Bivocom®

# Industrial Cellular WIFI Router
# TR321 Series User Guide

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# About This Guide

Thank you for choosing Bivocom Industrial Cellular WIFI Router TR321 Series.

Please thoroughly read this user guide before you configure and install the device.

This manual is compatible with below models

| Model | Description |
|---|---|
| TR321-W | Industrial WCDMA ROUTER |
| TR321-LF | Industrial LTE/WCDMA ROUTER |
| TR321-M | Industrial CAT-M NBIoT ROUTER |

# Table of Contents

# 1. Introduction

## 1.1 Overview

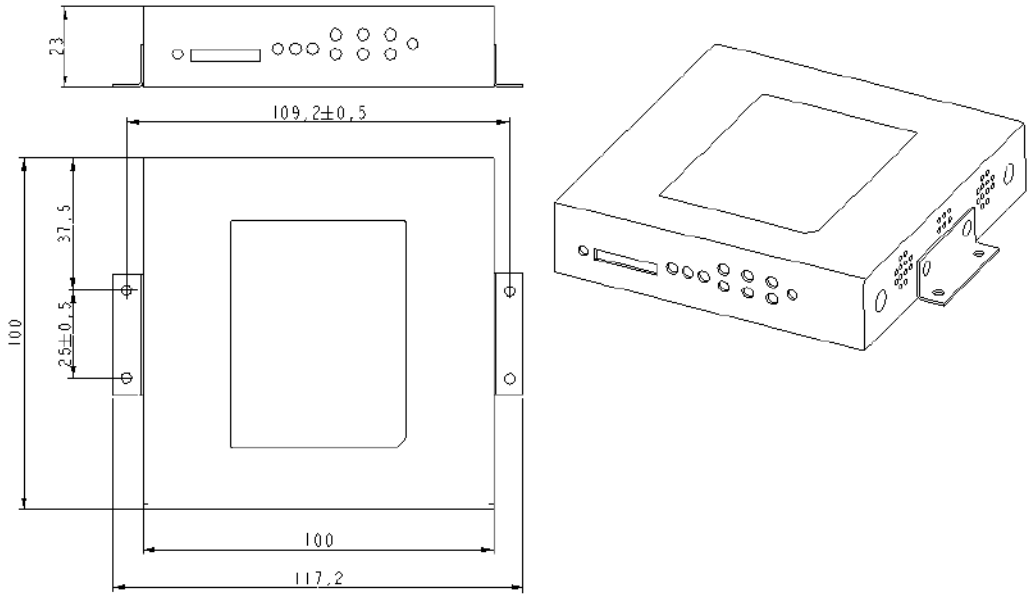
TR321 Series Router is a type of compact industrial wireless router, designed to fully meet the needs of industrial standards and industrial users. It adopts high-powered industrial 32-bits CPU, multi-layer software detection and hardware protection mechanism to ensure reliability and stability of the device. It supports worldwide carrier 4G/3G cellular network FDD-LTE, TD-LTE, and WCDMA, EVDO, TD-SCDMA, EDGE, CDMA 1X and GPRS, CAT-M, NBIoT. With rich VPN protocols(IPSEC、PPTP、L2TP etc.) to ensure the security of data transmission, and rich interfaces, such as RS232 (or RS485/RS422), Ethernet Port, I/O(Option) and WIFI(Option), etc.

TR321 Series Router enables users to quickly access the Internet, to ensure secure and reliable data transmission. It's ideal for IOT (Internet of Things) and M2M(Machine to Machine) applications, and has been widely used in many applications, such as Intelligent Transportation, Smart Grid, Vending Machine, Agricultural Irrigation, Environmental Protection, Industrial Automation, Energy Saving, Smart Home, etc.

## 1.2 Applications

TR321 Series Router utilizes cellular network to connect your network devices and serial port devices to your center for remote monitoring and control.
Typical application as below.

## 1.3 Dimensions




## 1.4 Physical Characteristics

| Physical Characteristics | |
|---|---|
| Housing | Metal, IP30 |
| Dimensions | 100x100x23mm(3.94x3.94x0.91 inches), Antenna and other accessories not included |
| Weight | 320g(0.71lbs) |

# 2. Getting Started

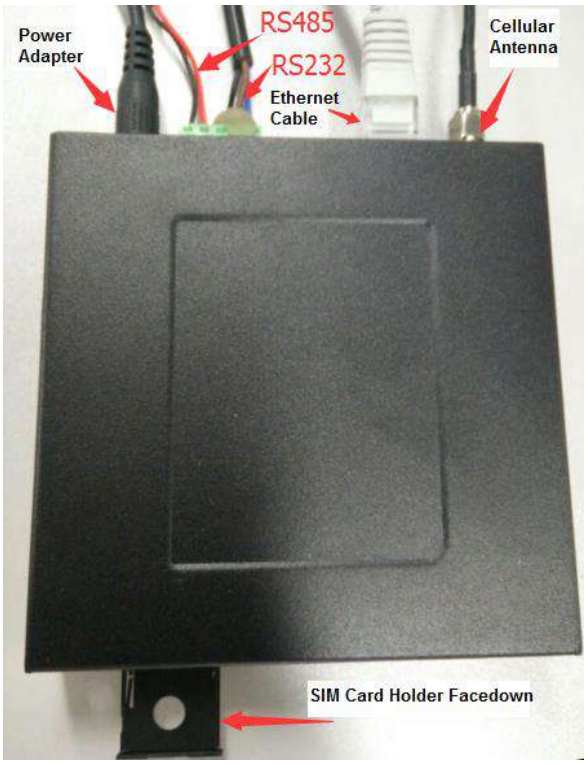
## 2.1 Package Checklist

The following components are included in your TR321 package.
Check the list before installation. If you find anything missing, Please feel free to contact Bivocom.

- TR321 Router Host
- Power Adapter(1.5A/12VDC)
- Cellular Antenna(Male SMA)
- Console Cable(RS232)
- Ethernet Cable(1 meter)

- 5-Pin Terminal Block


## 2.2 Installation



### 2.2.1 SIM/UIM Card

TR321 supports normal SIM/UIM only, so if you're using a Micro SIM or Nano SIM card, you may need to use a Micro SIM or Nano SIM to Normal SIM adapter.
Make sure your router is powered off, then use a needle object(such as a pen) to push the button near the SIM/UIM card holder, it will flick out immediately. Put the SIM/UIM card to card holder with chipset upside, insert it to router and make sure it's tightly matched.
Warning: Never install SIM/UIM card when router is powered on.

### 2.2.2 5-Pin Terminal Block and Console Cable

TR321 supports RS232 and RS485 serial port, which can be used for firmware upgrade, system log checking, or acts as serial port of a DTU(Please refer to Bivocom TD210 Series DTU).
TR321 designed with industrial terminal block interface, and the cable in this package with ends of female connector and stripping cable, the signal of console cable is defined as below,

**RS232 Cable(with DB9 female connector and stripping cable)**

| Color of cable | Corresponding DB9-Female Pin No. | Corresponding Pin No. of Router (Pin 1 closes to power jack, Pin 5 closes to ethernet port) |
|---|---|---|
| Blue | 2（RX） | 1(TX) |
| Brown | 3（TX） | 2(RX) |
| Black | 5（GND） | 3(GND) |

**RS485 Cable**

| Color of cable | TR321 Router |
|---|---|
| Red | 4(A) |
| Black | 5(B) |

### 2.2.3 Power Supply

We suggest you use Bivocom standard power adapter (1.5A/12VDC). If you have to use your own power supply, make sure the power range is 5-35VDC and it is stable enough(Ripple shall be less than 300mV, and Instantaneous voltage shall not larger than 35V), meanwhile, power shall over 4W.

### 2.2.4 Cellular Antenna

Screw the SMA male antenna to TR321(SMA female port), make sure it is screwed tightly to ensure the strength of signal.

## 2.3 LED Indicators


**TR321 Series Router provides 7 LED indicators, as following.**

| Indicator | Status | Content |
|---|---|---|
| Power | On | Powered On |
| | Off | Powered Off |
| Signal Strength | 1 Lights | Signal weak |
| | 2 Lights | Signal Middium |
| | 3 Lights | Signal Strong |
| System | Blink | System works perfect |
| | Off | System doesn't work |
| Online | On | Router accesses to Internet |
| | Off | Router doesn't access to Internet |
| Alarm | On | ● SIM/UIM Card is not insert corectly or broken<br>● Antenna signal is too weak |
| | 1 Blink Per | Cellular module was not registered to router |

| | | |
|---|---|---|
| | Second | |
| | 2 Blinks Per Second | Router can’t access to Internet |
| | Off | Router doesn’t have any alarm |
| WAN | On | WAN is connected |
| | Off | WAN is not connected |
| LAN | Blink | LAN works |
| | Off | LAN is not connected |

## 2.4 Reset

You can click Reset button to reset settings to factory defaults to solve the problem of incorrect configuration that makes you couldn’t access to internet, login and management, etc.
Use a needle object(such as pen) to insert into hole of ‘Reset’, hold until all the LED indicators turn off.

# 3. Configuration and Management

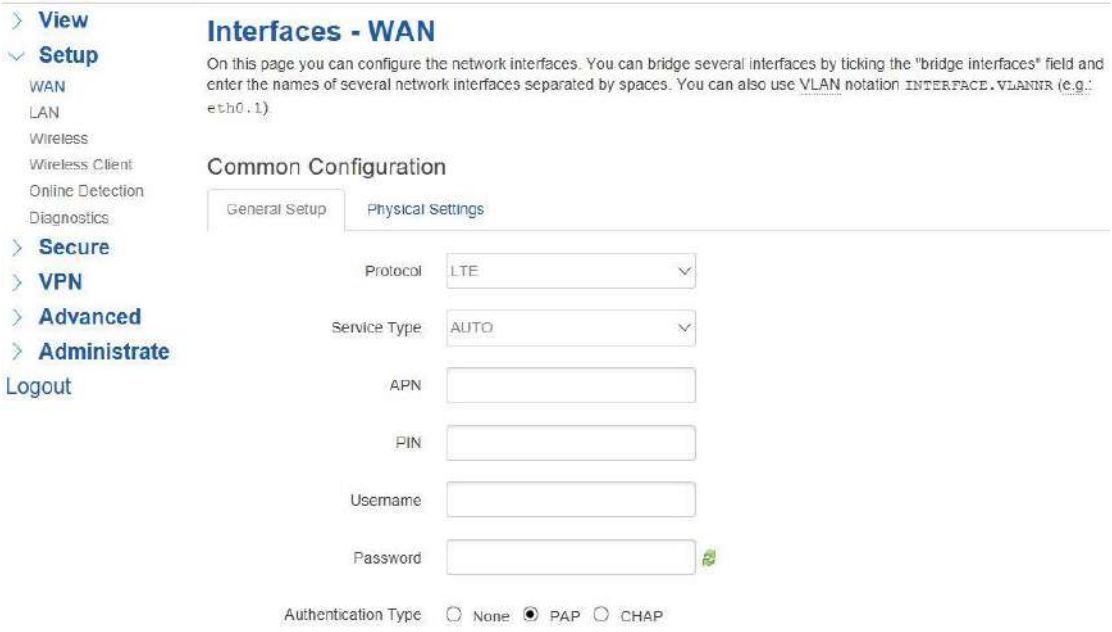
Use an Ethernet cable to connect the LAN port of TR321 to your laptop, or use your laptop or mobile phone to connect to WIFI hotspot ‘Bivocom’ of TR321, login with password: admin123, then configure you local IP to 192.168.1.100.
Open browser, enter 192.168.1.1 to enter into to login page, enter username: admin, and password: admin, to go to configuration page.

## 3.1 Setup

Main menu of this page includes, WAN, LAN, Wireless, Online Detection, Diagnostics.

### 3.1.1 WAN

WAN supports DHCP/Static IP/PPPoE/3G/LTE connection mode.
Choose the mode you need, then click ‘Switch Connection Mode’ and configure the related parameters, then you can connect to the internet.




**1) Server Type**

Type of network, the default value is AUTO, you can keep it or choose your own preference.

**2) APN**

Different carrier might have different APN, please ask your carrier if you have no idea of what your APN is.

**3) PIN**

PIN code of SIM card, please use it carefully, or the SIM card may be locked.

**4) PAP/CHAP Username**

Only for private network SIM card, if you’re using public network SIM card, just keep it as null.

**5) PAP/CHAP Password**

Only for private network SIM card, if you’re using public network SIM card, just keep it as null.

### 6) Call Center No.

When you're using SIM card, different carrier may have different call center Number, please ask your carrier for this info if you have questions.

### 7) Authentication Type

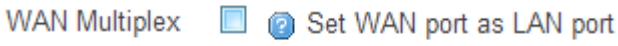
If there have username and password, you need to choose authentication type.

- PAP, Plaintext Authentication
- CHAP, Handshake authentication

You need to choose the authentication type according to carrier's network, or you may fail to dial up.

### 8) WAN Used As LAN

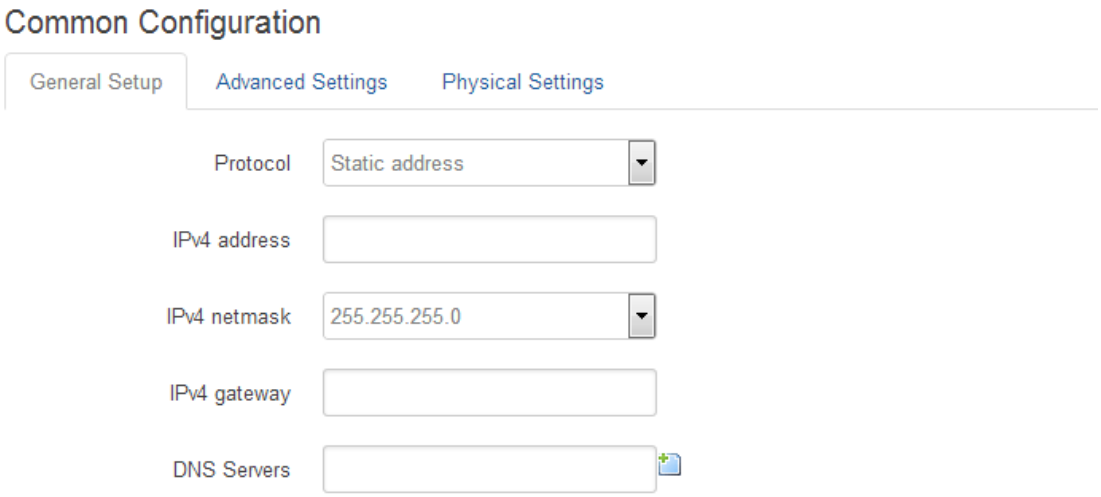
When you use 4G/3G/2G cellular network to access internet, you can change the WAN to act as a LAN port.




## 3.1.2 LAN

Menu of LAN are mainly for configuring IP address of router, enabling DHCP server, and assign the IP address.

The meaning of the parameters are as follows.



### 1) IPv4 Address

To configure IP address of LAN port.

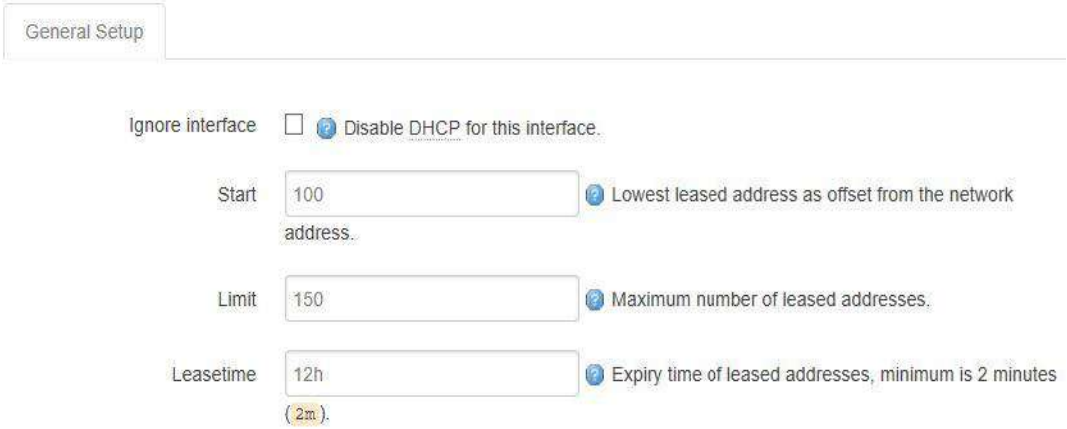
### 2) IPv4 Netmask

The netmask of LAN port IP address.

### 3) IPv4 Gateway

Specify the next-hop routing gateway.

### 4) DHCP Settings




- **Disable DHCP**

Click to disable DHCP server.

- **Start**

Assign the IP address of DHCP server. For example, 100 means IP address starts from 192.168.1.100.

- **Limit**

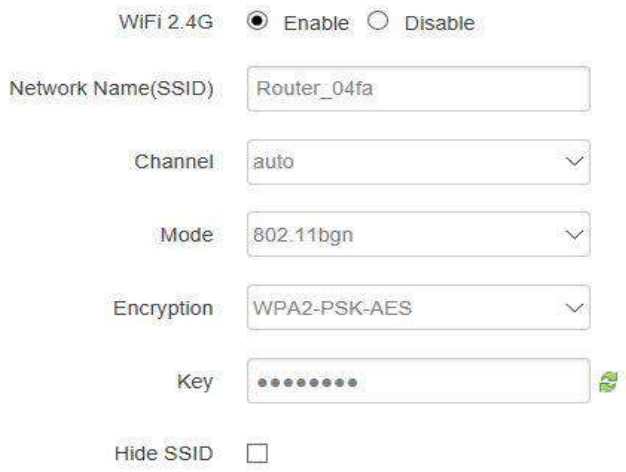
Assignable number of IP address, to ensure numbers of IP address of start and limit not exceed 250.

- **Lease time**

Time of assigning the IP address.

### 3.1.3 Wireless (Option)

Menu of wireless are mainly for configuring the SSID, work mode, password, etc.




**1) WIFI 2.4G**

Click ‘Enable’, to enable the WIFI function.

**2) Network Name（SSID）**

WIFI network name.

**3) Channel**

Support 1-13 channels, default value is auto, channel can be changed automatically.

**4) Mode**

Support 802.11b, 802.11g, 802.11bgn.
802.11b up to 11Mbps, 802.11g up to 54Mbps and 802.11n up to 300Mbps.

**5) Encryption**

You can only choose below types if the mode is set as 802.11b or 802.11g.


**6) Key**

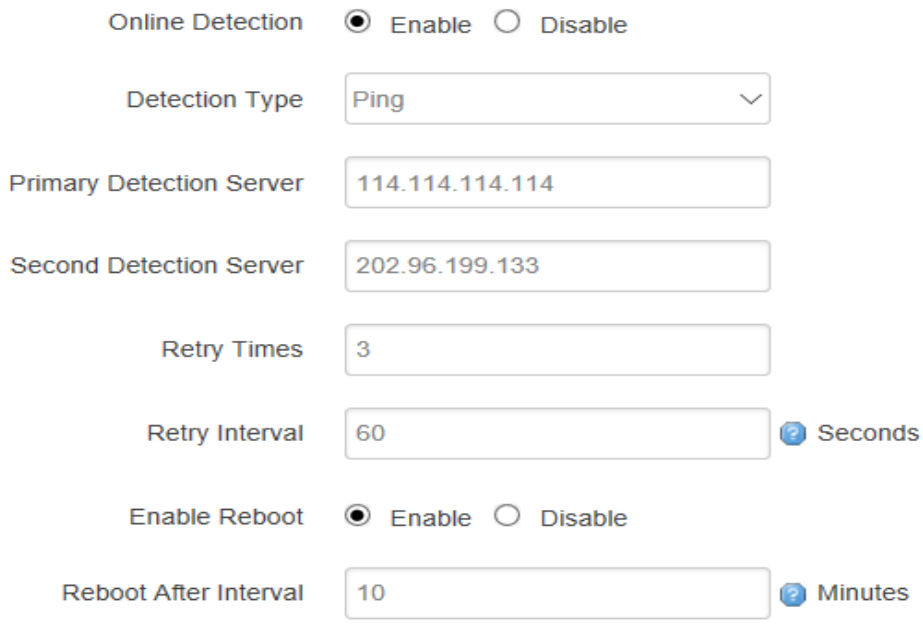
Password of sharing the WIFI, user need to enter it to access the internet. The minimum length of password is 8 bytes.

**7) Hide SSID**

When Hide SSID enabled, SSID is invisible, and user need to enter the SSID to share the WIFI.

### 3.1.4 Online Detection

Online detection will auto check the internet connection status of the router, if there has issue of connection, router will auto reconnect. If it fails to reconnect after times of trial, router will reboot, to ensure getting online.
The meaning of the parameters are as follows.



**1) Detection Type**

There are 3 types: ping, traceroute and DNS.

- **Ping**

Router will ping an IP address or DNS, if works, that means router is online.

- **Traceroute**

Traceroute will trace routing path, if achieves the target address, that means router is online.

- **DNS**

DNS will analytic a domain, if it works, that means router is online.

Note: the default setting is Ping, which is highly recommended, as traceroute will cost dataflow of SIM card, while DNS is faster, but as it has cache, it may shows the router is online even it is offline.

**2) Primary Detection Server**

It can be an IP address or a Domain Name.

**3) Second Detection Server**

If primary detection server fails, then router will auto switch to second detection server.

**4) Retry Times**

You can set up retry time in case detection fails.

**5) Retry Interval**

The interval time between 2 detection.

**6) Enable Reboot**

Click enable, and router will reboot within the time set if it fails to reconnect.

**7) Reboot After Interval**

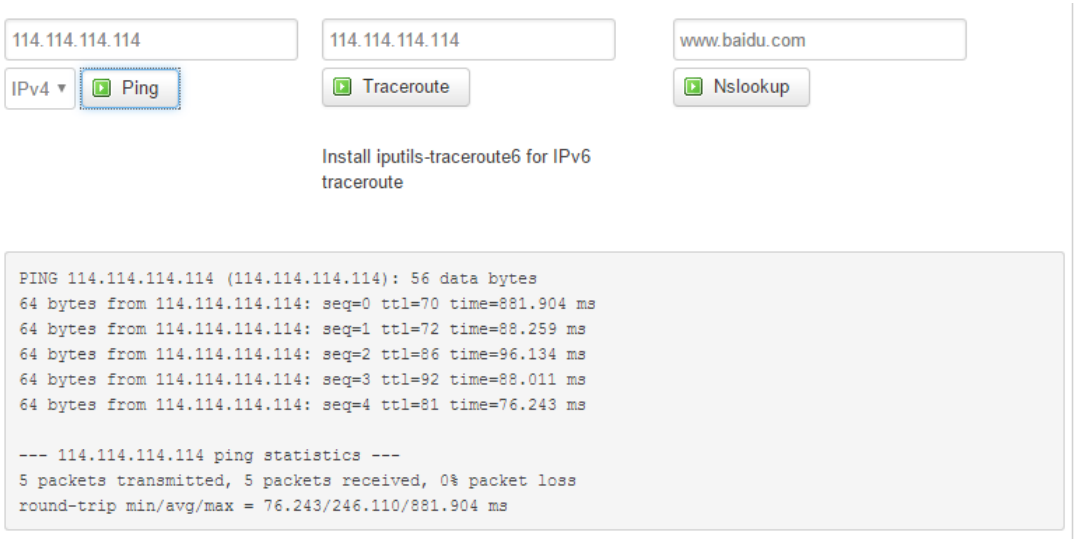
You can specify the time for offline, to reboot the router.

### 3.1.5 Diagnostics

There are 3 types of diagnostics: ping, traceroute and nslookup
Parameter of ping and traceroute can be a Domain Name or an IP address, used for checking if router is online or not. While nslookup is to analytic domain.

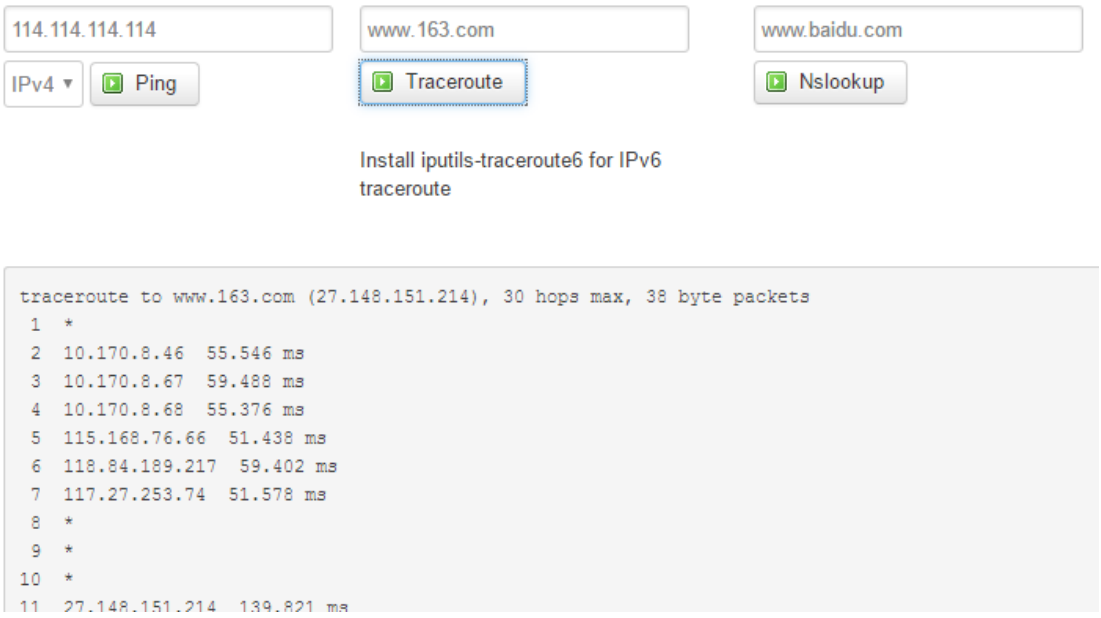
#### 1) Ping

Click ping, then you can check if there is response from an IP address, as bellow.




#### 2) Traceroute

Click traceroute, then you can see similar reponse as below.



**3) Nslookup**

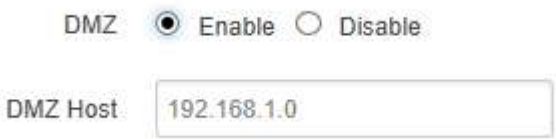
Click nslookup, then you can see similar reponse as below.


## 3.2 Security

Menu of Security are for configuring the firewall, to ensure the security of accessing to internet, and implement the port forwarding, access control, data packet filtering, and other functions.

### 3.2.1 DMZ Host

DMZ can forward the port of WAN to a host of LAN; all packet from WAN will be forwarded to specified host of LAN.




**1) DMZ**

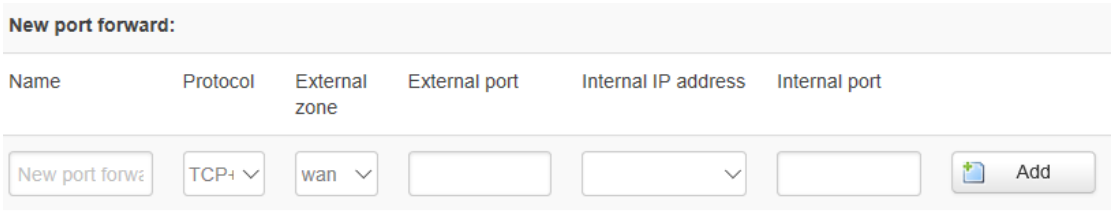
You can enable or disable the DMZ.

**2) DMZ Host**

An IP address of a host of LAN you want to map.

### 3.2.2 Port Forwarding

Comparing with DMZ, Port Forwarding is for more precise control, user can forward the data packet of a port to a host of LAN, to forward different port to different host.

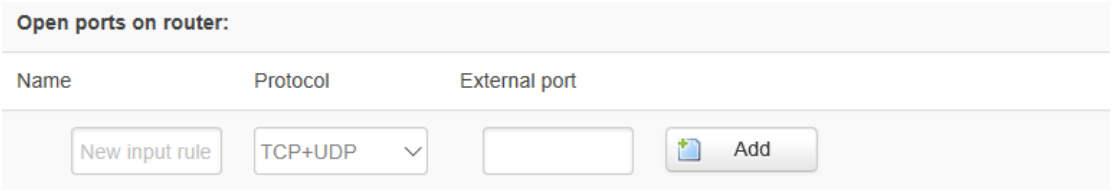



**1) Name**
You can name the rule you created.
**2) Protocol**
You can choose TCP, UDP, or TCP/UDP.
**3) External Port**
Destination port before port forwarding.
**4) Internal IP Address**
The Host IP address to forward.
**5) Internal Port**
The destination port after port forwarding. Normally, external port and internal port are the same, but also can be different.

After configured above-mentioned, click ‘Add’, then a new rule will be added, and click ‘Save & Apply’, to have the rule take effect.

### 3.2.3 Traffic Rules

Traffic rules is used for opening some router ports, such as remote access the configuration page of router, you can open port 80; for remote SSH connection, you can open port 22.



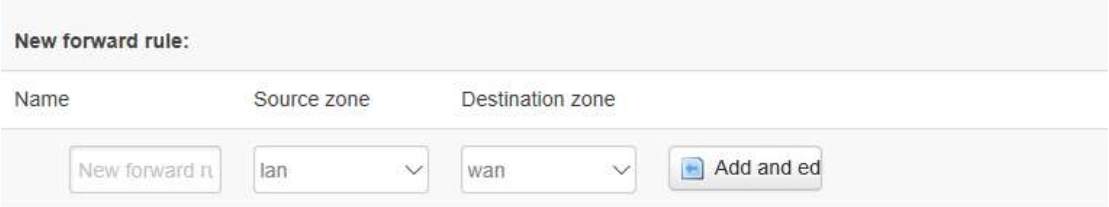

**1) Name**
You can name the rule yourself.
**2) Protocol**

Choose the protocol of you want to forward can be TCP, UDP, or TCP/UDP.

**3) External Port**

Choose the port you want to open.

**In addition, traffic rule can be used for creating some access control rules, it can be from LAN to WAN, or WAN to LAN.**




**1) Name**

You can name the rule yourself.

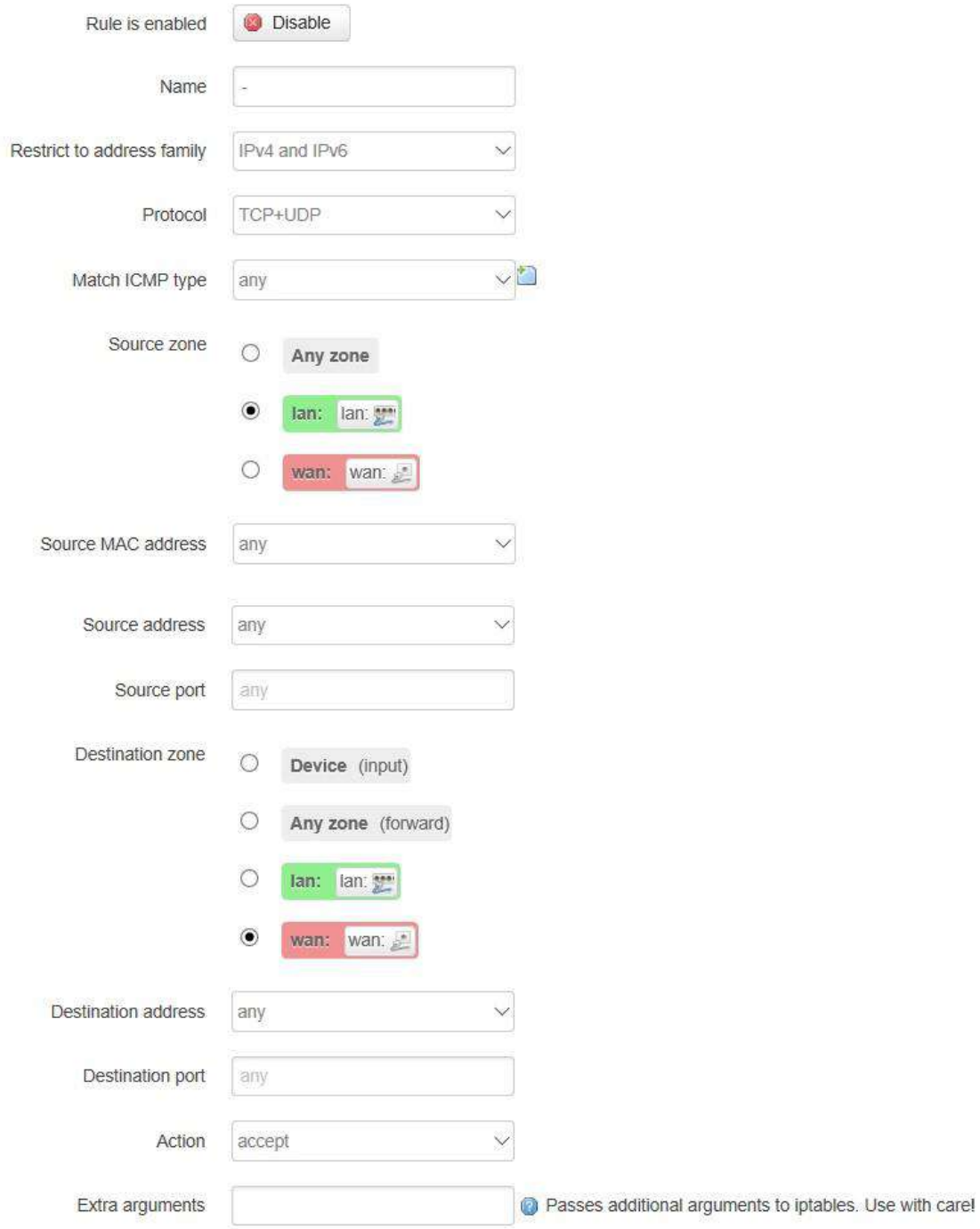
**2) Source Zone**

You can choose where to start the data packet.

**3) Destination Zone**

You can choose where to forward the data packet.

**Click ‘Add and Edit’, then you can get more detailed matching condition.**




**1) Restrict to Address Family**

You can choose IPv4, IPv6, or Pv4/IPv6.

**2) Protocol**

To choose the protocol you want for access control, it can TCP, UDP or TCP/UDP.

**3) Source MAC Address**

To choose the source MAC address of data packet.

**4) Source Address**

To choose the source IP address of data packet.

**5) Source Port**

To choose the source port of data packet.

**6) Destination Address**

To choose the destination IP address of data packet.

**7) Destination Port**

To choose the destination port of data packet.

**8) Action**

If the above-mentioned conditions matched, then you can choose below actions.

- **Accept**

Allow data packet to go through.

- **Drop**

Drop data packet

- **Reject**

Drop data packet, and return an unachievable data packet.

- **Don’t Track**

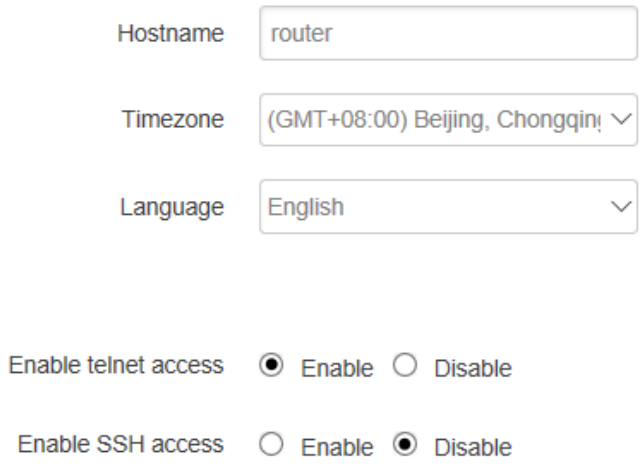
No action.

### 3.2.4 Custom Settings

Users can also customize some firewall rules themselves, as those rules is consist of iptable, we suggest users that are familiar with iptables command to do this. When you add rules, please add them at the bottom of existing rules, and don’t delete them.

## 3.3 Management

### 3.3.1 System



**1) Host Name**

The host name of router, default name is router.

**2) Time Zone**

Set up the time zone of system, default time zone is GMT8.

**3) Language**

Change the language of configuration interface, default language is English.

**4) Enable Telnet Access**

To enable the telnet server, the default function is enable.

**5) Enable SSH Access**

To enable the SSH server, the default function is disable.

### 3.3.2 Password

To revise the password of router.


**1) Origin Password**

You'll be required to enter your origin password before your revise your new password.

**2) Password**

Type the new password you want to change.

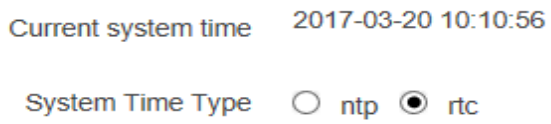
**3) Confirmation**

Type the new password again to confirm it.

If the new password and confirmation password you type is different, then it fails to revise the password. After password revised, router will return to login page, then you can enter your username and password.

### 3.3.3 Time Setting

System time type includes RTC (Real Time Clock) and NTP (Network Time Protocol).
RTC will save time even router is powered off, while for NTP, router will connect to NTP server which requires internet connection, time won't be saved once powered off. But NTP will be more accurate than RTC, and you may need to adjust the time manual if it is not accurate.




**1) Current System Time**

Display the time of router.

**2) System Time Type**

It includes NTP and RTC mentioned above, and different type has different configuration parameters

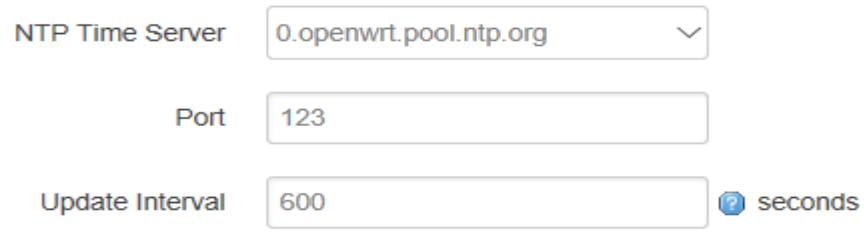
- **RTC**

You can update data and time yourself.


**RTC Data**
Format must be: 20xx-xx-xx (Year-Month-Day), or you will fail to update it.

**RTC Time**
Format must be xx: xx: xx (Hour-Min-Second), or you will fail to update it.

- **NTP**



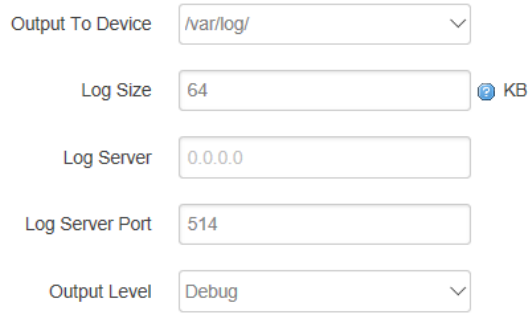

**NTP Time Server**
You can select the NTP time server through drop-down menu, or you can customize it yourself.

**Port**
NTP time server port, default port is 123.

**Update Interval**
How long to sync the time with NTP server, default time is 600 seconds.

### 3.3.4 Log Settings

Log settings is for configuring the output parameters of system log.




**1) Output to Device**

You can output the log to serial port, or specified file path, or external storage device, and the default path is:/var/log/

**2) Log Size**

Set up the size of log, default value is 64KB.

**3) Log Server**

Set up the IP address of log server.

#### 4) Log Server Port

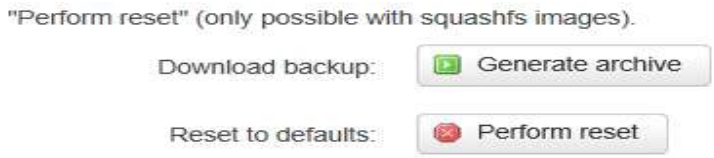
Set up the port of log server, default value is 514

#### 5) Output Level

There are several levels supported, including ‘Debug’, ’Info’, ‘Notice’, ‘Warning’, ‘Error’, and level increased in sequence, the higher level, the less output log.

### 3.3.5 Backup and Reset

User can either backup the configuration of router, or reset to factory defaults.



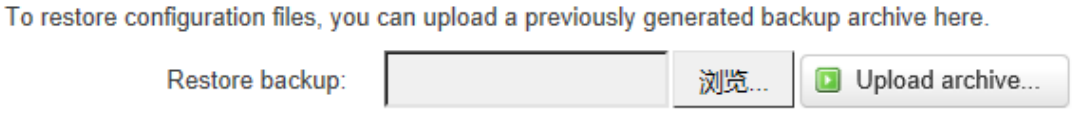

#### 1) Download Backup

Click to generate a configuration file in format of “backup-router-2016-**-**.tar.gz”.

#### 2) Reset to Default

Click ‘Perform Reset’, and a pop-up confirmation box with ‘Really Reset All Changes’ will display, then click ‘OK’ to reset to factory defaults.

#### 3) Restore Backup




After reset to default, you can also upload the saved configuration file to router, to recover the previous configuration. Click ‘upload archive’, select and upload the backup configuration file, and a pop-up confirmation box with ‘Really Restore’ will display, then click ‘OK’, to recover the configuration.

### 3.3.6 Firmware Upgrade

Before you upgrade the firmware for router, make sure the firmware you’re planning to upload is correct. If errors occurs, use serial port and connect the Ethernet cable, upgrade

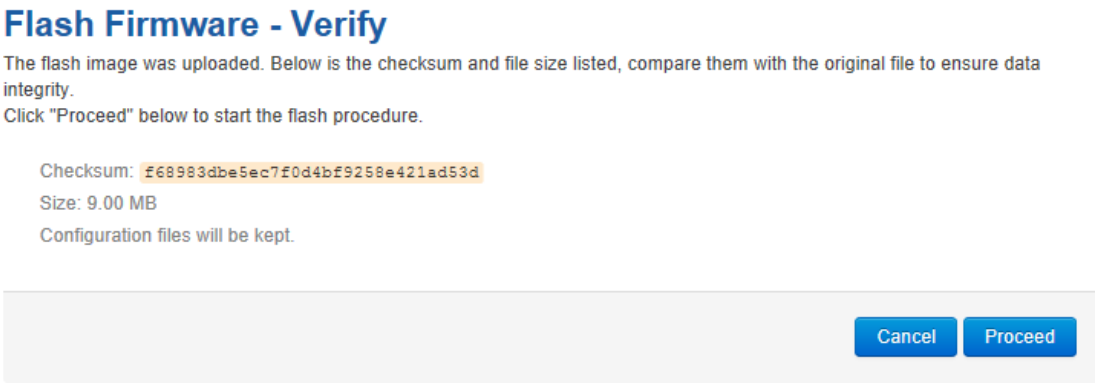
the firmware through u-boot.


**1) Keep Settings**

Click it, and system configuration will not be changed after firmware upgrade.

**2) Choose and Upload Firmware Image**

Click ‘browse’ and select the firmware, then click ‘Flash Image’, and firmware will be upload to router. Then you’ll go to below page.




- **Checksum**

MD5 checksum value of firmware.

- **Size**

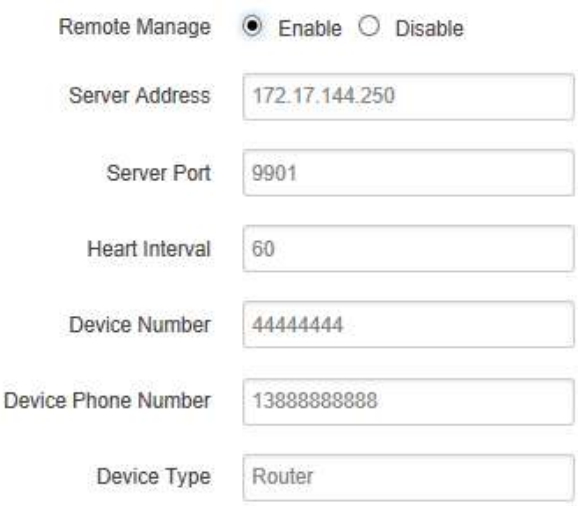
The size of firmware.

- **Proceed**

Click ‘proceed’ to start the firmware upgrade, or click ‘cancel’ to stop the firmware upgrade.

### 3.3.7 Remote Management

You can configure the IP address and port of remote server, device number and phone number of router, etc., as below.




**1) Remote Manage**

You can enable or disable this function to choose if you want to remote manage the router or not.

**2) Server Address**

Type the specified login server address you want to remote mange the router, it can be either an IP address or Domain Name.

**3) Server Port**

The specified login server port.

**4) Heartbeat Interval**

The heartbeat time interval (Unit: second)

**5) Device Number**

Device ID of router.

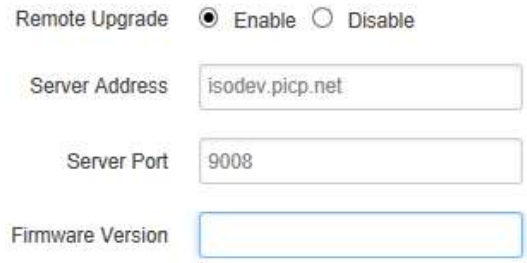
**6) Device Phone Number**

The phone number of SIM card insert in router.

**7) Device Type**

Type of the device, default is router.

You can also remote upgrade the firmware for router, as below.




**8) Remote Upgrade**

Click ‘Enable’ to enable remote firmware upgrade function.

**9) Server Address**

Type the server IP address or Domain Name for remote upgrade.

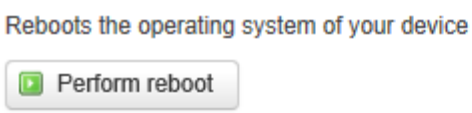
**10) Server Port**

Type the server port for remote upgrade.

**11) Firmware Version**

Type the firmware version that you want to upgrade remotely.

### 3.3.8 Reboot



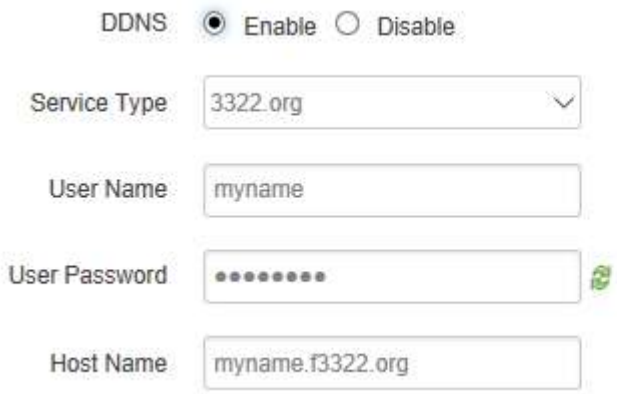

Click ‘Perform Reboot’, and a pop-up confirmation box with ‘Really Reboot’ will display, then click ‘OK’ to reboot the router.

## 3.4 Advanced

You can set up some advanced functions here.

### 3.4.1 Dynamic DNS

If the assigned public IP address of router is dynamic and changes frequently, you can enable DDNS function, while allows you to register a domain to bundle with the IP address, in this case, no matter what the IP address changed, it will direct to your registered domain.




**1) Service Type**

There are several types of DDNS service supported in router, as below.


**2) User Name**

The username you register at DDNS service provider.

**3) User Password**

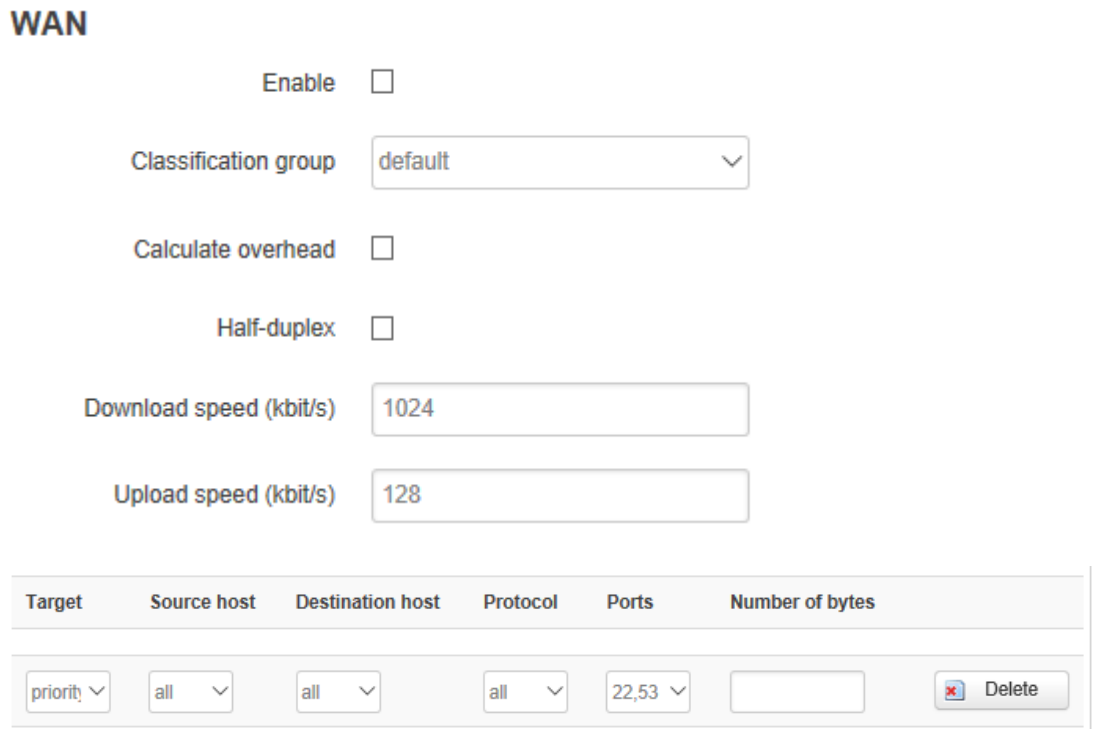
The password you set up when registering the user name at DDNS service provider.

**4) Host Name**

The register domain you want to bundle.

### 3.4.2 QoS Settings

QoS helps you to set up priority for different IP address and port. You can choose ‘Priority’, ‘Express’, ‘Normal’, ‘Low’.
You can set up the download and upload speed and click ‘Enable’ to limit the speed.




**Target:** Specify the priority.
**Source Host:** To match the source IP of data packets.
**Destination Host:** To match the destination IP of data packets.
**Protocol:** To match the protocol of data packets.
**Ports:** If it is TCP/UDP, then the port can be matched.
If above-mentioned are configured, and router will auto implement the related priority level.

### 3.4.3 Static Routing

Static routing is used to add a routing table entry.


**Interface:** To choose which interface you want to add routing.
**Target:** Can be a host IP, or subnet.
**IPv4 Netmask:** The netmask of subnet, if the target is host, the netmask shall be

255.255.255.255.
**IPv4 Gateway:** The address of next-hop gateway address.
Note: this address shall be achievable, or you'll fail to add static routing.

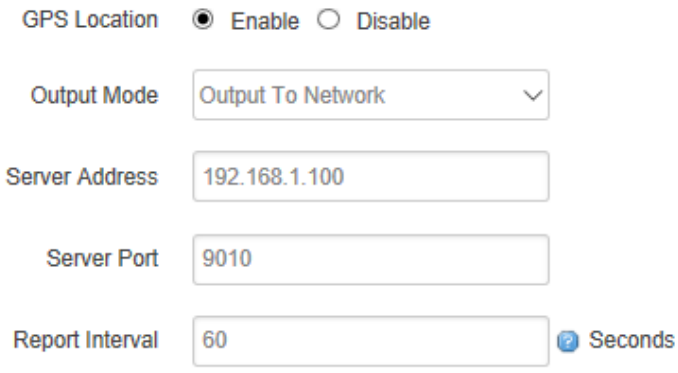
### 3.4.4 Base Station Location (Option)

Base station location is to locate the TR321 by obtaining the nearest base station number, this function is mainly for rough location of indoor application.
Enter the server IP address and port that you want to report the location of router, then router will auto report its location to server regularly(within the interval time you set).


**Server Address:** The IP address of server that you want the router to report the location, which is based on TCP connection.
**Server Port:** The port of server.
**Report Interval:** The interval time for auto report of router location, default value is 60 seconds.

### 3.4.5 GPS (Option)

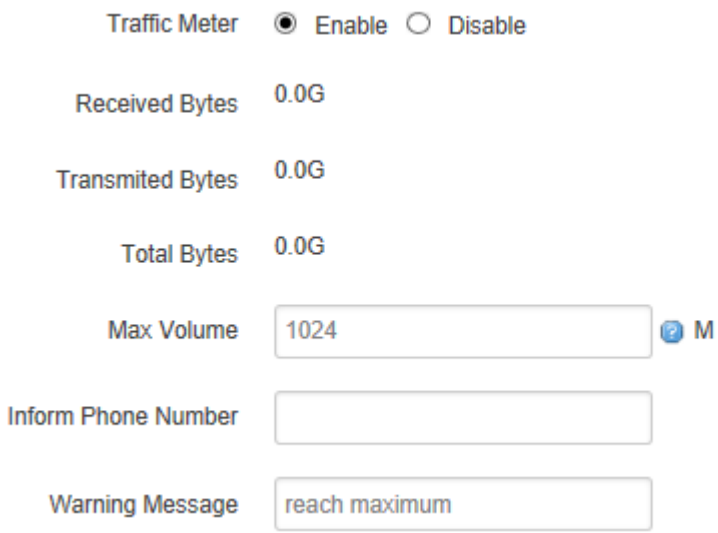
GPS location will report GPRMV information regularly, saying longitude and latitude information. And this function is used for accurate location of outdoor open area.




**Server Address:** The IP address of server that you want the router to report the location, which is based on TCP connection.
**Server Port:** The port of server.
**Report Interval:** The interval time for auto report of router location, default value is 60 seconds.

### 3.4.6 Traffic Meter

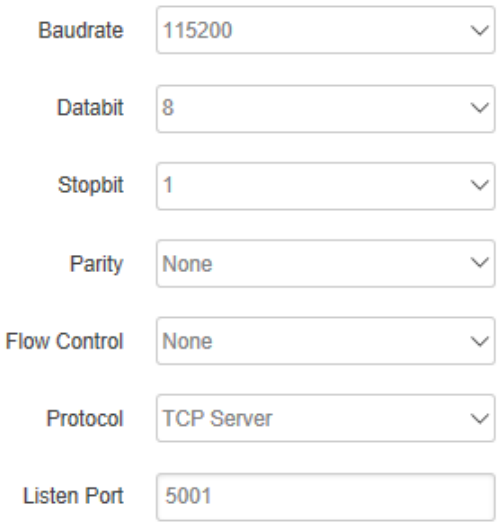
The traffic meter function of TR314 is for traffic statistics from WAN port, meanwhile, it has traffic overflow alarm function. Even if the router is powered off, the traffic statistics will be saved, and when you power on the router, the traffic will be counted based on your last time traffic.




**Received Bytes:** Current bytes received.
**Transmitted Bytes:** Current bytes transmitted.
**Total Bytes:** The total bytes of received bytes and transmitted bytes.
**Max Volume:** The max volume you set to alarm.
**Inform Phone Number:** The cell phone number you set for receiving warning message.
**Warning Message:** The warning message configured phone number will receive once the traffic exceeds the max volume you set, only support English and number input.

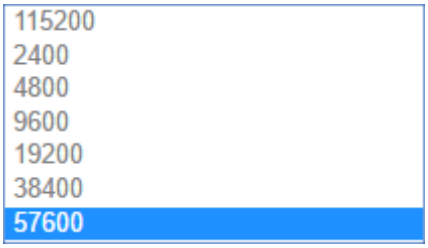
### 3.4.7 Serial Application

The serial port will transfer the data to server, or server will transfer the data to serial port.




**1) Baud Rate**

There are some baud rate supported below, and default value is 115200.




**2) Databit**

8 and 7, default value is 8.

**3) Stopbit**

2 and 1, default value is 1.

**4) Parity check**

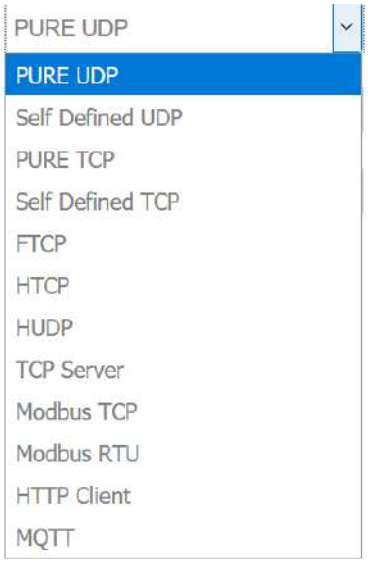
None, Odd Check and Even Check, default value is None.

**5) Flow Control**

None, Hardware and Firmware, default is None.

### 6) Protocol

There are some transmission protocols of serial port data, as below.




**UDP (DTU):** Configured as UDP client, which can be connected to UDP server, specified device number and heartbeat interval is required.
**TCP (DTU):** Configured as TCP client, which can be connected to TCP server, specified device number and heartbeat interval is required.
**PURE UDP:** Configured as pure UDP client.
**PURE TCP:** Configured as pure TCP client.
**TCP Server:** Configured as TCP server.
**Customed TCP:** Custom TCP client, it can be format of custom register string, heartbeat string.
If configured as client, a specified address of server is required.
**Server Port:** Port of server.
**Heartbeat Interval:** The interval time of heartbeat string sent by client.
**Custom Heartbeat String:** Hexadecimal format.
**Custom Register String:** Hexadecimal format.

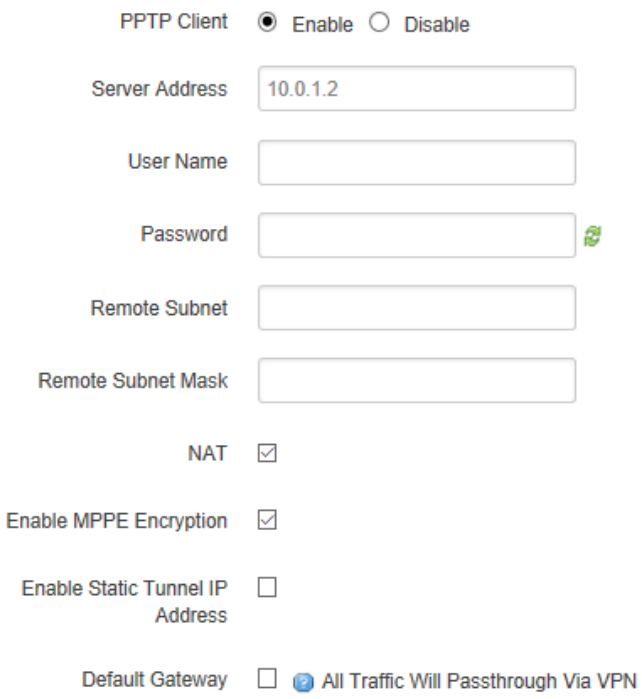
## 3.5 VPN

VPN is used to establish a virtual private channel, and all the data in this channel will be encrypted to ensure that data security during transmission.
TR321 support VPN: PPTP, L2TP, OpenVPN and IPSec. PPTP/L2TP are layer 2 VPN, and OpenVPN is VPN based on SSL, while IPSec layer 3 VPN. PPTP/L2TP are more convenient to use, while OpenVPN and IPSec is more complex, as they need complex certification management, meanwhile, they offer more secured encrypted data.

### 3.5.1 PPTP

You can configure either PPTP client or PPTP server, but not both of them at the same time, as that may cause uncertain issues.

#### 1) PPTP Client




**1. PPTP Client**

You can enable or disable PPTP client.

**2. Server Address**

To enter the IP address or Domain Name of PPTP server.

**3. User Name and Password**

To enter the user name and password provided by server.

**4. Remote Subnet**

To enter the remote subnet, for example, if LAN of PPTP server is 192.168.2.1, then you can enter remote subnet 192.168.2.0.

**5. Remote Subnet Mark**

To enter the remote subnet mask, normally it is 255.255.255.0.

**6. NAT**

If click NAT, all packets come from ppp0, and the source IP of the packets will be replaced as IP of ppp0.

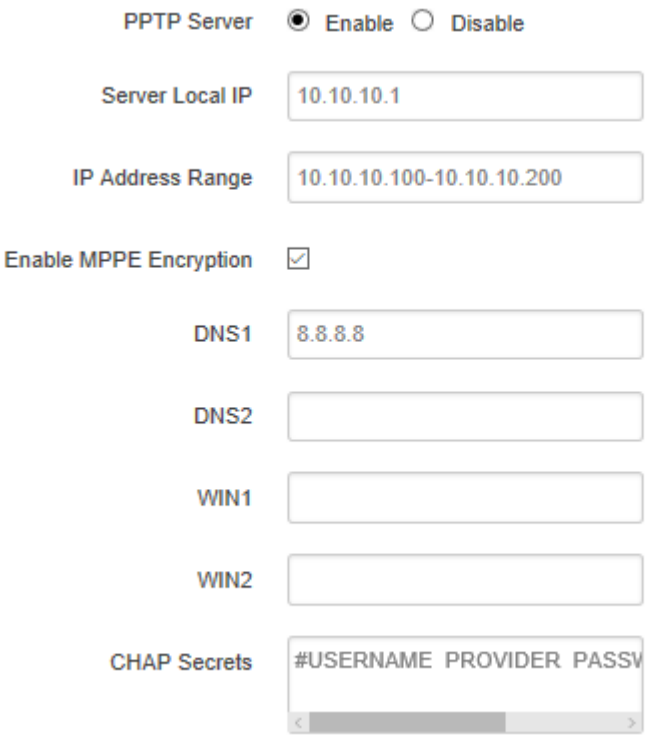
**7. Enable MPPE Encryption.**

You can enable MPPE encryption here.

**8. Default Gateway**

Click Default Gateway, then a default route will be established under ppp0, and all the data will go through this route.

**2) PPTP Server**




**1. PPTP Server**

You can enable or disable PPTP server.

**2. Server Local IP**

To enter the server local IP address.

**3. IP Address Range**

Type the range of assigned IP address.

**4. Enable MPPE Encryption.**

You can enable MPPE encryption here.

**5. DNS1/DNS2**

To enter the assigned DNS address.

**6. WIN1/WIN2**

To enter the WIN address.

**7. CHAP Secrets**

To create an username and password under CHAP Secrets, format as below,

Username<space>*<space>password<space>*

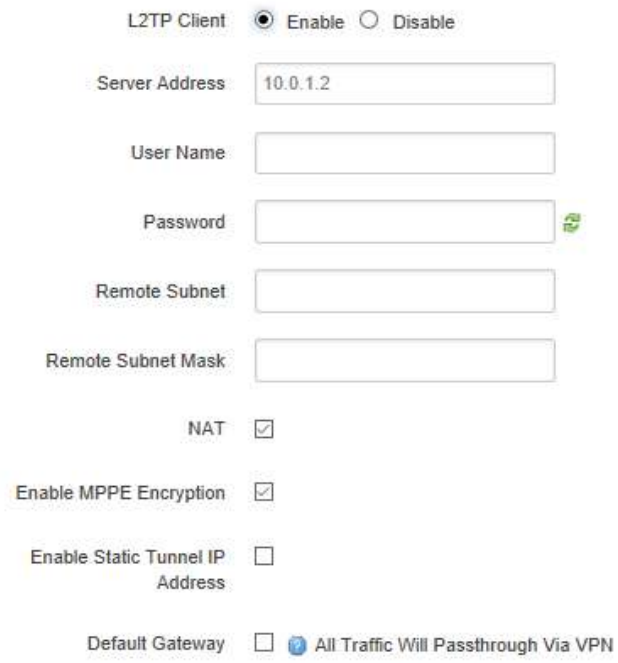
For example, if you want to create a username: test, password: test, it is as below,

Test * testing *

### 3.5.2 L2TP

You can also configure either L2TP client or L2TP server, but not both of them at the same time, as that may cause uncertain issues.

#### 1) L2TP Client




**1. L2TP Client**

You can enable or disable L2TP client.

**2. Server Address**

To enter the IP address or Domain Name of L2TP server.

**3. User Name and Password**

To enter the user name and password provided by server.

**4. Remote Subnet**

To enter the remote subnet, for example, if LAN of L2TP server is 192.168.2.1, then you can enter remote subnet 192.168.2.0.

**5. Remote Subnet Mark**

To enter the remote subnet mask, normally it is 255.255.255.0.

**6. NAT**

If click NAT, all packets come from ppp0, and the source IP of the packets will be replaced as IP of ppp0.

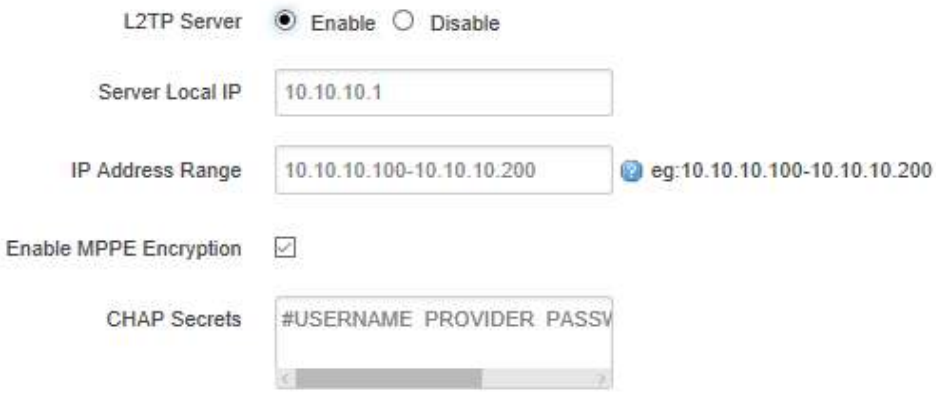
**7. Enable MPPE Encryption.**

You can enable MPPE encryption here.

**8. Default Gateway**

Click Default Gateway, then a default route will be established under ppp0, and all the data will go through this route.

## 2) L2TP Server




**1. L2TP Server**

You can enable or disable L2TP server.

**2. Server Local IP**

To enter the server local IP address.

**3. IP Address Range**

Type the range of assigned IP address.

**4. Enable MPPE Encryption.**

You can enable MPPE encryption here.

**5. CHAP Secrets**

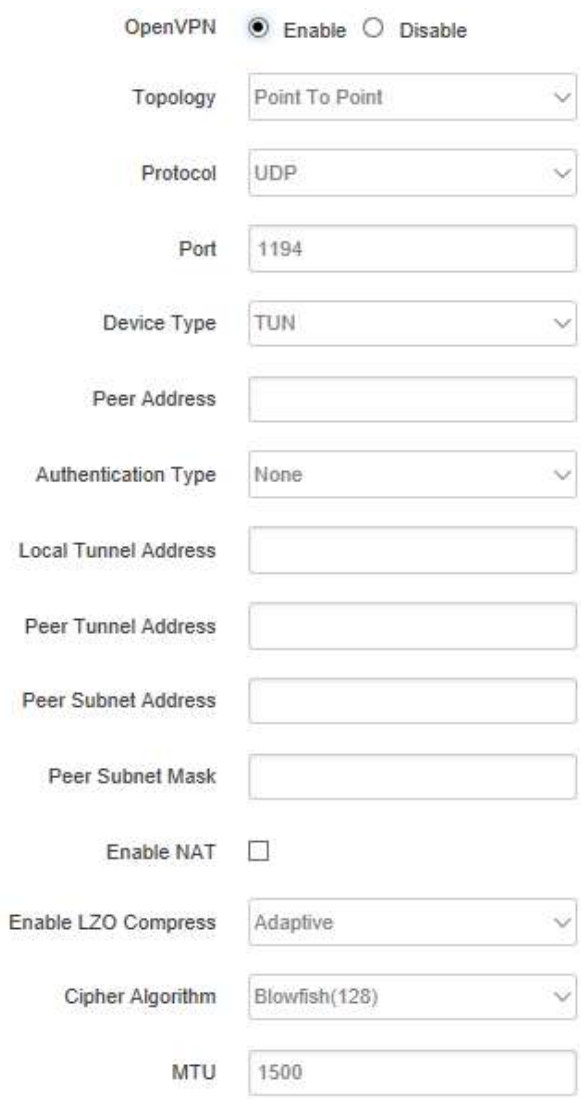
To create an username and password under CHAP Secrets, format as below,

Username<space>*<space>password<space>*

For example, if you want to create a username: test, password: test, it is as below,

Test * test *

### 3.5.3 OpenVPN




**1) OpenVPN**

You can enable or disable OpenVPN.

**2) Topology**

Choose the topology, it can be point to point or subnet

Note: For point to point, a tunnel will be established between 2 devices.

While for subnet, multi devices will be connected to one server.

**3) Role**

When topology is subnet, you need to choose you want it be a server or client.

**4) Protocol**

Choose the protocol, it can be UDP or TCP, default is UDP.

**5) Port**

Enter the port you want to assign to OpenVPN, default port is 1194.

**6) Device Type**

Choose device type, there are 2 types to choose, TUN and TAP. TUN is layer 3 data encapsulation, while TAP is layer 2 data encapsulation.

**7) OpenVPN Server**

When you choose server in 角色, you need to enter an IP address or domain name of server.

**8) Authentication Type**

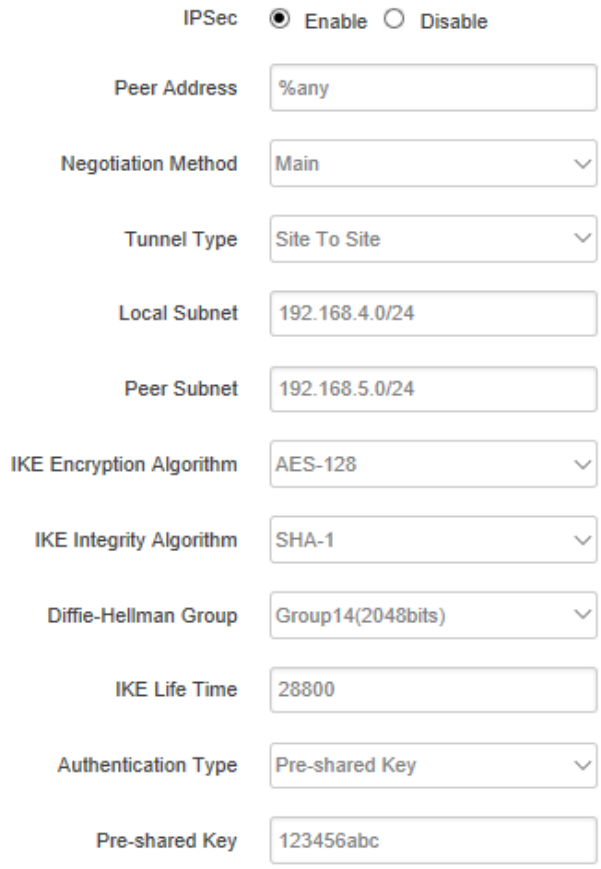
If topology is subnet, authentication type is certification. If it is point to point, you can choose none, certificate or static secret.

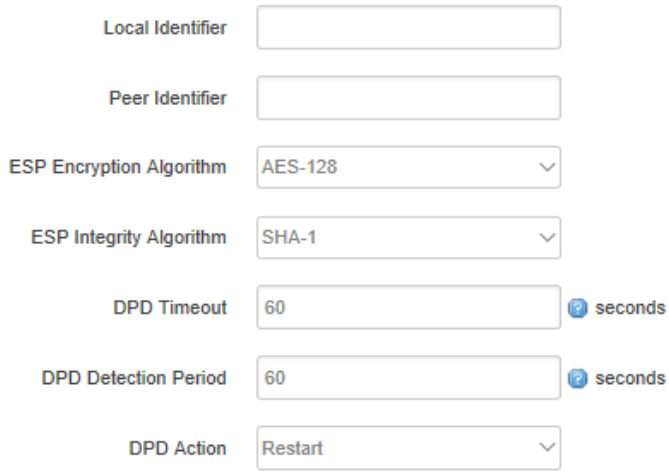
**9) TLS Role**

When topology is point to point, and authentication type is certification, you need to choose if it is server or client.

### 3.5.4 IPSec

On IPSEC page, system will display the IPSEC connection and status.






**1) Peer Address**

To enter peer IP address or Domain Name, if choose as a server, you don't need to enter it.

**2) Negotiation Method**

You can choose 'Main' or 'Aggressive'.

**3) Tunnel Type**

You can choose 'Site to Site, 'Site to Host', 'Host to Host', 'Host to Site'.

**4) Local Subnet**

Local subnet and mask, like 192.168.10.0/24.

**5) Peer Subnet**

Peer subnet and mask, like 192.168.20.0/24.

**6) IKE Encryption Algorithm**

IKE phase encryption method

**7) IKE Lifetime**

To set up IKE lifttime.

**8) Local Identifier**

Local identifier of channel, can be an IP address or domain name.

**9) Peer Identifier**

Peer identifier of channel, can be an IP address or domain name.

**10) ESP Encryption Algorithm**

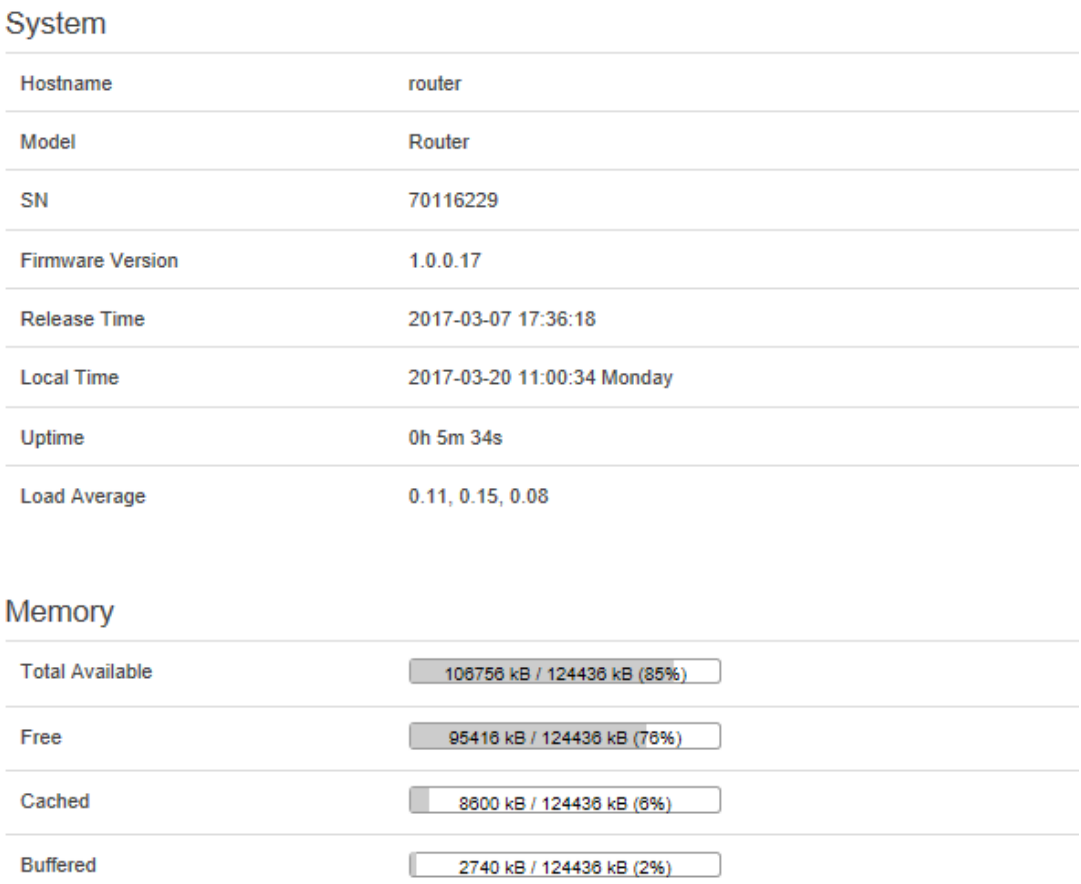
The encryption method of ESP.

## 3.6 View

To check the following system information.

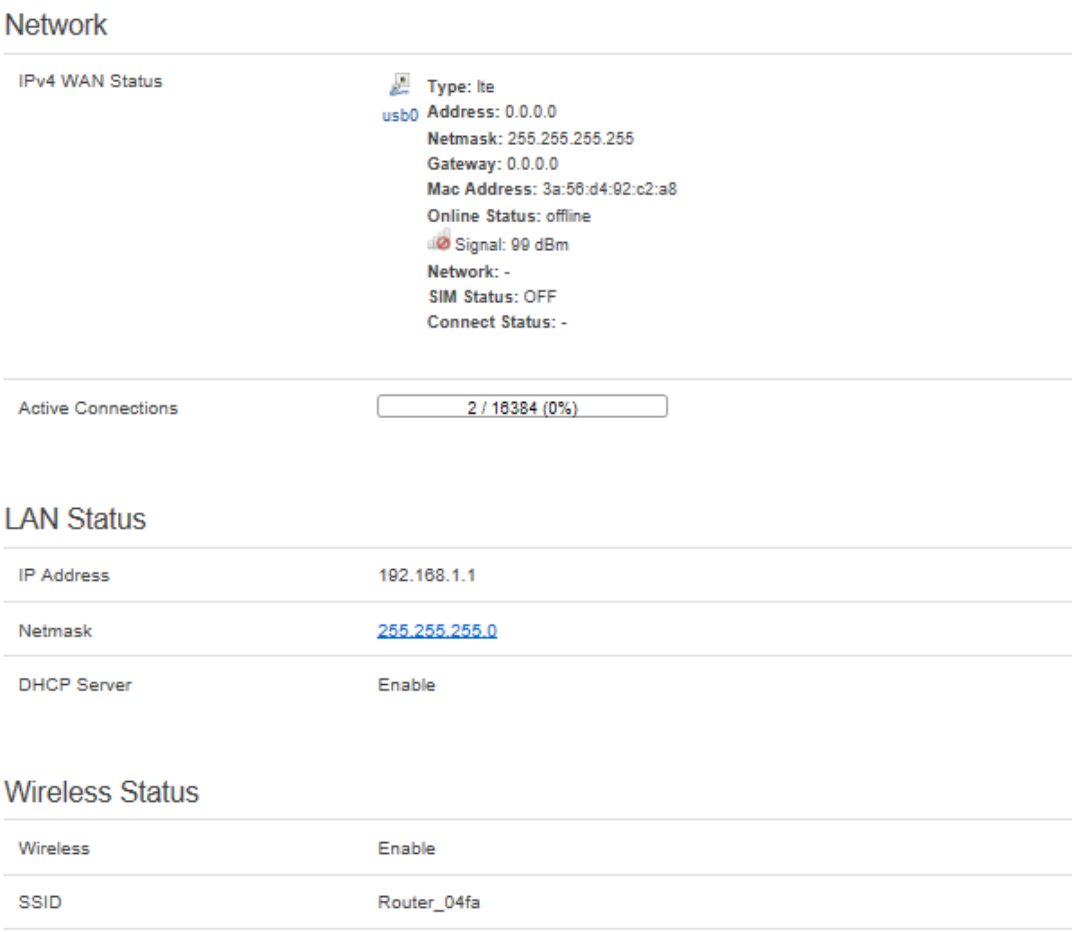
### 3.6.1 System

Display system information.




### 3.6.2 Network

Display network information.




### 3.6.3 Routing Tables

Display routing tables.

ARP

| IPv4-Address | MAC-Address | Interface |
|---|---|---|
| 192.168.1.100 | 1c:39:47:3f:28:1d | br-lan |

Active IPv4-Routes

| Network | Target | IPv4-Gateway | Metric |
|---|---|---|---|
| lan | 192.168.1.0/24 | 0.0.0.0 | 0 |

Active IPv6-Routes

| Network | Target | IPv6-Gateway | Metric |
|---|---|---|---|
| loopback | 0:0:0:0:0:0:0:0/0 | 0:0:0:0:0:0:0:0/0 | FFFFFFFF |
| loopback | 0:0:0:0:0:0:0:1 | 0:0:0:0:0:0:0:0/0 | 00000000 |
| (eth2) | FF00:0:0:0:0:0:0:0/8 | 0:0:0:0:0:0:0:0/0 | 00000100 |
| lan | FF00:0:0:0:0:0:0:0/8 | 0:0:0:0:0:0:0:0/0 | 00000100 |
| (ra0) | FF00:0:0:0:0:0:0:0/8 | 0:0:0:0:0:0:0:0/0 | 00000100 |
| wan | FF00:0:0:0:0:0:0:0/8 | 0:0:0:0:0:0:0:0/0 | 00000100 |
| loopback | 0:0:0:0:0:0:0:0/0 | 0:0:0:0:0:0:0:0/0 | FFFFFFFF |

### 3.6.4 System Log

Display system log.


### 3.6.5 VPN Status

Display VPN status.