200:~#
```

5.2.4 traceroute command

tracerouter command can trace the path of accessing address, steps as below:

```
root@GL-X1200:~# traceroute
BusyBox v1.28.3 () multi-call binary.

Usage: traceroute [-46FIlnrv] [-f 1ST_TTL] [-m MAXTTL] [-q PROBES] [-p PORT]
        [-t TOS] [-w WAIT_SEC] [-s SRC_IP] [-i IFACE]
        [-z PAUSE_MSEC] HOST [BYTES]

Trace the route to HOST

        -4,-6   Force IP or IPv6 name resolution
        -F      Set don't fragment bit
        -l      Display TTL value of the returned packet
        -n      Print numeric addresses
        -r      Bypass routing tables, send directly to HOST
        -v      Verbose
        -f N    First number of hops (default 1)
        -m N    Max number of hops
        -q N    Number of probes per hop (default 3)
        -p N    Base UDP port number used in probes
                (default 33434)
        -s IP   Source address
        -i IFACE Source interface
        -t N    Type-of-service in probe packets (default 0)
        -w SEC  Time to wait for a response (default 3)
        -g IP   Loose source route gateway (8 max)
root@GL-X1200:~#
```

Example of tracerouter command:

```
root@GL-X1200:~# traceroute 8.8.8.8
traceroute to 8.8.8.8 (8.8.8.8), 30 hops max, 38 byte packets
 1  192.168.3.1 (192.168.3.1)  0.601 ms  0.234 ms  0.603 ms
 2  192.168.17.1 (192.168.17.1)  0.994 ms  0.920 ms  0.882 ms
 3  113.116.144.1 (113.116.144.1)  9.148 ms  4.693 ms  4.734 ms
 4  202.105.154.133 (202.105.154.133)  3.400 ms  113.106.39.30 (113.106.39.30)  2.528 ms  121.187.37.59.broad.dg.gd.dynamic.163data.com.cn (59.37.187.121)  2.979 ms
 5  183.56.65.66 (183.56.65.66)  8.278 ms  183.56.65.2 (183.56.65.2)  7.700 ms  183.56.65.6 (183.56.65.6)  13.118 ms
 6  202.97.94.134 (202.97.94.134)  6.752 ms  6.746 ms  202.97.94.126 (202.97.94.126)  5.974 ms
 7  202.97.94.102 (202.97.94.102)  9.736 ms  202.97.94.98 (202.97.94.98)  12.401 ms  202.97.94.102 (202.97.94.102)  13.620 ms
 8  202.97.95.170 (202.97.95.170)  17.283 ms  14.720 ms  15.807 ms
 9  202.97.62.214 (202.97.62.214)  13.463 ms  12.428 ms  12.617 ms
10  108.170.241.33 (108.170.241.33)  13.474 ms  108.170.241.1 (108.170.241.1)  11.915 ms  108.170.241.65 (108.170.241.65)  12.319 ms
11  216.239.62.59 (216.239.62.59)  13.273 ms  72.14.233.169 (72.14.233.169)  12.304 ms  11.663 ms
12  dns.google (8.8.8.8)  12.674 ms  12.976 ms  12.988 ms
root@GL-X1200:~#
```

5.2.5 iwinfo command

iwinfo command is wireless related command, steps as below:

```
root@GL-X1200:~# iwinfo --help
Usage:
        iwinfo <device> info
        iwinfo <device> scan
        iwinfo <device> txpowerlist
        iwinfo <device> freqlist
        iwinfo <device> assoclist
        iwinfo <device> countrylist
        iwinfo <device> htmodelist
        iwinfo <backend> phyname <section>
root@GL-X1200:~#
```

Example of iwinfo command:

Check basic information of network port

```
root@GL-X1200:~# iwinfo wlan0 info
wlan0     ESSID: "GL-X1200-cf4-5G"
          Access Point: E6:95:6E:4C:9C:F7
          Mode: Master  Channel: 36 (5.180 GHz)
          Tx-Power: 23 dBm  Link Quality: unknown/70
          Signal: unknown  Noise: -104 dBm
          Bit Rate: unknown
          Encryption: WPA2 PSK (CCMP)
          Type: nl80211  HW Mode(s): 802.11nac
          Hardware: 168C:0056 0000:0000 [Generic MAC80211]
          TX power offset: unknown
          Frequency offset: unknown
          Supports VAPs: yes  PHY name: phy0
root@GL-X1200:~#
```

Scan surrounding hot spots

```
root@GL-X1200:~# iwinfo wlan2 scan
Cell 01 - Address: E4:95:6E:40:00:B2
          ESSID: "0-LX-S1300-0af-5G"
          Mode: Master  Channel: 36
          Signal: -56 dBm  Quality: 54/70
          Encryption: WPA2 PSK (CCMP)
          HT Capabilities: HT20 HT40 VHT20 VHT40

Cell 02 - Address: E4:95:6E:43:41:63
          ESSID: "GL-AR750-162-5G"
          Mode: Master  Channel: 36
          Signal: -48 dBm  Quality: 62/70
          Encryption: mixed WPA/WPA2 PSK (CCMP)
          HT Capabilities: HT20 HT40 VHT20 VHT40 VHT80

Cell 03 - Address: E4:95:6E:46:E3:FF
          ESSID: "GL-X750-3fc-5G"
          Mode: Master  Channel: 36
          Signal: -48 dBm  Quality: 62/70
          Encryption: WPA2 PSK (CCMP)
          HT Capabilities: HT20 HT40 VHT20 VHT40 VHT80

Cell 04 - Address: E4:95:6E:4F:41:01
          ESSID: "GL-AR750S-100-5G"
          Mode: Master  Channel: 36
          Signal: -88 dBm  Quality: 22/70
          Encryption: WPA2 PSK (CCMP)
          HT Capabilities: HT20 HT40 VHT20 VHT40 VHT80

Cell 05 - Address: E4:95:6E:4E:54:27
          ESSID: "ceshibuchangqitest"X750-424-5G"@"
          Mode: Master  Channel: 36
          Signal: -53 dBm  Quality: 57/70
          Encryption: mixed WPA/WPA2 PSK (CCMP)
          HT Capabilities: HT20 HT40 VHT20 VHT40 VHT80
```

5.2.6 uci command

uci command can check, modify and set configuration, steps as below:

```
root@GL-X1200:~# uci
Usage: uci [<options>] <command> [<arguments>]

Commands:
        batch
        export      [<config>]
        import      [<config>]
        changes     [<config>]
        commit      [<config>]
        add         <config> <section-type>
        add_list    <config>.<section>.<option>=<string>
        del_list    <config>.<section>.<option>=<string>
        show        [<config>[.<section>[.<option>]]]
        get         <config>.<section>[.<option>]
        set         <config>.<section>[.<option>]=<value>
        delete      <config>[.<section>[[.<option>][=<id>]]]
        rename      <config>.<section>[.<option>]=<name>
        revert      <config>[.<section>[.<option>]]
        reorder     <config>.<section>=<position>

Options:
        -c <path>  set the search path for config files (default: /etc/config)
        -d <str>   set the delimiter for list values in uci show
        -f <file>  use <file> as input instead of stdin
        -m         when importing, merge data into an existing package
        -n         name unnamed sections on export (default)
        -N         don't name unnamed sections
        -p <path>  add a search path for config change files
        -P <path>  add a search path for config change files and use as default
        -q         quiet mode (don't print error messages)
        -s         force strict mode (stop on parser errors, default)
        -S         disable strict mode
        -X         do not use extended syntax on 'show'

root@GL-X1200:~#
```

Example of uci command, checking network configuration:

```
root@GL-X1200:~# uci show network
network.loopback=interface
network.loopback.ifname='lo'
network.loopback.proto='static'
network.loopback.ipaddr='127.0.0.1'
network.loopback.netmask='255.0.0.0'
network.globals=globals
network.globals.ula_prefix='fd8d:ed2a:0662::/48'
network.lan=interface
network.lan.type='bridge'
network.lan.ifname='eth0.1'
network.lan.proto='static'
network.lan.netmask='255.255.255.0'
network.lan.ip6assign='60'
network.lan.hostname='GL-X1200-cf4'
network.lan.ipaddr='192.168.18.1'
network.wan=interface
network.wan.ifname='eth0.2'
network.wan.proto='dhcp'
network.wan.hostname='GL-X1200-cf4'
network.wan.metric='10'
network.wan6=interface
network.wan6.ifname='eth0.2'
network.wan6.proto='dhcpv6'
network.@switch[0]=switch
network.@switch[0].name='switch0'
network.@switch[0].reset='1'
network.@switch[0].enable_vlan='1'
network.@switch_vlan[0]=switch_vlan
network.@switch_vlan[0].device='switch0'
network.@switch_vlan[0].vlan='1'
network.@switch_vlan[0].ports='1 2 3 4 0t'
network.@switch_vlan[1]=switch_vlan
network.@switch_vlan[1].device='switch0'
network.@switch_vlan[1].vlan='2'
network.@switch_vlan[1].ports='5 0t'
network.guest=interface
network.guest.ifname='guest'
network.guest.type='bridge'
network.guest.proto='static'
network.guest.ipaddr='192.168.9.1'
network.guest.netmask='255.255.255.0'
network.guest.ip6assign='60'
network.wwan=interface
network.wwan.proto='dhcp'
network.wwan.metric='20'
root@GL-X1200:~#
```

5.2.7 route command

Route command can manage routing table, steps as below :

```
root@GL-X1200:~# route --help
BusyBox v1.28.3 () multi-call binary.

Usage: route [{add|del|delete}]

Edit kernel routing tables

        -n      Don't resolve names
        -e      Display other/more information
        -A inet{6}      Select address family
root@GL-X1200:~#
```

Example of route command:

```
root@GL-X1200:~# route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         192.168.3.1     0.0.0.0         UG    10     0        0 eth0.2
default         192.168.1.1     0.0.0.0         UG    20     0        0 wlan-sta
192.168.1.0     *               255.255.255.0   U     20     0        0 wlan-sta
192.168.3.0     *               255.255.255.0   U     10     0        0 eth0.2
192.168.9.0     *               255.255.255.0   U     0      0        0 br-guest
192.168.18.0    *               255.255.255.0   U     0      0        0 br-lan
root@GL-X1200:~#
```

5.2.8 mwan3 command

mwan3 command is responsible for network priority switching, steps as below:

```
root@GL-X1200:~# mwan3
Syntax: mwan3 [command]

Available commands:
        start           Load iptables rules, ip rules and ip routes
        stop            Unload iptables rules, ip rules and ip routes
        restart         Reload iptables rules, ip rules and ip routes
        ifup <iface>    Load rules and routes for specific interface
        ifdown <iface>  Unload rules and routes for specific interface
        interfaces      Show interfaces status
        policies        Show currently active policy
        connected       Show directly connected networks
        rules           Show active rules
        status          Show all status

root@GL-X1200:~#
```

Example of mwan3 command:

```
root@GL-X1200:~# mwan3 status
Interface status:
 interface wan is online and tracking is active
 interface wwan is online and tracking is active
 interface tethering is unknown and tracking is down
 interface modem is unknown and tracking is down

Current ipv4 policies:
default_poli:
 wan (100%)


Current ipv6 policies:
default_poli:
 default


Directly connected ipv4 networks:
 192.168.18.255
 192.168.9.0
 192.168.1.255
 192.168.18.0/24
 192.168.3.0/24
 127.0.0.0/8
 192.168.3.0
 224.0.0.0/3
 127.0.0.0
 192.168.1.0
 192.168.9.1
 192.168.18.1
 192.168.9.0/24
 192.168.3.255
 192.168.1.0/24
 192.168.18.0
 127.255.255.255
 192.168.1.106
 127.0.0.1
 192.168.9.255
 192.168.3.38

Directly connected ipv6 networks:
 fd8d:ed2a:662::/64
 fe80::/64
 fd8d:ed2a:662:10::/64

Active ipv4 user rules:
 1422  124K - default_poli  all  --  *      *       0.0.0.0/0           0.0.0.0/0

Active ipv6 user rules:
 3440  668K - default_poli  all      *      *       ::/0                ::/0

root@GL-X1200:~#
```

5.2.9 iptables command

iptables command is firewall-related, steps as below:

```
root@GL-X1200:~# iptables
iptables v1.6.2: no command specified
Try `iptables -h' or 'iptables --help' for more information.
root@GL-X1200:~# iptables --help
iptables v1.6.2

Usage: iptables -[ACD] chain rule-specification [options]
       iptables -I chain [rulenum] rule-specification [options]
       iptables -R chain rulenum rule-specification [options]
       iptables -D chain rulenum [options]
       iptables -[LS] [chain [rulenum]] [options]
       iptables -[FZ] [chain] [options]
       iptables -[NX] chain
       iptables -E old-chain-name new-chain-name
       iptables -P chain target [options]
       iptables -h (print this help information)

Commands:
Either long or short options are allowed.
  --append  -A chain            Append to chain
  --check   -C chain            Check for the existence of a rule
  --delete  -D chain            Delete matching rule from chain
  --delete  -D chain rulenum
                                Delete rule rulenum (1 = first) from chain
  --insert  -I chain [rulenum]
                                Insert in chain as rulenum (default 1=first)
  --replace -R chain rulenum
                                Replace rule rulenum (1 = first) in chain
  --list    -L [chain [rulenum]]
                                List the rules in a chain or all chains
  --list-rules -S [chain [rulenum]]
                                Print the rules in a chain or all chains
  --flush   -F [chain]          Delete all rules in  chain or all chains
  --zero    -Z [chain [rulenum]]
                                Zero counters in chain or all chains
  --new     -N chain            Create a new user-defined chain
  --delete-chain
            -X [chain]          Delete a user-defined chain
  --policy  -P chain target
                                Change policy on chain to target
  --rename-chain
            -E old-chain new-chain
                                Change chain name, (moving any references)
Options:
    --ipv4      -4              Nothing (line is ignored by ip6tables-restore)
    --ipv6      -6              Error (line is ignored by iptables-restore)
[!] --protocol  -p proto        protocol: by number or name, eg. `tcp'
[!] --source    -s address[/mask][...]
                                source specification
[!] --destination -d address[/mask][...]
                                destination specification
[!] --in-interface -i input name[+]
                                network interface name ([+] for wildcard)
 --jump -j target
                                target for rule (may load target extension)
  --goto      -g chain
                               jump to chain with no return
  --match       -m match
                                extended match (may load extension)
  --numeric     -n              numeric output of addresses and ports
[!] --out-interface -o output name[+]
```

```
[!] --out-interface -o output name[+]
                              network interface name ([+] for wildcard)
  --table       -t table      table to manipulate (default: `filter')
  --verbose     -v            verbose mode
  --wait        -w [seconds]  maximum wait to acquire xtables lock before give up
  --wait-interval -W [usecs]  wait time to try to acquire xtables lock
                              default is 1 second
  --line-numbers              print line numbers when listing
  --exact       -x            expand numbers (display exact values)
[!] --fragment  -f            match second or further fragments only
  --modprobe=<command>        try to insert modules using this command
  --set-counters PKTS BYTES   set the counter during insert/append
[!] --version   -V            print package version.
root@GL-X1200:~#
```

Example of iptables command:

```
root@GL-X1200:~# iptables -t nat -S
-P PREROUTING ACCEPT
-P INPUT ACCEPT
-P OUTPUT ACCEPT
-P POSTROUTING ACCEPT
-N GL_SPEC_DMZ
-N GL_SPEC_FORWARDING
-N postrouting_guestzone_rule
-N postrouting_lan_rule
-N postrouting_rule
-N postrouting_wan_rule
-N prerouting_guestzone_rule
-N prerouting_lan_rule
-N prerouting_rule
-N prerouting_wan_rule
-N zone_guestzone_postrouting
-N zone_guestzone_prerouting
-N zone_lan_postrouting
-N zone_lan_prerouting
-N zone_wan_postrouting
-N zone_wan_prerouting
-A PREROUTING -j GL_SPEC_DMZ
-A PREROUTING -j GL_SPEC_FORWARDING
-A PREROUTING -m comment --comment "!fw3: Custom prerouting rule chain" -j prerouting_rule
-A PREROUTING -i br-lan -m comment --comment "!fw3" -j zone_lan_prerouting
-A PREROUTING -i eth0.2 -m comment --comment "!fw3" -j zone_wan_prerouting
-A PREROUTING -i wlan-sta -m comment --comment "!fw3" -j zone_wan_prerouting
-A PREROUTING -i br-guest -m comment --comment "!fw3" -j zone_guestzone_prerouting
-A POSTROUTING -m comment --comment "!fw3: Custom postrouting rule chain" -j postrouting_rule
-A POSTROUTING -o br-lan -m comment --comment "!fw3" -j zone_lan_postrouting
-A POSTROUTING -o eth0.2 -m comment --comment "!fw3" -j zone_wan_postrouting
-A POSTROUTING -o wlan-sta -m comment --comment "!fw3" -j zone_wan_postrouting
-A POSTROUTING -o br-guest -m comment --comment "!fw3" -j zone_guestzone_postrouting
-A zone_guestzone_postrouting -m comment --comment "!fw3: Custom guestzone postrouting rule chain" -j postrouting_guestzone_rule
-A zone_guestzone_prerouting -m comment --comment "!fw3: Custom guestzone prerouting rule chain" -j prerouting_guestzone_rule
-A zone_lan_postrouting -m comment --comment "!fw3: Custom lan postrouting rule chain" -j postrouting_lan_rule
-A zone_lan_prerouting -m comment --comment "!fw3: Custom lan prerouting rule chain" -j prerouting_lan_rule
-A zone_wan_postrouting -m comment --comment "!fw3: Custom wan postrouting rule chain" -j postrouting_wan_rule
-A zone_wan_postrouting -m comment --comment "!fw3" -j MASQUERADE
-A zone_wan_prerouting -m comment --comment "!fw3: Custom wan prerouting rule chain" -j prerouting_wan_rule
root@GL-X1200:~#
```

```
root@GL-X1200:~# iptables -t mangle -S
-P PREROUTING ACCEPT
-P INPUT ACCEPT
-P FORWARD ACCEPT
-P OUTPUT ACCEPT
-P POSTROUTING ACCEPT
-N mwan3_connected
-N mwan3_hook
-N mwan3_iface_in_wan
-N mwan3_iface_in_wwan
-N mwan3_iface_out_wan
-N mwan3_iface_out_wwan
-N mwan3_ifaces_in
-N mwan3_ifaces_out
-N mwan3_policy_default_poli
-N mwan3_rules
-A PREROUTING -j mwan3_hook
-A FORWARD -o eth0.2 -p tcp -m tcp --tcp-flags SYN,RST SYN -m comment --comment "!fw3: Zone wan MTU fixing" -j TCPMSS --clamp-mss-to-pmtu
-A FORWARD -o wlan-sta -p tcp -m tcp --tcp-flags SYN,RST SYN -m comment --comment "!fw3: Zone wan MTU fixing" -j TCPMSS --clamp-mss-to-pmtu
-A OUTPUT -j mwan3_hook
-A mwan3_connected -m set --match-set mwan3_connected dst -j MARK --set-xmark 0x3f00/0x3f00
-A mwan3_hook -j CONNMARK --restore-mark --nfmask 0x3f00 --ctmask 0x3f00
-A mwan3_hook -m mark --mark 0x0/0x3f00 -j mwan3_ifaces_in
-A mwan3_hook -m mark --mark 0x0/0x3f00 -j mwan3_connected
-A mwan3_hook -m mark --mark 0x0/0x3f00 -j mwan3_ifaces_out
-A mwan3_hook -m mark --mark 0x0/0x3f00 -j mwan3_rules
-A mwan3_hook -j CONNMARK --save-mark --nfmask 0x3f00 --ctmask 0x3f00
-A mwan3_hook -m mark ! --mark 0x3f00/0x3f00 -j mwan3_connected
-A mwan3_iface_in_wan -i eth0.2 -m set --match-set mwan3_connected src -m mark --mark 0x0/0x3f00 -m comment --comment default -j MARK --set-xmark 0x3f00/0x3f00
-A mwan3_iface_in_wan -i eth0.2 -m mark --mark 0x0/0x3f00 -m comment --comment wan -j MARK --set-xmark 0x100/0x3f00
-A mwan3_iface_in_wwan -i wlan-sta -m set --match-set mwan3_connected src -m mark --mark 0x0/0x3f00 -m comment --comment default -j MARK --set-xmark 0x3f00/0x3f00
-A mwan3_iface_in_wwan -i wlan-sta -m mark --mark 0x0/0x3f00 -m comment --comment wwan -j MARK --set-xmark 0x200/0x3f00
-A mwan3_iface_out_wan -o eth0.2 -m mark --mark 0x0/0x3f00 -m comment --comment wan -j MARK --set-xmark 0x100/0x3f00
-A mwan3_iface_out_wwan -o wlan-sta -m mark --mark 0x0/0x3f00 -m comment --comment wwan -j MARK --set-xmark 0x200/0x3f00
-A mwan3_ifaces_in -m mark --mark 0x0/0x3f00 -j mwan3_iface_in_wwan
-A mwan3_ifaces_in -m mark --mark 0x0/0x3f00 -j mwan3_iface_in_wan
-A mwan3_ifaces_out -m mark --mark 0x0/0x3f00 -j mwan3_iface_out_wwan
-A mwan3_ifaces_out -m mark --mark 0x0/0x3f00 -j mwan3_iface_out_wan
-A mwan3_policy_default_poli -m mark --mark 0x0/0x3f00 -m comment --comment "wan 3 3" -j MARK --set-xmark 0x100/0x3f00
-A mwan3_rules -m mark --mark 0x0/0x3f00 -m comment --comment default_rule -j mwan3_policy_default_poli
root@GL-X1200:~#
```