

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



Copyright © 2019 Shenzhen Guanglianzhitong Tech Co., Ltd. All rights reserved.

Document Copyrights

No duplication or distribution of this document or any portion thereof shall take place without the express written permission of Shenzhen Guanglianzhitong Tech Co., Ltd. No part of this manual may be reproduced, distributed, or transmitted in any form or by any means, electronic or mechanical, for any purpose without the express written permission of Shenzhen Guanglianzhitong Tech Co., Ltd.

Software Copyrights

The products described in this manual may include copyrighted Shenzhen Guanglianzhitong Tech Co., Ltd. software. Laws in China and other countries preserve certain exclusive rights of copyrighted software, including, but not limited to, the exclusive right to copy or reproduce in any form the copyrighted software. Accordingly, any copyrighted Shenzhen Guanglianzhitong Tech Co., Ltd. software contained in the products described in this manual may not be copied, reproduced, modified, reverse-engineered, or distributed in any manner without the express written permission of Shenzhen Guanglianzhitong Tech Co., Ltd.

Trademarks

GL·iNet is trademark of Shenzhen Guanglianzhitong Tech. Co., Ltd., registered in China and other countries, all other product or service names appearing in this manual are the property of their respective owners.

Disclaimer

Some features of the product and its accessories described herein rely on the software installed, capacities and settings of local network, and may not be activated or may be limited by local network operators or network service providers. Therefore, the descriptions in this manual may not exactly match the purchased product or its accessories. Shenzhen Guanglianzhitong Tech. Co., Ltd. reserves the right to change or modify any information or specifications contained in this manual without prior notice and any liability.

Limitation of Liability

All information provided in this manual is provided on "as is" basis without warranties, guarantees or representations of any kind. Shenzhen Guanglianzhitong Tech. Co., Ltd. hereby expressly disclaims, to the maximum extent permitted by applicable law, in no case shall Shenzhen Guanglianzhitong Tech. Co., Ltd. be liable for any special, incidental, indirect, or consequential damages; or lost profits, business, revenue, data, goodwill or anticipated savings. To the maximum extent permitted by applicable law, in any case, the maximum compensation of Shenzhen Guanglianzhitong Tech. Co., Ltd for the loss caused by using the products described in this manual, is the price paid of products (Except for damages in accordance with applicable law in cases involving personal injury).

Import and export regulations

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

Shenzhen Guanglianzhitong Tech. Co., Ltd

Room 305-306, Skyworth Digital, Songbai road, Shiyan Street, Baoan District, Shenzhen, China

Email:sales@gl-inet.com

Tel: +86-755-86606126

Website: www.gl-inet.com

Catalogue

Chapter 1	General Product Introduction	7
1.1	Brief Product Introduction	7
1.2	Technical Specifications	9
1.3	Appearance and dimension	11
1.4	Package list	12
1.5	Optional Configuration	15
Chapter 2	Hardware installation	16
2.1	LED light indicator	16
2.2	Reset button	17
2.3	USB port	17
2.4	Micro-SD card slot	17
2.5	SIM card slot	18
2.6	Install antennas	19
2.7	Install the device	19
2.7.1	Place on desk	19
2.7.2	Wall Mounting	20
2.7.3	DIN-Rail Mounting	21
2.7.4	Cabinet Installation	22
2.8	Ground wire installation	23
2.9	Console port connection	23
2.10	Ethernet cable connection	24
2.11	Power Supply connection	24
2.11.1	Powered by DC adapter	24
2.11.2	Powered by PoE Ethernet cable	25
2.11.3	POE output	25
Chapter 3	Login Web UI	26
3.1	Login	26
3.2	Language Setting	26
3.3	Set Admin Password	27
3.4	Admin Panel	27
Chapter 4	Device Configuration	28
4.1.1	Brief introduction	29
4.1.2	Status	30
4.1.3	Cable	30

4.1.4 Repeater.....	31
4.1.5 Tethering.....	35
4.1.6 3G/4G Modem	36
4.2 Wireless.....	42
4.2.1 2.4G & 5G WiFi.....	43
4.2.2 2.4G & 5G Guest WiFi	44
4.3 Client	46
4.4.1 Online Upgrade	48
4.4.2 Local Upgrade	49
4.4.3 Automatic Upgrade.....	50
4.5 Firewall.....	51
4.5.1 Port Forwarding.....	51
4.5.2 Turn on Ports.....	52
4.5.3 DMZ	54
4.6 VPN（No Chinese Version）	55
4.6.1 OpenVPN Client	55
4.6.2 OpenVPN Server	55
4.6.3 Wireguard Client.....	56
4.6.4 Wireguard Server.....	57
4.6.5 VPN Policies	57
4.7 Application Program.....	58
4.7.2 File sharing	60
4.7.3 Remote Access	60
4.7.4 Captive Portal.....	62
4.8 More Settings.....	62
4.8.1 Admin Password	62
4.8.2 LAN IP	63
4.8.3 Time Zone.....	69
4.8.4 GPS	70
4.8.5 MAC address Clone.....	72
4.8.6 Self-defined DNS server.....	74
4.8.7 Network mode	75
4.8.8 Reset to factory setting	76
4.8.9 Advanced functions	77
5.1.2 Login by PuTTY	82

5.2 Commands introduction	85
5.2.2 ping command	86
5.2.3 nslookup commmand	87
5.2.4 traceroute command	88
5.2.5 iuserinfo command	89
5.2.9 iptables command	95

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 compliant 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 select CAT6 module, 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.

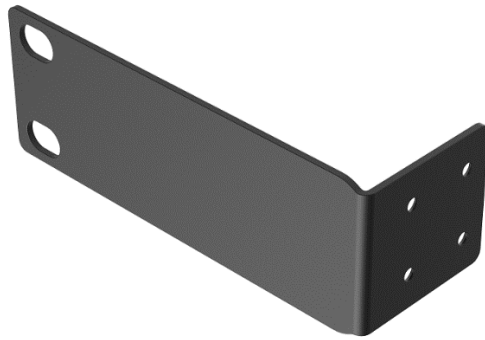
- Ethernet cable



- 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.

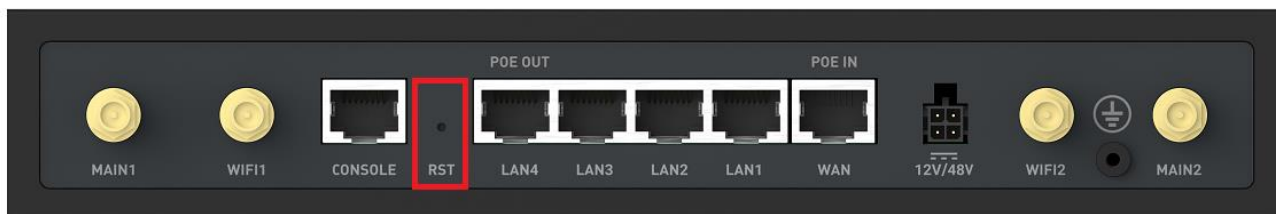
Chapter 2 Hardware installation

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



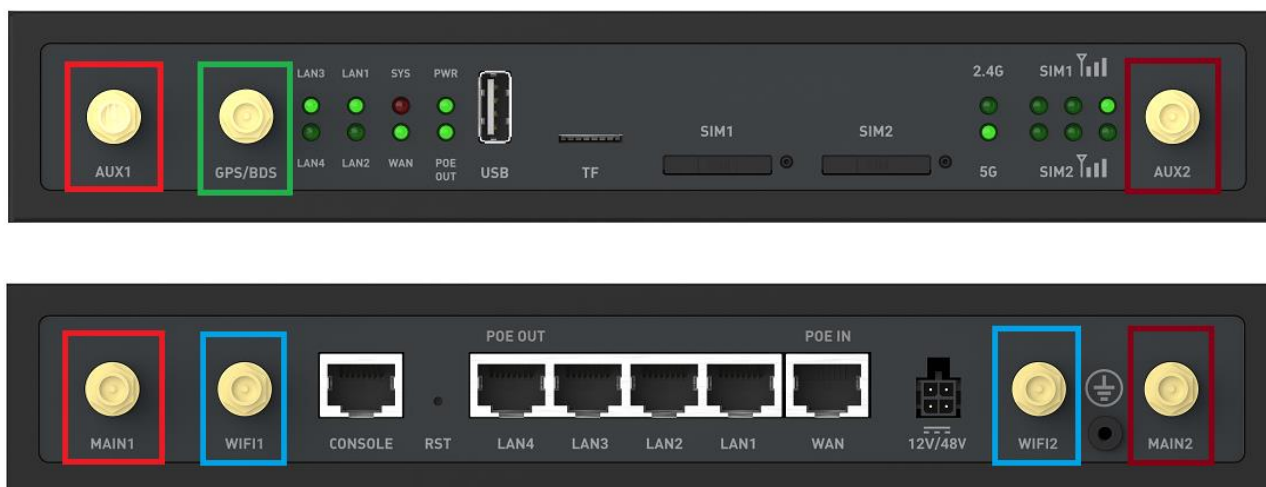
Insert or remove SIM card

- 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

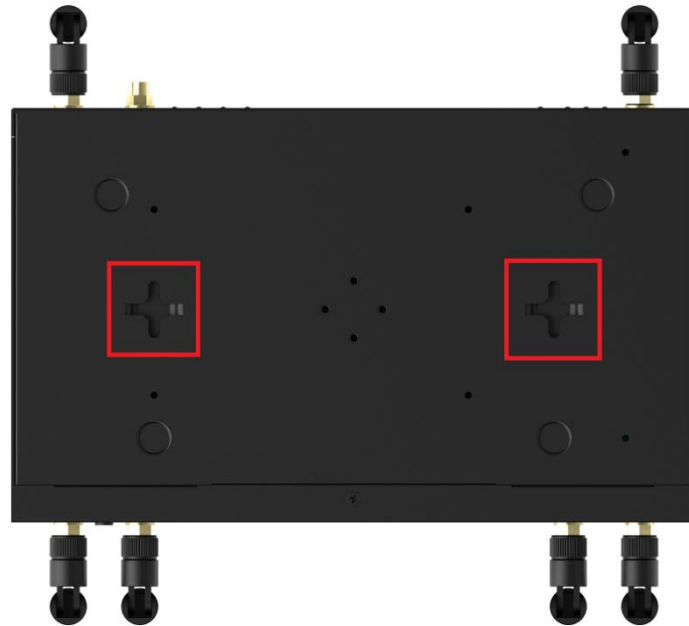
It supports placing on desk, wall-mounted and 35mm DIN-rail installation

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



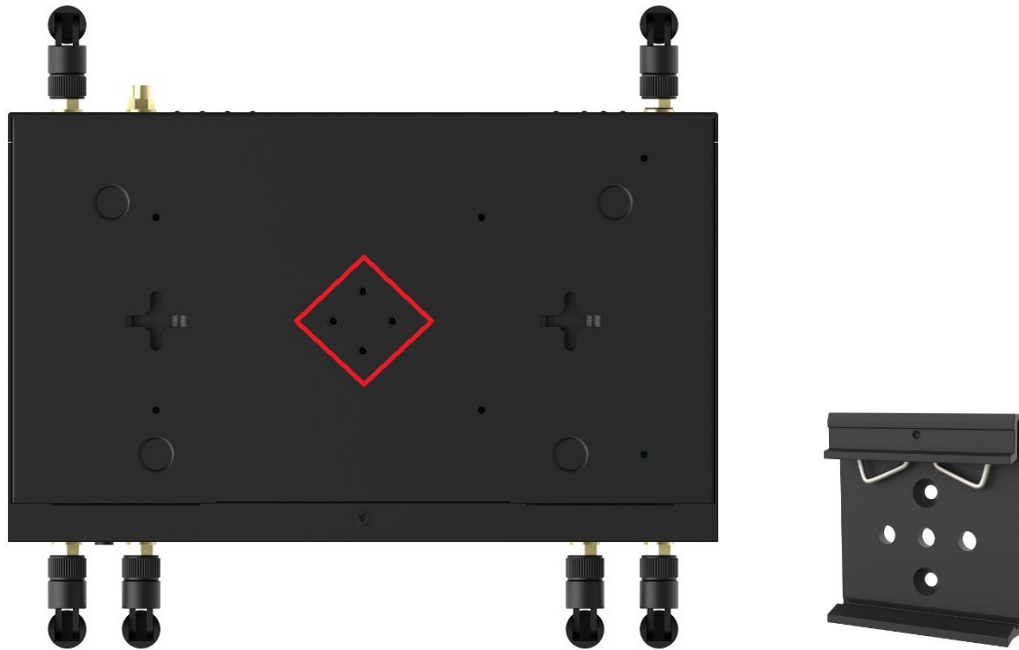
Steps as below:

- 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 is $\phi 5-\phi 7.3\text{mm}$. 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



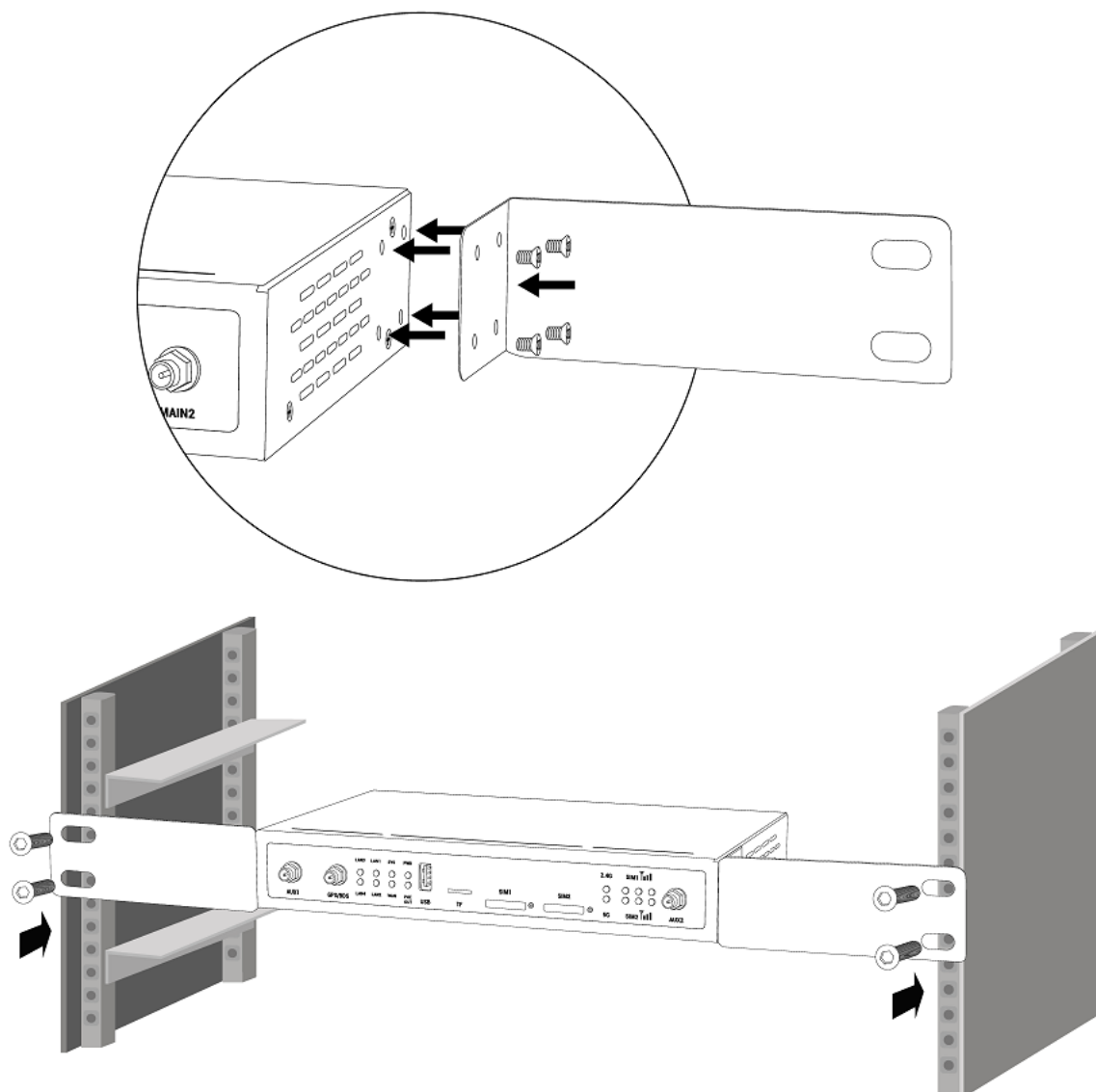
Steps as below:

- 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



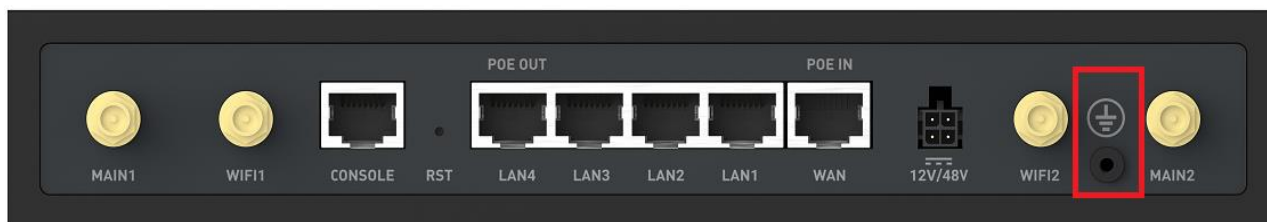
Steps as below:

- 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:

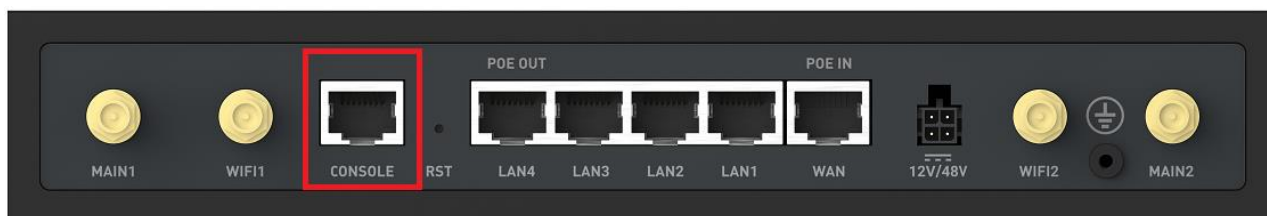
- The Hanging Ears and screws are optional accessories, please contact with our sales team.

2.8 Ground wire installation

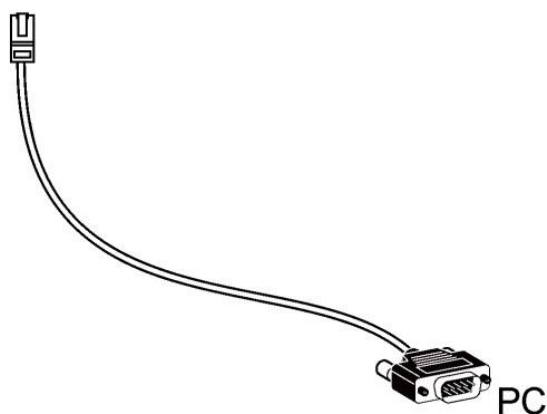


- Ground wire of the device helps prevent the effects of electromagnetic interference.
- Connect the device with ground wire before powering on.
- Remark: Ground wire should be installed on the well-grounded surface such as metal plates.

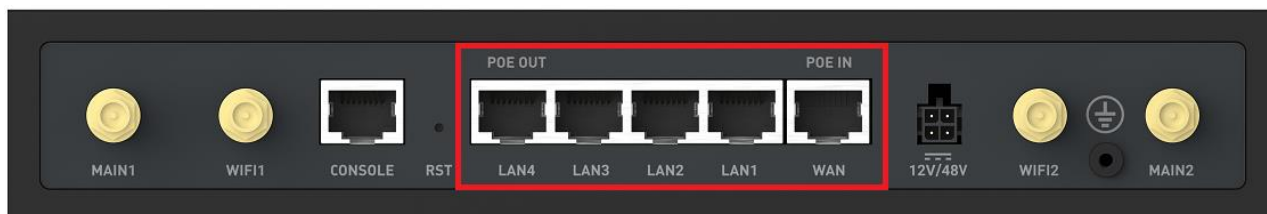
2.9 Console port connection



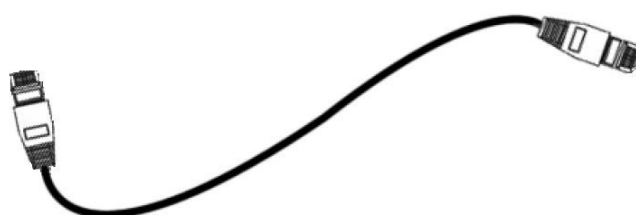
- The device could be debugged through console port.
- Using the following serial cable, one end is RJ45 connector for console port.
- The other end is 9-pin RS232 port for serial part of PC.



2.10 Ethernet cable connection



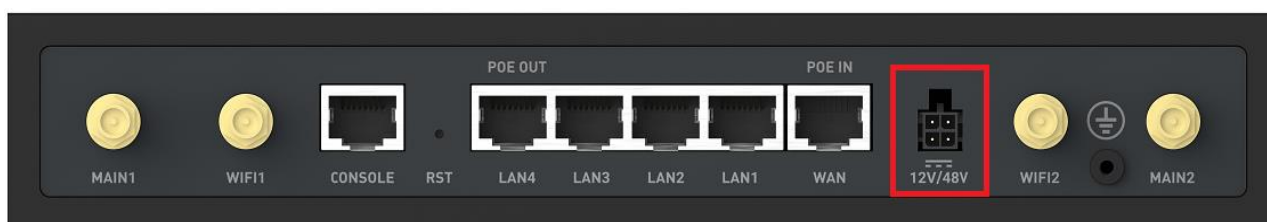
- There are 1 WAN port and 4 LAN ports of the device.
- WAN port is connected to the main router or modem, LAN port is connected to LAN devices.
- Plug the Ethernet cable to LAN port and PC by using the Ethernet cable in accessory box.



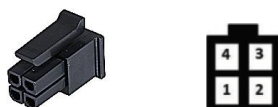
2.11 Power Supply connection

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

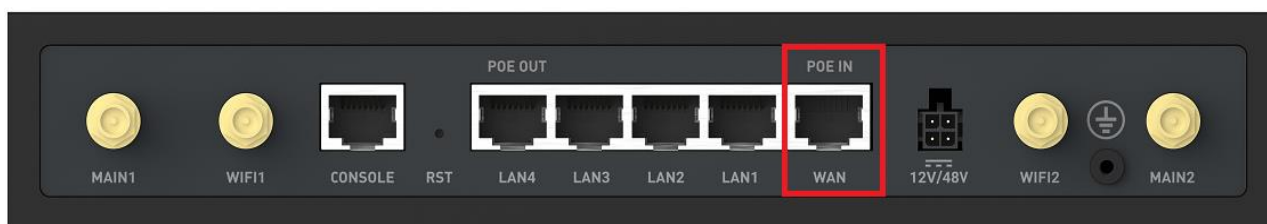
2.11.1 Powered by DC adapter



- 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

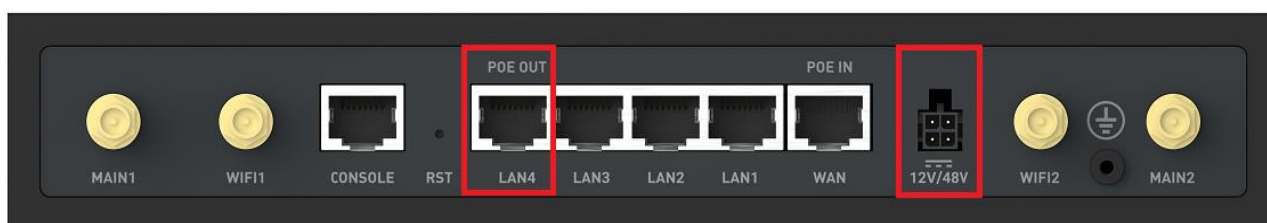


- WAN port supports PoE power supply
- Support 802.3at standard protocol, max receiving power is 25.5W.

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.

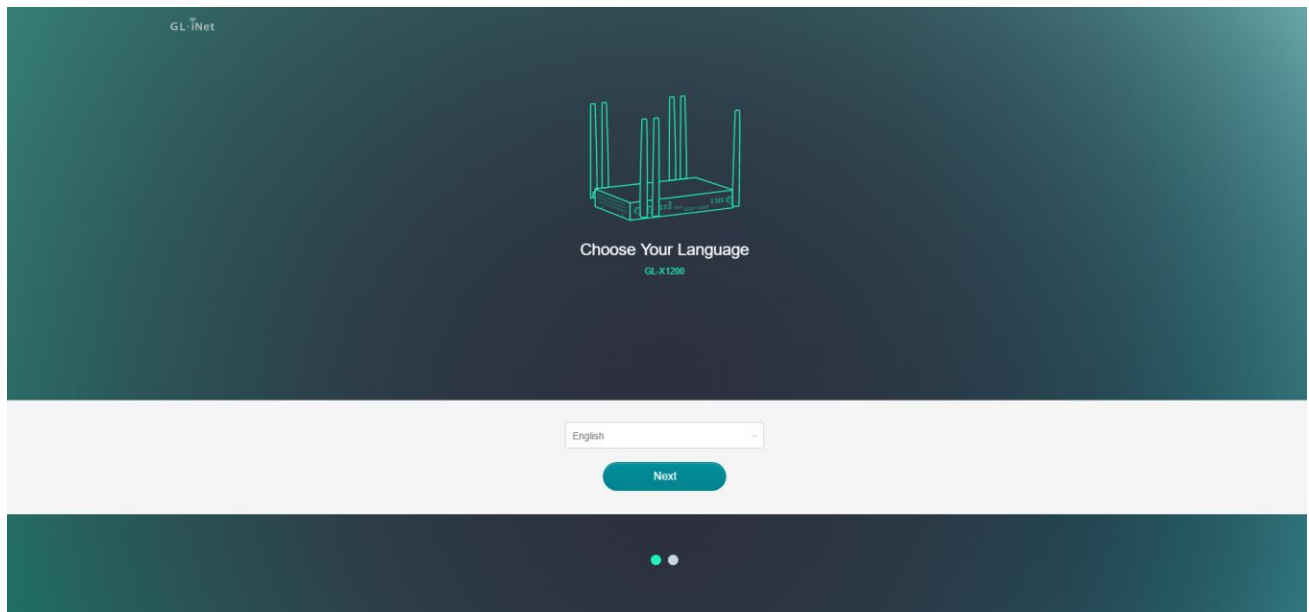
Note:

- 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

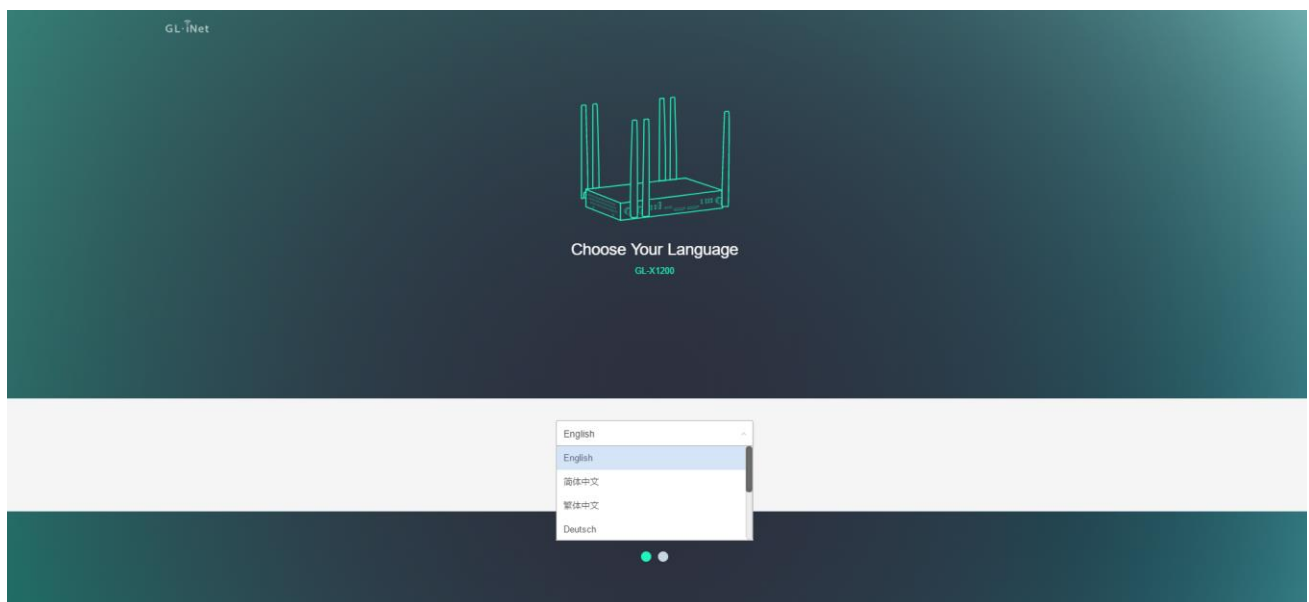
3.1 Login

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



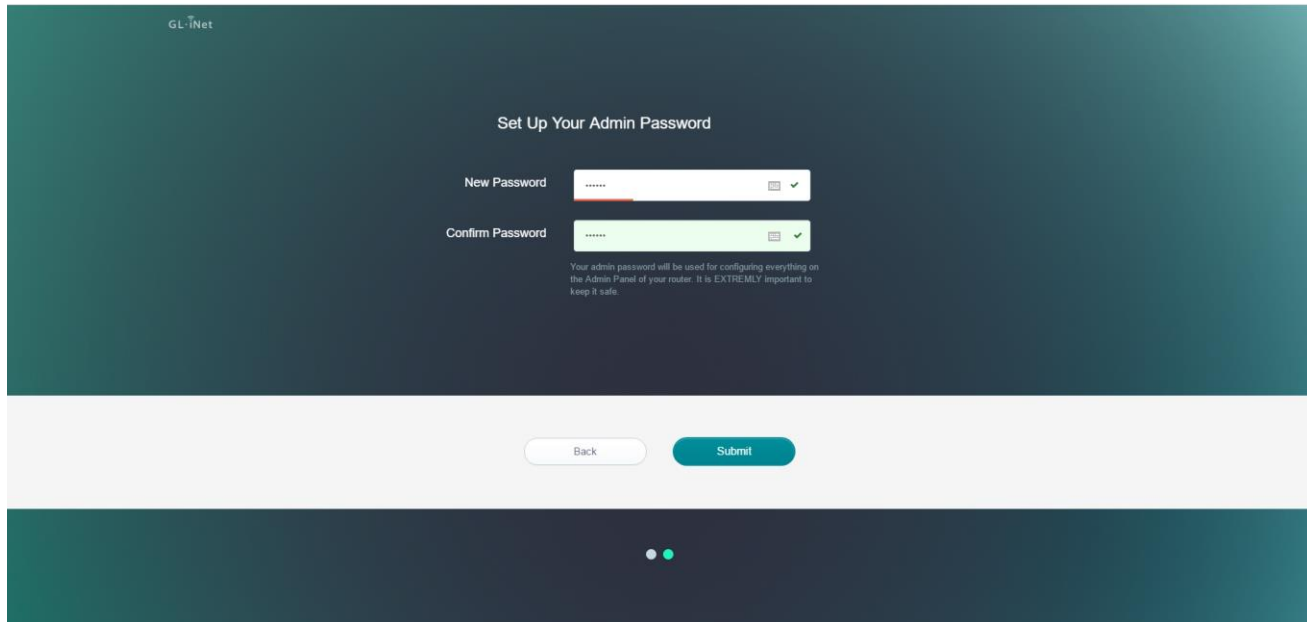
3.2 Language Setting

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

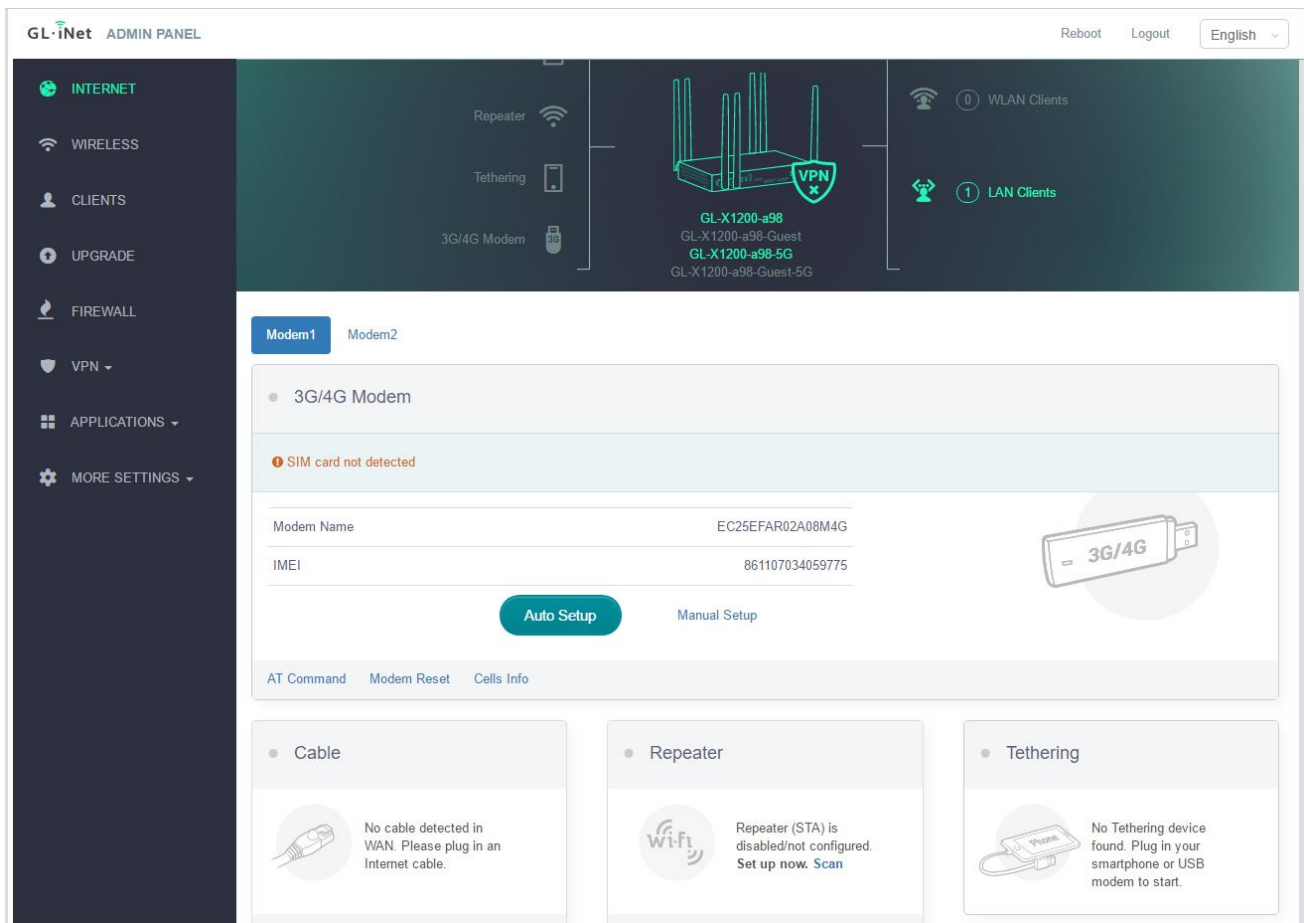
Set the admin password, showing as below:



The screenshot shows the 'Set Up Your Admin Password' page of the GL.iNet web interface. The page has a dark teal background. At the top left, the 'GL.iNet' logo is visible. The main heading is 'Set Up Your Admin Password'. Below this, there are two password input fields. The first is labeled 'New Password' and the second is labeled 'Confirm Password'. Both fields show a red progress bar and a green checkmark icon, indicating that the passwords are valid. Below the 'Confirm Password' field, there is a warning message: 'Your admin password will be used for configuring everything on the Admin Panel of your router. It is EXTREMELY important to keep it safe.' At the bottom of the form, there are two buttons: 'Back' and 'Submit'. The 'Submit' button is highlighted in a lighter teal color. At the very bottom of the page, there are two small dots, one white and one green, indicating the current step in the setup process.

3.4 Admin Panel

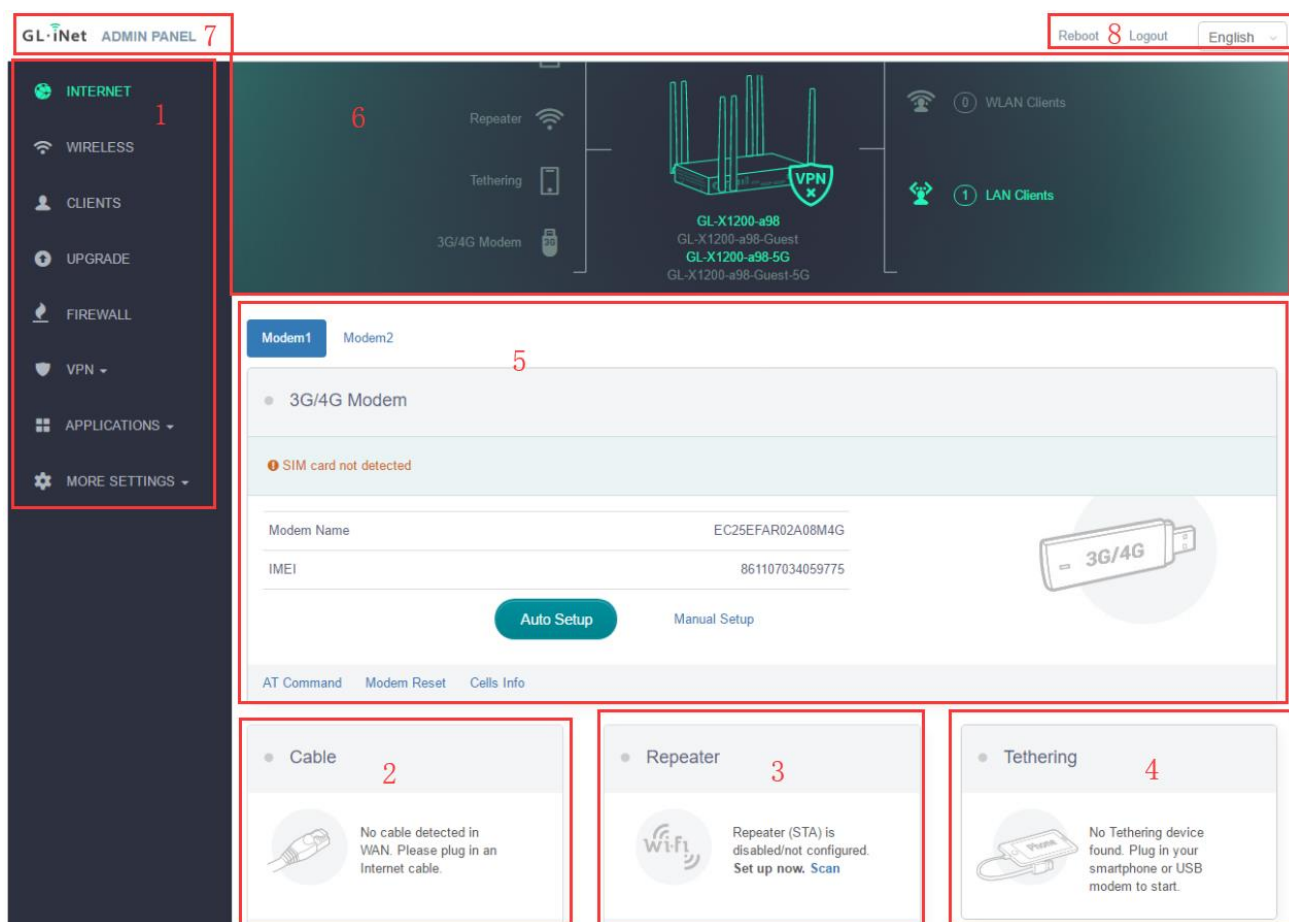
Enter and submit the admin password, then access to the main page of the device, showing as below:



Chapter 4 Device Configuration

4.1 Network

4.1.1 Brief introduction



1: Menu bar

2: Cable

3: Repeater

4: Tethering

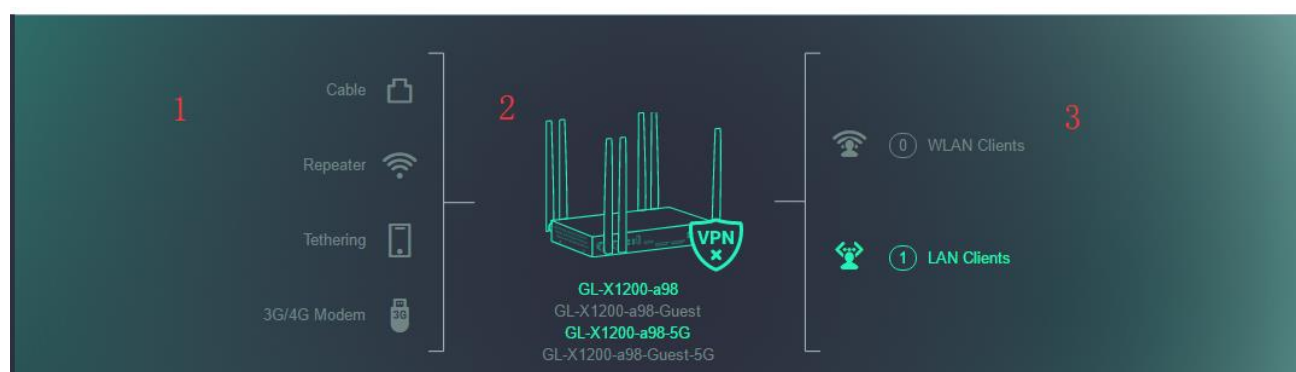
5: 3G/4G Modem

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

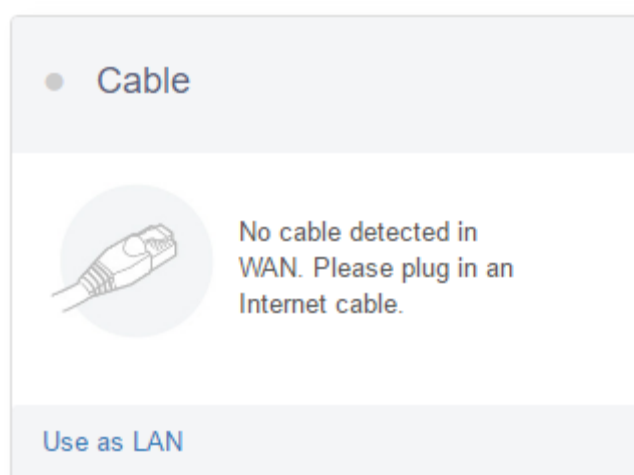
2.4G/5G SSID/ Guest SSID are displayed, gray indicates disable, and highlighted indicates enable.

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:

• Cable

Protocol	DHCP
IP Address	192.168.3.116
Netmask	255.255.255.0
Gateway	192.168.3.1
DNS Server	192.168.3.1

Modify




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

• Cable

Protocol

DHCP
DHCP
Static
PPPoE


Cancel
Apply



4.1.4 Repeater

Before setting, it will show as below:

• Repeater



Repeater (STA) is disabled/not configured. **Set up now.** [Scan](#)

Saved Networks
Repeater Options ⚙️

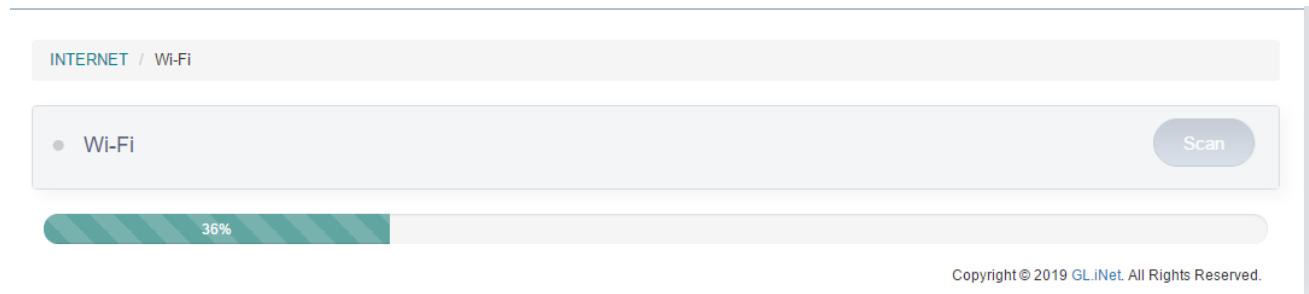
Scan: Scan the surrounding hot spots

Existing network: It will save wireless hot spots connected previously

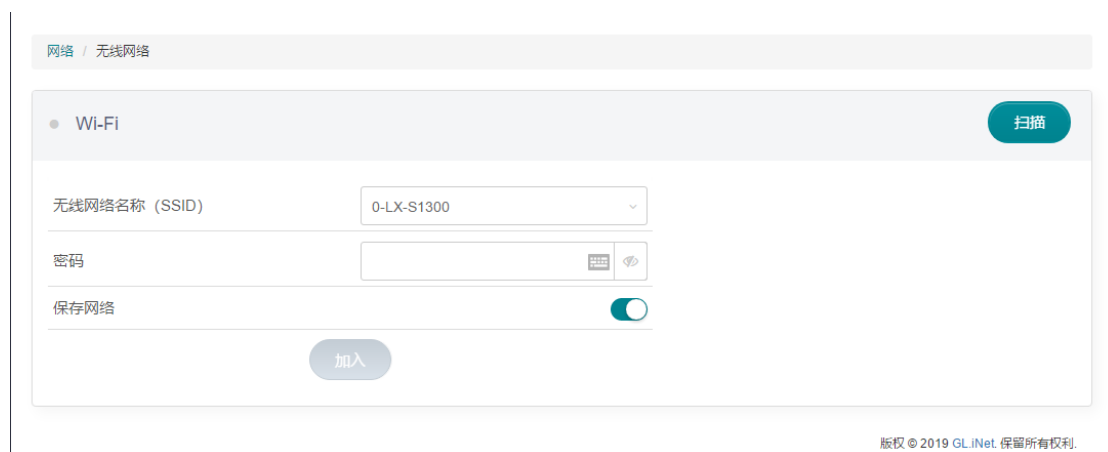
Repeater Options: Turn on or off its auto connection function

4.1.4.1 Scan

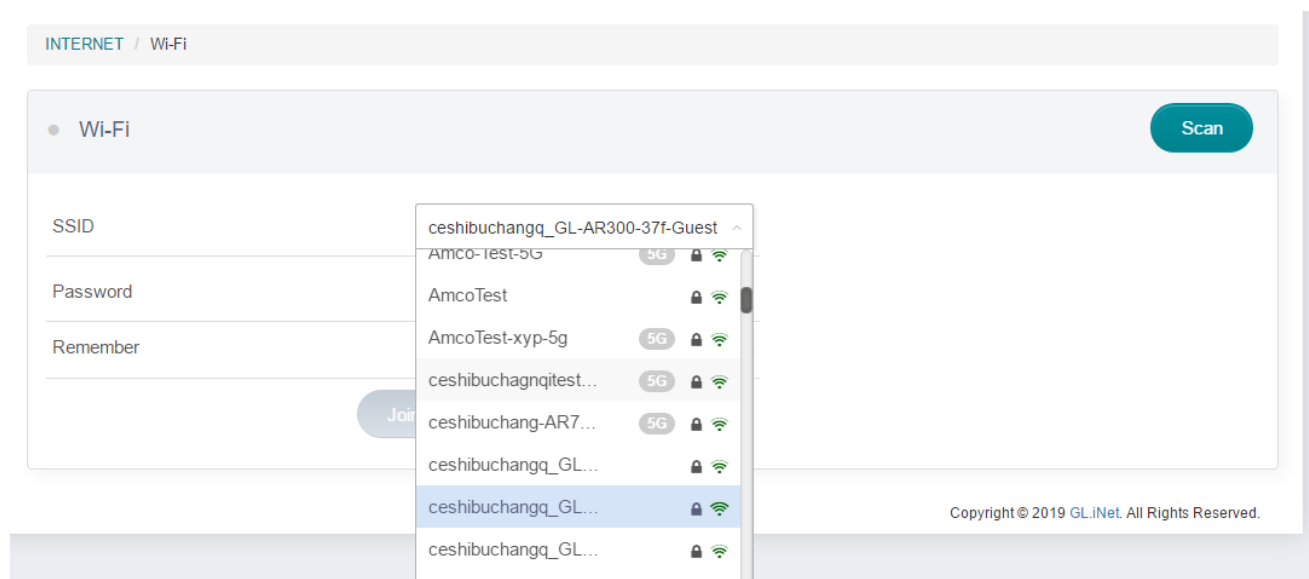
Click 'Scan' and it will show as below:



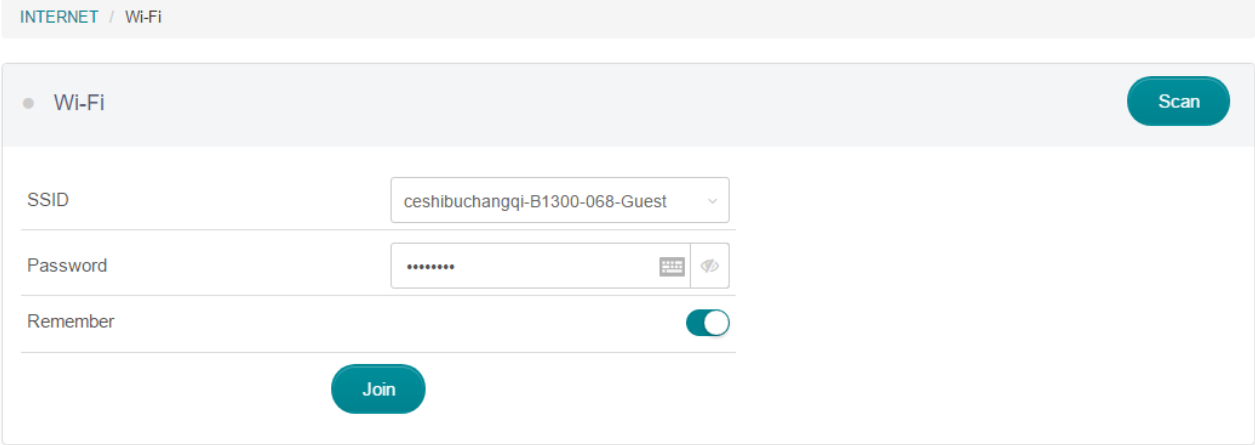
Finish scan it will show as below:



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

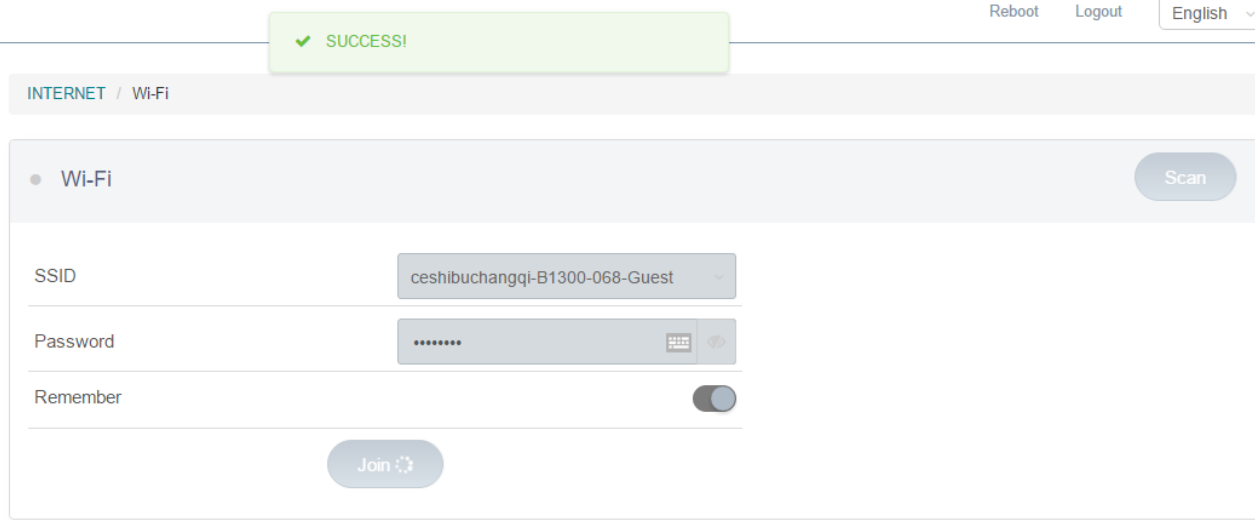


Choose the SSID, input password, turn on network saving function, then add, showing as below:



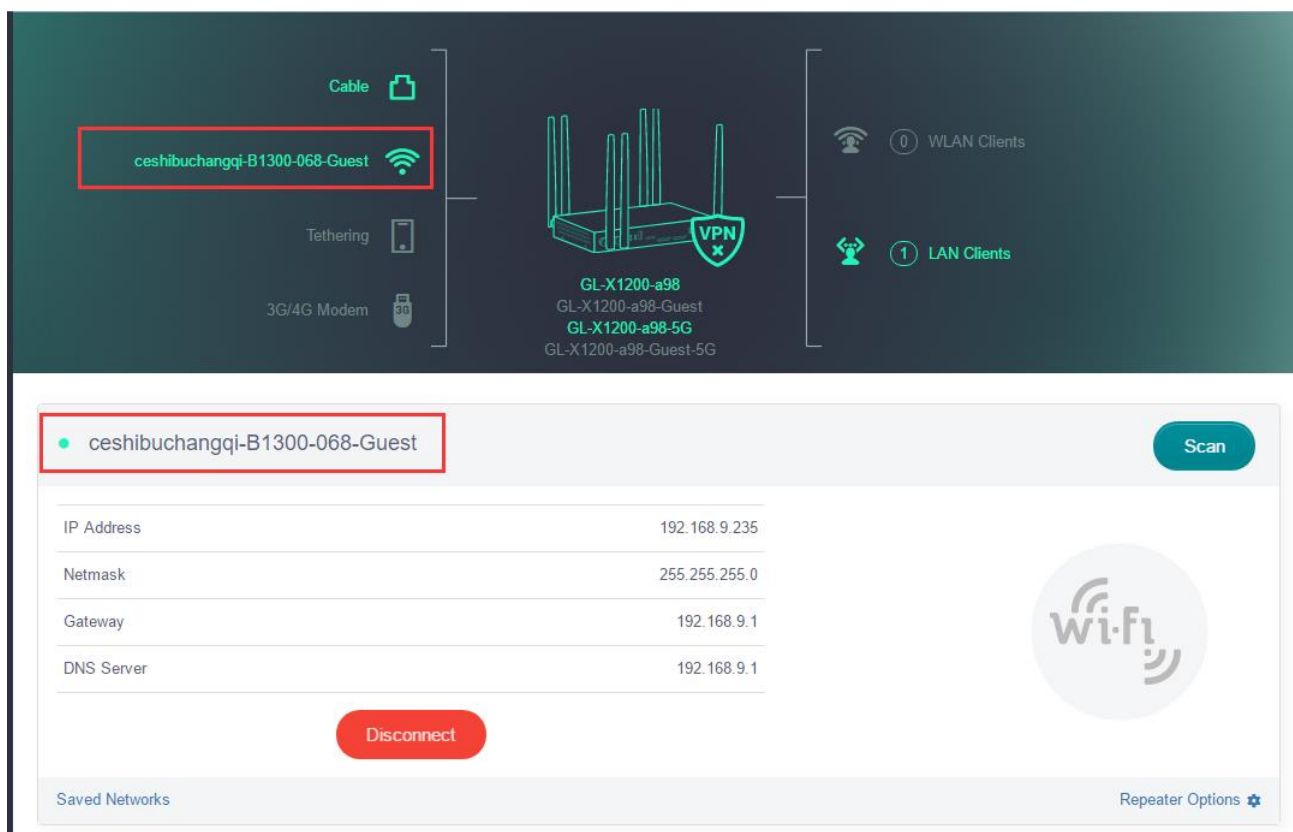
The image shows a web interface for Wi-Fi configuration. At the top, there is a breadcrumb trail: "INTERNET / Wi-Fi". Below this, a section titled "Wi-Fi" contains a "Scan" button. The main form has three fields: "SSID" with a dropdown menu showing "ceshibuchangqi-B1300-068-Guest", "Password" with a masked input field and icons for password visibility and QR code, and "Remember" with a toggle switch that is currently turned on. A "Join" button is at the bottom of the form. At the bottom right of the page, there is a copyright notice: "Copyright © 2019 GL.iNet. All Rights Reserved."

After successful connection it will pop-up as below:



The image shows the same web interface as before, but with a green success message "✓ SUCCESS!" displayed at the top. The "Join" button is now disabled and shows a loading spinner. The "Remember" toggle switch is now turned off. The "Scan" button is also disabled. At the bottom right, the copyright notice "Copyright © 2019 GL.iNet. All Rights Reserved." is visible.

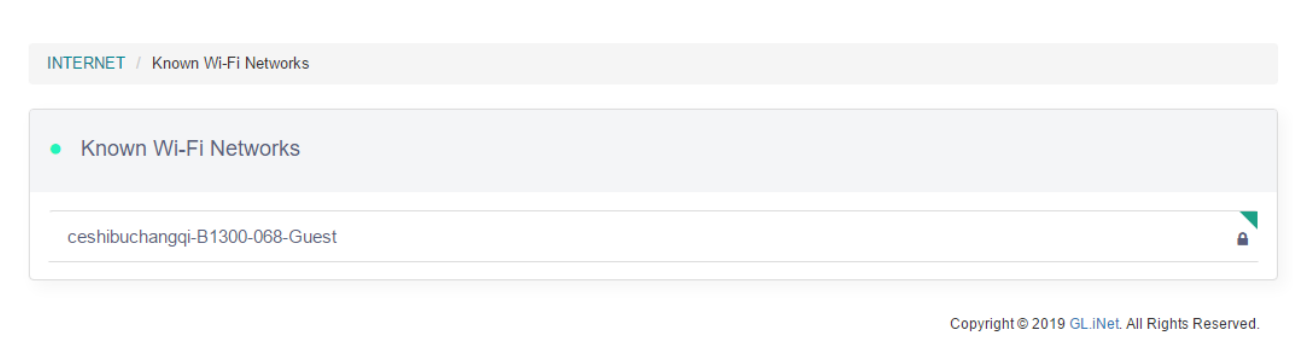
Wait 5s, it will enter into admin panel. Status bar will show the SSID connected, showing as below:



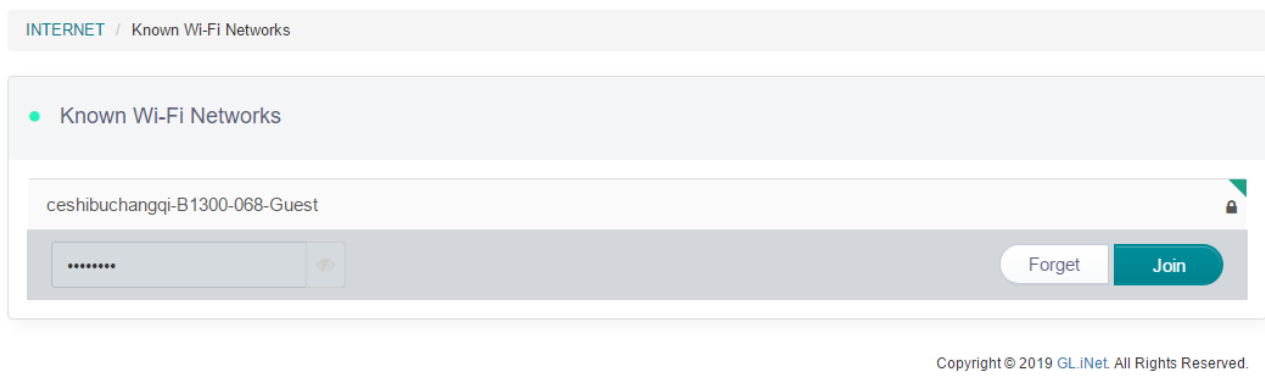
SSID, IP address, subnet mask, gateway, DNS server will be displayed.

4.1.4.2 Existing Network

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

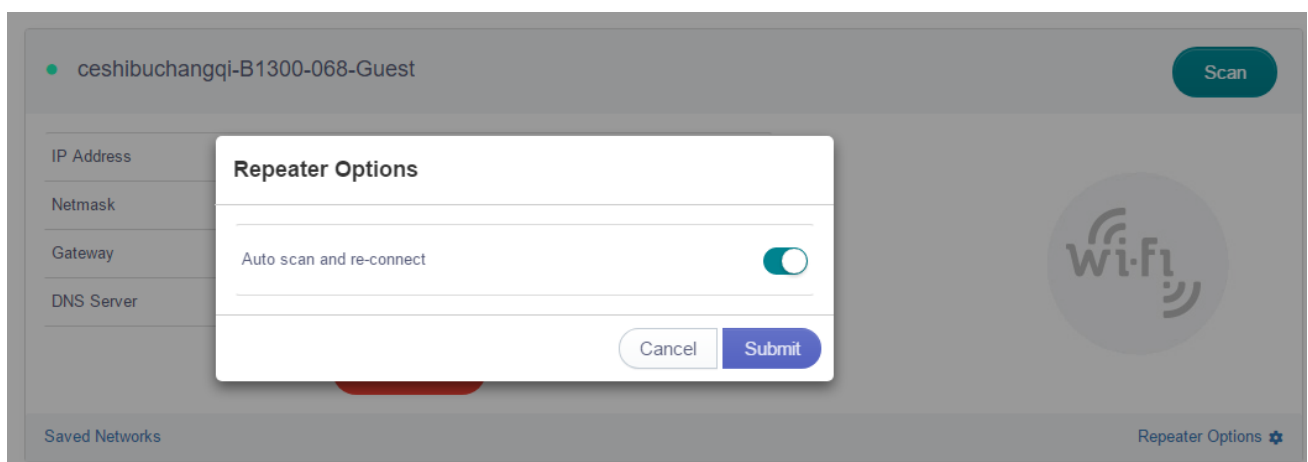


Click SSID, user can click forget or add to re-connect this SSID, showing as below:



4.1.4.3 Repeater Options

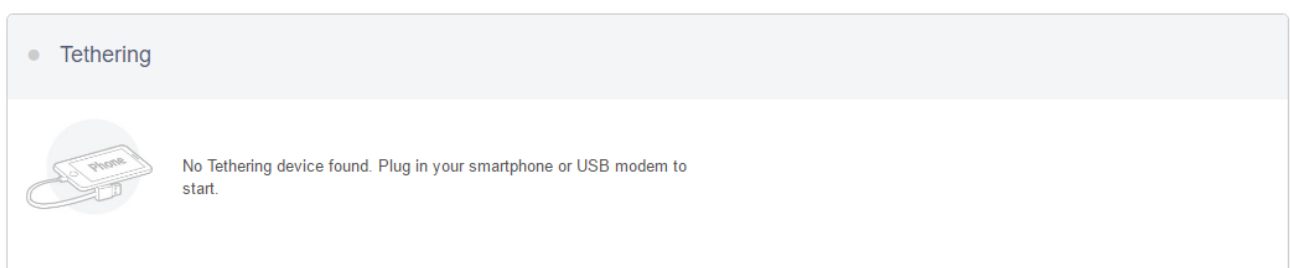
Click 'Repeater options', it will pop-up below page. User can turn on or off the function of auto scan and connection.



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:

Tethering

Device

usb0

Connect

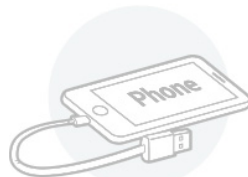


It will display as below after successful connection:

Tethering

IP Address	192.168.42.143
Netmask	255.255.255.0
Gateway	192.168.42.129
DNS Server	192.168.42.129

Disconnect



4.1.6 3G/4G Modem

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

Modem1

Modem2

CHN-UNICOM

4G

Modem Name	EC20CEFDKGR06A03M2G
IMEI	866297037036188

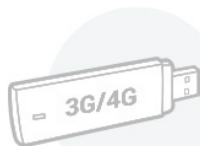
Auto Setup

Manual Setup

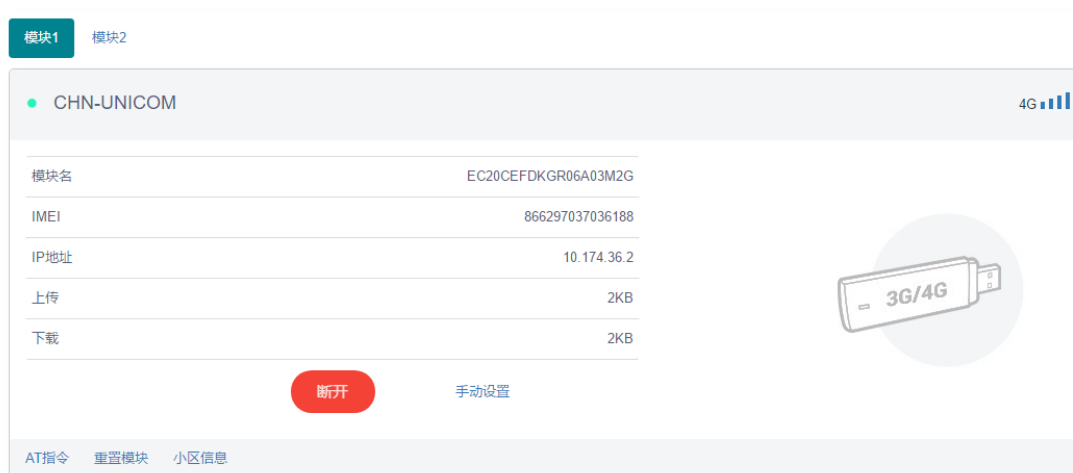
AT Command

Modem Reset

Cells Info

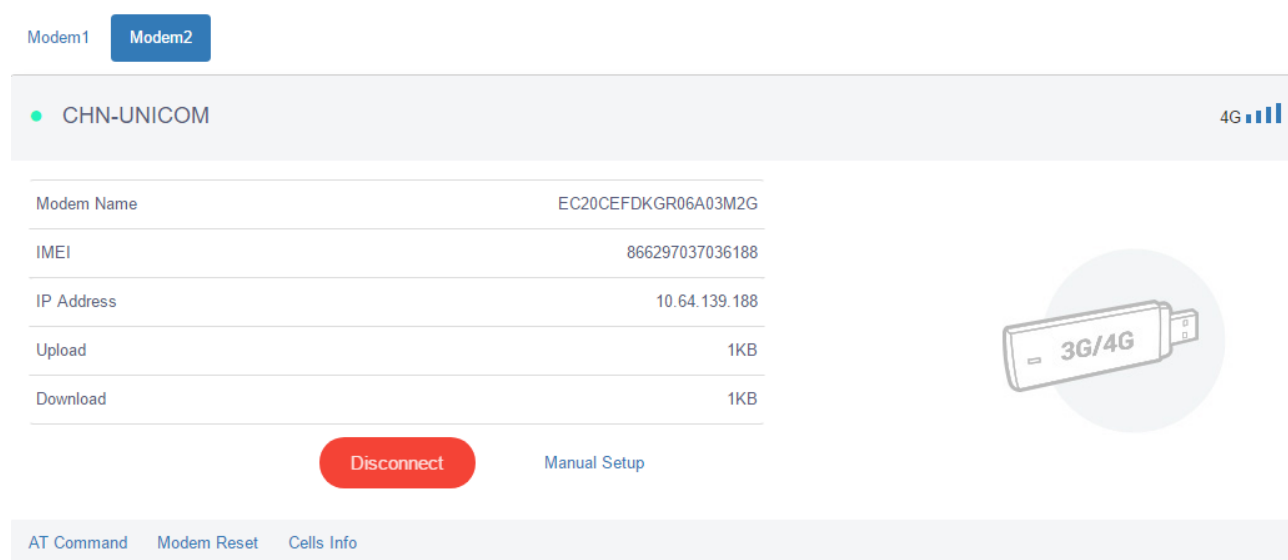


Click 'Auto setting', after successful connection it will show as below:



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:

Modem1
Modem2

CHN-UNICOM

4G

Device

/dev/cdc-wdm0

APN

3gnet

Dial number

User Name

Password

Cancel

Apply

AT Command

Modem Reset

Cells Info

4.1.6.2 AT command

Click 'AT command' and enter into interface as follows:

INTERNET / AT Command

Modem1

Modem2

AT Command

Shortcut

Manual command

AT Command

Required

Port

/dev/ttyUSB4

Send

Copyright © 2019 GL.iNet. All Rights Reserved.

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

INTERNET / AT Command

Modem1 **Modem2**

● AT Command

Shortcut

AT Command

Port

Send

- Manual command
- Manual command
- Request IMEI
- Request QCCID
- Request IMSI
- Check Signal Quality
- Reset modem

Copyright © 2019 GL.iNet. All Rights Reserved.

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

Reboot Logout English

✓ SUCCESS!

INTERNET / AT Command

Modem1 **Modem2**

● AT Command

Shortcut Operator Names

AT Command AT+COPS?

Port /dev/ttyUSB4

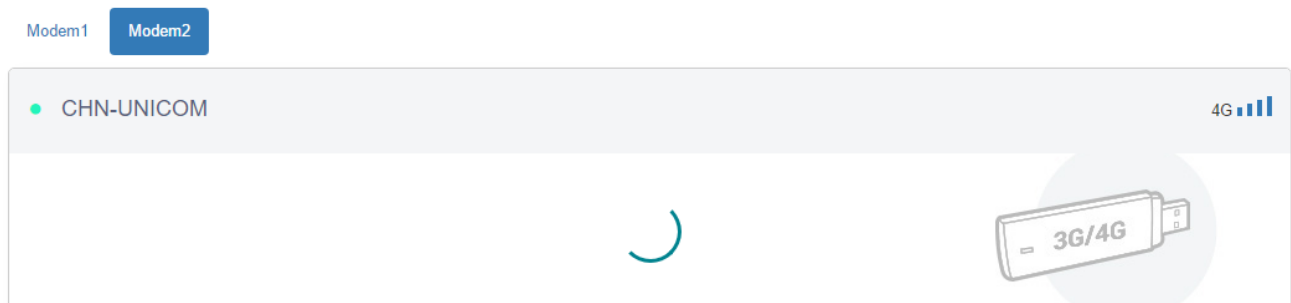
```
AT+COPS?  
+COPS: 0,0,"CHN-UNICOM",7  
OK
```

Send

Copyright © 2019 GL.iNet. All Rights Reserved.

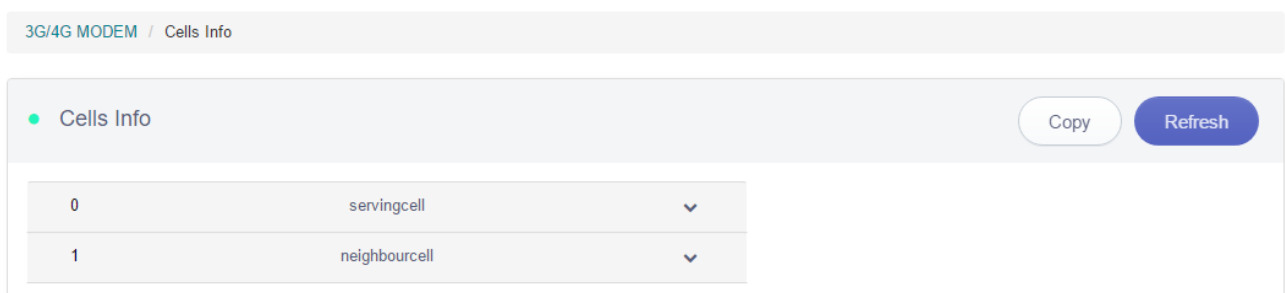
4.1.6.3 Reset Module

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:



Copyright © 2019 GL.iNet. All Rights Reserved.

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:

CHN-UNICOM

3G

SIM

SIM1

Modem Name

EC20CEFDKGR06A03M2G

IMEI

866297037009698

Auto Setup

Manual Setup

AT Command

Modem Reset

Cells Info

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

CHN-UNICOM

3G

SIM

SIM1

SIM1

SIM2

Modem Name

IMEI

Auto Setup

Manual Setup

AT Command

Modem Reset

Cells Info

Note:

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

GL·iNet

41

4.2 Wireless

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

The screenshot displays the GL.iNet Admin Panel interface. On the left, a dark sidebar contains navigation options: INTERNET, WIRELESS (highlighted with a red box), CLIENTS, UPGRADE, FIREWALL, VPN, APPLICATIONS, and MORE SETTINGS. The main content area is titled 'GL.iNet ADMIN PANEL' and includes links for Reboot, Logout, and a language dropdown set to English. Below the header, there are tabs for '2.4G WiFi' and '2.4G Guest WiFi'. The '2.4G WiFi' tab is active, showing settings for a network named 'GL-X1200-a98'. The settings include: Wi-Fi Name (SSID) as 'GL-X1200-a98', Wi-Fi Security as 'WPA2-PSK', Wi-Fi Key as a masked password, SSID Visibility as 'Shown', Channel as '5', Speed as '300M', and TX Power (dBm) as a slider set to 23. A 'Modify' button is at the bottom. Below this, there are tabs for '5G WiFi' and '5G Guest WiFi'. The '5G WiFi' tab is active, showing settings for a network named 'GL-X1200-a98-5G'. The settings include: Wi-Fi Name (SSID) as 'GL-X1200-a98-5G', Wi-Fi Security as 'WPA2-PSK', Wi-Fi Key as a masked password, SSID Visibility as 'Shown', Channel as '36', Speed as '866M', and TX Power (dBm) as a slider set to 23. A 'Modify' button is at the bottom. The footer of the page states 'Copyright © 2019 GL.iNet. All Rights Reserved.'

4.2.1 2.4G & 5G WiFi

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

2.4G WiFi

2.4G Guest WiFi

GL-X1200-a98

ON

Wi-Fi Name (SSID)	GL-X1200-a98
Wi-Fi Security	WPA2-PSK
Wi-Fi Key ⓘ
SSID Visibility	Shown
Channel	5
Speed	300M
TX Power (dBm) ⓘ	<div><div></div><div>23</div></div>

Modify

5G WiFi
5G Guest WiFi

GL-X1200-a98-5G 5G
ON

Wi-Fi Name (SSID) GL-X1200-a98-5G

Wi-Fi Security WPA2-PSK

Wi-Fi Key

SSID Visibility Shown

Channel 36

Speed 866M

TX Power (dBm) 23

Modify

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:

• 2.4G WiFi

• 2.4G Guest WiFi

GL-X1200-a98-Guest

OFF

Wi-Fi Name (SSID)

GL-X1200-a98-Guest

Wi-Fi Security

WPA2-PSK

Wi-Fi Key ⓘ

.....

Modify

• 5G WiFi

• 5G Guest WiFi

GL-X1200-a98-Guest-5G 5G

OFF

Wi-Fi Name (SSID)

GL-X1200-a98-Gues...

Wi-Fi Security

WPA2-PSK

Wi-Fi Key ⓘ

.....

Modify

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:

The screenshot shows the GL.iNet Admin Panel. On the left is a dark sidebar with navigation options: INTERNET, WIRELESS, CLIENTS (highlighted with a red box), UPGRADE, FIREWALL, VPN, APPLICATIONS, and MORE SETTINGS. The main content area is titled 'CLIENTS' and features a toggle switch for 'Enable real-time speed and traffic statistics. This requires higher CPU load.' which is currently set to 'OFF'. Below this is a table with columns: Brand, Name, IP, MAC, and Block. A tooltip 'Unknown device' points to a question mark icon in the Brand column. The table contains one entry: SC-201804100947, 192.168.8.112, E0:D5:5E:86:EA:61, with a 'Block' toggle switch.

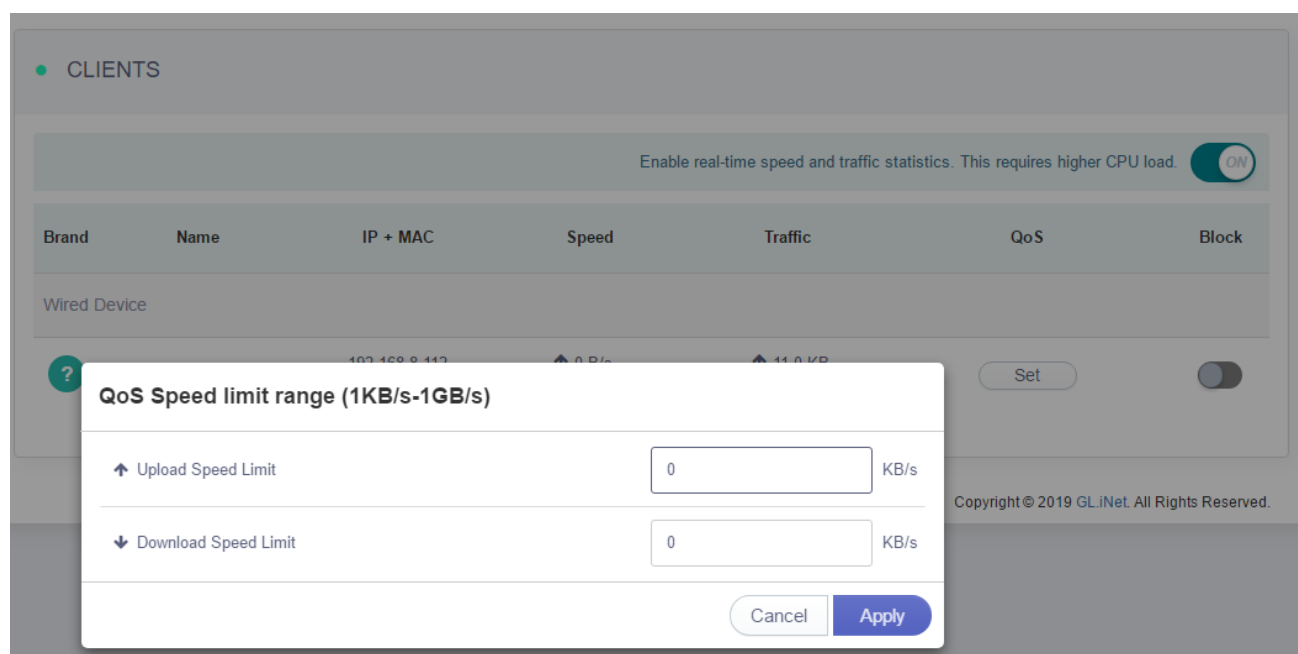
Brand	Name	IP	MAC	Block
Unknown device	SC-201804100947	192.168.8.112	E0:D5:5E:86:EA:61	<input type="checkbox"/>

Turn on traffic statistics which supports QoS as follows:

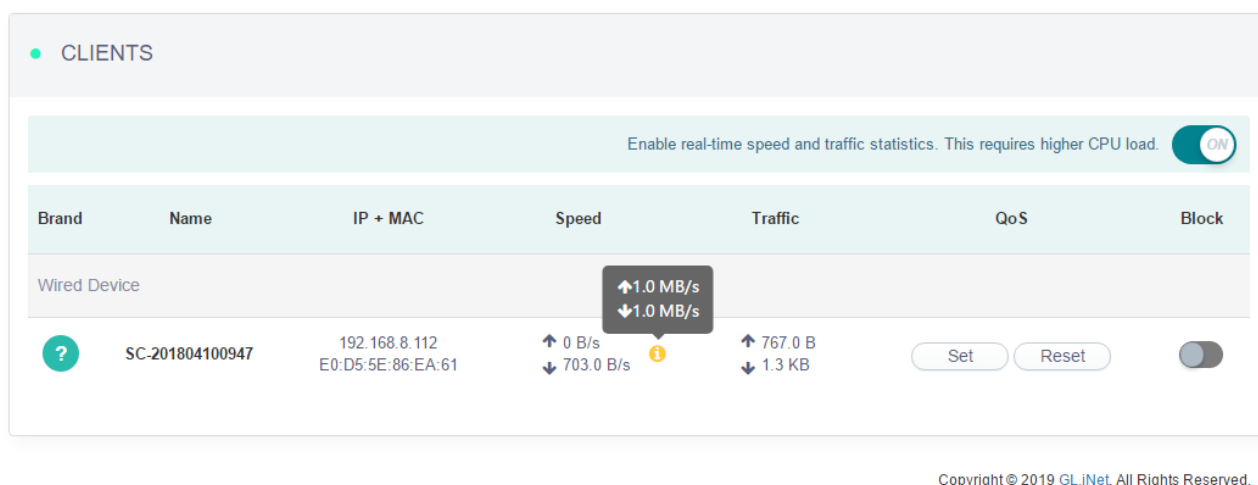
The screenshot shows the GL.iNet Admin Panel with the 'CLIENTS' page. The toggle switch for 'Enable real-time speed and traffic statistics. This requires higher CPU load.' is now set to 'ON'. The table columns are: Brand, Name, IP + MAC, Speed, Traffic, QoS, and Block. A section header 'Wired Device' is present. The table entry for SC-201804100947 shows IP 192.168.8.112 and MAC E0:D5:5E:86:EA:61. The Speed and Traffic columns show '0 B/s' and '0 B' respectively. A 'Set' button is in the QoS column, and a 'Block' toggle switch is in the Block column.

Brand	Name	IP + MAC	Speed	Traffic	QoS	Block
Wired Device						
?	SC-201804100947	192.168.8.112 E0:D5:5E:86:EA:61	↑ 0 B/s ↓ 0 B/s	↑ 0 B ↓ 0 B	Set	<input type="checkbox"/>

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



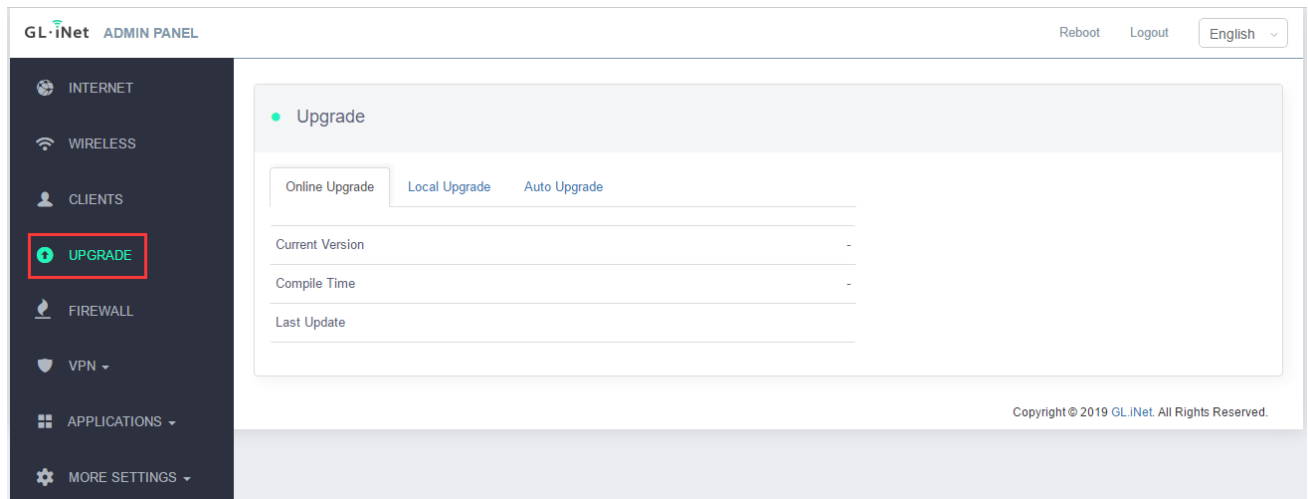
The speed limit value can be checked. Click Reset to cancel speed limit, showing as below:



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

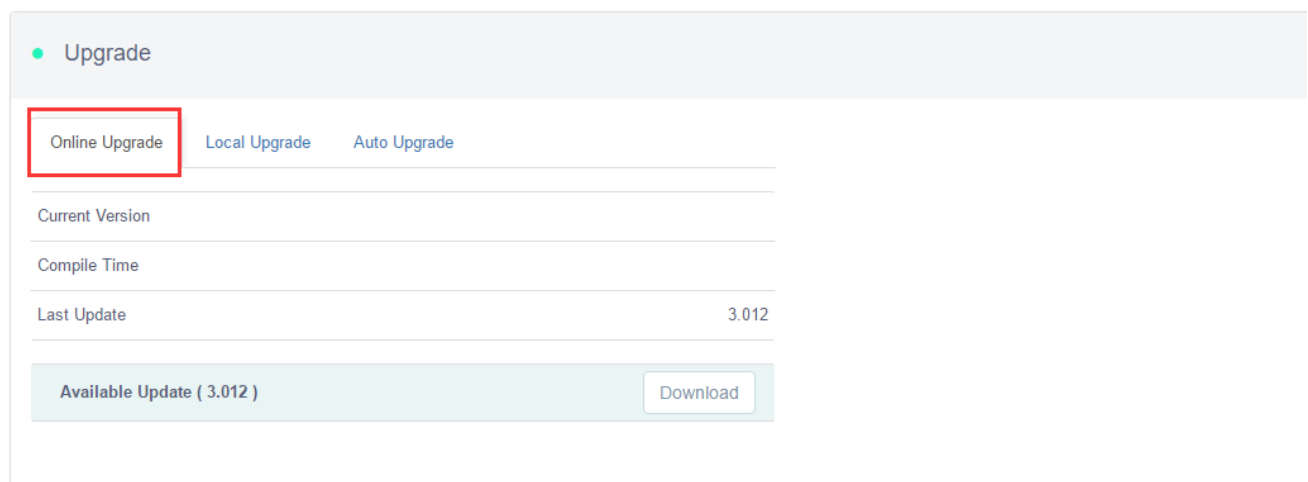
4.4 Upgrade

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:

Copyright © 2019 GL.iNet. All Rights Reserved.

● Upgrade

Online Upgrade

Local Upgrade

Auto Upgrade

Current Version

Compile Time

Last Update3.012

Available Update (3.012)

Download

Firmware Verification

Version3.012

MD54c1f7224cd4eee8134a0468e10eb7143

Verification ResultPass

Keep Settings ⓘ

Keep Installed Packages

Install

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

● Upgrade

Online Upgrade

Local Upgrade

Auto Upgrade

Select a file or drag it here.

File types include .bin .img .zip .tar .gz

Copyright © 2019 GL.iNet. All Rights Reserved.

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

Online Upgrade

Local Upgrade

Auto Upgrade

Router Time

Wed Aug 21 08:23:35 UTC 2019

Enable Auto Upgrade

☐

Auto Upgrade Time

04:00

Copyright © 2019 GL.iNet. All Rights Reserved.

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:

GL.iNet ADMIN PANEL

Reboot Logout English

INTERNET
WIRELESS
CLIENTS
UPGRADE
FIREWALL
VPN
APPLICATIONS
MORE SETTINGS

Firewall

Port Forwards Open Ports on Router DMZ

Port Forwarding allows remote computers to connect to a specific computer or service behind the firewall in the local LAN (such as web servers, FTP servers, etc.)

Name	Internal IP	External Ports	Internal Ports	Protocol	Status	Action
Required	Required	Required	Required	TCP/UDP	Enabled	Add

Add a New One

Copyright © 2019 GL.iNet. All Rights Reserved.

4.5.1 Port Forwarding

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

Firewall

Port Forwards Open Ports on Router DMZ

Port Forwarding allows remote computers to connect to a specific computer or service behind the firewall in the local LAN (such as web servers, FTP servers, etc.)

Name	Internal IP	External Ports	Internal Ports	Protocol	Status	Action
Required	Required	Required	Required	TCP/UDP	Enabled	Add

Add a New One

Copyright © 2019 GL.iNet. All Rights Reserved.

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:

Firewall

Port Forwards

Open Ports on Router

DMZ

Port Forwarding allows remote computers to connect to a specific computer or service behind the firewall in the local LAN (such as web servers, FTP servers, etc.)

Name	Internal IP	External Ports ⓘ	Internal Ports	Protocol	Status	Action
<div>Required</div>	<div>Required</div>	<div>Required</div>	<div>Required</div>	<div>TCP/UDP</div>	<div>Enabled</div>	<div>Add</div>
8080	192.168.8.112	8080	8080	TCP/UDP	Enabled	<div>Modify</div> <div>Delete</div>

Delete All

Copyright © 2019 GL.iNet. All Rights Reserved.

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:

Firewall

Port Forwards

Open Ports on Router

DMZ

The router's services, such as web, FTP and so on, require their respective ports to be opened on the router in order to be publicly reachable.

Name	Port	Protocol	Status	Action
Required	Required	TCP/UDP	Enabled	Add

Add a New One

Copyright © 2019 GL.iNet. All Rights Reserved.

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:

Firewall

Port Forwards

Open Ports on Router

DMZ

The router's services, such as web, FTP and so on, require their respective ports to be opened on the router in order to be publicly reachable.

Name	Port	Protocol	Status	Action
Required	Required	TCP/UDP	Enabled	Add
80	80	TCP/UDP	Enabled	Modify Delete

Delete All

Copyright © 2019 GL.iNet. All Rights Reserved.

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:

Firewall

Port Forwards Open Ports on Router DMZ

DMZ allows you to expose one computer to the Internet, so that all the inbounds packets will be redirected to the computer you set.
If you enable DMZ, your port forward and port open rules will not take effect.

Open DMZ ☐

DMZ Host IP

Apply

Copyright © 2019 GL.iNet. All Rights Reserved.

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.

Firewall

Port Forwards Open Ports on Router DMZ

DMZ allows you to expose one computer to the Internet, so that all the inbounds packets will be redirected to the computer you set.
If you enable DMZ, your port forward and port open rules will not take effect.

Open DMZ ☒

DMZ Host IP

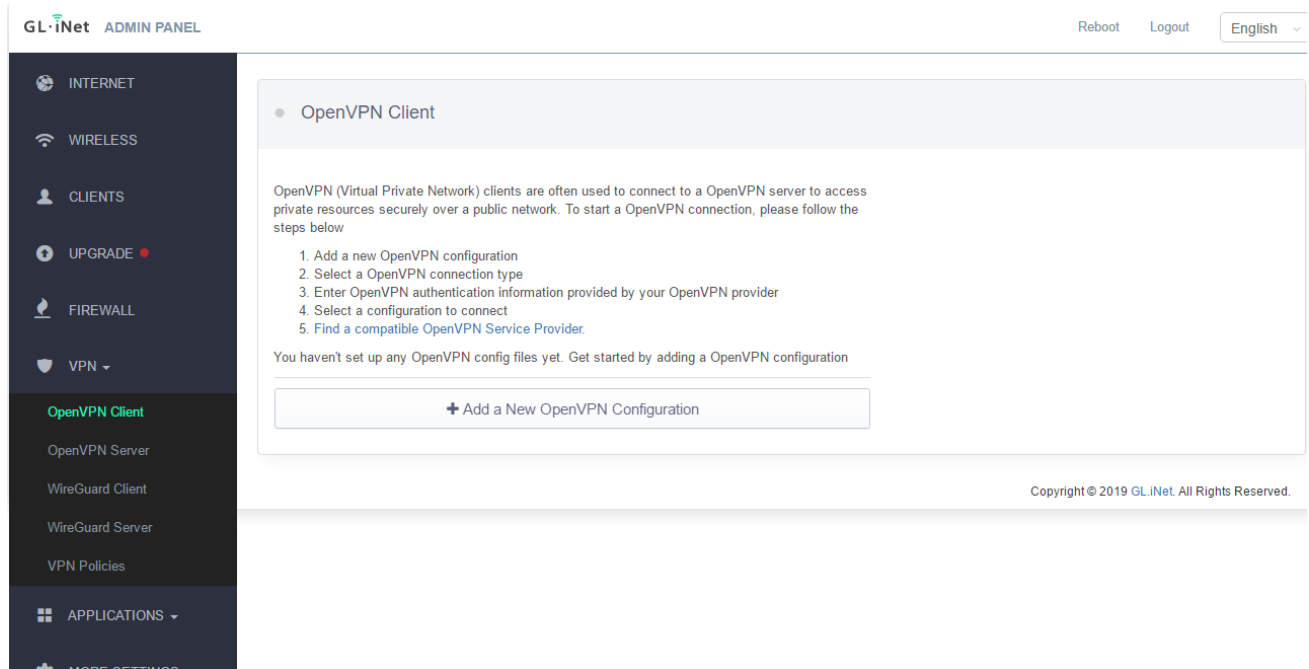
Apply

Copyright © 2019 GL.iNet. All Rights Reserved.

4.6 VPN (No Chinese Version)

4.6.1 OpenVPN Client

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

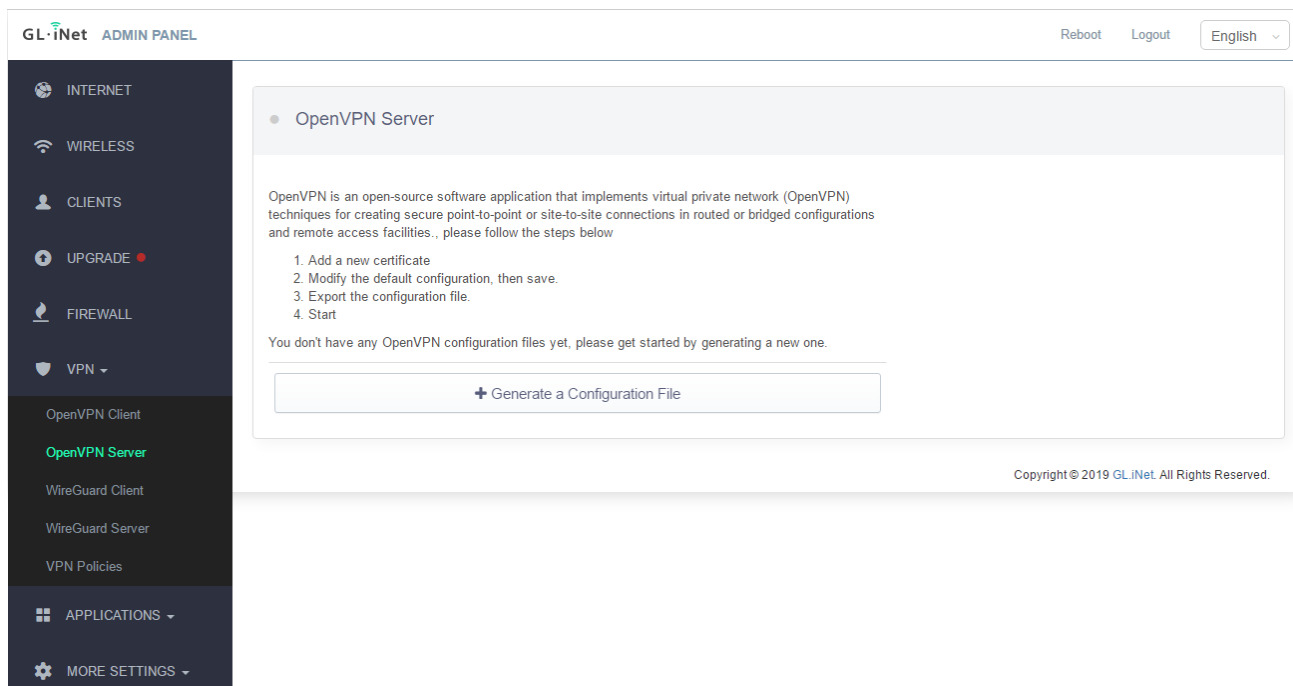


For instructions, please refer to the following link to the OpenVPN Client chapter

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

4.6.2 OpenVPN Server

Click 'OpenVPN Server' under VPN menu, showing as below:

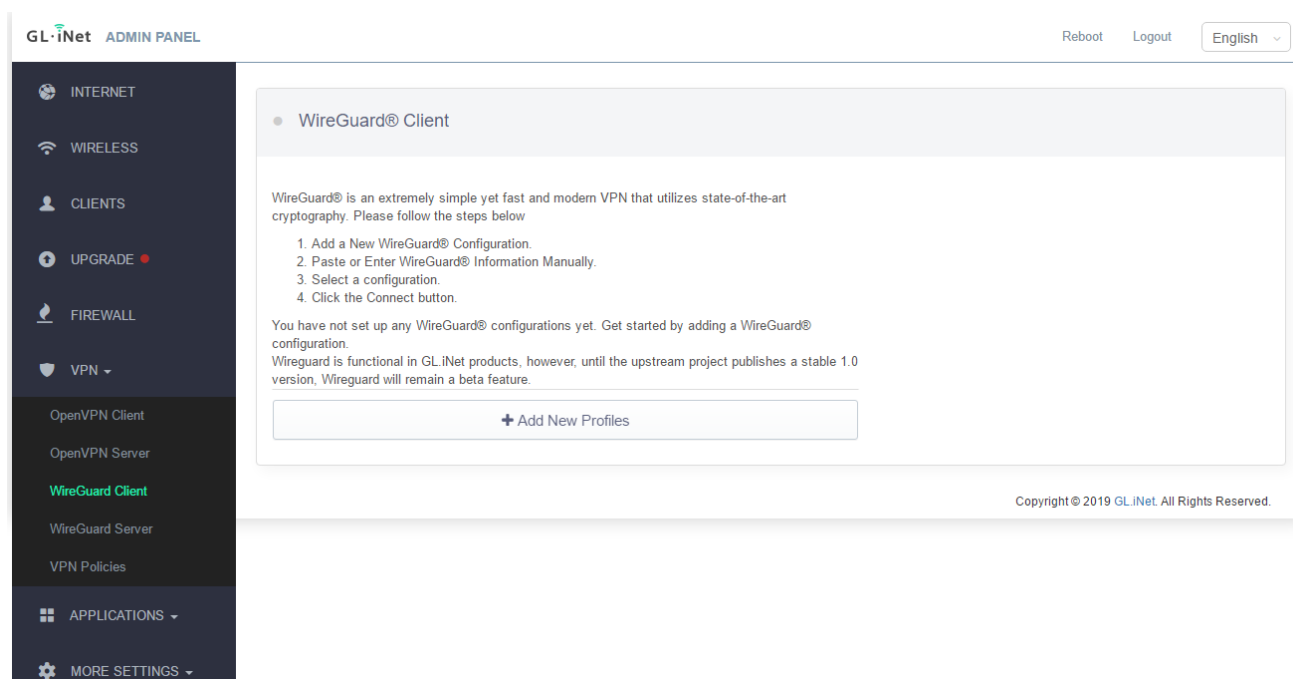


For instructions, please refer to the following link to the OpenVPN Server chapter

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

4.6.3 Wireguard Client

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

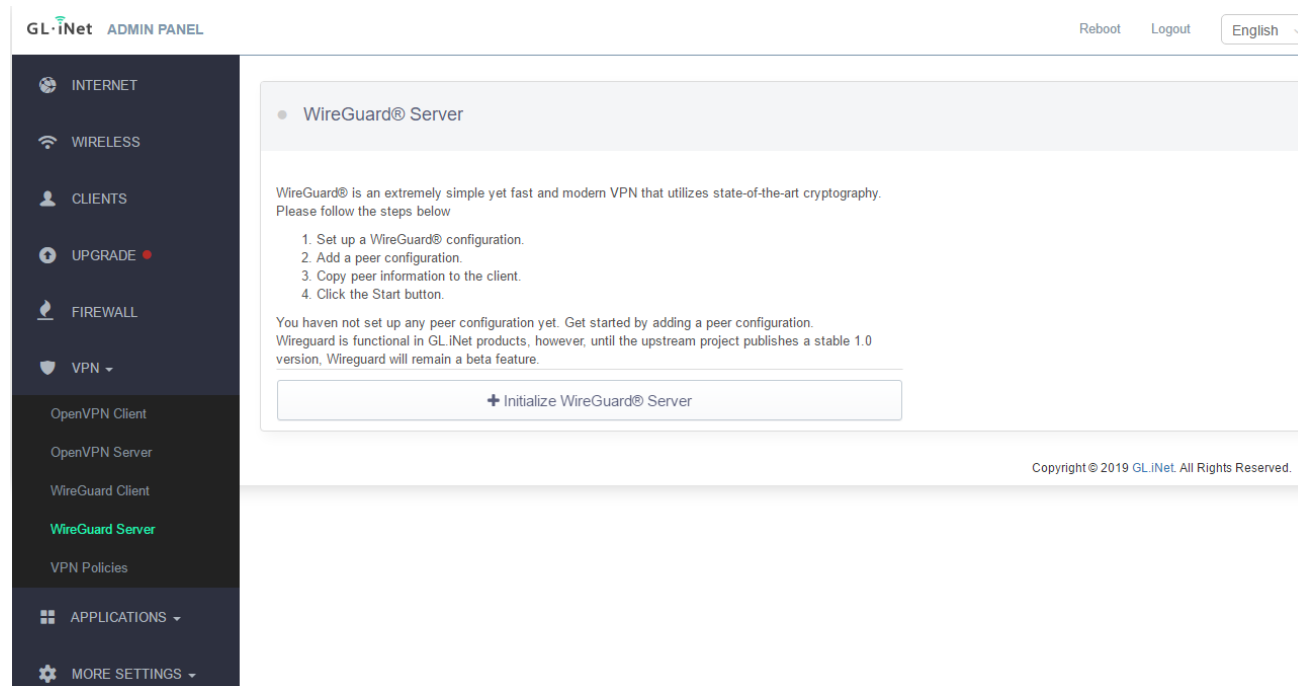


For instructions, please refer to the following link to the Wireguard Client chapter

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

4.6.4 Wireguard Server

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

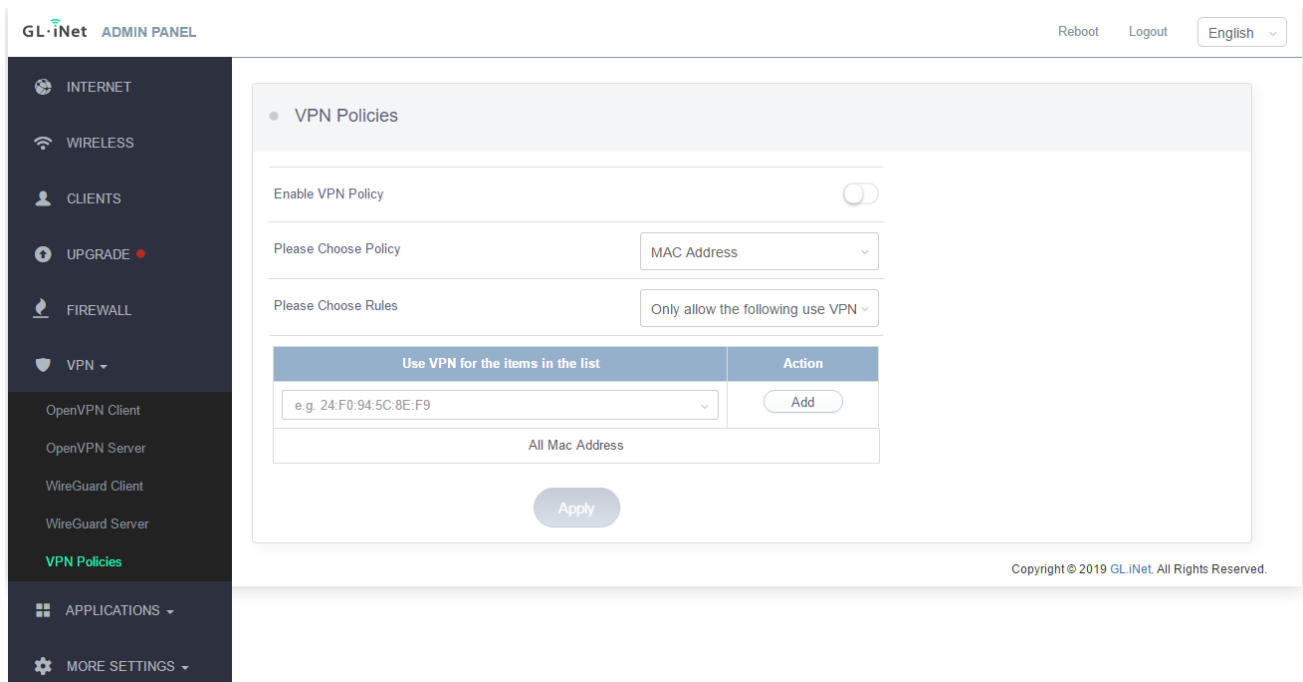


For instructions, please refer to the following link to the Wireguard Servers chapter

<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:

GL·iNet ADMIN PANEL

Reboot Logout English

INTERNET

WIRELESS

CLIENTS

UPGRADE

FIREWALL

VPN

APPLICATIONS

Plug-ins

File Sharing

Remote Access

Captive Portal

MORE SETTINGS

Plug-ins

Update

Filter Search Package

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Name	Version	Description	Action
ath10k-firmware-qca9888	2018-04-19-71e50312-1	-	Uninstall
base-files	194-r7258-5eb055306f	-	Uninstall
blkid	2.32-2	-	Uninstall
bridge	1.5-5	-	Uninstall
busybox	1.28.3-6	-	Uninstall
ca-bundle	20180409	-	Uninstall
ca-certificates	20180409	-	Uninstall
chat	2.4.7-12	-	Uninstall

1 2 3 ... 32 33

Go

Free space: 74% (95 MB)

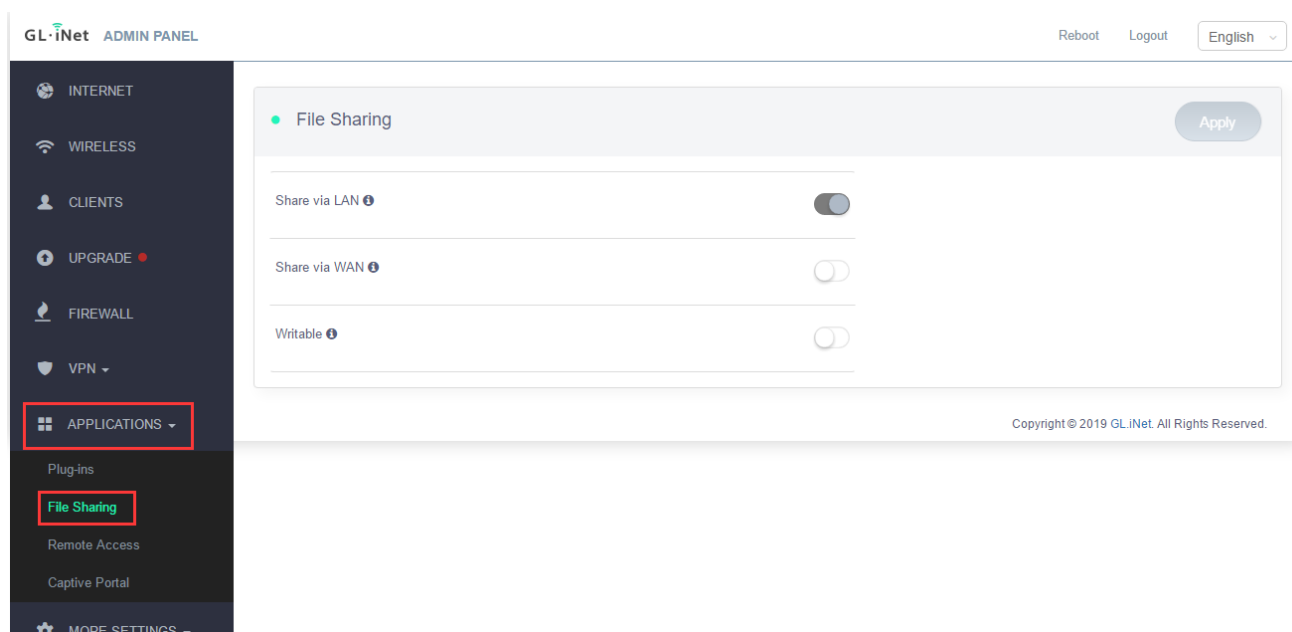
Upgrade: Upgrade the package to get a list of software for routing support

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.

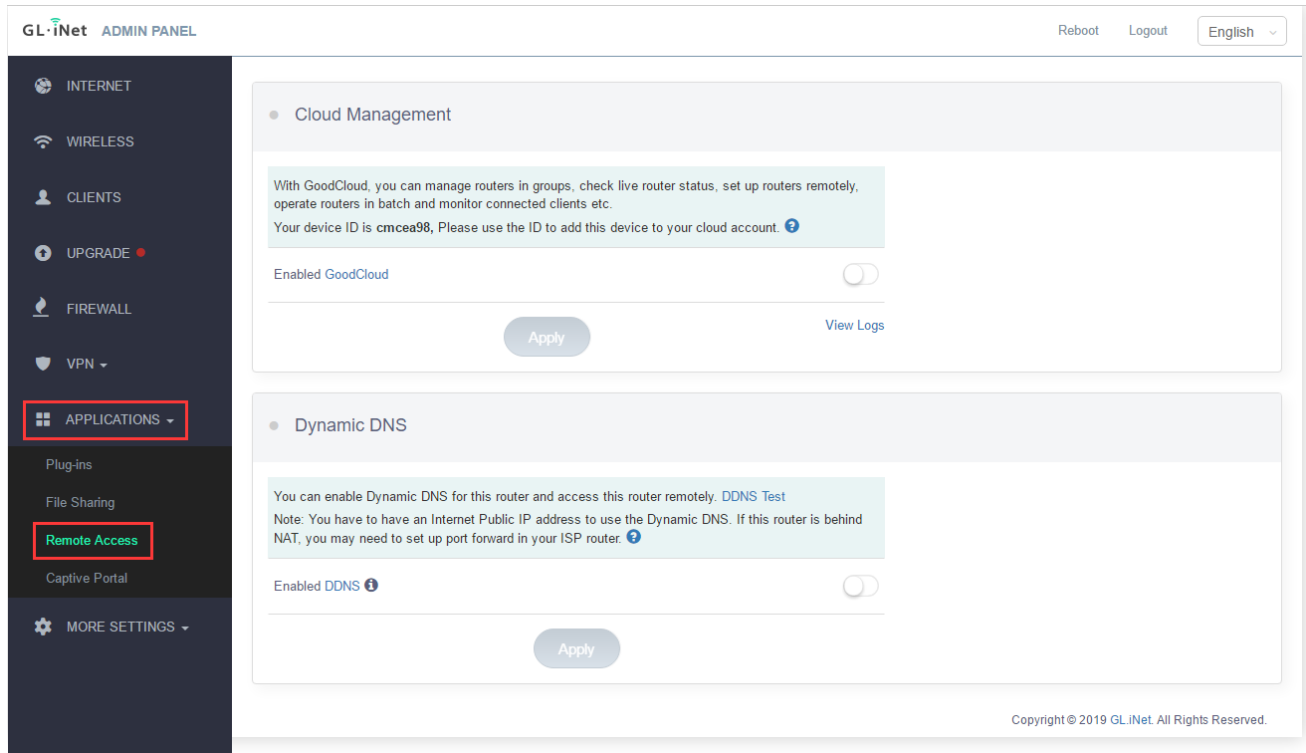
Writable: USB flash disk and SD card is not writable in default. This function should be used carefully, it is easy to write the USB flash disk disabled.

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:

The screenshot shows the GL.iNet Admin Panel interface. On the left is a dark sidebar menu with options: INTERNET, WIRELESS, CLIENTS, UPGRADE (with a red dot), FIREWALL, VPN (with a dropdown arrow), APPLICATIONS (with a dropdown arrow), and MORE SETTINGS (with a gear icon). The 'Captive Portal' option under APPLICATIONS is highlighted in green. The main content area is titled 'Captive Portal' and contains the following elements:

- A light blue informational box with the text: "You can set up a captive portal to display a web page when a user connects to your Wi-Fi network. [Help?](#)"
- Two warning icons (exclamation marks) with the following text:
 - "If Guest network is disabled, captive portal function is unavailable."
 - "Opening the captival portal will cause the block function to fail."
- A toggle switch for "Enable captive portal", which is currently turned off.
- A dropdown menu for "Virtual network interface" set to "Guest".
- A text input field for "Lease time minutes (1-1440):" with the value "1440".
- A text input field for "Forward URL after Authorization" with the value "Optional".
- An "Apply" button.

At the bottom right of the main content area, it says "Copyright © 2019 GL.iNet. All Rights Reserved."

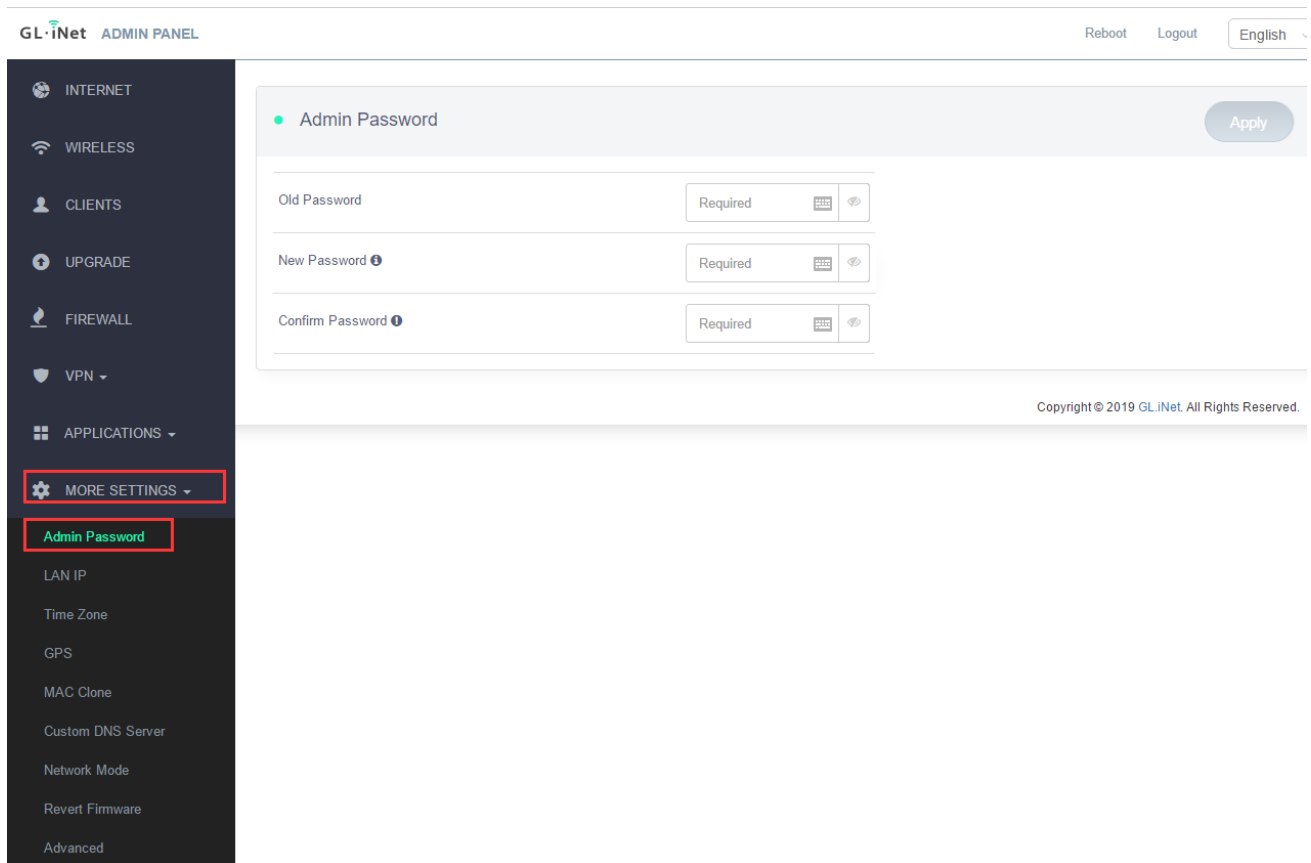
Detailed usage, please refer to below link,

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:

GL.iNet ADMIN PANEL

Reboot Logout English

INTERNET
WIRELESS
CLIENTS
UPGRADE
FIREWALL
VPN
APPLICATIONS
MORE SETTINGS
Admin Password
LAN IP
Time Zone
GPS
MAC Clone
Custom DNS Server
Network Mode
Revert Firmware
Advanced

LAN IP Guest IP

LAN IP

GL routers use 192.168.8.1 as the default LAN IP address. This is the address you would enter into your browser's address bar to access the router admin page. You can manually setup one within these three ranges: 192.168.x.x , 172.x(16-31).x.x or 10.x.x.x

Note: The starting IP address and ending IP address must be in the range of 2-254, and the ending address should be greater than starting address.

LAN IP

192.168.8.1

Start IP Address

192.168.8.100

End IP Address

192.168.8.249

Static IP Address Binding

Usually your computer's IP address is dynamically assigned by the router. If you want your computer to have a static IP address, you can manually add your computer's MAC address and the static IP address you want to use.

Mind the configured client has to reconnect the router to come into effect.

MAC	IP	Action
		Add

Copyright © 2019 GL.iNet. All Rights Reserved.

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

Guest IP

LAN IP

Apply

GL routers use 192.168.8.1 as the default LAN IP address. This is the address you would enter into your browser's address bar to access the router admin page. You can manually setup one within these three ranges: 192.168.x.x , 172.x(16-31).x.x or 10.x.x.x

Note: The starting IP address and ending IP address must be in the range of 2~254, and the ending address should be greater than starting address.

LAN IP

192.168.8.1

Start IP Address

192.168.8.

100

End IP Address

192.168.8.

249

Static IP Address Binding

Usually your computer's IP address is dynamically assigned by the router. If you want your computer to have a static IP address, you can manually add your computer's MAC address and the static IP address you want to use.

Mind the configured client has to reconnect the router to come into effect.

MAC	IP	Action
<input type="text"/>	<input type="text"/>	<div>Add</div>

Copyright © 2019 GL.iNet. All Rights Reserved.

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

Apply

The GL router uses 192.168.9.1 as the default guest IP address. Note: Do not conflict with the LAN IP when modifying the guest IP. You can manually setup one within these three ranges: 192.168.x.x, 172.x(16-31).x.x or 10.x.x.x

Note: The starting IP address and ending IP address must be in the range of 2~254, and the ending address should be greater than starting address.

GUEST IP

192.168.19.1

Start IP Address

192.168.19.100

End IP Address

192.168.19.249

● Static IP Address Binding

Usually your computer's IP address is dynamically assigned by the router. If you want your computer to have a static IP address, you can manually add your computer's MAC address and the static IP address you want to use.

Note: Mind the configured client has to reconnect the router to come into effect.

MAC	IP	Action
<input type="text"/>	<input type="text"/>	<input type="button" value="Add"/>

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,

● GUEST IP

Apply

The GL router uses 192.168.9.1 as the default guest IP address. Note: Do not conflict with the LAN IP when modifying the guest IP. You can manually setup one within these three ranges: 192.168.x.x, 172.x(16-31).x.x or 10.x.x.x

Note: The starting IP address and ending IP address must be in the range of 2-254, and the ending address should be greater than starting address.

GUEST IP

192.168.19.1

Start IP Address

192.168.19.100

End IP Address

192.168.19.249

● Static IP Address Binding

Usually your computer's IP address is dynamically assigned by the router. If you want your computer to have a static IP address, you can manually add your computer's MAC address and the static IP address you want to use.

Note: Mind the configured client has to reconnect the router to come into effect.

MAC	IP	Action
<input type="text"/>	<input type="text"/>	<input type="button" value="Add"/>

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:

GUEST IP

Apply

The GL router uses 192.168.9.1 as the default guest IP address. Note: Do not conflict with the LAN IP when modifying the guest IP. You can manually setup one within these three ranges: 192.168.x.x, 172.x(16-31).x.x or 10.x.x.x

Note: The starting IP address and ending IP address must be in the range of 2-254, and the ending address should be greater than starting address.

GUEST IP	<input type="text" value="192.168.19.1"/>
Start IP Address	<input type="text" value="192.168.19."/> <input type="text" value="100"/>
End IP Address	<input type="text" value="192.168.19."/> <input type="text" value="249"/>

Static IP Address Binding

Usually your computer's IP address is dynamically assigned by the router. If you want your computer to have a static IP address, you can manually add your computer's MAC address and the static IP address you want to use.

Note: Mind the configured client has to reconnect the router to come into effect.

MAC	IP	Action
<input type="text" value=""/>	<input type="text" value=""/>	<input type="button" value="Add"/>
SC-201804100947 E0:D5:5E:86:EA:61	192.168.8.112	<input type="button" value="Modify"/> <input type="button" value="Delete"/>
<input type="button" value="Delete All"/>		

Copyright © 2019 GLiNet. All Rights Reserved.

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:

The screenshot displays the GL.iNet Admin Panel interface. On the left sidebar, the 'MORE SETTINGS' menu item is highlighted with a red box, and the 'Time Zone' option is also highlighted with a red box. The main content area is divided into two sections: 'Time Zone' and 'Time Synchronization'. The 'Time Zone' section shows the 'Router Time' as 'Wed Aug 21 08:31:57 UTC 2019' and a message indicating that the router time differs from the browser time, with a 'Sync' button. Below this, a dropdown menu is set to 'UTC'. The 'Time Synchronization' section includes a description of the NTP function, a toggle for 'NTP Client' which is turned on, and a toggle for 'NTP Server' which is turned off. There are four input fields for 'NTP Server Address' (1 through 4), all containing the default address '0.openwrt.pool.ntp.org'. The bottom right corner of the panel shows the copyright notice: 'Copyright © 2019 GL.iNet. All Rights Reserved.'

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

Sync: Synchronize Browser time

Time Sync: NTP Client and NTP server settings

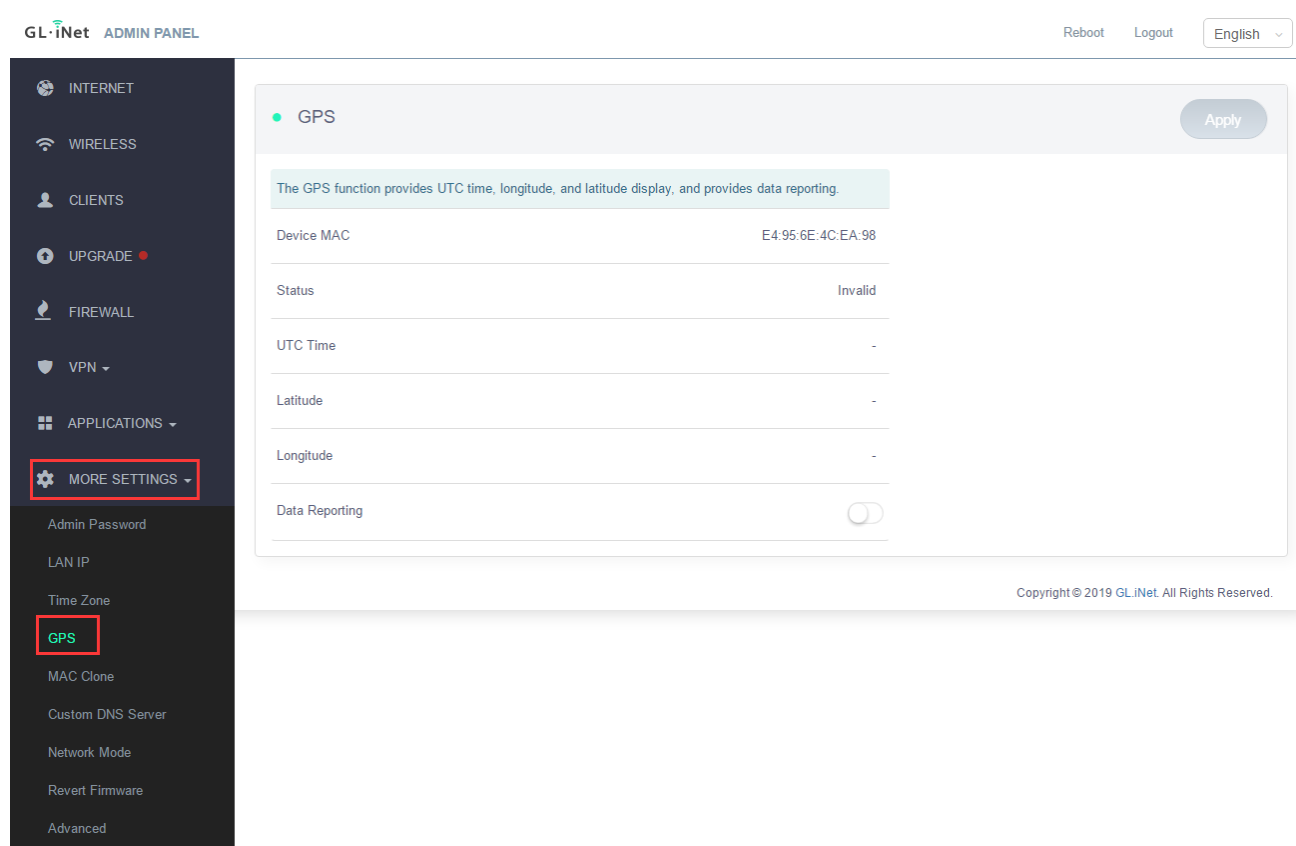
NTP Client: NTP Client switch, on and off is optional

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:

GPS

The GPS function provides UTC time, longitude, and latitude display, and provides data reporting.

Device MAC

E4:95:6E:4C:EA:98

Status

Valid

UTC Time

2019-08-21 08:35:19

Latitude

2238.750977N

Longitude

11355.045898E

Data Reporting

☐

SGNRMC,083519.00,A,2238.75099,N,11355.04586,E,0.233,210819,,A,V*16

SGNVTG,T,M,0.233,N,0.432,K,A*3A

SGNGGA,083519.00,2238.75099,N,11355.04586,E,1.07,3.42,222.3,M,-2.9,M,*54

SGNGSA,A,3,195,02,,,,,,,,,4.62,3.42,3.11,1*38 SGNGSA,A,3,26,04,12,03,08,,,,,,,,,4.62,3.42,3.11,4*0A

SGPGSV,1,1,04,02,48,117,43,15,,22,21,08,318,22,195,37,166,34,0*65

SGBGSV,2,1,06,01,,33,03,64,189,37,04,32,111,38,08,72,082,28,0*44

SGBGSV,2,2,06,12,64,203,34,26,06,179,27,0*7E

SGNGLL,2238.75099,N,11355.04586,E,083519.00,A,A*74

SGNRMC,083520.00,A,2238.74929,N,11355.04872,E,0.188,,210819,,A,V*1A

SGNVTG,T,M,0.188,N,0.349,K,A*32

SGNGGA,083520.00,2238.74929,N,11355.04872,E,1.07,3.42,233.2,M,-2.9,M,*5A

SGNGSA,A,3,195,02,,,,,,,,,4.63,3.42,3.11,1*39 SGNGSA,A,3,26,04,12,03,08,,,,,,,,,4.63,3.42,3.11,4*0B

SGPGSV,1,1,04,02,48,117,43,15,,22,21,08,318,22,195,37,166,35,0*64

SGBGSV,2,1,06,01,,33,03,64,189,37,04,32,111,38,08,72,082,28,0*44

SGBGSV,2,2,06,12,64,203,34,26,06,179,30,0*78

Copyright © 2019 GL.iNet. All Rights Reserved.

Enable data reporting function, showing as below:

GL.iNet ADMIN PANEL

Reboot Logout English

INTERNET

WIRELESS

CLIENTS

UPGRADE

FIREWALL

VPN

APPLICATIONS

MORE SETTINGS

Admin Password

LAN IP

Time Zone

GPS

MAC Clone

IPv6

Custom DNS Server

Network Mode

Revert Firmware

Advanced

GPS

The GPS function provides UTC time, longitude, and latitude display, and provides data reporting.

Device MAC

94:83:C4:0C:A3:53

Status

Valid

UTC Time

2021-09-01 10:12:47

Latitude

2238.76778N

Longitude

11355.01332E

Data Reporting

☒

HTTP Path

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

Time Interval

300

SGNRMC,101247.00,A,2238.76778,N,11355.01332,E,0.067,010921,,A,V*1D

SGNVTG,T,M,0.067,N,0.125,K,A*3A

SGNGGA,101247.00,2238.76778,N,11355.01332,E,1.12,0.71,85.4,M,-2.9,M,*6B

SGNGSA,A,3,18,12,25,194,32,15,10,23,31,195,,1.23,0.71,1.01,1*0C

SGNGSA,A,3,22,01,03,21,13,16,19,04,20,,1.23,0.71,1.01,4*08

SGPGSV,3,1,12,10,58,339,27,12,36,097,43,15,09,080,36,18,31,193,44,0*6B

SGPGSV,3,2,12,23,75,082,27,24,28,038,,25,39,139,40,31,18,227,40,0*66

SGPGSV,3,3,12,32,33,307,34,193,61,063,23,194,52,108,41,195,14,161,18,0*5C

SGBGSV,4,1,18,01,46,123,43,02,48,237,03,63,189,40,04,32,111,40,0*7B

SGBGSV,4,2,18,05,25,257,,06,56,328,,07,21,175,18,08,,38,0*45

SGBGSV,4,3,16,09,50,299,,10,16,184,22,13,64,231,24,16,56,335,24,0*73

SGBGSV,4,4,16,19,51,076,34,20,11,11,25,21,06,311,35,22,48,343,35,0*70

SGNGLL,2238.76778,N,11355.01332,E,101247.00,A,A*74

SGNRMC,101248.00,A,2238.76762,N,11355.01341,E,0.118,010921,,A,V*14

SGNVTG,T,M,0.118,N,0.219,K,A*3F

SGNGGA,101248.00,2238.76762,N,11355.01341,E,1.12,0.77,85.5,M,-2.9,M,*6C

SGNGSA,A,3,18,12,25,194,32,15,10,23,31,195,,1.43,0.77,1.20,1*0F

SGNGSA,A,3,22,01,03,21,13,16,19,04,20,,1.43,0.77,1.20,4*0B

SGPGSV,3,1,12,10,58,339,29,12,36,097,44,15,09,080,36,18,31,193,45,0*63

SGPGSV,3,2,12,23,75,082,28,24,28,038,,25,39,139,39,31,18,227,40,0*67

SGPGSV,3,3,12,32,33,307,34,193,61,063,,194,52,108,41,195,14,161,18,0*5D

SGBGSV,4,1,18,01,46,123,43,02,48,237,03,63,189,40,04,32,111,40,0*7C

Enable to set reporting address and reporting circle

GL.iNet

71

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).

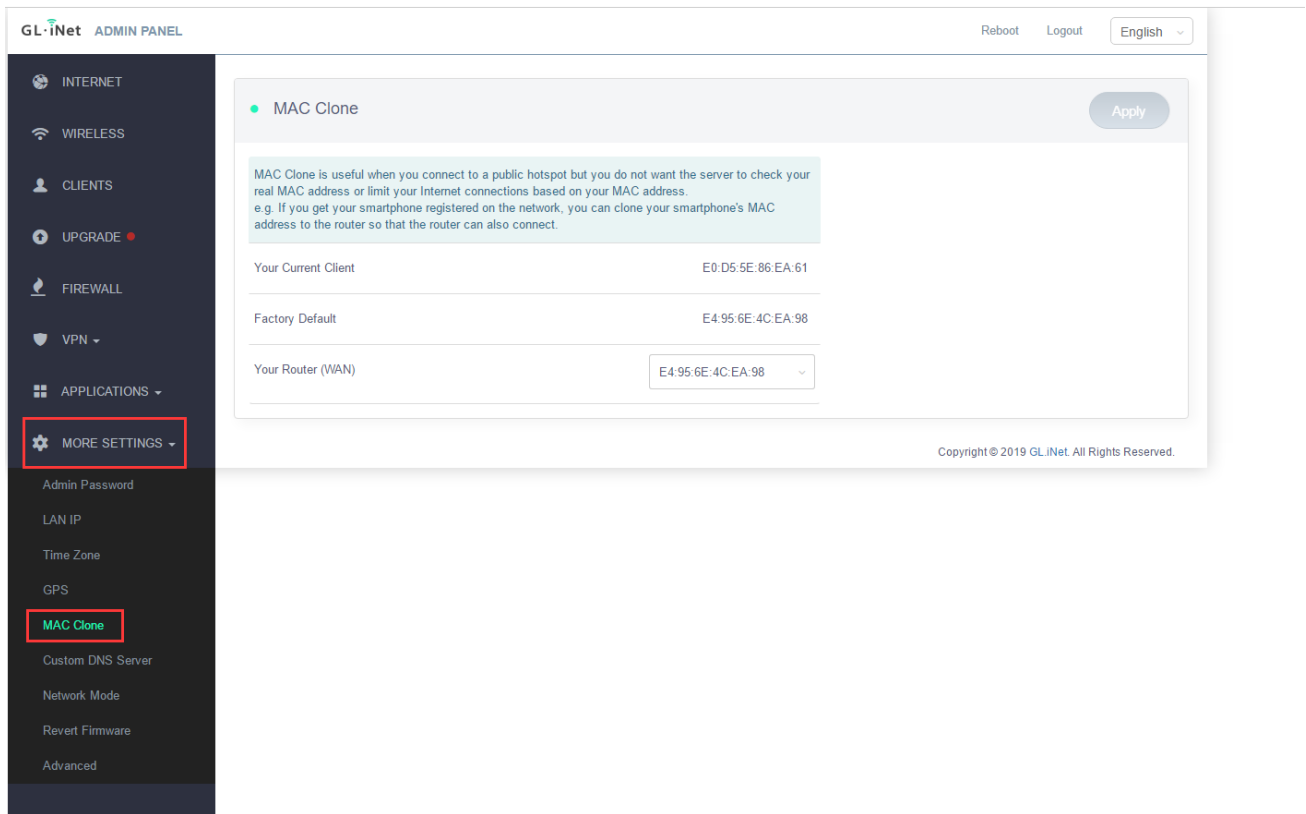
The screenshot shows a web browser window with the address bar displaying gps-test.gl-inet.cn. The page has a teal header with the text "GL-iNet". Below the header, there is a search bar with fields for "Mac:" and "Date:", a "Search" button, and a "confirm" button. The main content is a table with 10 columns: ID, Mac, Status, UTC TIME, UTC DATE, North Latitude, East Longitude, SeaHeight, and Date. The table contains 17 rows of data, all with a Status of "true". At the bottom of the table, there is a pagination bar showing "1" of "1" pages, a "confirm" button, "total 17", and a "20 /page" dropdown menu.

ID	Mac	Status	UTC TIME	UTC DATE	North Latitude	East Longitude	SeaHeight	Date
163117708453791056	94:83:c4:0e:50:7a	true	2021-09-09 08:44:42	2021-09-09 08:44:42	2238.75194N	11355.01263E	143.9	2021-09-09T16:44:44
163117711728296328	94:83:c4:0e:50:7a	true	2021-09-09 08:45:15	2021-09-09 08:45:15	2238.75190N	11355.01324E	143.3	2021-09-09T16:45:17
163117715000515917	94:83:c4:0e:50:7a	true	2021-09-09 08:45:48	2021-09-09 08:45:48	2238.75195N	11355.01400E	146.4	2021-09-09T16:45:50
163117718292348262	94:83:c4:0e:50:7a	true	2021-09-09 08:46:21	2021-09-09 08:46:21	2238.75217N	11355.01427E	142.9	2021-09-09T16:46:22
163117721570593756	94:83:c4:0e:50:7a	true	2021-09-09 08:46:54	2021-09-09 08:46:54	2238.75365N	11355.01477E	140.1	2021-09-09T16:46:55
163117723260416859	94:83:c4:0e:50:7a	true	2021-09-09 08:46:54	2021-09-09 08:46:54	2238.75365N	11355.01477E	140.1	2021-09-09T16:47:12
163117724846550155	94:83:c4:0e:50:7a	true	2021-09-09 08:47:26	2021-09-09 08:47:26	2238.75392N	11355.01479E	131.7	2021-09-09T16:47:28
163117728119293263	94:83:c4:0e:50:7a	true	2021-09-09 08:47:59	2021-09-09 08:47:59	2238.75575N	11355.01538E	136.8	2021-09-09T16:48:01
163117731399512096	94:83:c4:0e:50:7a	true	2021-09-09 08:48:32	2021-09-09 08:48:32	2238.75385N	11355.01441E	135.7	2021-09-09T16:48:33
163117734702382350	94:83:c4:0e:50:7a	true	2021-09-09 08:49:05	2021-09-09 08:49:05	2238.75193N	11355.01420E	133.5	2021-09-09T16:49:07
163117737987397048	94:83:c4:0e:50:7a	true	2021-09-09 08:49:38	2021-09-09 08:49:38	2238.75150N	11355.01463E	129.6	2021-09-09T16:49:39
163117741266428497	94:83:c4:0e:50:7a	true	2021-09-09 08:50:10	2021-09-09 08:50:10	2238.75139N	11355.01424E	121.1	2021-09-09T16:50:12

© 2018 gl-inet.com

4.8.5 MAC address Clone

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

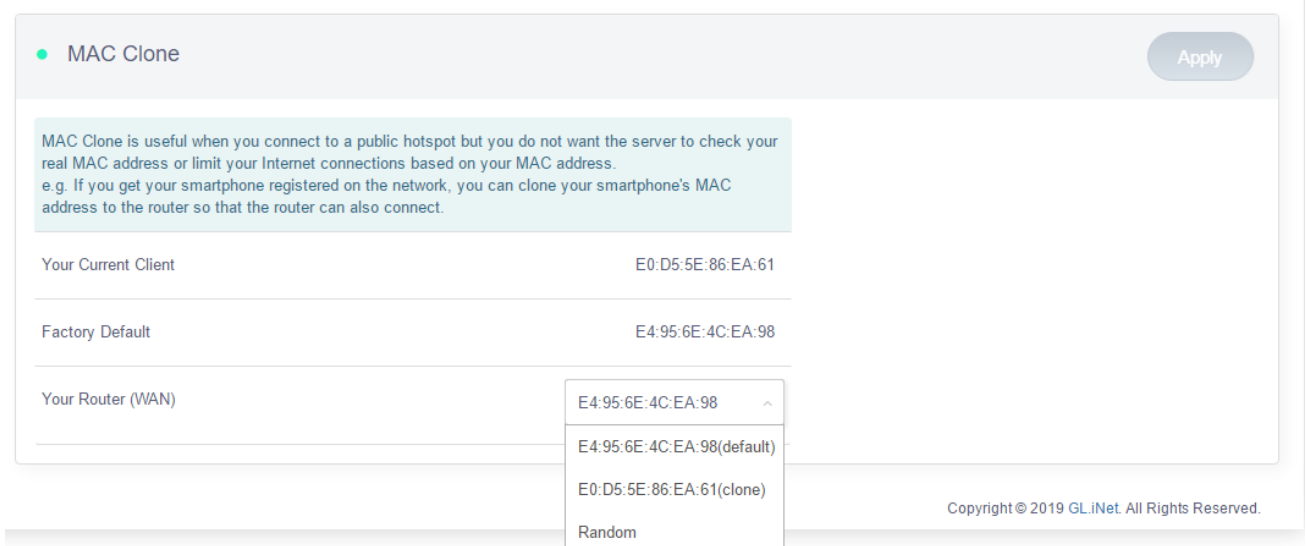


Current Client: current client MAC address

Factory Default: Factory default WAN port MAC address

Your device (WAN): Current device WAN MAC Address

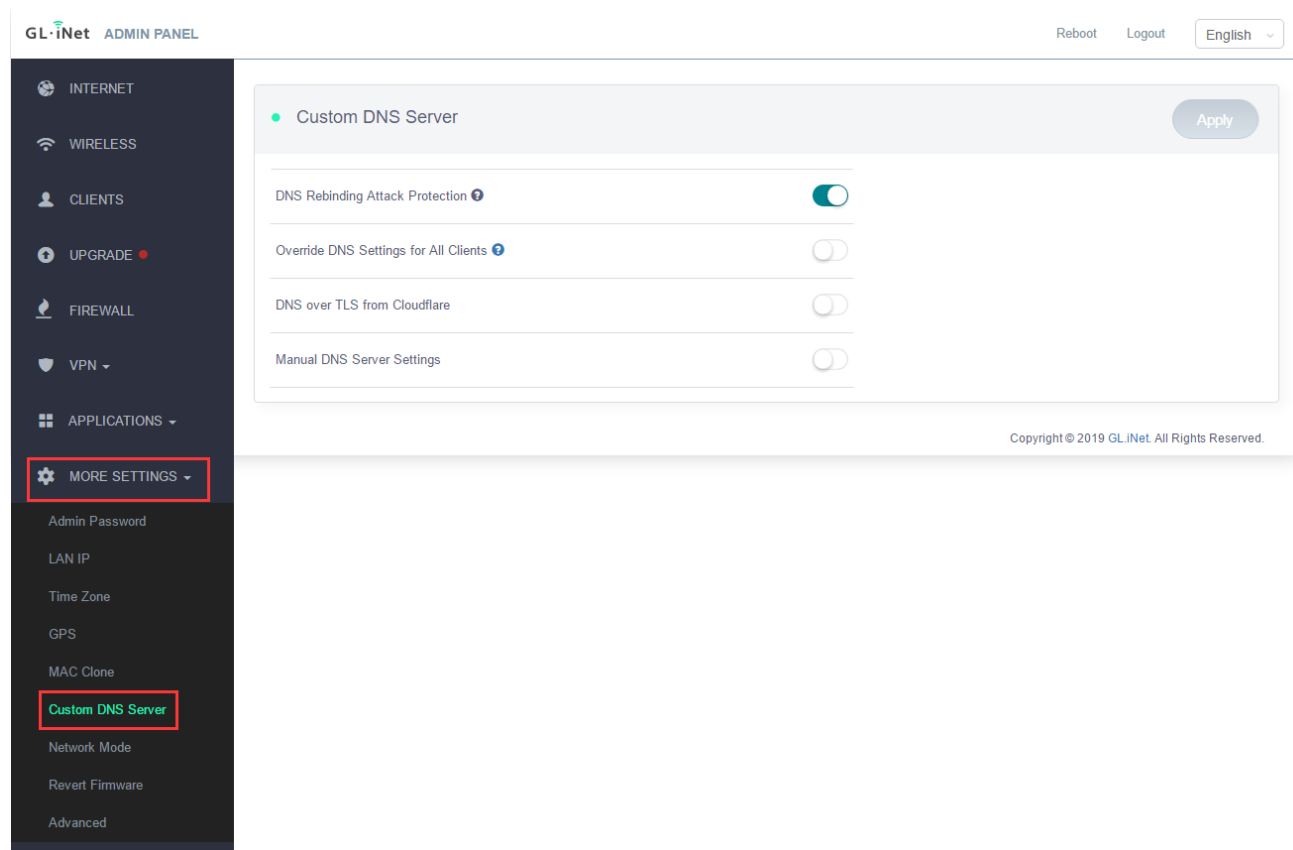
Click your device to choose clone MAC address, showing as below:



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

Custom DNS Server

Apply

DNS Rebinding Attack Protection ?

Override DNS Settings for All Clients ?

DNS over TLS from Cloudflare

Manual DNS Server Settings

A DNS server is any computer registered to join the Domain Name System. Manual DNS setting might result in DNS lookup failure. Please use with caution.

DNS Server1

Leave blank to auto choose DNS Servers

DNS Server2

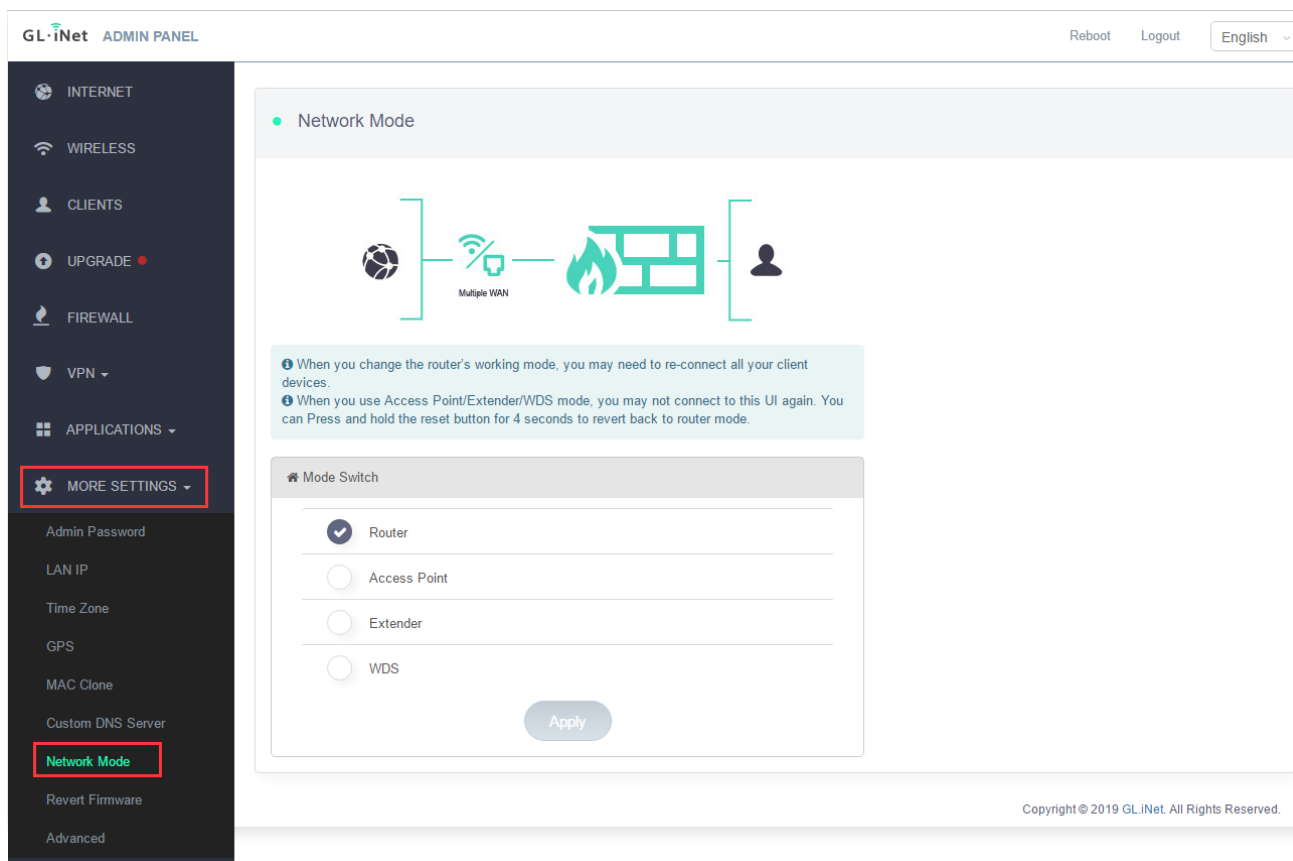
Leave blank to auto choose DNS Servers

Copyright © 2019 GL.iNet. All Rights Reserved.

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.

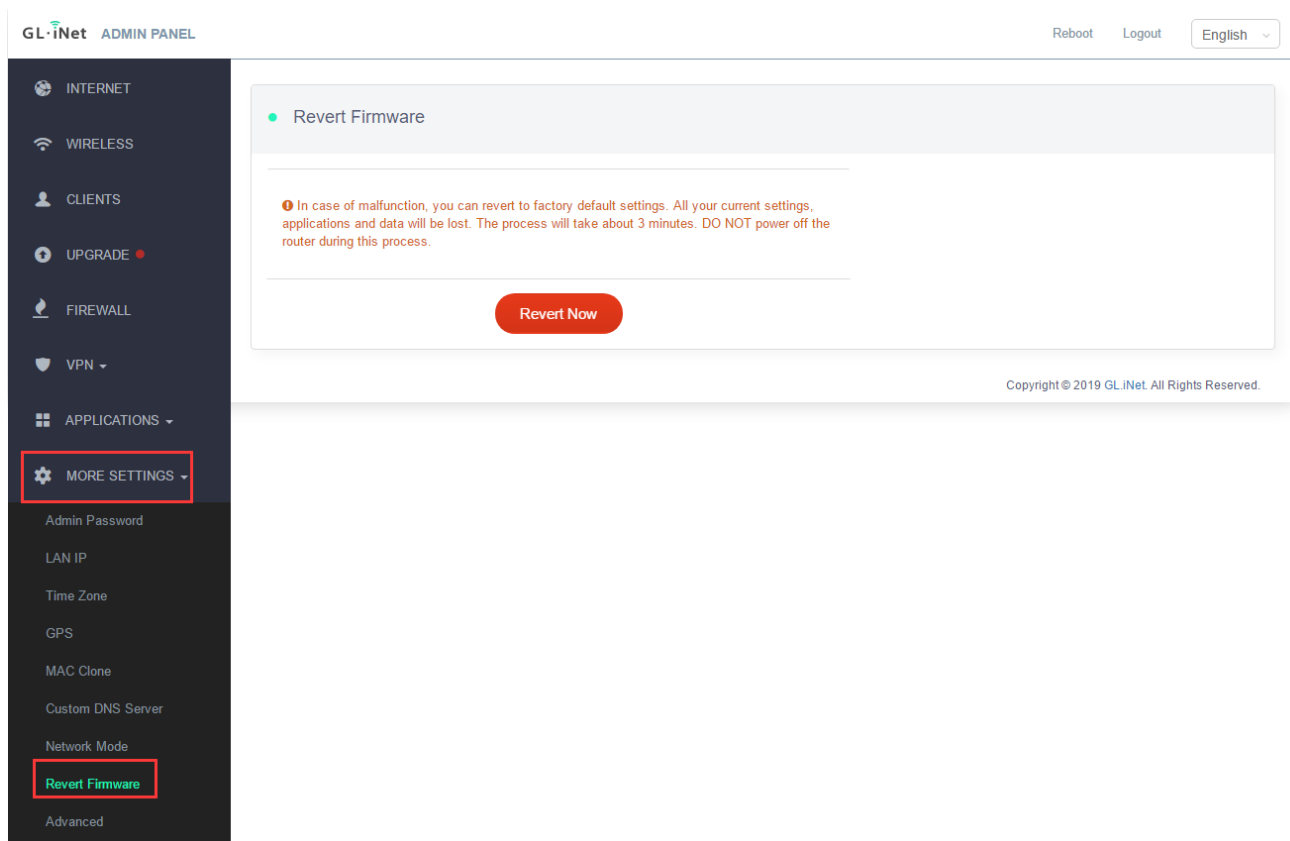
AP mode: The device connect to upper device by WAN Port.

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 main router.

4.8.8 Reset to factory setting

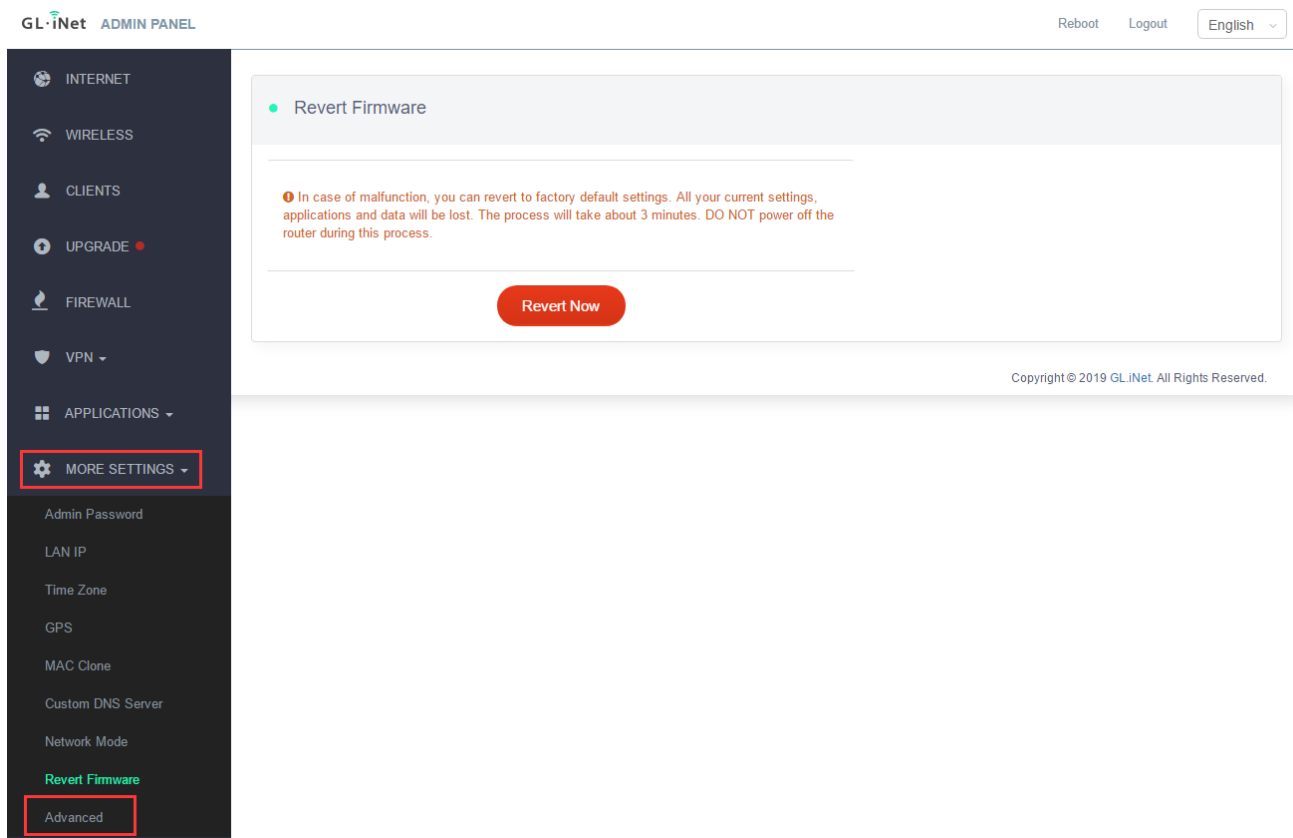
Click 'more setting', then click 'Reset to factory setting' to enter into setting page, showing as below:



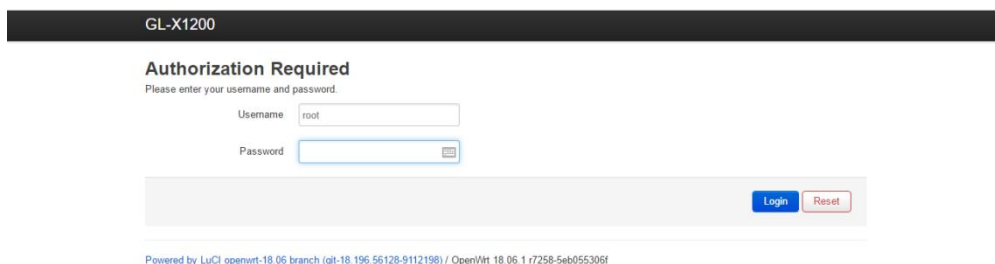
Note: Reset to factory setting will clear all the settings of the device, be cautious.

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:



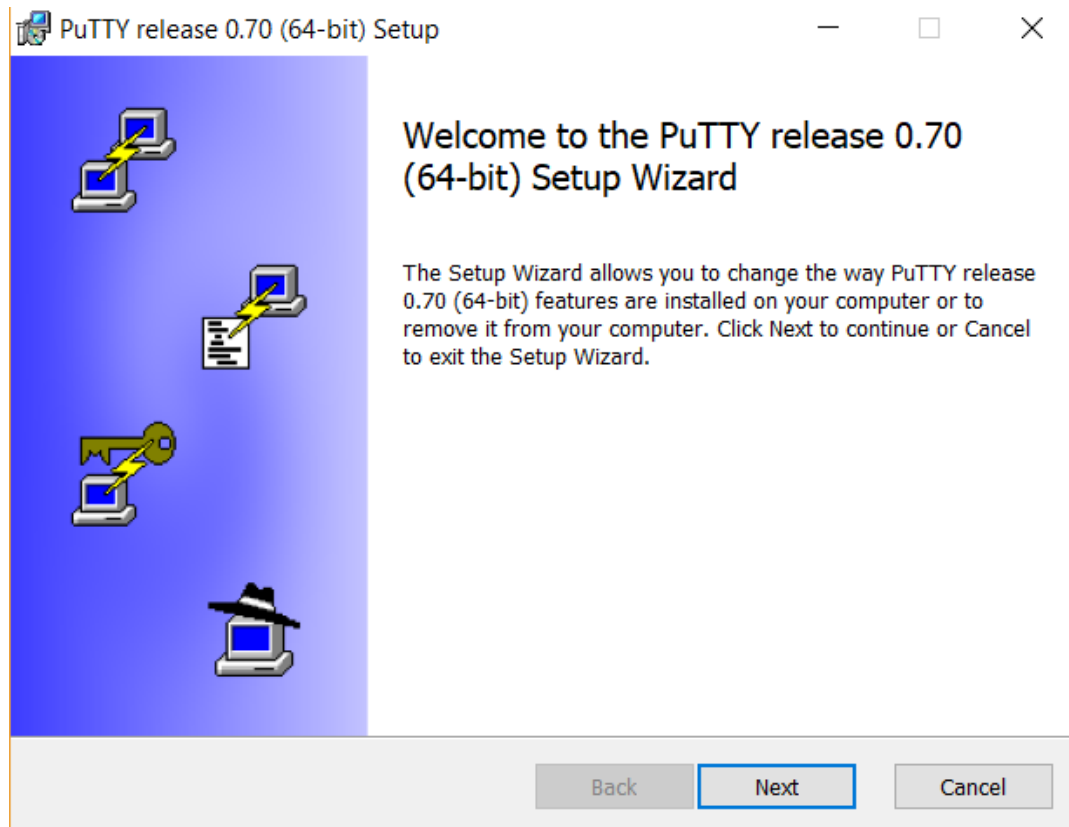
Chapter 5 Commands Introduction

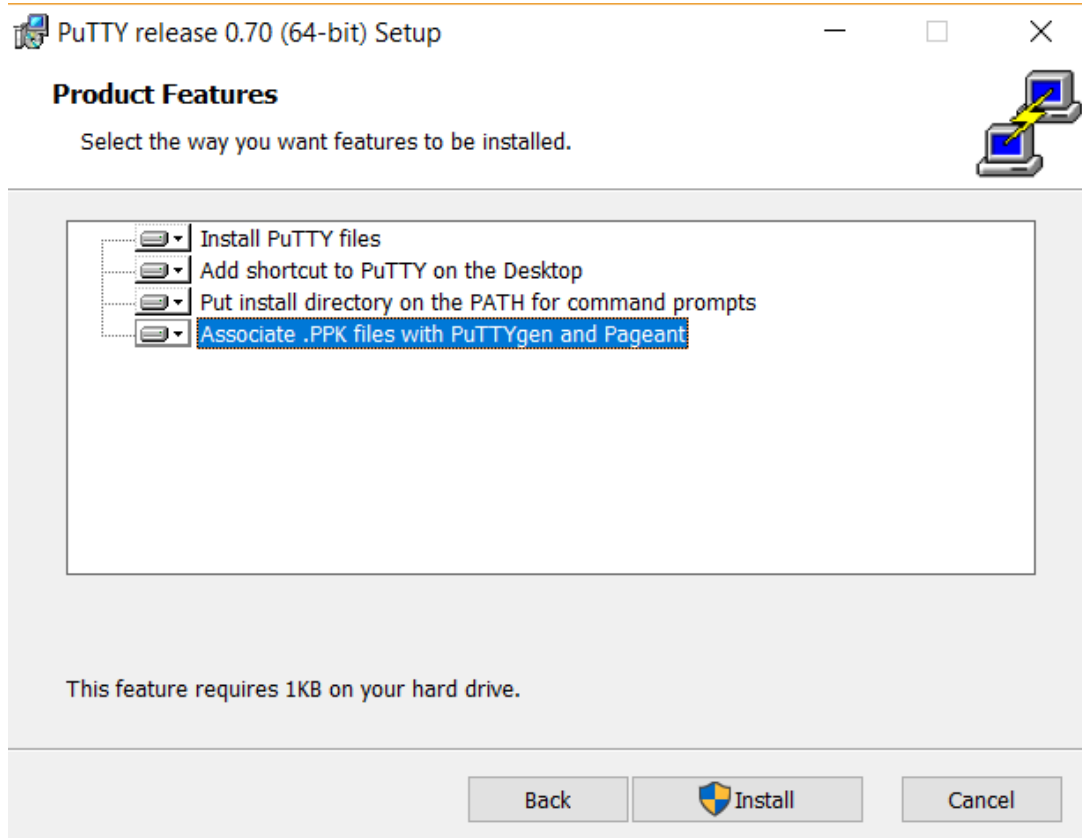
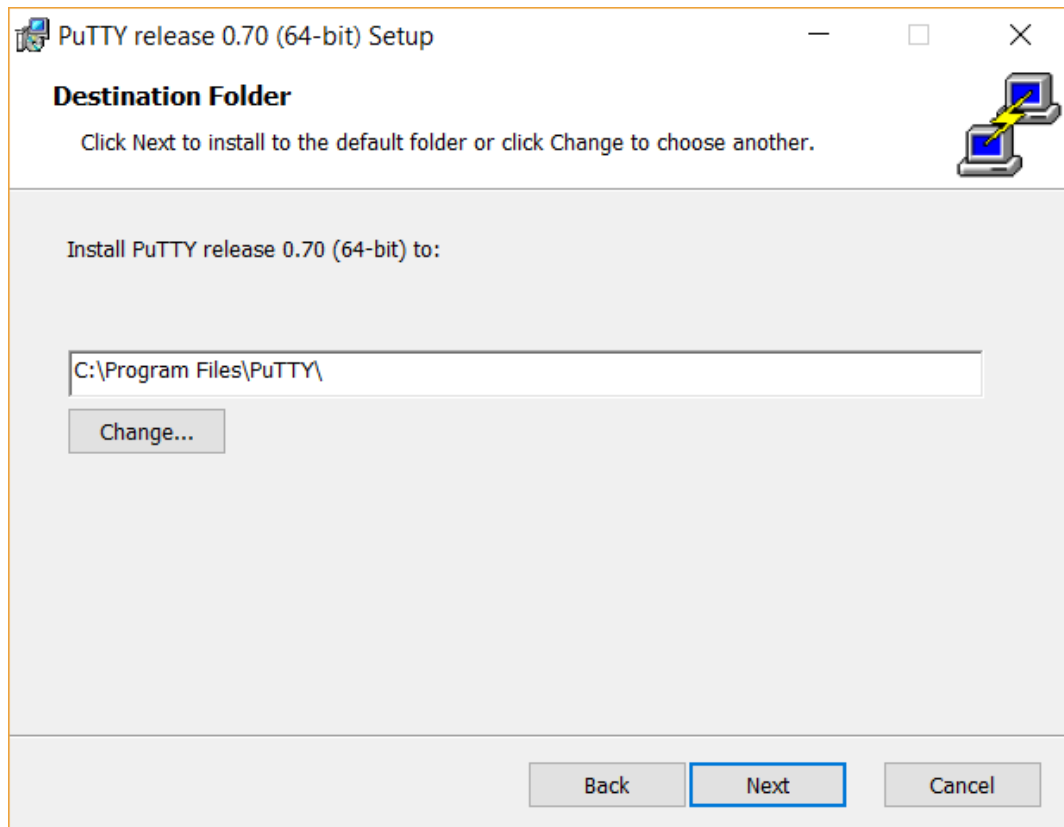
5.1 Login by SSH

5.1.1 Download and install PuTTY

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

Install PuTTY







Completed the PuTTY release 0.70 (64-bit) Setup Wizard

Click the Finish button to exit the Setup Wizard.

☒ View README file

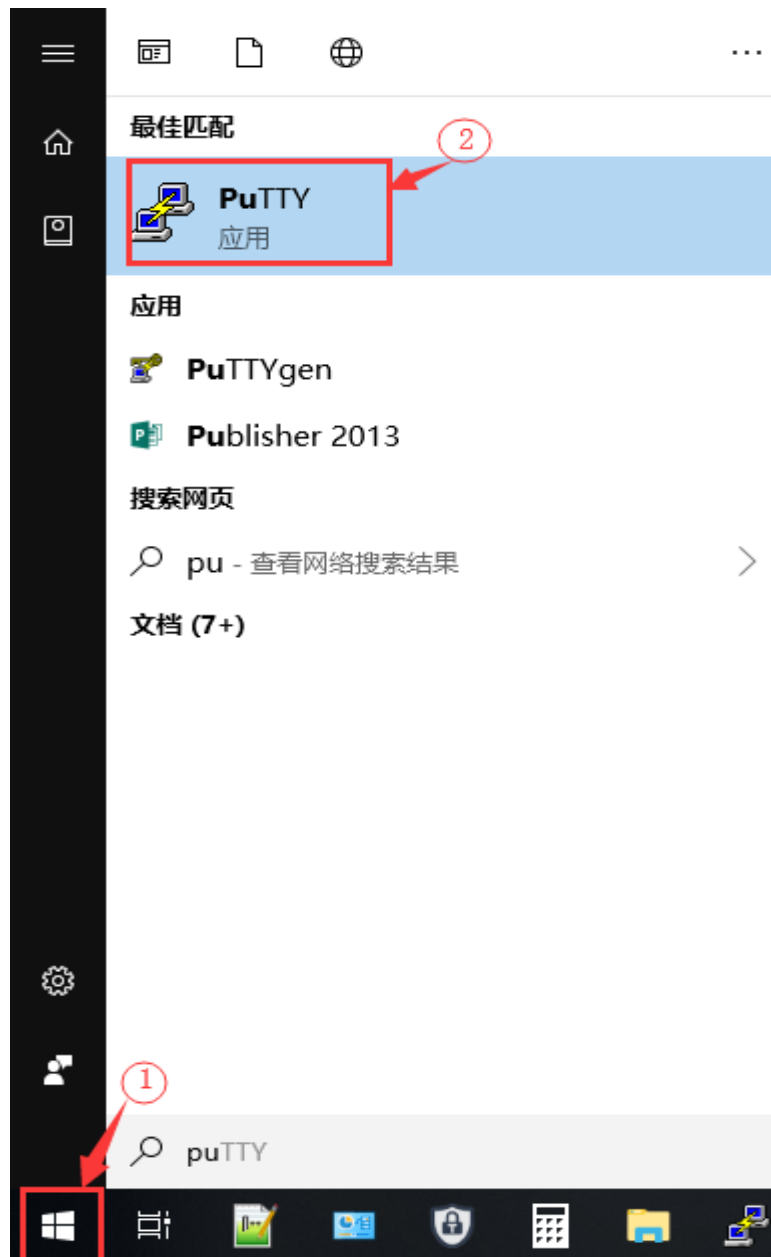
Back

Finish

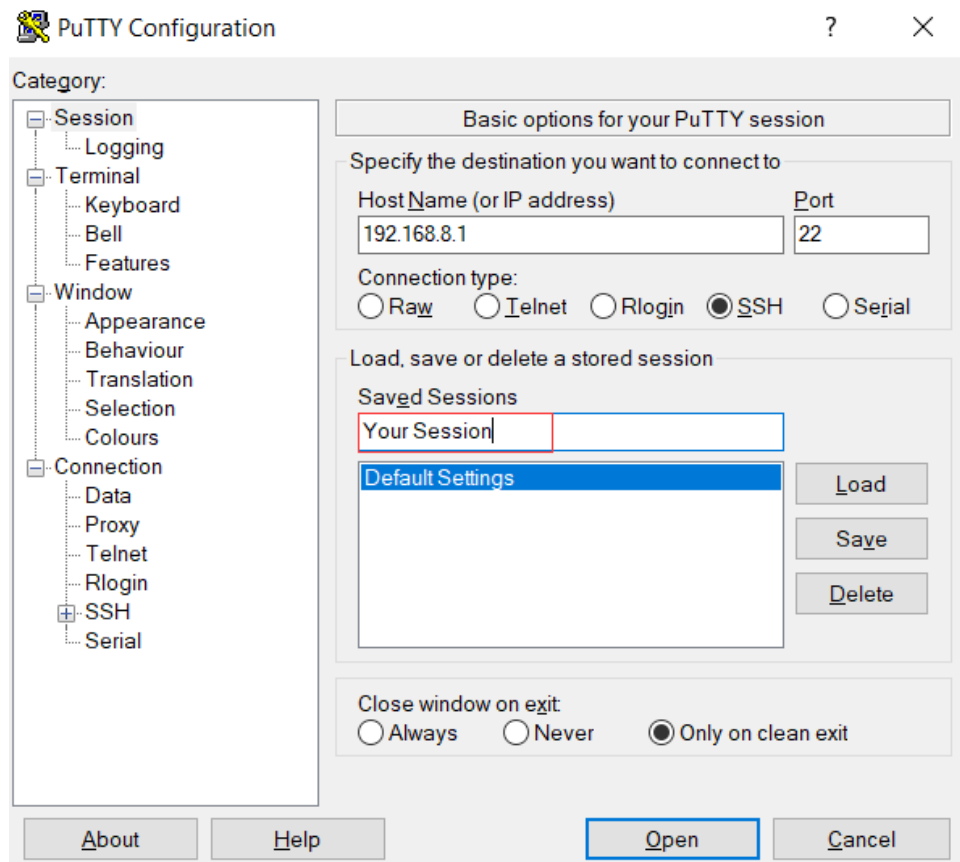
Cancel

5.1.2 Login by PuTTY

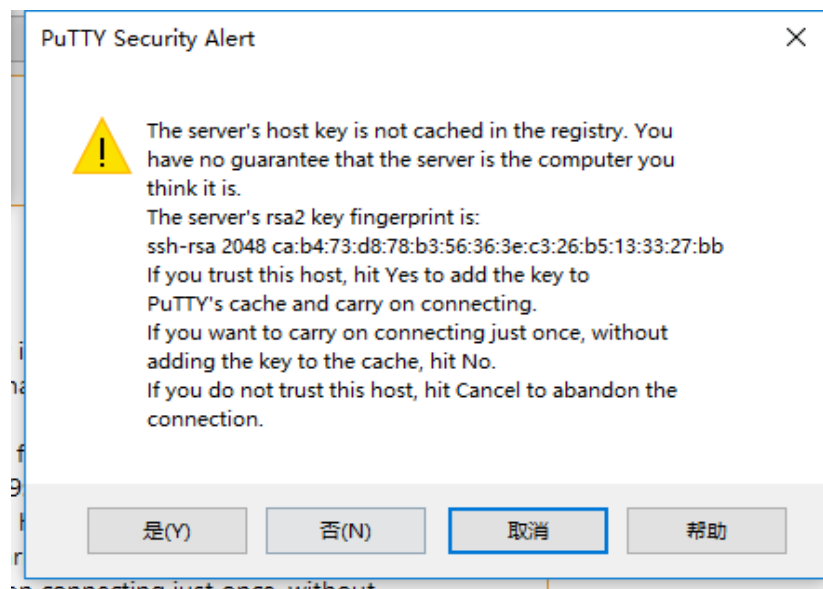
Follow below steps to open PuTTY:



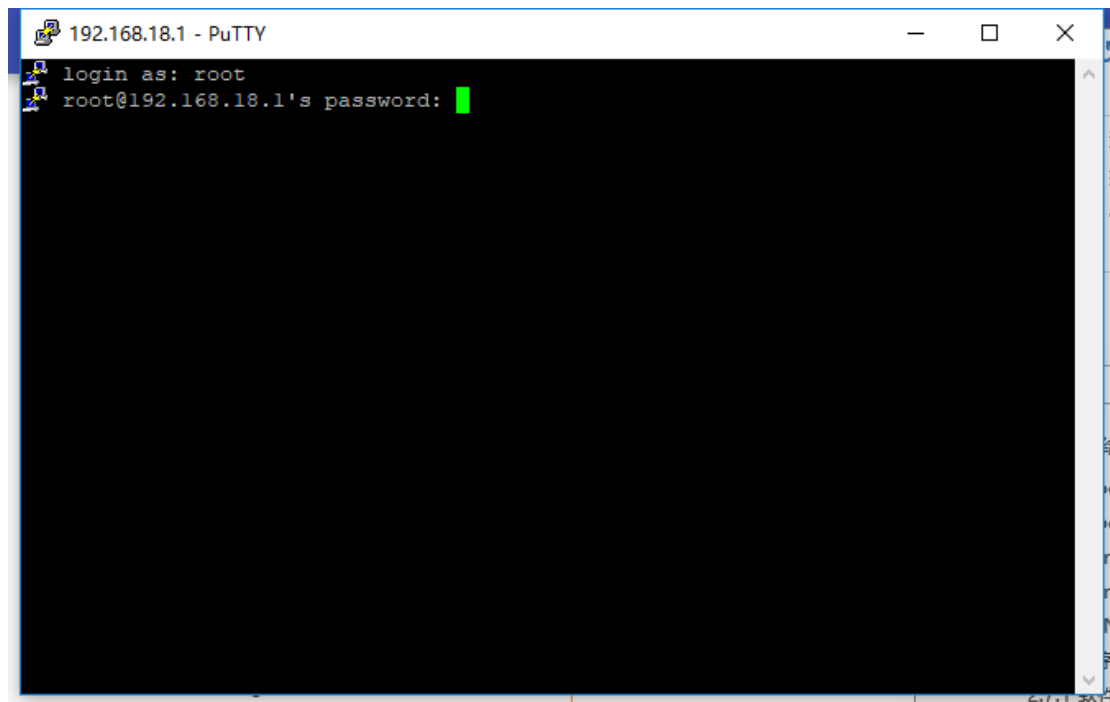
Set PuTTY. Default IP address is 192.168.8.1, default port is 22, and choose the connecting type SSH as below:



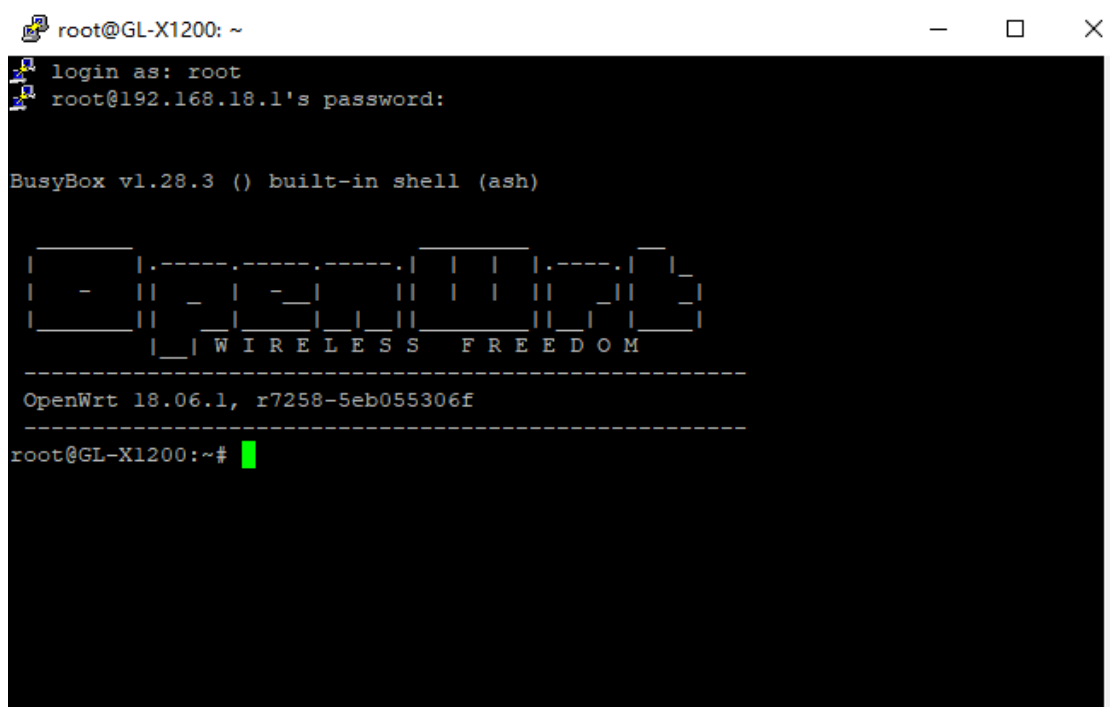
Click Open to pop up the interface as below, choose "Yes"



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-Xl200:~# 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-Xl200:~#
```

Example of ifconfig command:

```
root@GL-Xl200:~# 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-Xl200:~# 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-Xl200:~#
```

Example of ping command:

```
root@GL-Xl200:~# 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 command

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

traceroute 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 traceroute 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
 4 202.109.154.133 (202.109.154.133)  9.400 ms  113.106.39.90 (113.106.39.90)  2.528 ms  121.157.37.59.broad.dy.gd.dynamic.163data.com.cn (59.37.107.121)  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-Xl200:~# iptables
iptables v1.6.2: no command specified
Try `iptables -h' or 'iptables --help' for more information.
root@GL-Xl200:~# 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 iptables-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_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_vwan
-N mwan3_iface_out_wan
-N mwan3_iface_out_vwan
-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_vwan -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_vwan -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_vwan -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_wan
-A mwan3_ifaces_out -m mark --mark 0x0/0x3f00 -j mwan3_iface_out_wan
-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:~#

```