XPON/EPON ONU

USER MANUAL

Version V2.0

Release Date 2019-06-26

Contents

Chapter 1 Product Introduction

1.1 Product Description

Thank you for choosing the 1G3F+WIFI+CATV+POTS XPON ONU. The product is designed as HGU (Home Gateway Unit) in deferent FTTH solutions. The carrier-class FTTH application provides data service access. It is based on mature and stable, cost-effective XPON technology. XPON can switch automatically with EPON and GPON mode when it accesses to the EPON OLT or GPON OLT. It adopts high reliability, easy management, configuration flexibility and good quality of service (QoS) guarantees to meet the technical performance of the module of Telecom EPON CTC3, and GPON Standard of ITU-TG.984.

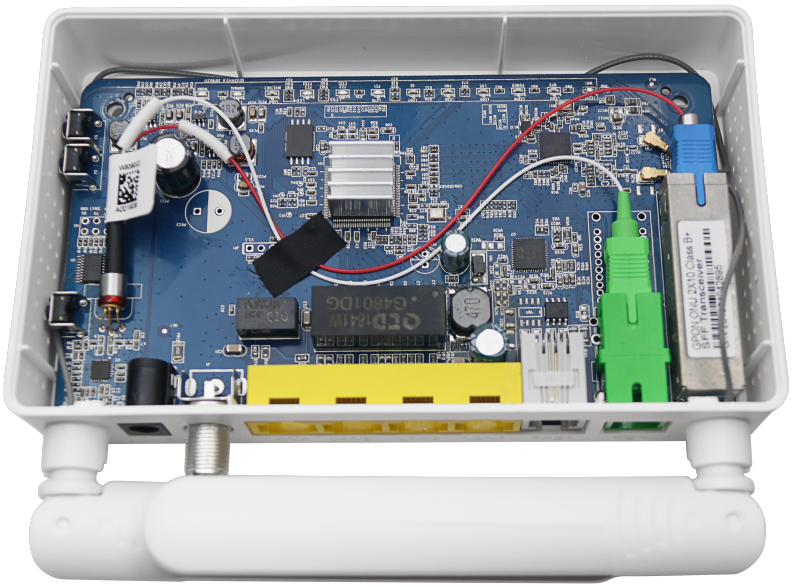


Figure 1-1: 1G3F+WIFI+CATV+POTS XPON ONU

1.2 Special features

- Support EPON and GPON Mode
- Support ONU auto-discovery/Link detection/remote upgrade of software
- WAN connections support Route and Bridge mode
- Route mode supports PPPoE/DHCP/ static IP
- Support IPv4/IPv6

- Support WIFI Interface and multiple SSID
- Support QoS and DBA
- Support port VLAN configuration
- Support Firewall function and IGMP snooping multicast feature
- Support LAN IP and DHCP Server configuration;
- Support Port Forwarding and Loop-Detect
- Support TR069 remote configuration and maintenance
- Support Pots interface for VoIP Service
- Support CATV interface for Video Service
- Specialized design for system breakdown prevention to maintain stable system

1.3 Technical Parameter

Technical item	Details
PON Interface	1 G/EPON port(EPON PX20+ and GPON Class B+) Receiving sensitivity: ≤-27dBm Transmitting optical power: 0~+4dBm Transmission distance: 20KM
Wavelength	TX: 1310nm, RX: 1490nm
Optical Interface	SC/UPC Connector (SC/APC Connector for CATV)
POTS interface	1 FXS, RJ11 connectors Support: G.711/G.723/G.726/G.729 codec Support: T.30/T.38/G.711 Fax mode, DTMF Relay Line testing according to GR-909
LAN Interface	LAN port for GE and FE automatic adaptive mode. Full/Half, RJ45 connector

CATV Interface	RF, optical power: +2~-18dBm Optical reflection loss: ⩾45dB Optical receiving wavelength: 1550±10nm RF frequency range: 47~1000MHz, RF output impedance: 75Ω RF output level: 78dBuV AGC range: 0~-15dBm MER: ⩾32dB@-15dBm
Wireless	Compliant with IEEE802.11b/g/n, Operating frequency: 2.400-2.4835GHz Support MIMO, Rate up to 300Mbps, 2T2R,2 external antenna 5dBi, Support: multiple SSID Channel: Auto Modulation type: DSSS, CCK and OFDM Encoding scheme: BPSK, QPSK, 16QAM and 64QAM
Push-Button	3,For Function of Reset、WLAN、WPS
Operating Condition	Temperature: 0℃~+50℃ Humidity: 10%~90%（non-condensing）
Storing Condition	Temperature: -30℃~+60℃ Humidity: 10%~90%（non-condensing）
Power Supply	DC 12V/1A

Power Consumption	≤6W
Dimension	155mm×92mm×34mm（L×W×H）
Net Weight	≤0.24Kg

Table 1: Technical parameters

1.4 Application chart

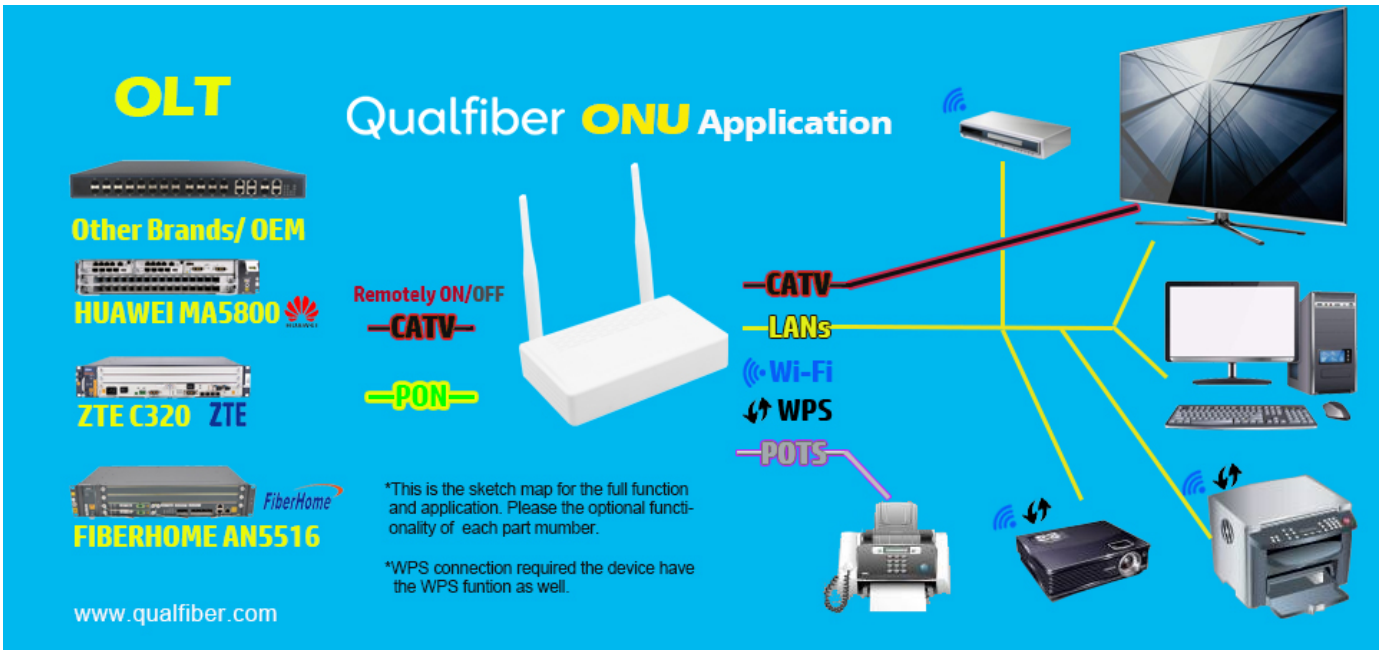


Figure 1-2: Application chart

1.5 Panel description

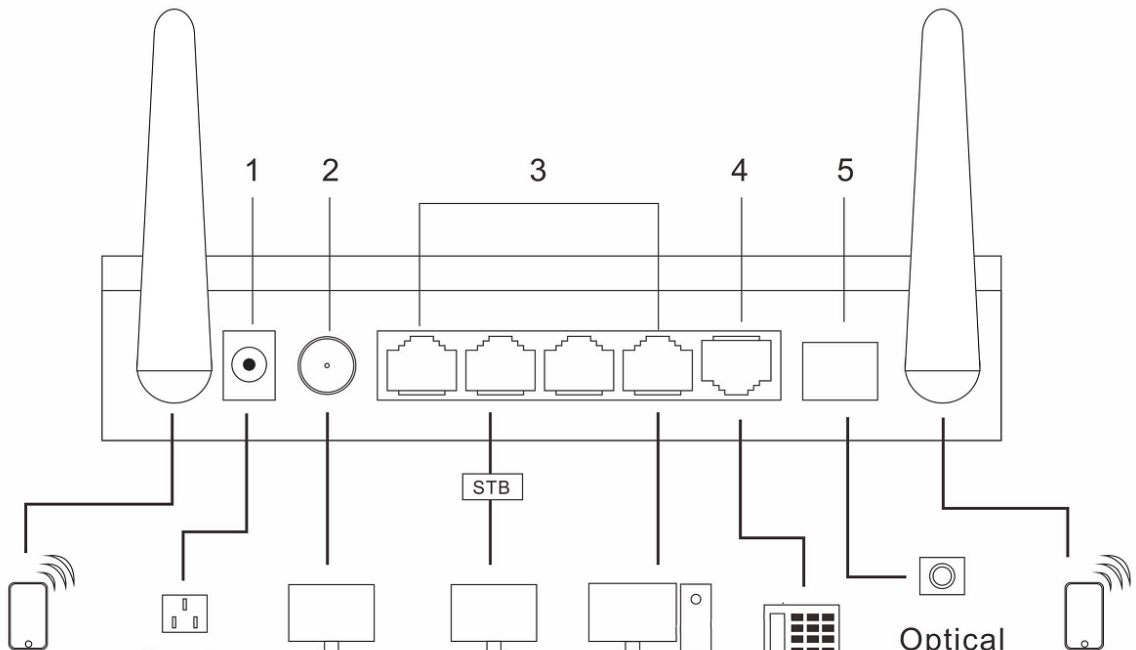


Figure 1-3: Rear View for multiple port

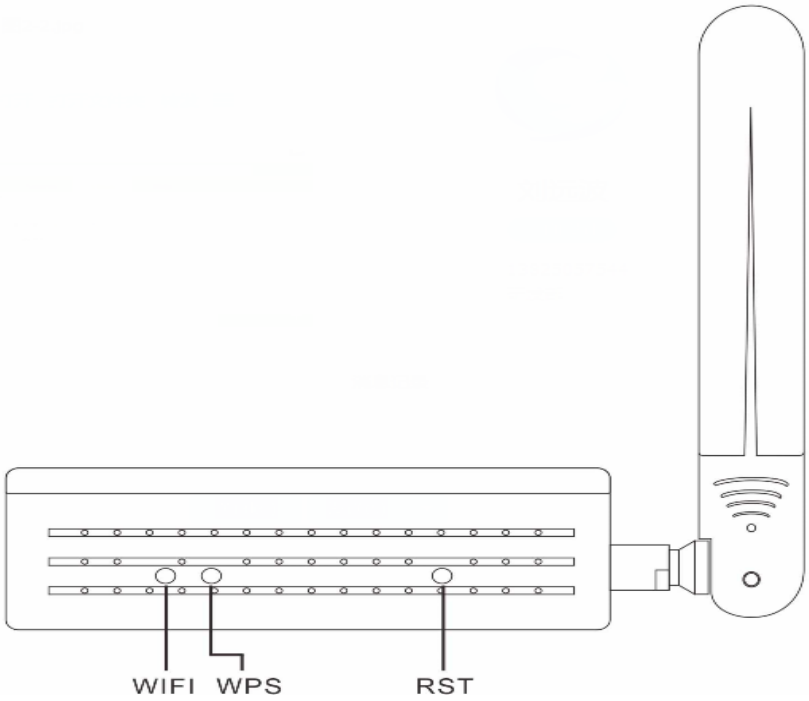


Figure 1-4: Push button Panel

Figure 1-5: Led Panel

LED	Status	Description
POWER	On	The device is powered up.
	Off	The device is powered down.
PON	On	The device has registered to the PON system.
	Blink	The device is registering the PON system.
	Off	The device registration is incorrect.

LOS	Blink	The device doses not receive optical signals.
	Off	The device has received optical signal.
SYS	On	The device system runs normally.
	Off	The device system runs abnormally.
WIFI	On	The WIFI interface is up.
	Blink	The WIFI interface is sending or/and receiving data (ACT).
	Off	The WIFI interface is down.
WPS	Blink	The WIFI interface is securely establishing a connection.
	Off	The WIFI interface does not establish a secure connection.
FXS	On	Phone has registered to the SIP Server.
	Blink	Phone has registered and data transmission (ACT).
	Off	Phone registration is incorrect.
LAN1~LAN4	On	Ethernet connected properly (LINK).
	Blink	Ethernet is sending or/and receiving data (ACT).
	Off	Ethernet connection exception or not connected.
Worn (CATV)	On	Input optical power is higher than 3dbm or lower than -13dbm
	Off	Input optical power is between -13dbm and 3dbm
Normal (CATV)	On	Input optical power is between -13dbm and 3dbm
	Off	Input optical power is higher than 3dbm or lower than -13dbm

Table 2: Panel Lights Description

Chapter 2 Quick Installation

2.1 Standard Packing Contents

When you receive our products, please check carefully to make sure that our products whether have some defects or not. If something wrong with shipping, please contact carrier; other damage or lack of some parts, please contact with dealer.

Contents	Description
ONU	1 pcs
Power Adapter	1 pcs
User Manual	1 pcs

Table 3: Packing Contents

Figure 2-1: Actual package content

2.2 Quick Installation

1. Connecting the optical fiber cable to the unit.
   a) Remove the protective cap of the optical fiber.
   b) Clean the end of the optical fiber with an optical fiber end cleaner.
   c) Remove the protective cap of the ONU optical interface (PON interface). Connect the fiber to the PON port on the unit.

   Note: When measuring the optical power before connecting to the ONU, it is recommended to use a PON Inline Power Meter. The receiver optical power should be between -7dbm and -28 dBm by using 1490nm.

While connecting, please note:

- Keep the optical connector and the optical fiber clean.
- Make sure there are no tight bends in the fiber and that the bending diameter is greater than 6cm. Otherwise, the optical signal loss may be increased, to the extent that signal may be unavailable.
- Cover all optic ports and connectors with protective cap to guard against dust and moisture when the fiber is not used.

2. Apply power to the unit. If the product has the power button, please push the power button before used.
3. After the ONU is power ON, Indicators should light up as for normal operation. Check whether the PON interface status LED (PON) is on continuously. If it is, the connection is normal; otherwise there is either problem of the physical connection or the optical level at either end. This may be caused by either too much or too little attenuation over the optical fiber. Please refer to the Panel Lights Description for normal LED activity.
4. Check all signal levels and services on all the ONU communication ports.

Unit Installation Adjustment

Installing the ONU on a horizontal surface (Bench top)

Put the ONU on a clean, flat, sturdy bench top. You must keep the clearance for all sides of the unit to more than 10cm for heat dissipation.

Chapter 3 Configuration

After finishing the basic connection configuration, you can use its basic function. In order to satisfy individuation service requirements, this charter provides the user parameter modification and individuation configuration description.

3.1 Login

The device is configured by the web interface. The following steps will enable you to login:

1、Conform “2.2 Quick Installation” to install;

2、The device management default IP address is 192.168.1.1;

3、Open your web browser, type the device IP in address bar;

4、Entry of the user name and password will be prompted. Enter the default login user name and password.

By default, there are two user levels for management. Administration level

*User name is "**superadmin**",*

*Password is "**superadminqf**".*

Normal level user name is "admin", password is "admin".

The Administration account is able to access and modify all settings of ONU. It also can modify user account's username and password.

The normal account can only be used to view configurations, status and configure few parameters.

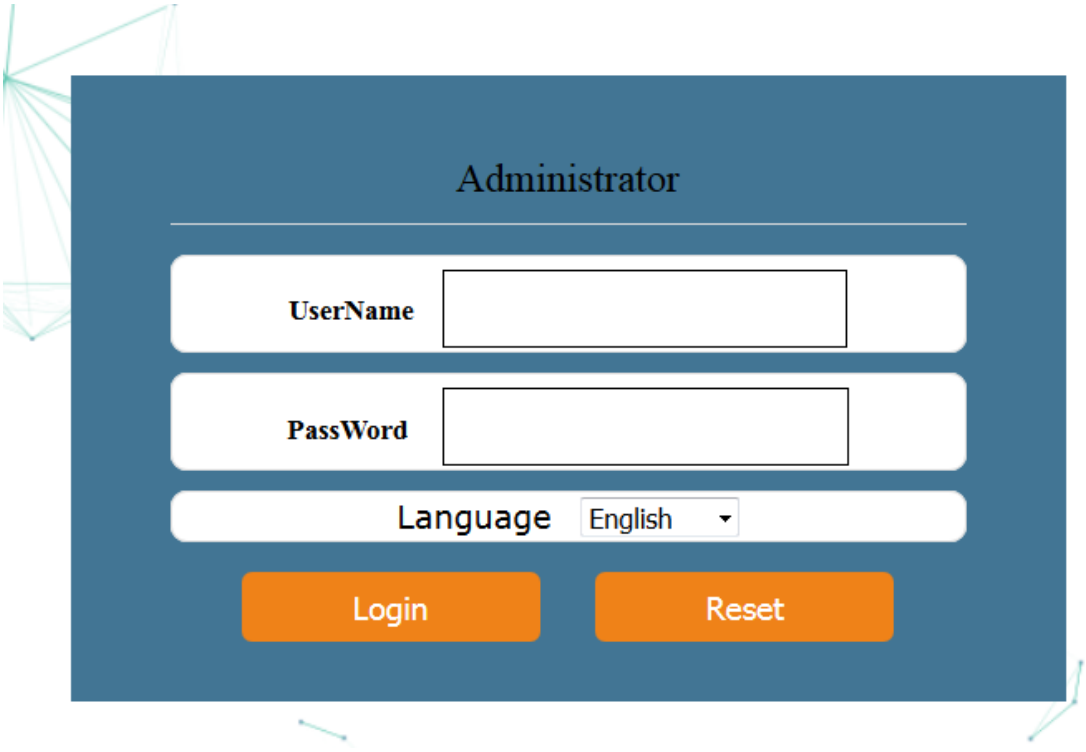


Figure 3-1: Login

3.2 Status

This part shows the main information of device and the active status about major services.

3.2.1 Device Information

This page shows the basic information about device, such as Device Type, PON MODE, Device Model, PON MAC /SN, Software Version, Register State.

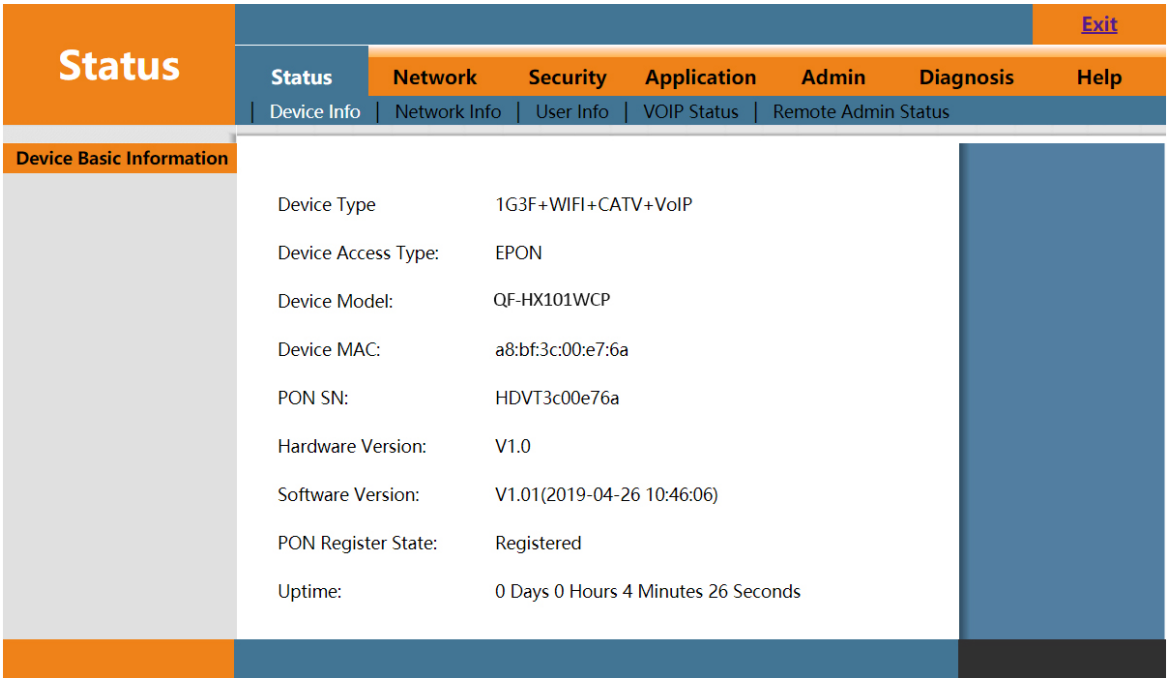


Figure 3-2: Device Information

3.2.2 Network Info

3.2.2.1 IPv4 WAN Connection Information

This page shows IPv4 WAN connection information you have configured.

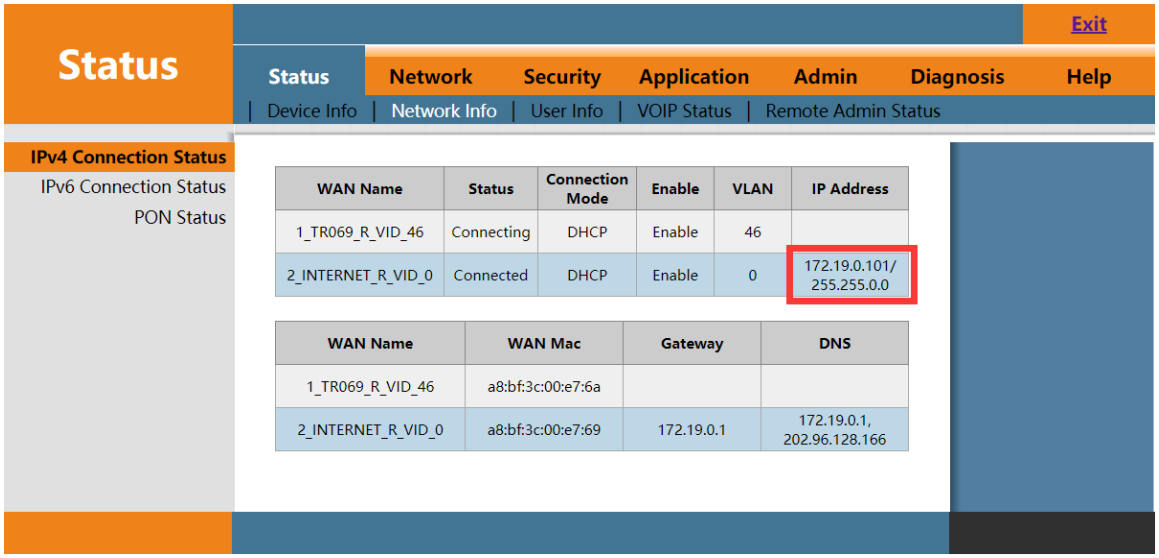


Figure 3-3: IPv4 WAN Information

3.2.2.2 IPv6 WAN Connection Information

This page shows IPv6 WAN connection information you have configured.

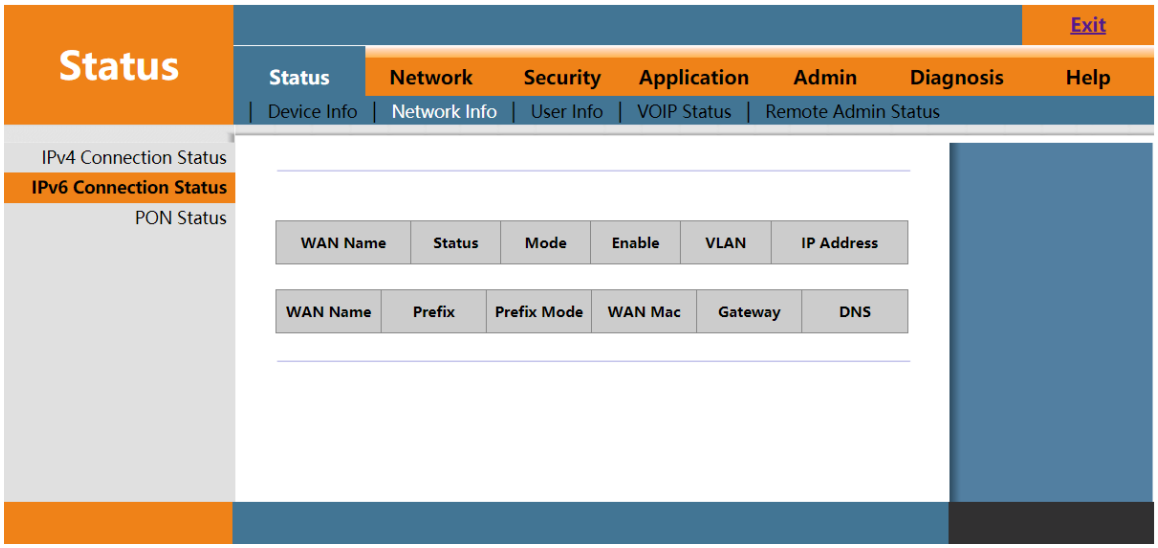


Figure 3-4: IPv6 WAN information

3.2.2.3 PON Information

This page shows the PON information, including Optical module information, Link Status, Performance statistics.

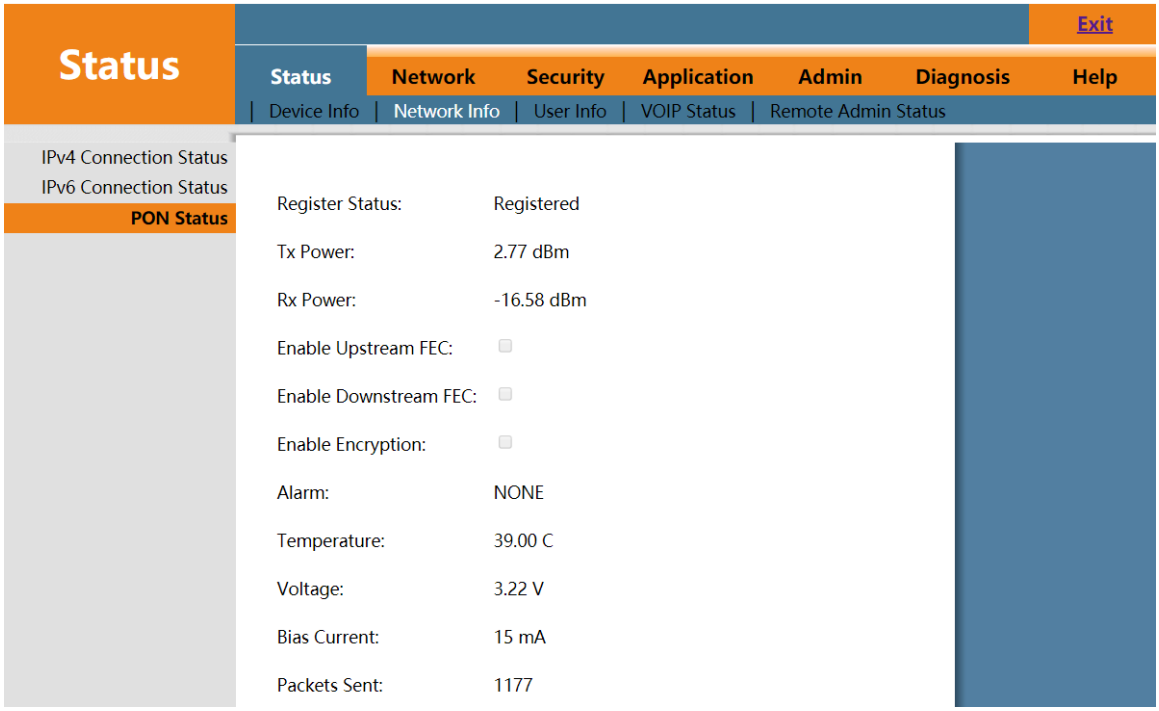


Figure 3-5: PON Status

3.2.3 User Information

3.2.3.1 LAN Interface Information

This page shows the Ethernet port information, including LAN Link Information, Transceiver statistics.

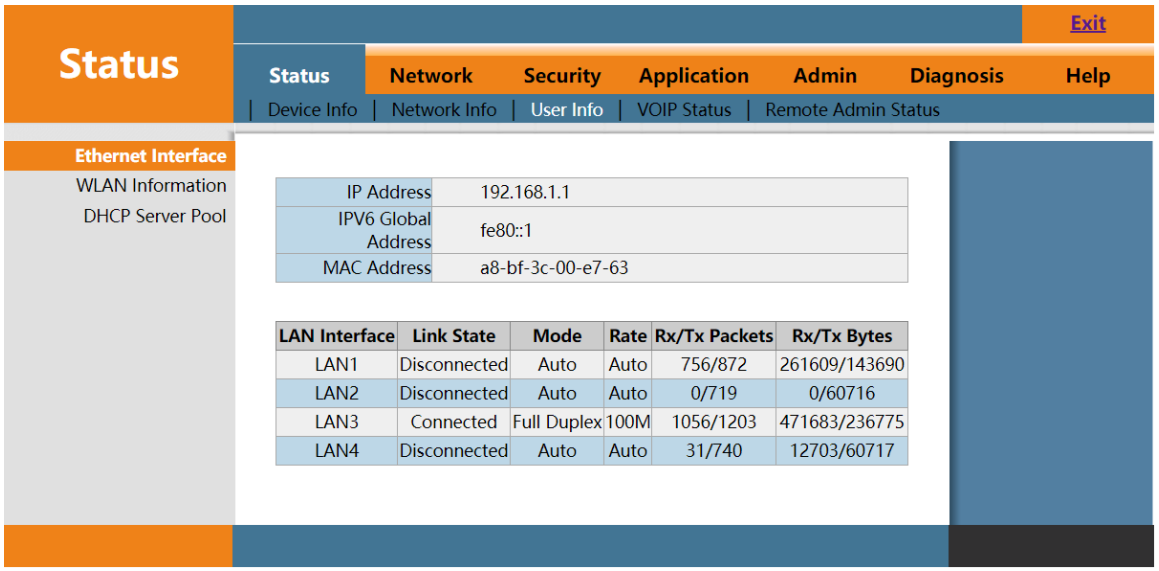


Figure 3-6: LAN Interface Information

3.2.3.2 WLAN Interface Information

This page shows the WLAN Interface information, including basic WIFI information and WIFI Client information.

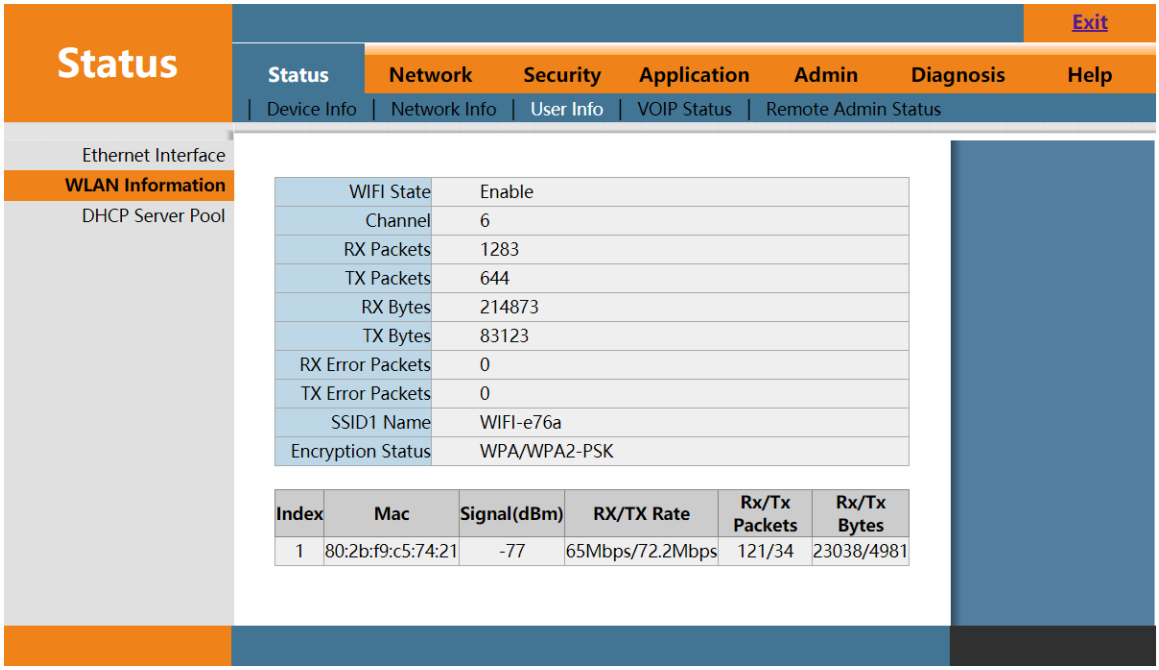


Figure 3-7: WLAN Interface Information

3.2.3.3 DHCP Pool Information

This page shows the DHCP Pool Information, including the DHCP client information.

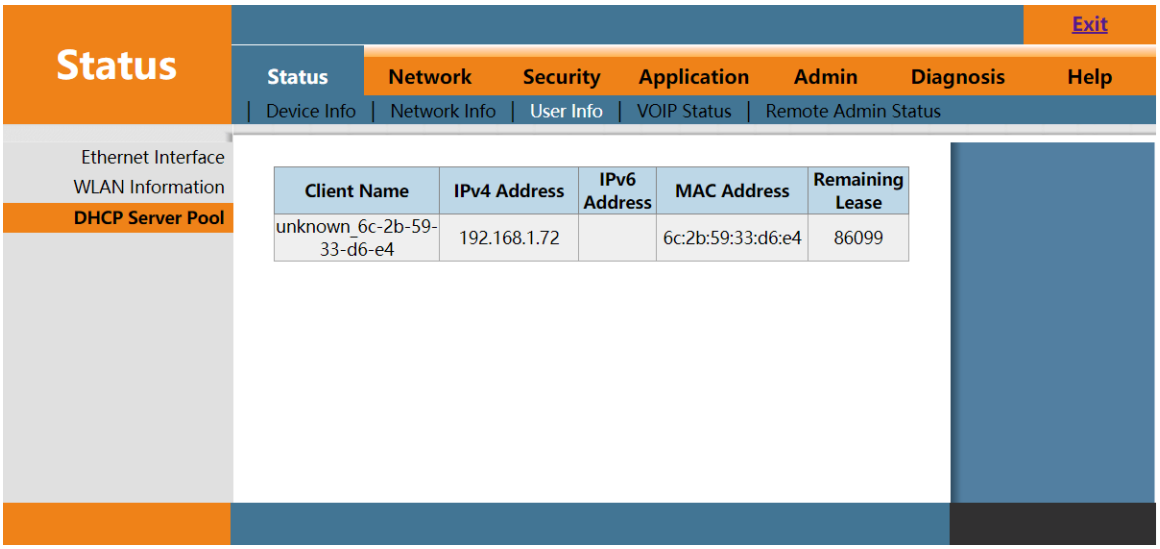


Figure 3-8: DHCP Pool Information

3.2.4 Voip Status

3.2.4.1 Phone Register Status

This page shows the register status of POTS1.Attention, you need to configure the part of VoIP Configuration. Otherwise, it couldn't be registered.

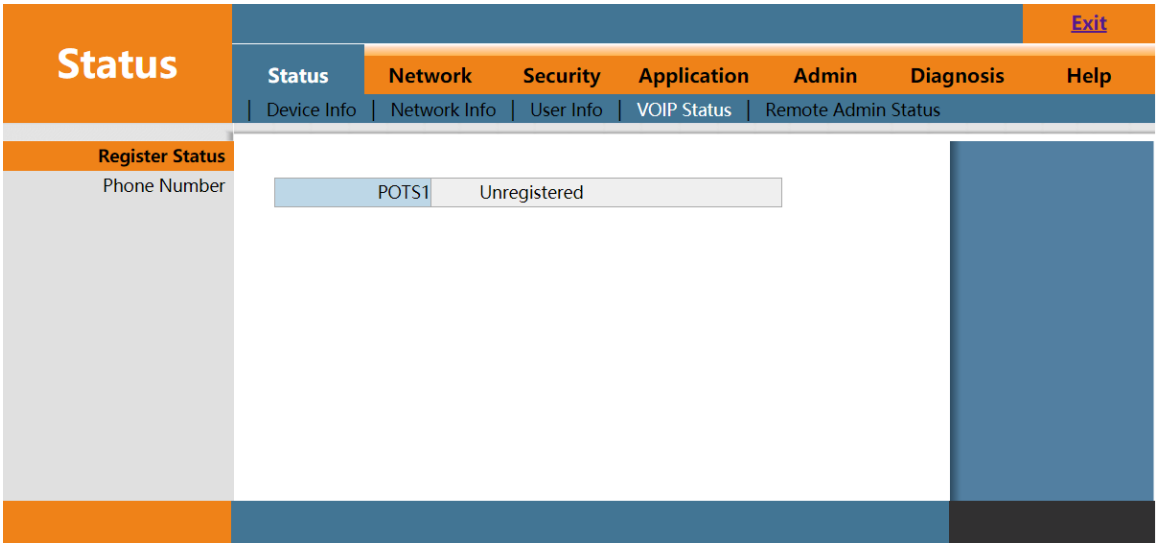


Figure 3-9: Phone Register Status

3.2.4.2 Phone Number Information

This page shows the Phone number you had configured, if you haven't configured the phone number, it would be blank in this part.

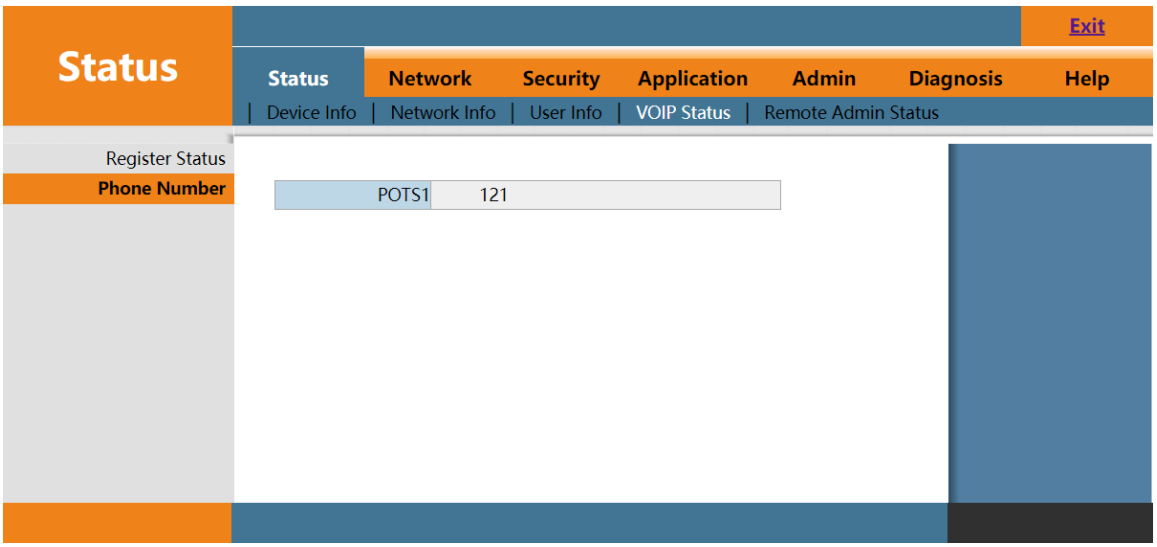


Figure 3-10: Phone Number Information

3.2.5 Remote Admin Status

3.2.5.1 TR069 Connection Status

This page shows the TR069 Inform Status and Remote Connection status.

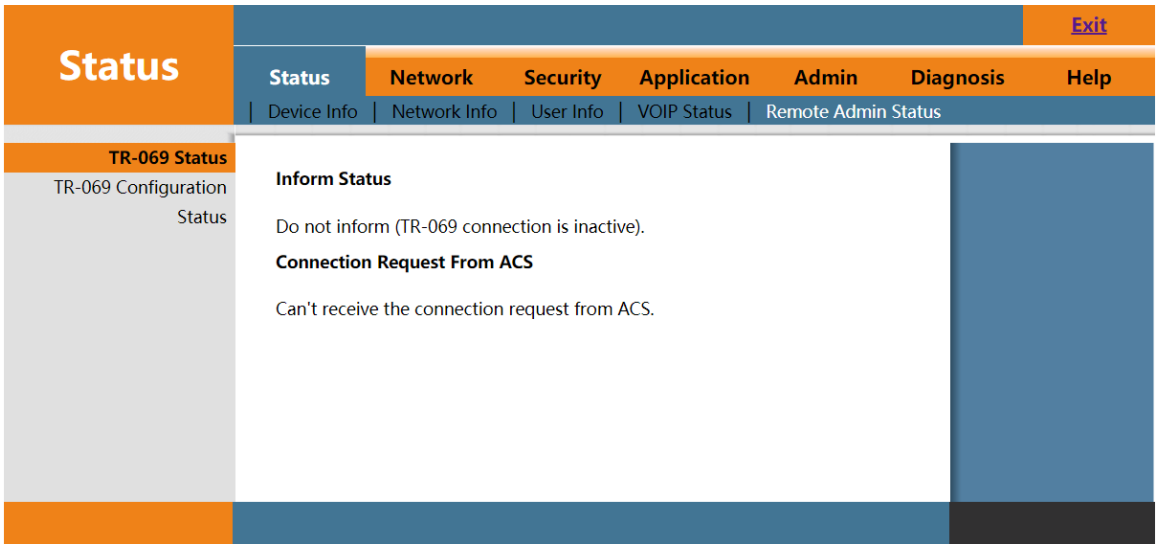


Figure 3-11: TR069 Connection Status

3.2.5.2 TR069 Configuration Status

This page shows the TR069 Configuration Status.

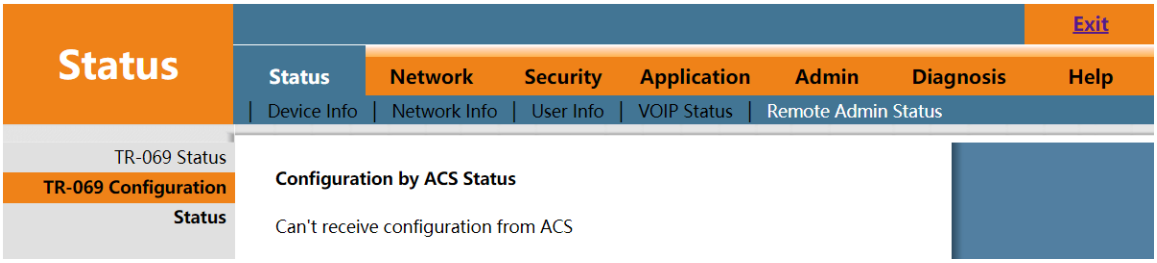


Figure 3-12: TR069 Configuration Status

3.3 Network

3.3.1 WAN Configuration

This page allows the user to configure WAN connections. You can add/delete/modify WAN connections here. The device default settings about TR069 WAN and Route Internet WAN Connections.

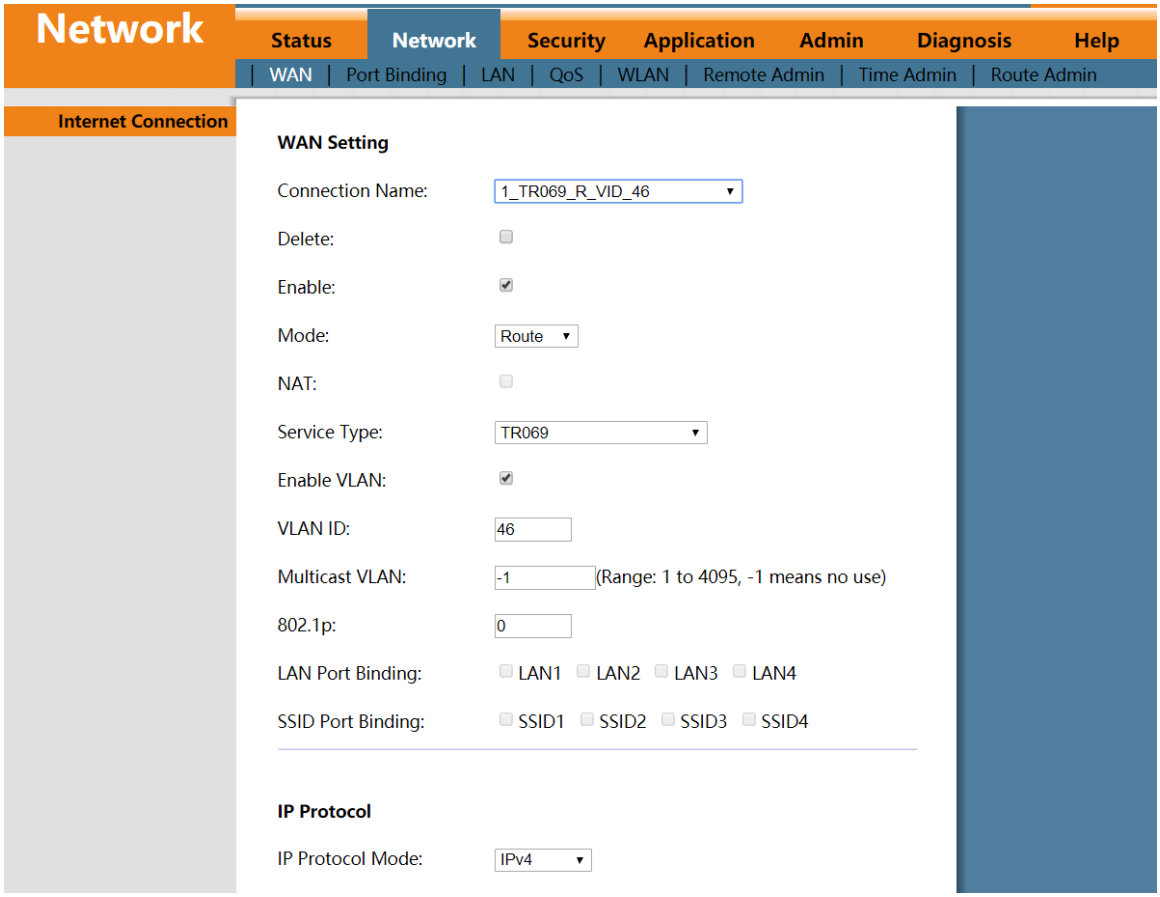


Figure 3-13: WAN Setting

Parameter	Description
Connection Name	The list of WAN connection name that would be created according to the detail WAN Configuration. If you want to create a new WAN connection, please select "Create a new WAN connection" and input other Parameter at the same time and then click "OK" button. If you want to edit WAN connection, please select the wan connect name you want to edit and change some Parameter and then click "OK" button.
Delete	If you want to delete one connection, please select the wan connection you want to delete and then check "Delete" option.
Enable	Enable or Disable the WAN Connection you have choosed.
Mode	Route/Bridge. The device works on route mode with this WAN connection.
NAT	If you select Route WAN Connection,the NAT option is default enable.If you select Bridge WAN connection,the NAT option is default disable. Checked indicates the NAT Function is enabled.

Service Type		Service mode indicates what the wan connection is used for. There are INTERET 、TR069、Other and Voip for choosing.
VLAN	Enable VLAN	Checked indicates the packets are transmitted by the PON port take VLAN tag. Unchecked indicates the packets are transmitted by the PON port don't take VLAN tag.
	VLAN ID	Input the VLAN ID you want to set. Range is 0~4094. Input 0 means don't use any VLAN.
Multicast VLAN		Input the VLAN ID you want to set,according to the IPTV Confiuration.This option default value is -1,means no use.
802.1P		Select VLAN priority you want to set. Range is 0~7.
LAN Port Binding		Checked the LAN Port indicates that lan interface would act with this wan connection Route or Bridge.
SSID Port Binding		Checked the SSID Port indicates that lan interface would act with this wan connection route or bridge.
IP Protocol Mode		IPv4、IPv6、IPv4/IPv6
MTU		Max transfer unit. Default Value (in Byte): 1500(static/DHCP) or 1492(PPPoE).
WAN IP Mode		IPoE/PPPoE/Static
PPPoE	Username	PPPOE account.
	Password	PPPOE password.
	Keep Alive Time	The PPP Link maintenance time. This parameter value default is 60S.
	PPPoE Mode	Continous or Connect on Demand
	Service Name	This option is not required generally, but if the PPPoE Server checks the option, you should input according to ISP.

3.3.2 Port Binding

3.3.2.1 Binding Mode

This page supports the LAN or SSID binding mode based on VLAN. Users could deploy different VLAN configuration according to actual demands.

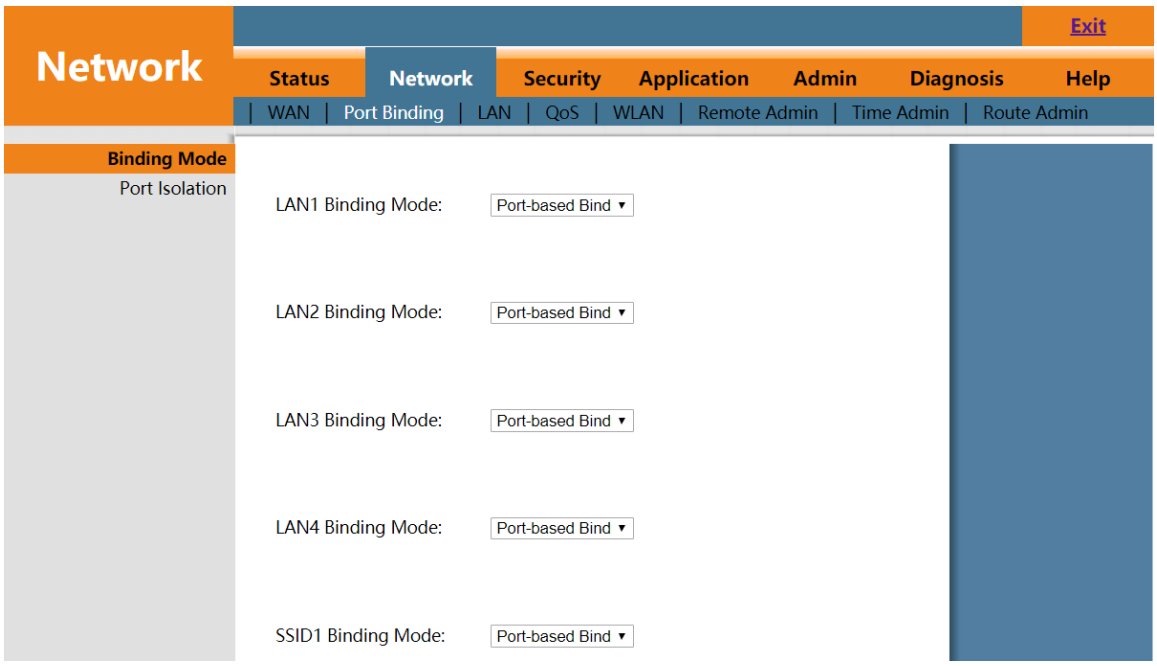


Figure 3-14: Port Binding Mode

3.3.2.2 Port Isolation

This page allows the user to deploy whether ports need communicate with each other. If the Port Isolation function is enabled, all the ports cann't access each other.

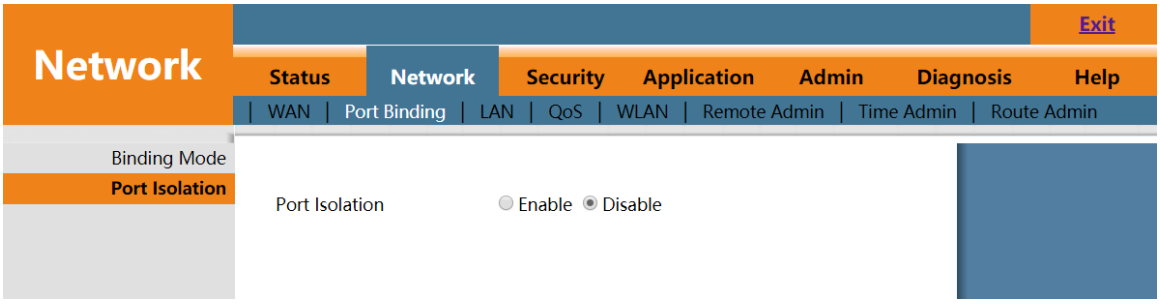


Figure 3-15: Port Isolation

3.3.4 LAN Configuration

3.3.4.1 LAN IPv4 Address Settings

This page supports the management of the ONU's IPv4 address, DHCP Server management, including address distribution and relevant parameters distribution, such as lease time, address pool range, dns distribution.

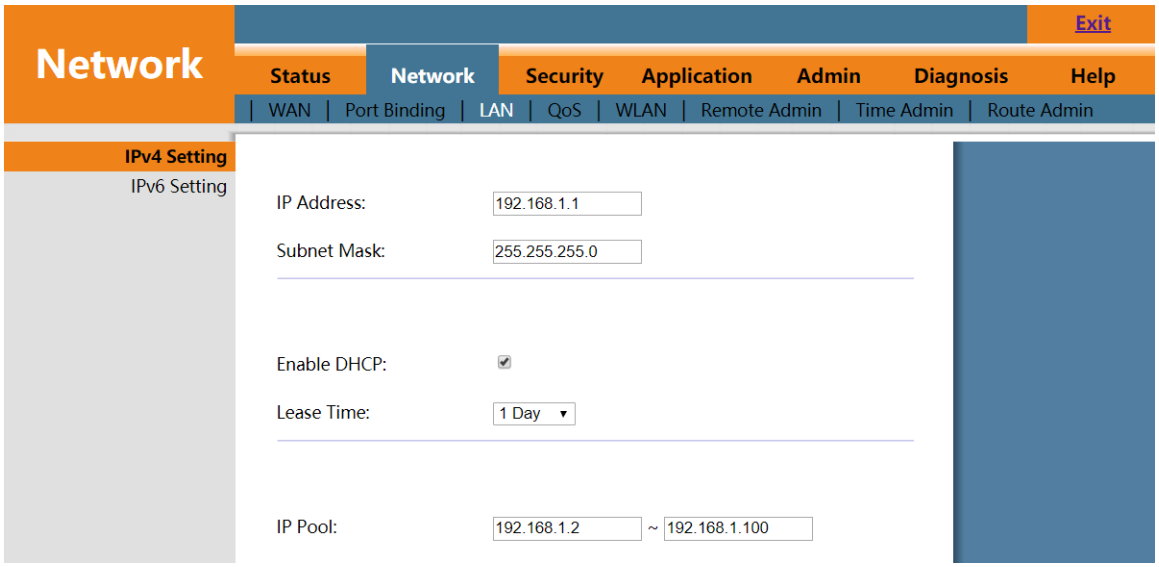


Figure 3-16: LAN IPv4 Address Settings

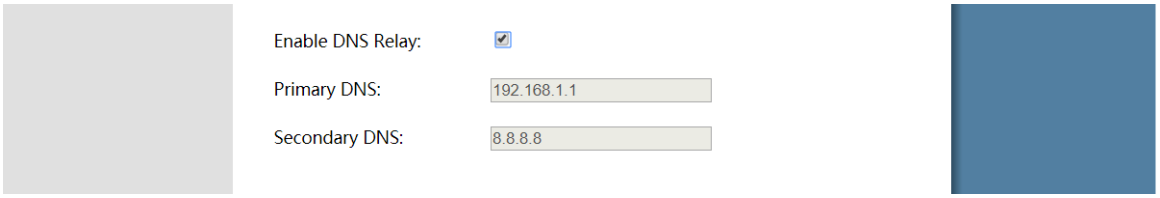


Figure 3-17: DNS Settings

Parameter	Description
IP Address	LAN IP address.
Subnet Mask	LAN IP Subnet Mask.
Enable DHCP	Enable ONU DHCP Server.
Lease Time	Lease time of the ONU DHCP Server
IP Pool	The address range of DHCP Pool
Enable DNS Relay	Whether to enable DNS Realy
Primary DNS	The Primary DNS of DHCP Server
Secondary DNS	The Secondary DNS of DHCP Server

3.3.4.2 LAN IPv6 Settings

This page supports the management of the LAN IPv6 address, including LAN IPv6 Address Settings、LAN IPv6 DHCP configuration、RA Configuration

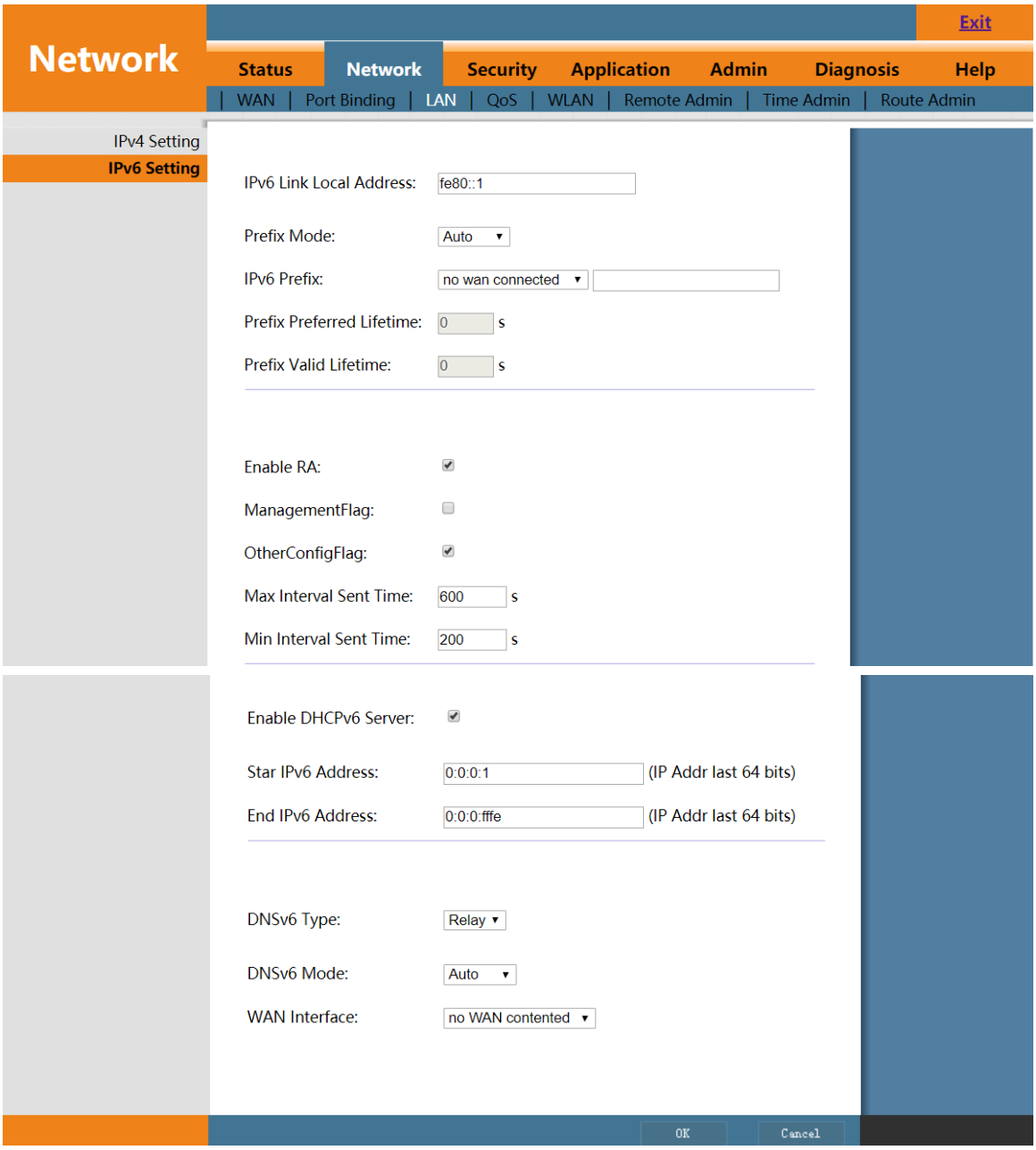


Figure 3-18: LAN IPv6 Address Settings

3.3.5.1 Qos Configuration

3.3.5.1 Qos Settings

This page allows the user to configure Qos (quality of service) parameters, including enable option, uplink Bandwidth, Rule template and Scheduling Police.

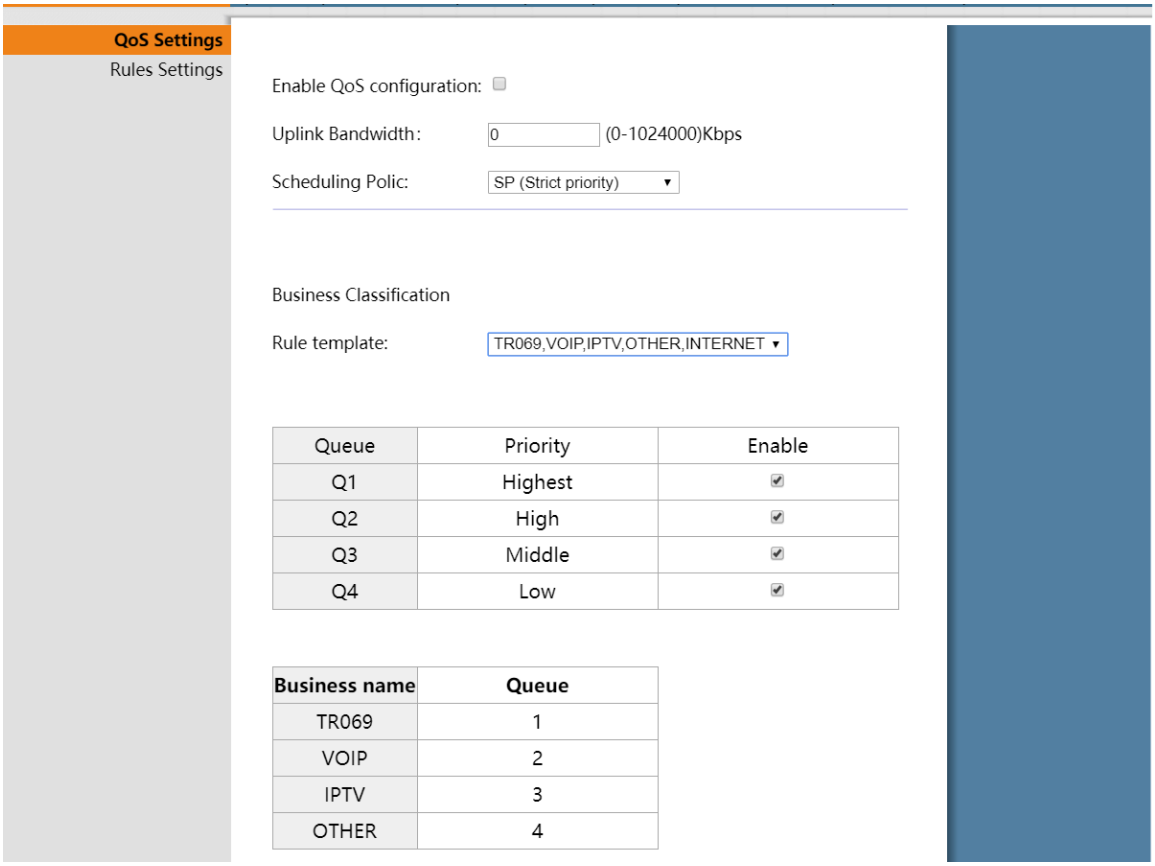


Figure 3-19:Qos Settings

Parameter	Description
Enable QoS configuration	Enable or Disable QoS function
Uplink Bandwidth	The Max rate of uplink transmission
Scheduling Polic	SP/WRR/CAR
Rule template	The various template about dirrerent services

3.3.5.2 Rule Settings

This page allows the user to deploy detail Queues through flow classification, such as LAN Port, Ethernet Type, Protocol, Vid, Source Mac, Destination Mac, Source IP, Destination IP, Source Port, Destination Port and etc…..

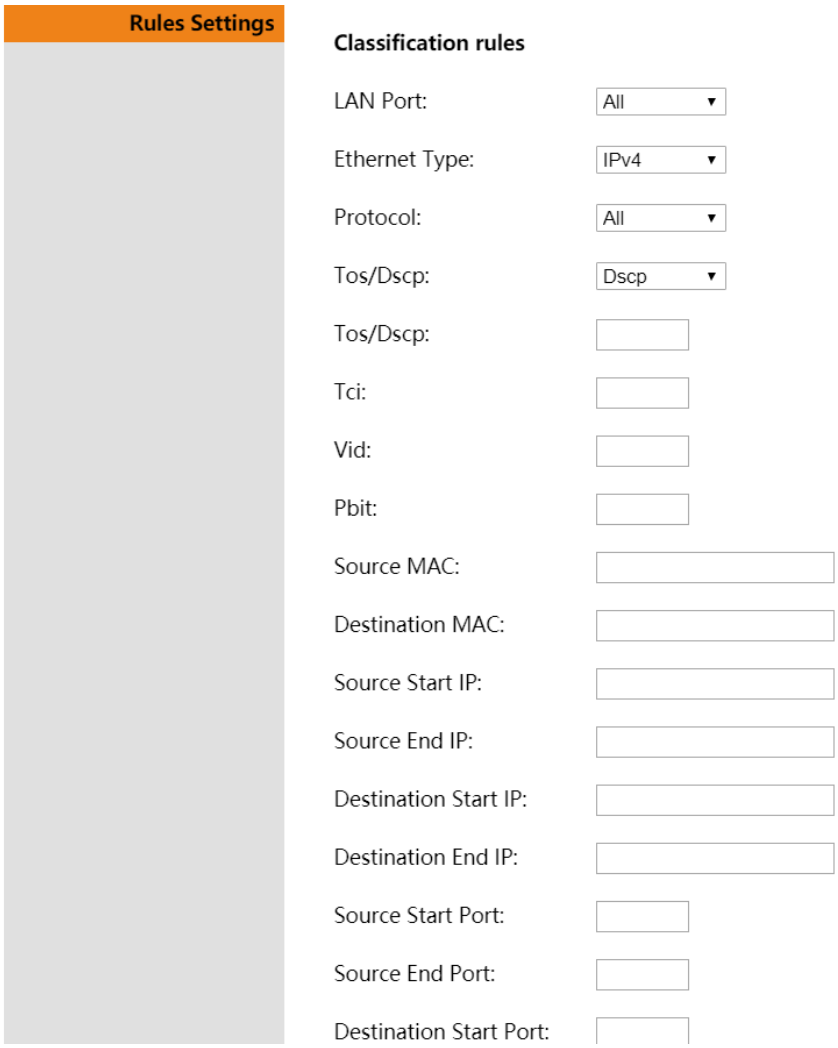


Figure 3-20: Rules Settings

3.3.6 WLAN Configuration

This page allows the user to deploy WLAN (Wi-Fi) Configuration, including WLAN Enable option, SSID Name, Encryption options.

Parameter	Description
Enable	Checked indicates that WLAN function is enabled. Unchecked indicates that WLAN function is disabled.
Mode Selection	The Standard of WLAN Mode: B, G, N, B/G, B/G/N
Band Width	20MHz, 20/40MHz
SSID List	SSID1, SSID2, SSID3, SSID4. Support multiple SSID. SSID1 enable, SSID2/SSID3/SSID4 disable
SSID Name	WiFi name

SSID Broadcast	Enable indicates that Wlan client could find the SSID Disable indicates that Wlan client couldn't find the SSID
Encryption	Open ,WEP,WPA/WPA2 Personal, WPA/WPA2 Enterprise
WPA Password	The password of SSID
WPS Enable	Enable or disable WPS function

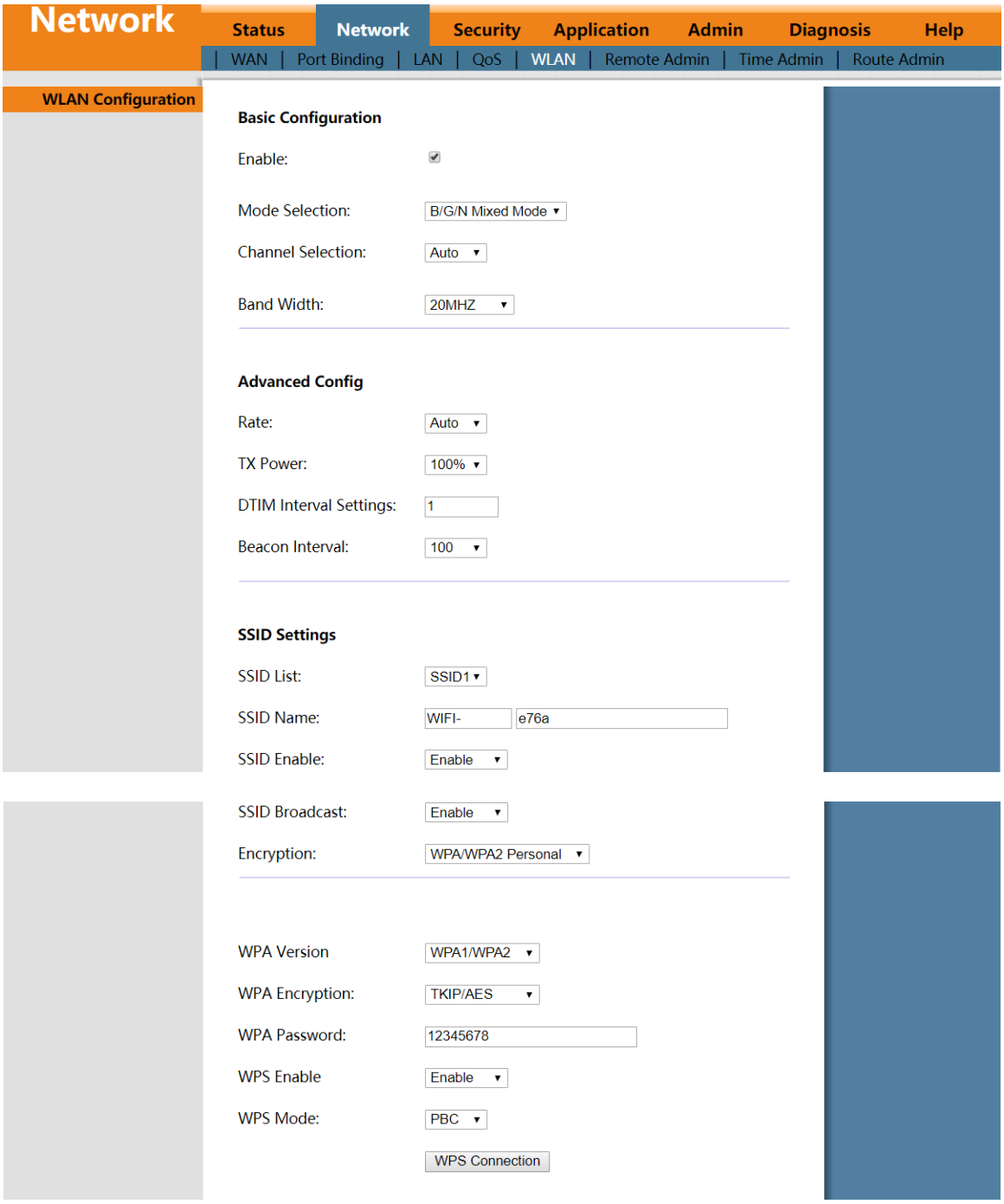


Figure 3-21: WLAN Basic Configuration and Advanced Configuration

3.3.7 Remote Admin

This page allows the user to deploy TR069 Remote Management Configuration, including Server Address, Server User Name, Server Password, Client Username, Client Password and Cycle Reporting Interval, enable or disable Cycle Reporting.

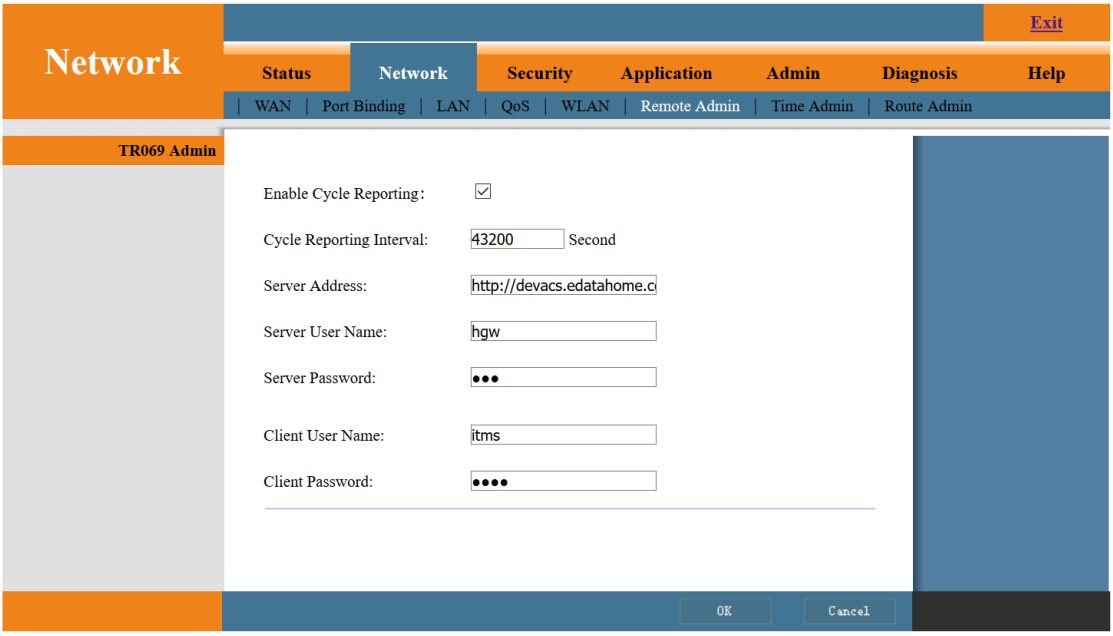


Figure 3-22: TR069 Configuration

3.3.8 Time Configuration

This page allows the user to configure NTP Client function. For this ,the user can get current time from the NTP Server.

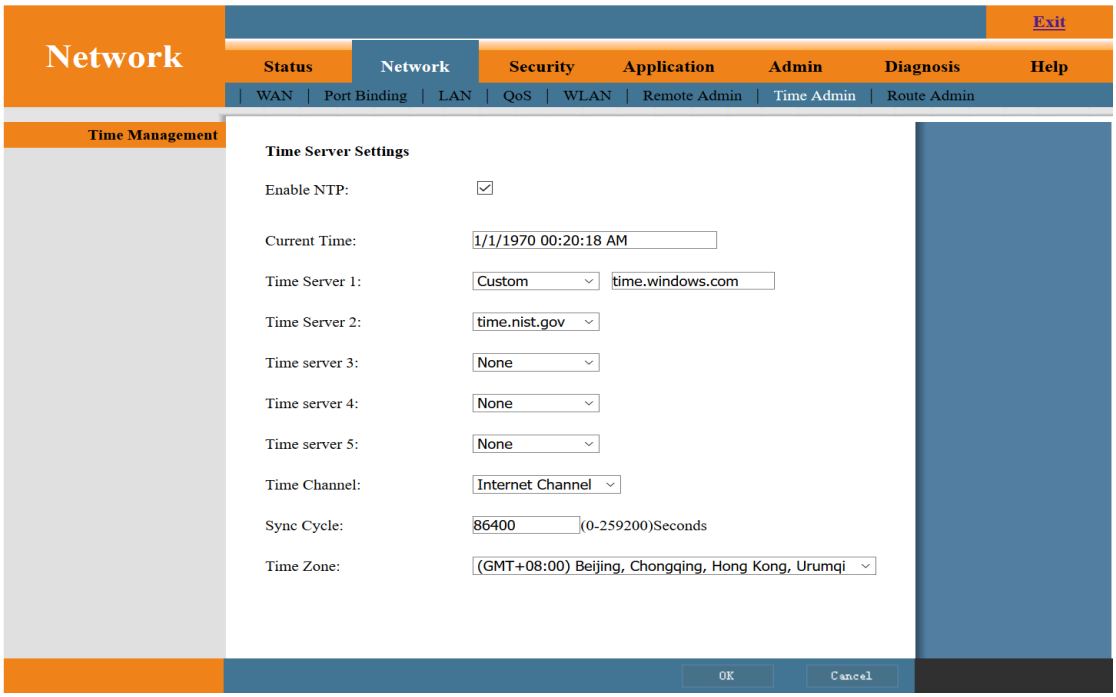


Figure 3-22: Time Admin

3.3.9 Route Configuration

This page allows the user to configure statics route function. For this, the user could deploy more options about network.

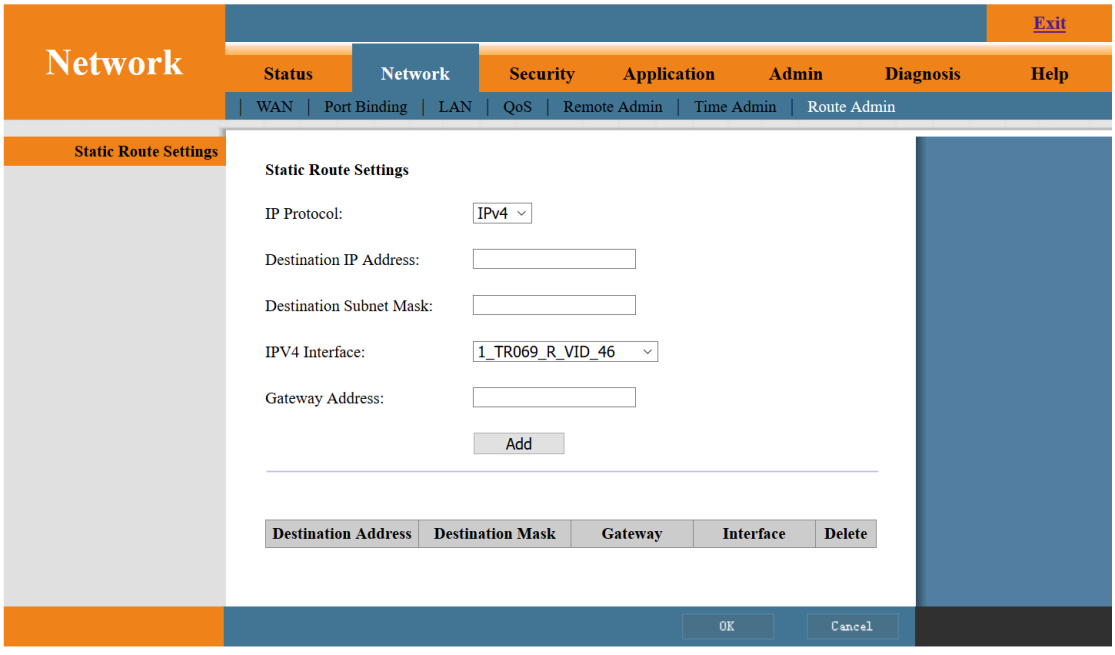


Figure 3-23: Static Route Configuration

3.4 Security

3.4.1 Firewall

3.4.1.1 Security Level

This page allows the user to set the level of the firewall. Low, Medium, High, three options are Available.

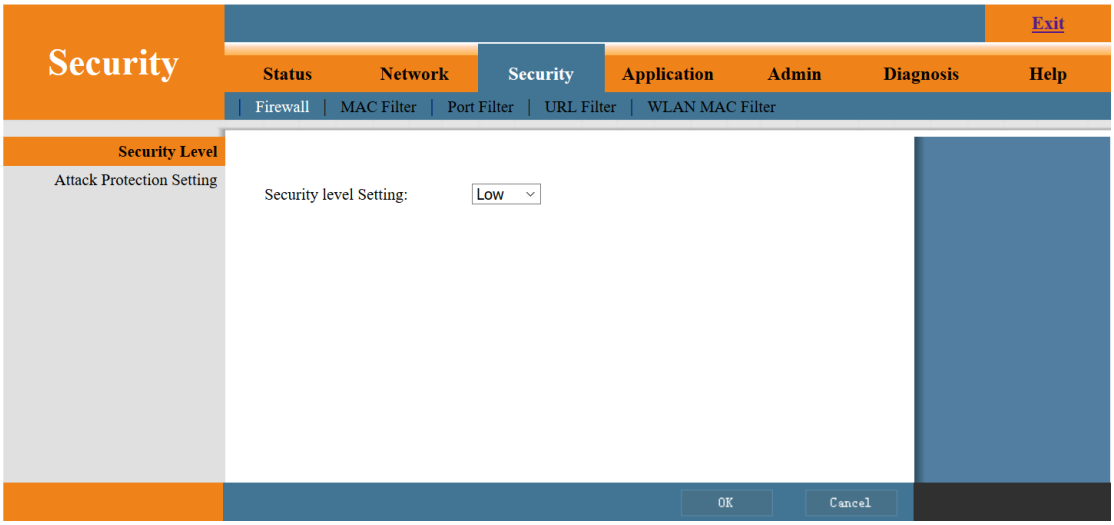


Figure 3-24: Security Level

3.4.1.2 Attack Protection Setting

This page allows the user to set the protection against DOS attacks.

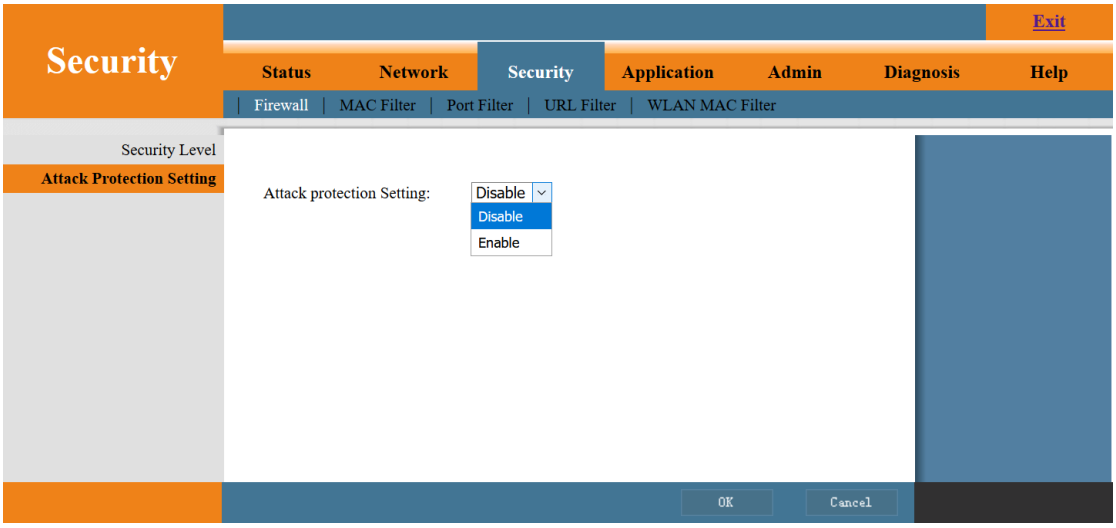


Figure 3-25: Attack Protection Configuration

3.4.2 MAC Filter

This page allows the user to set the relevant parameters of the MAC filter function,

including black-list and white-list. The black-list indicates that forbidden access, white-list indicates that allow access.

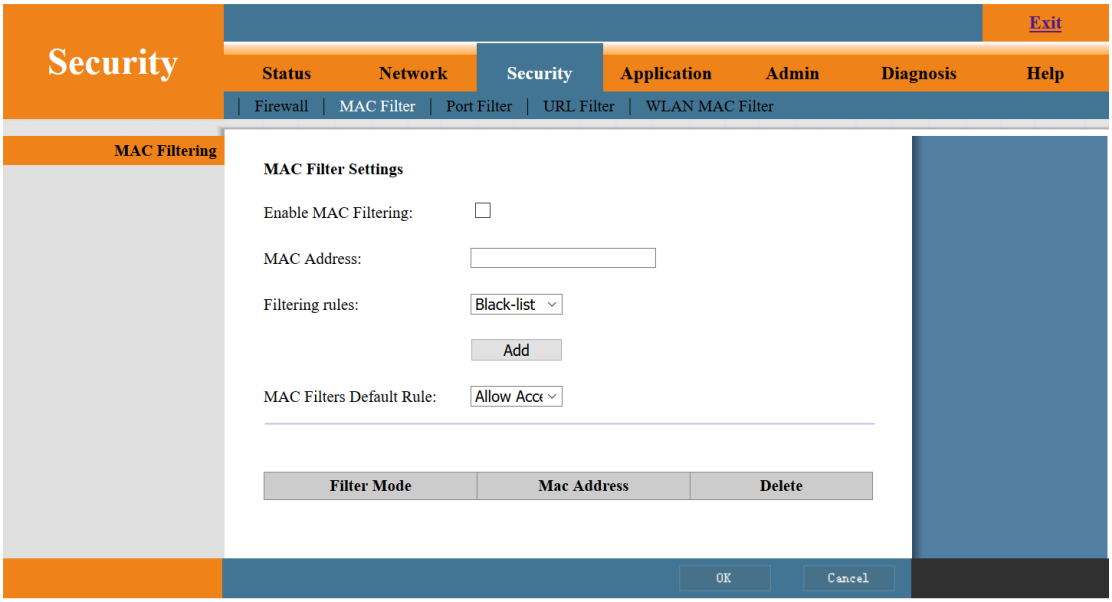


Figure 3-26: MAC Filter

3.4.3 Port Filter

This page allows the user to set the port filtering function. The rules are based on Source IP range and Destination IP range

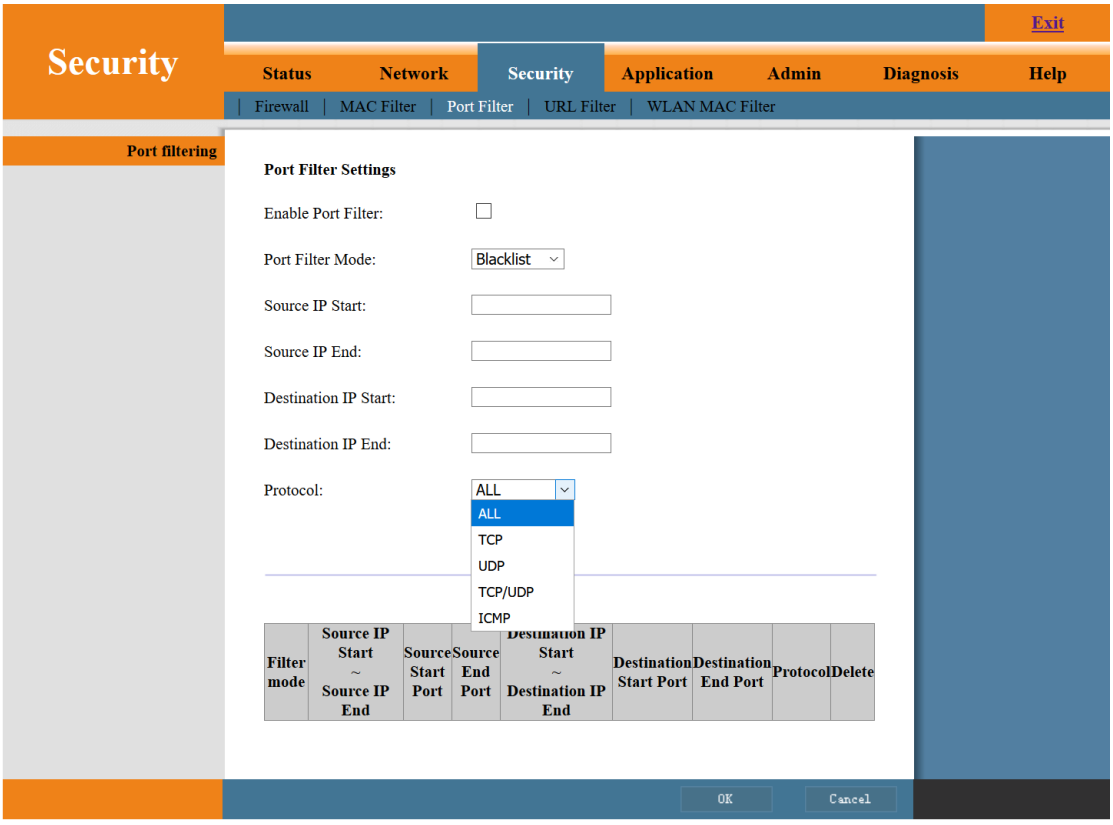


Figure 3-27: Port Filter

3.4.4 URL Filter

This page allows the user to set the URL filter function（Attention, it supports http website not https website）.

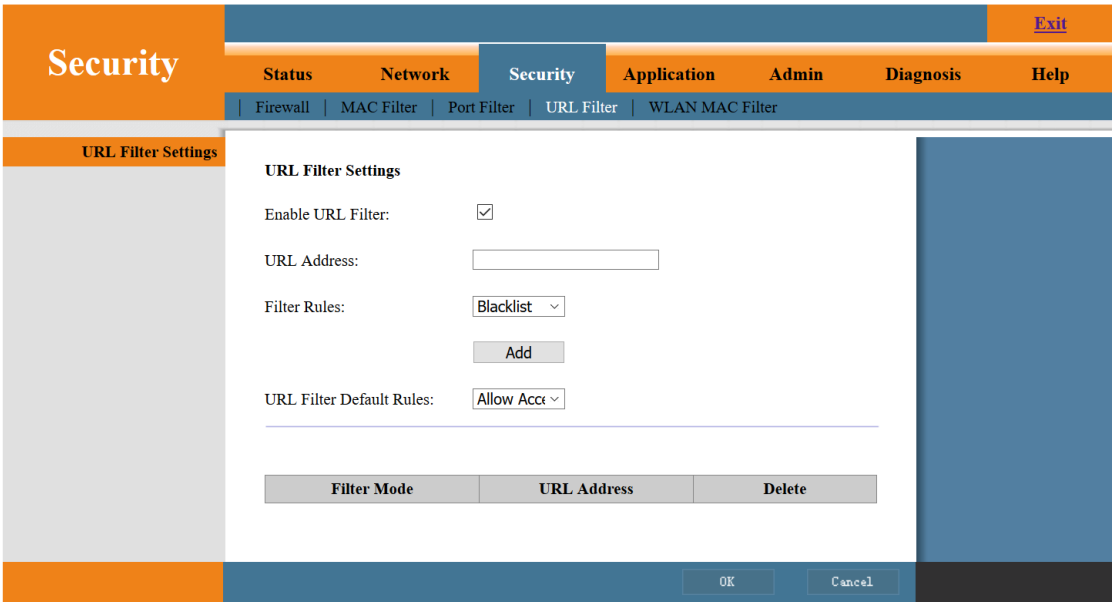


Figure 3-28: URL Filter

3.4.5 WLAN MAC Filter

This page allows the user to set the WLAN MAC filter function. If the wifi client mac address is in the black-list, it couldn't get access on the internet.

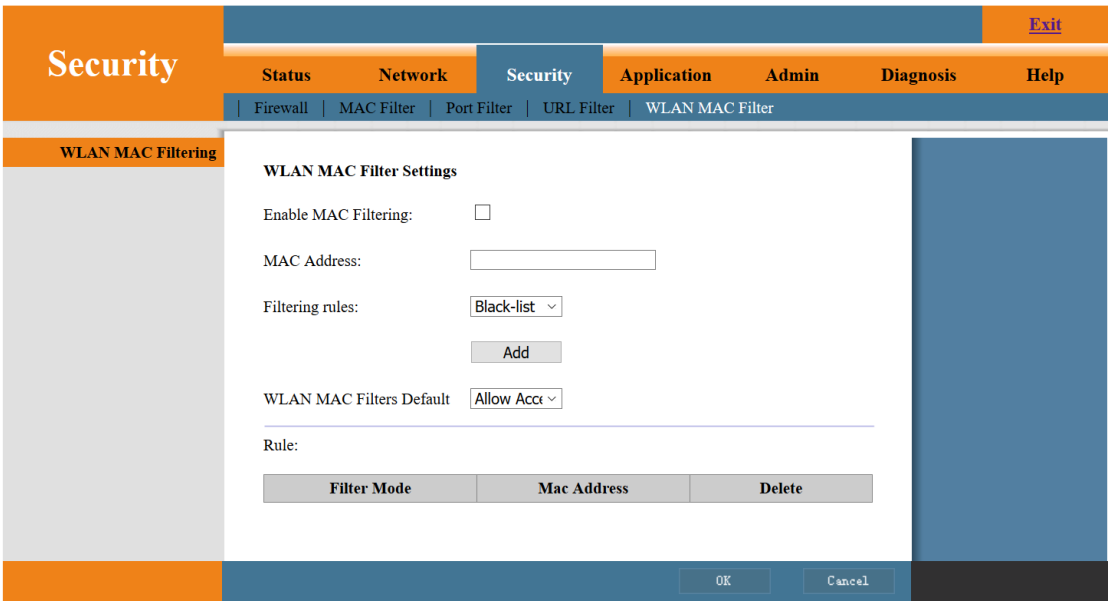


Figure 3-29: WLAN MAC Filter

3.5 Application

3.5.1 DDNS Configuration

This page allows the user to set DDNS function.

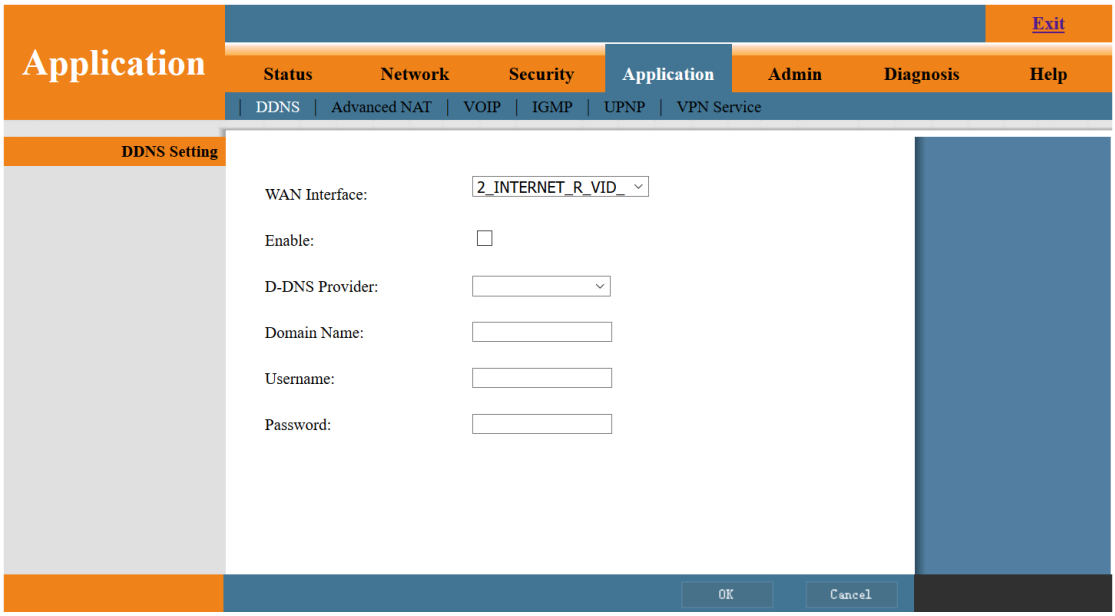


Figure 3-30: DDNS Configuration

3.5.2 Advanced NAT Configuration

This page allows the user to set Advanced NAT function, including ALG Configuration,

DMZ Settings, Virtual Host Settings. (Attention ,there are some different description about Virtual Host Settings, such as Port Forwarding ,Port Mapping)

3.5.2.1 ALG Configuration

Figure 3-31: ALG Configuration

3.5.2.2 DMZ Configuration

Figure 3-32: DMZ Configuration

3.5.2.3 Virtual Host Settings Configuration

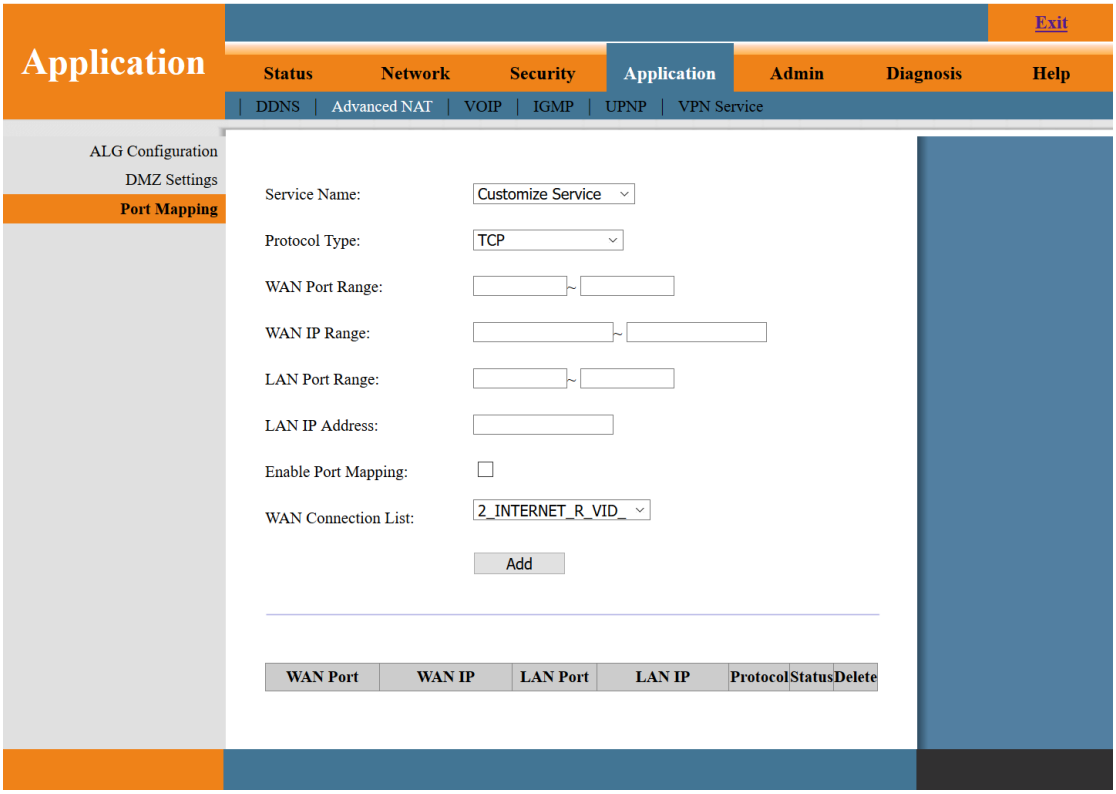
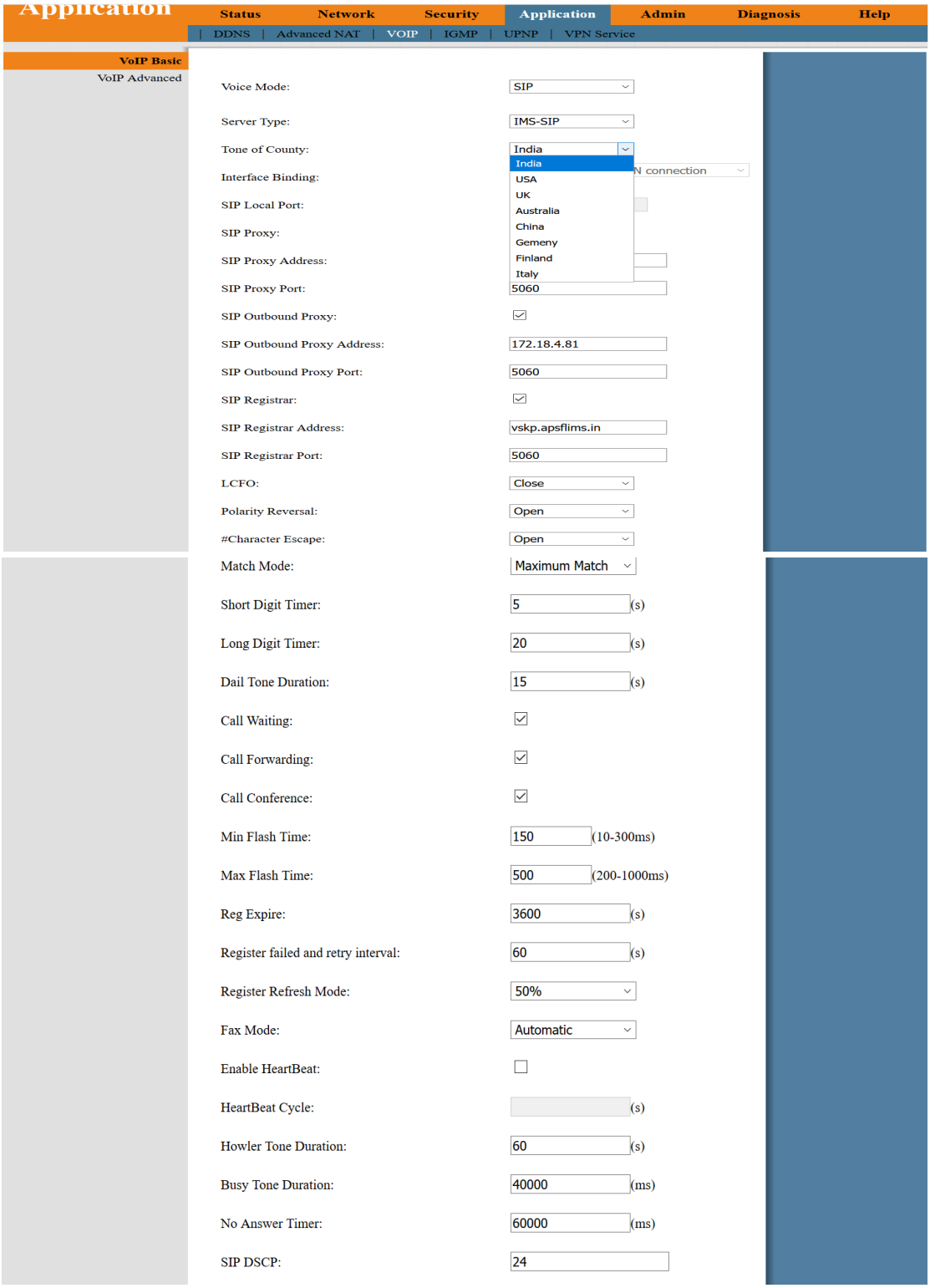


Figure 3-33: Virtual Host Settings Configuration

3.5.3 VOIP Configuration

This page allows the user set VOIP Configuration, including two parts, Basic and Advance configuration.

3.5.3.1 VOIP Basic Configuration



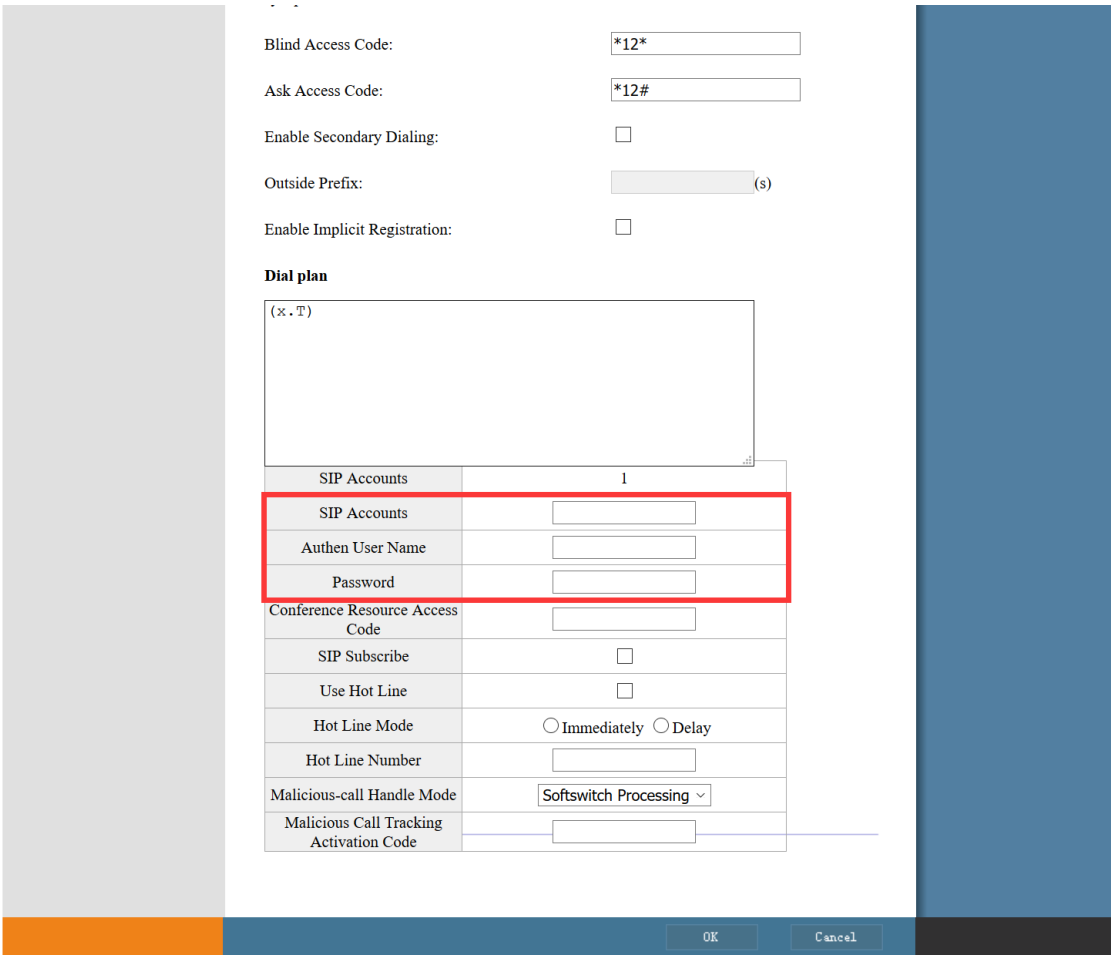


Figure 3-34: VOIP Basic Configuration

3.5.3.2 VOIP Advanced Configuration

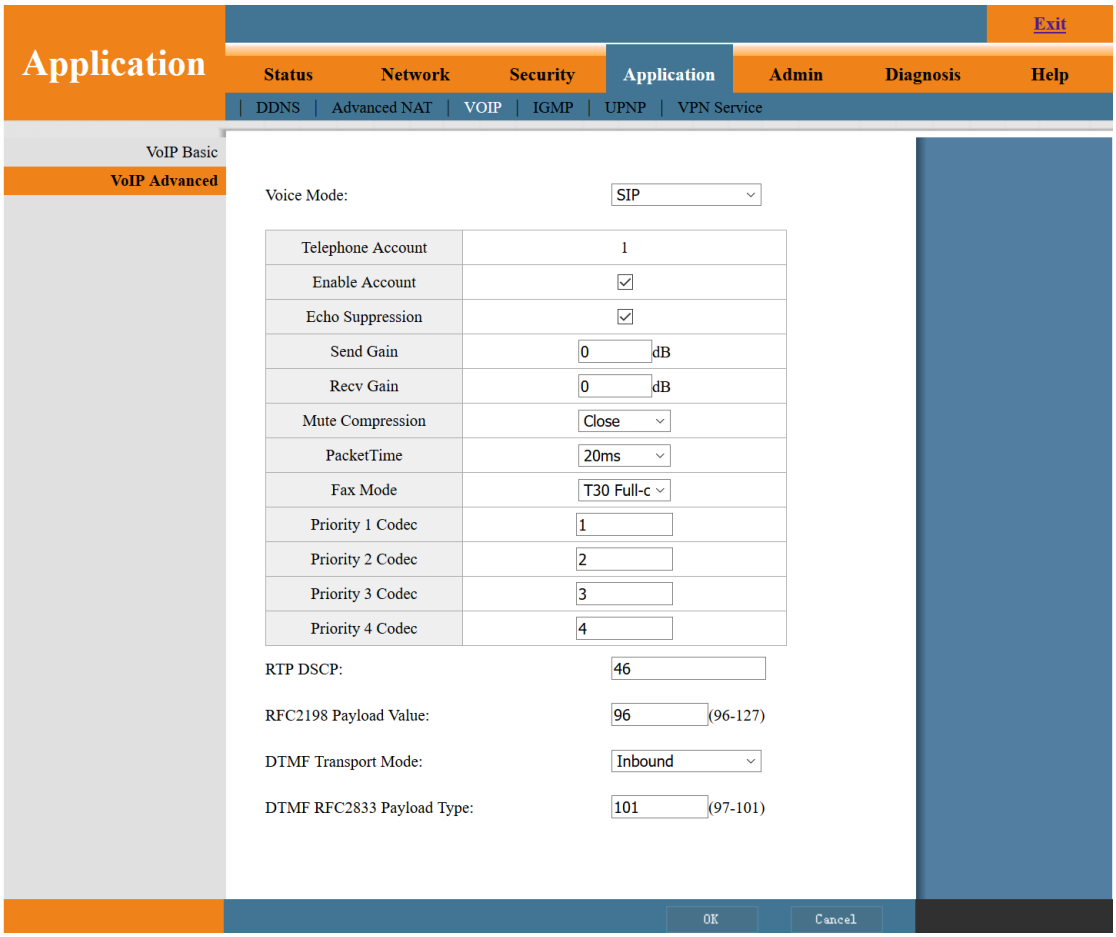


Figure 3-35: VOIP Advanced Configuration

3.5.4 IGMP Configuration

This page allows the user to set IGMP SNOOPING、 IGMP Proxy、MLD Configuration、MLD Proxy Configuration

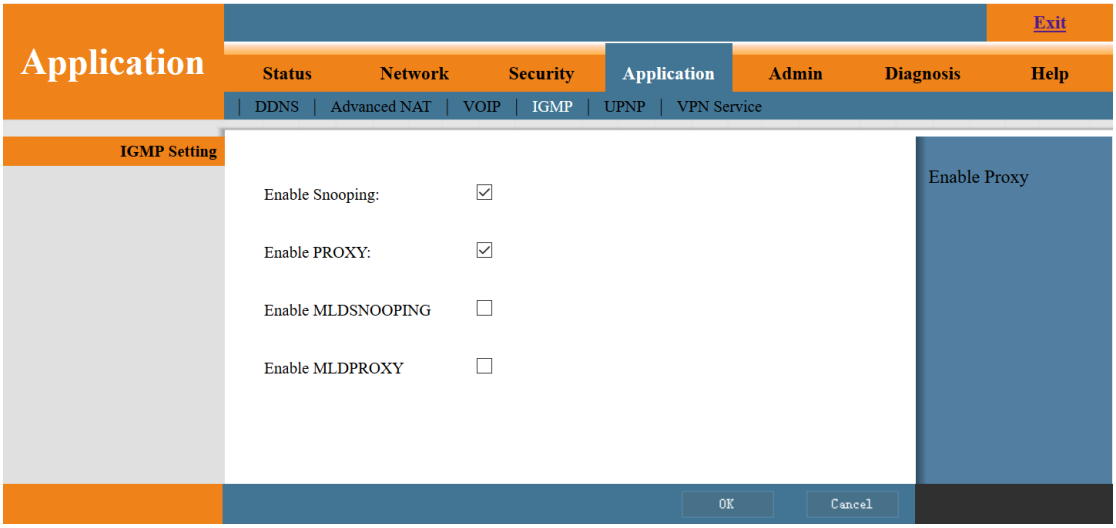


Figure 3-36: IGMP Configuration

3.5.5 UPNP Configuration

This page allows the user to set UPNP function. If enable UPNP, the device would open Port Mapping automatically according to what the client used.

Figure 3-37: UPNP Configuration

3.5.6 VPN Service

This page allows the user to set VPN Client configuration, including the parameters Protocol Type, Server address, Username and Password.

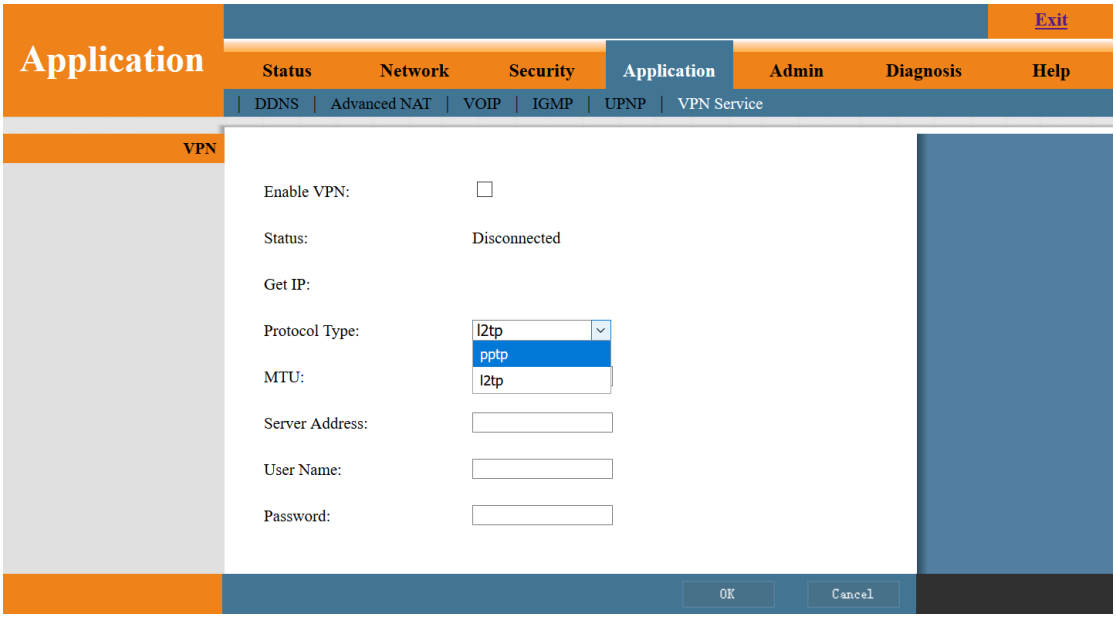


Figure 3-38: VPN Service Setting

3.6 Admin

3.6.1 User Management

This page allows the user to change normal account password.

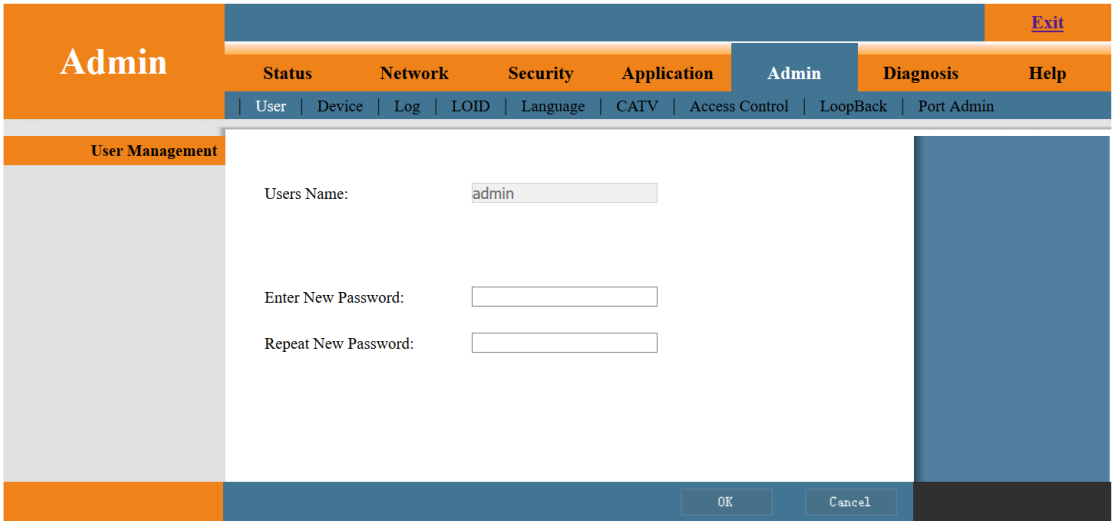


Figure 3-39: User management

3.6.2 Device Management

3.6.2.1 Software Upgrade

This page allows the user to update the software of the device. Click the “Choose File ” button to select the software and then click the “Upgrade” button to update. When the device upgrade successed, it would reboot automatically. The whole process of upgrade will take 3 minutes.

Figure 3-40: Software Upgrade

3.6.2.2 reboot

This page allows the user to reboot the device. After reboot, the normal configuration wouldn’t be changed.

The whole process of reboot will take 1-2 minutes.

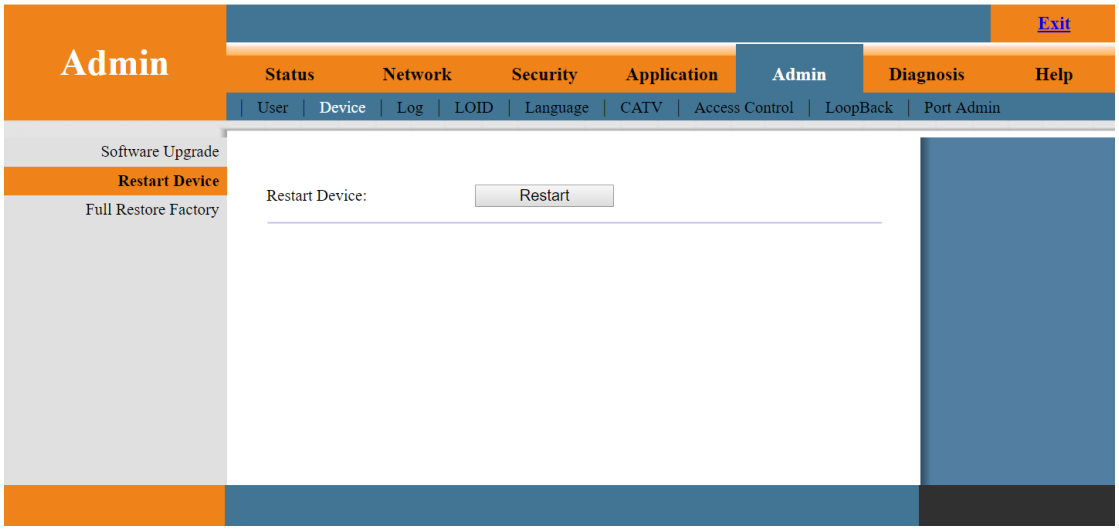


Figure 3-41: Restart Device

3.6.2.3 Restore Default

This page allows the user to restore the device. After restore the device, the whole configuration would be changed to default configuration. The whole process of restore factory will take 1-2 minutes.

Figure 3-42: Restore Default

3.6.3 Log File Configuration

3.6.2.1 Log Level

This page allows the user to different level about Write Level and Display Level. There are many available options, such as Emergency, Alert, Critical, Error, Warning, Notice,

Informational, Debug.

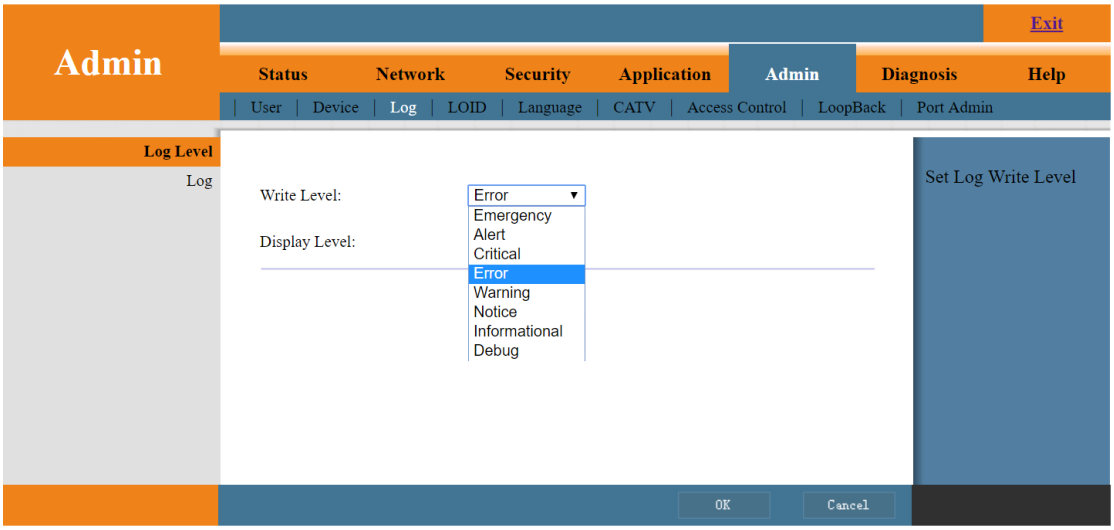


Figure 3-43: Level

3.6.2.2 Log

This page shows the device running status according to the log display level.

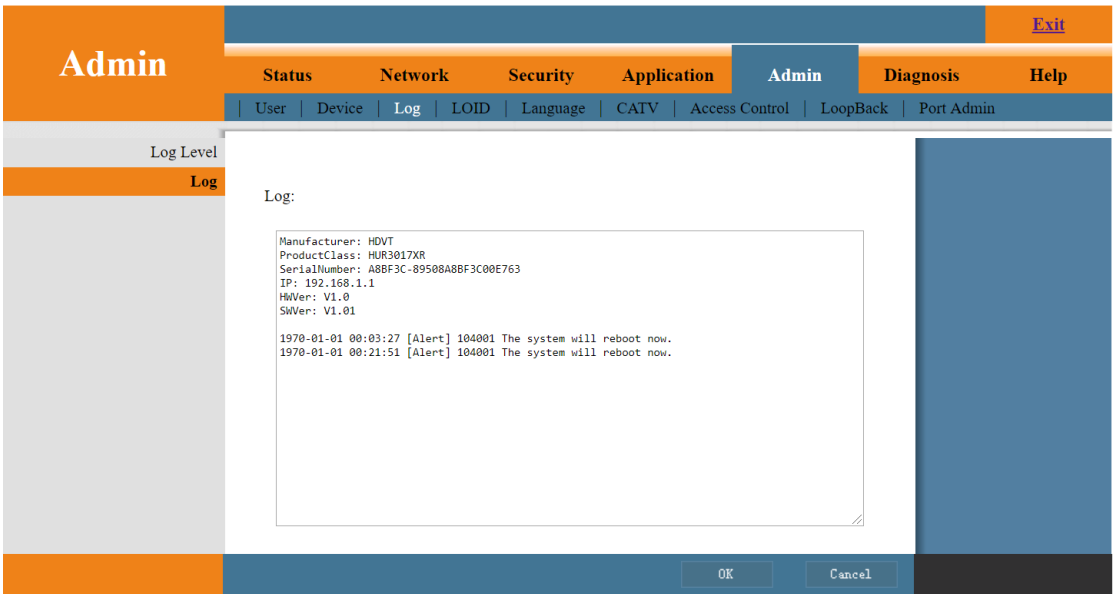


Figure 3-44: Log

3.6.4 LOID

This page allows the user to set the LOID and Password, this is other mode for OLT Authorize

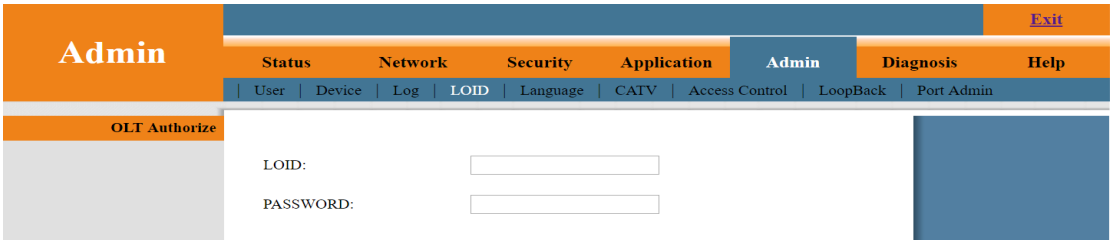


Figure 3-45: LOID Configuration

3.6.5 Language

This page allows the user to choose the language between English and Sample Chinese.

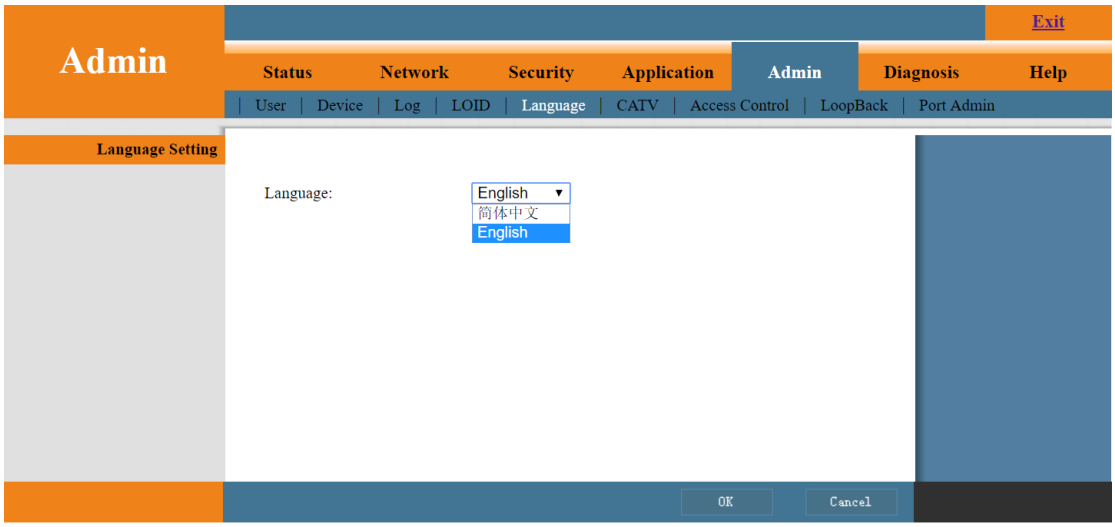


Figure 3-46: Language Setting

3.6.6 CATV

This page allows the user to get the current CATV information and set Output Level Attention value, RF Switch On/Off.

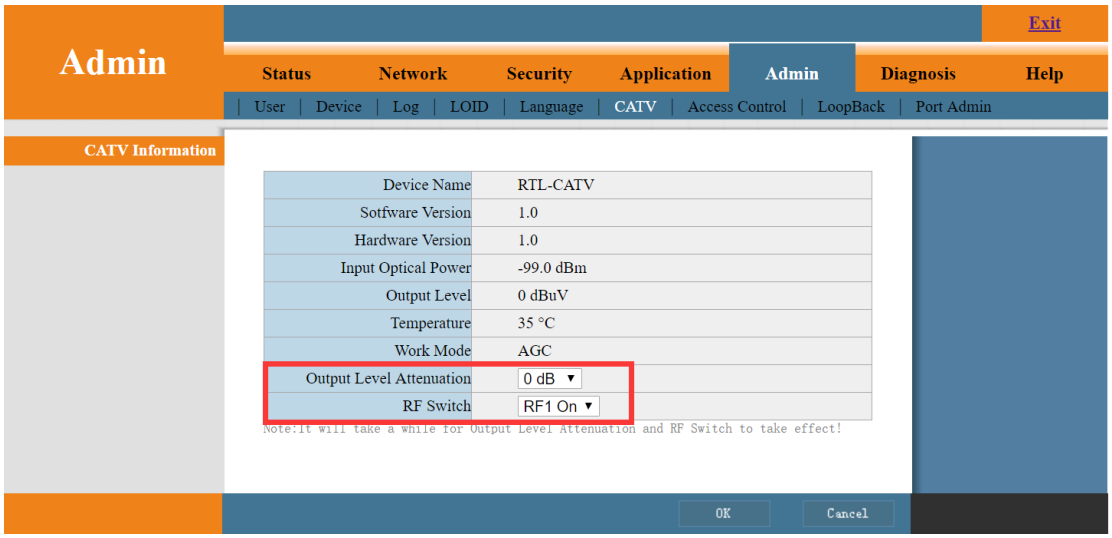


Figure 3-47: CATV Information

3.6.7 Access Control

This page allows the user to set the access control function, including three access services (telnet, http, Ping) from LAN and WAN side. User also can modify the port about WAN access.

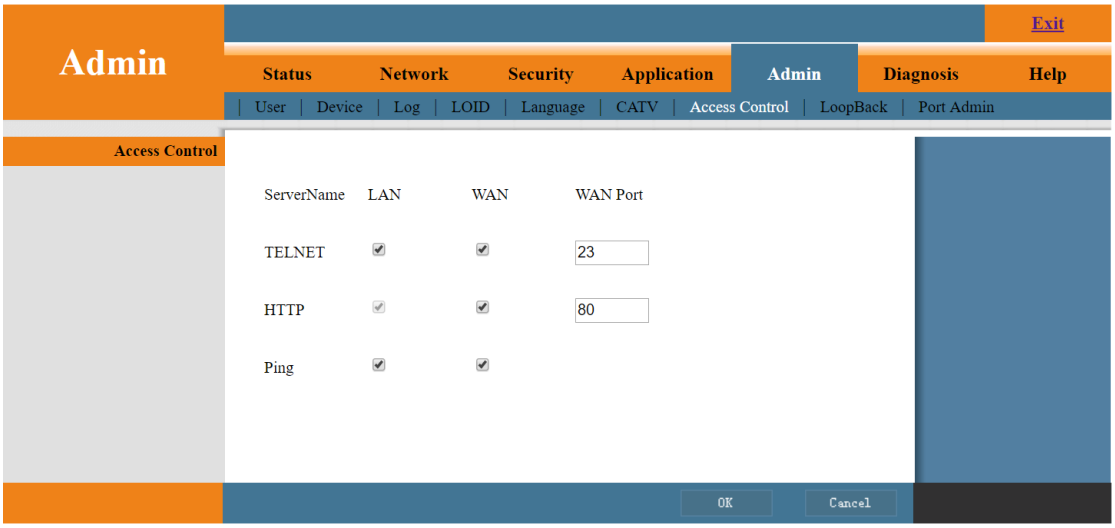


Figure 3-48: Access Control

3.6.8 LoopBack

This page allows the user to set the Loop Detection, including Sending Interval, Loopback Recovery Time.

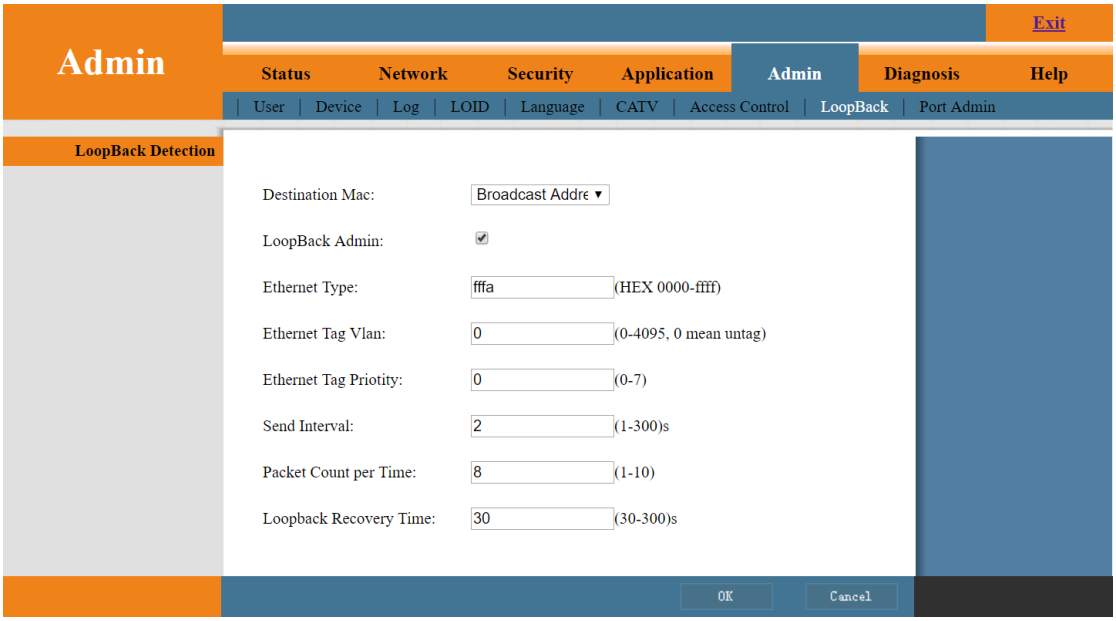


Figure 3-49: Loopback Detection

3.6.9 Port Admin

This page allows the user to set the Port configuration. If the LAN port is enabled, user can connect the device by cable. Otherwise, if the LAN port is disabled, user can't connect the device by cable.

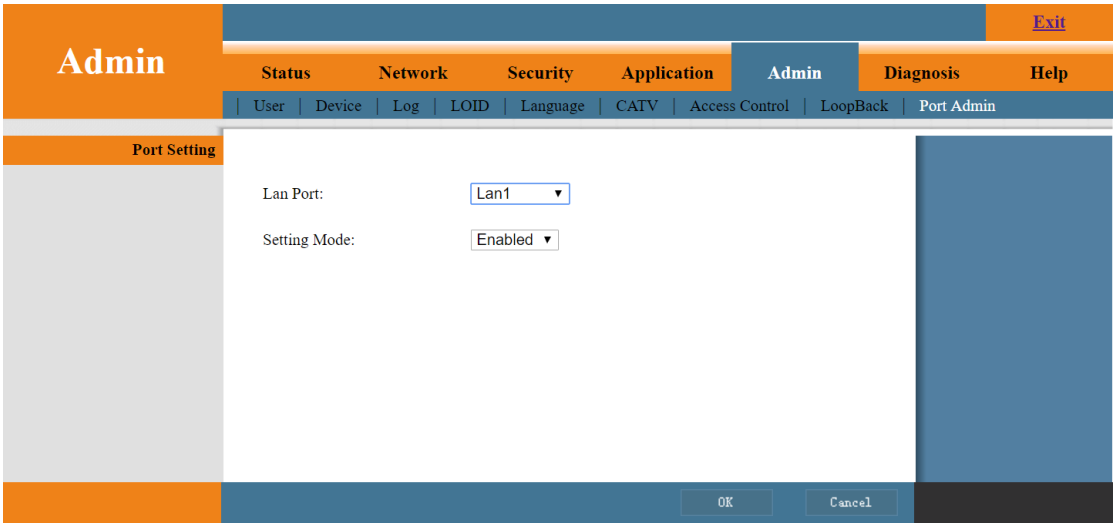


Figure 3-50: Port Setting

3.7 Diagnosis

3.7.1 Network Diagnosis

3.7.1.1 PING/Tracert Test

This page shows about the ping test. Users can diagnose connection status between ONU and other devices.

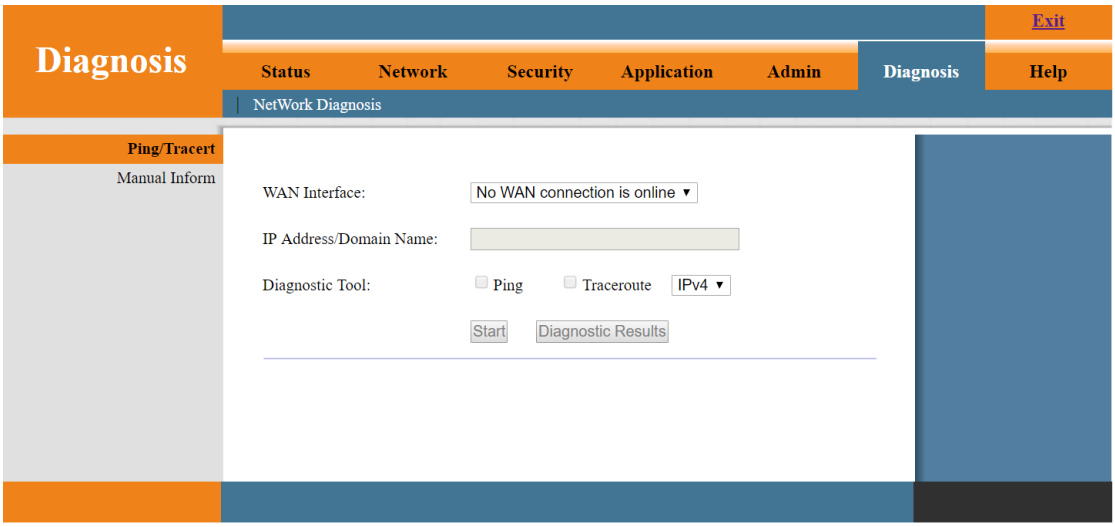


Figure 3-51: PING Diagnosis

Parameter	Illustration

WAN Interface	Select the WAN Connection interface you want to test.
IP Address or Domain Name	Input the destination IP address or domain name you want to ping.
Diagnostic Tool	Select the way between Ping and Traceroute.

3.7.1.2 Manually Inform

This page allows the user to test tr069 inform function.

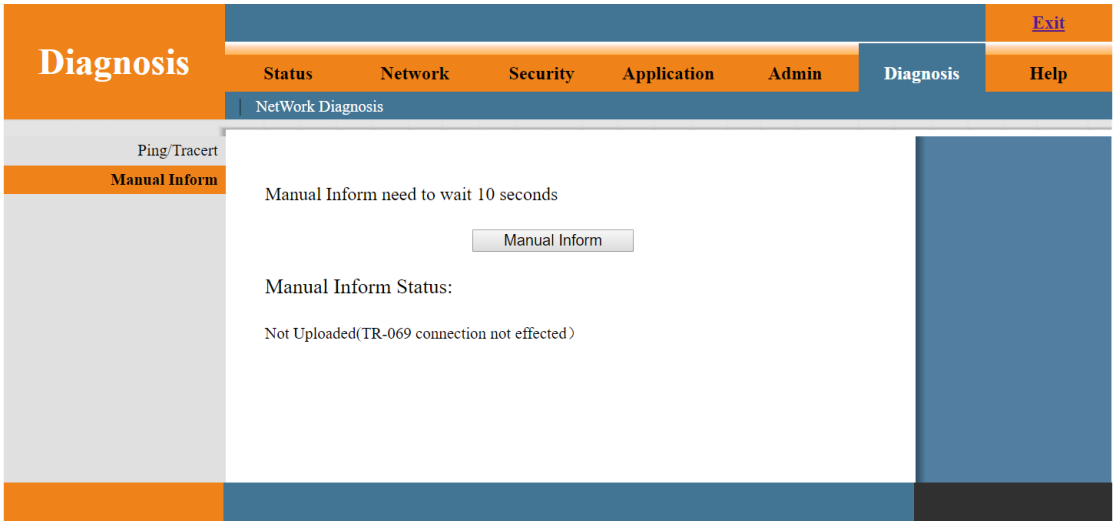


Figure 3-52: Manually Inform Use Tr069

3.8 Help

The Help information of ONU displays instruction and prompt of each web UI.

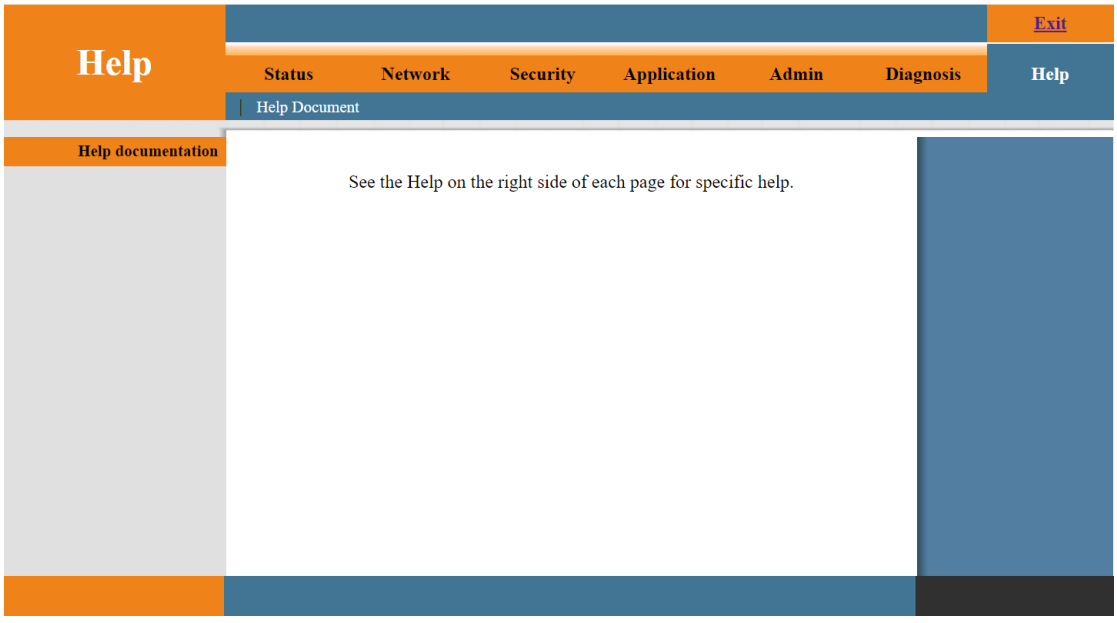


Figure 3-53: Help information

Chapter 4 Examples

4.1 Internet service

There are two configuration methods for Internet service. One works on Bridge WAN and another works on Route WAN.

4.1.1 Requirement

Scenario 1:

Client binds on bridge mode, service VLAN is 10. User client gets IP address from DHCP Server.

Scenario 2:

Client binds on route mode, service VLAN is 10. ONU gets IP address by PPPoE.

4.1.2 Steps

For scenario 1 and scenario 2, it needs to configuring VLAN in OLT side and WAN connection in ONU web.

4.1.2.1 Bridge and Route mode for Internet service

In this example, we take Huawei MA5680T for example, to introduce how to configure Internet service.

Huawei MA5680T Configurations

(1) Create VLAN

MA5680T(config)#vlan 10 smart

(2) Configure uplink port's VLAN

MA5680T(config)#port vlan 10 0/19 1

MA5680T(config)#interface giu 0/19

MA5680T(config-if-giu-0/19)#native-vlan 1 vlan 10

(3) Configure DBA profile

MA5680T(config)#dba-profile add profile-id 12 profile-name test type3 assure 102400 max 899968

(4) Configure line profile

MA5680T(config)#ont-lineprofile epon profile-id 11 profile-name test

MA5680T(config-epon-lineprofile-11)#llid dba-profile-id 12

MA5680T(config-epon-lineprofile-11)#commit

(5) Configure service profile

MA5680T(config)#ont-srvprofile epon profile-id 6 profile-name test

MA5680T(config-epon-srvprofile-6)#ont-port eth 4

MA5680T(config-epon-srvprofile-6)#commit

(6) Authorize ONU

MA5680T(config)#interface epon 0/5

MA5680T(config-if-epon-0/5)#ont add 1 0 mac-auth a8bf-3c00-e76a oam ont-lineprofile-id 11 ont-srvprofile-id 6

(7) Configure service-port

MA5680**T(config)#service-po**rt 27 vlan 10 epon 0/5/1 ont 0 multi-service user-vlan 10

(8) Configure ONU bridge mode or Route mode by ONU web

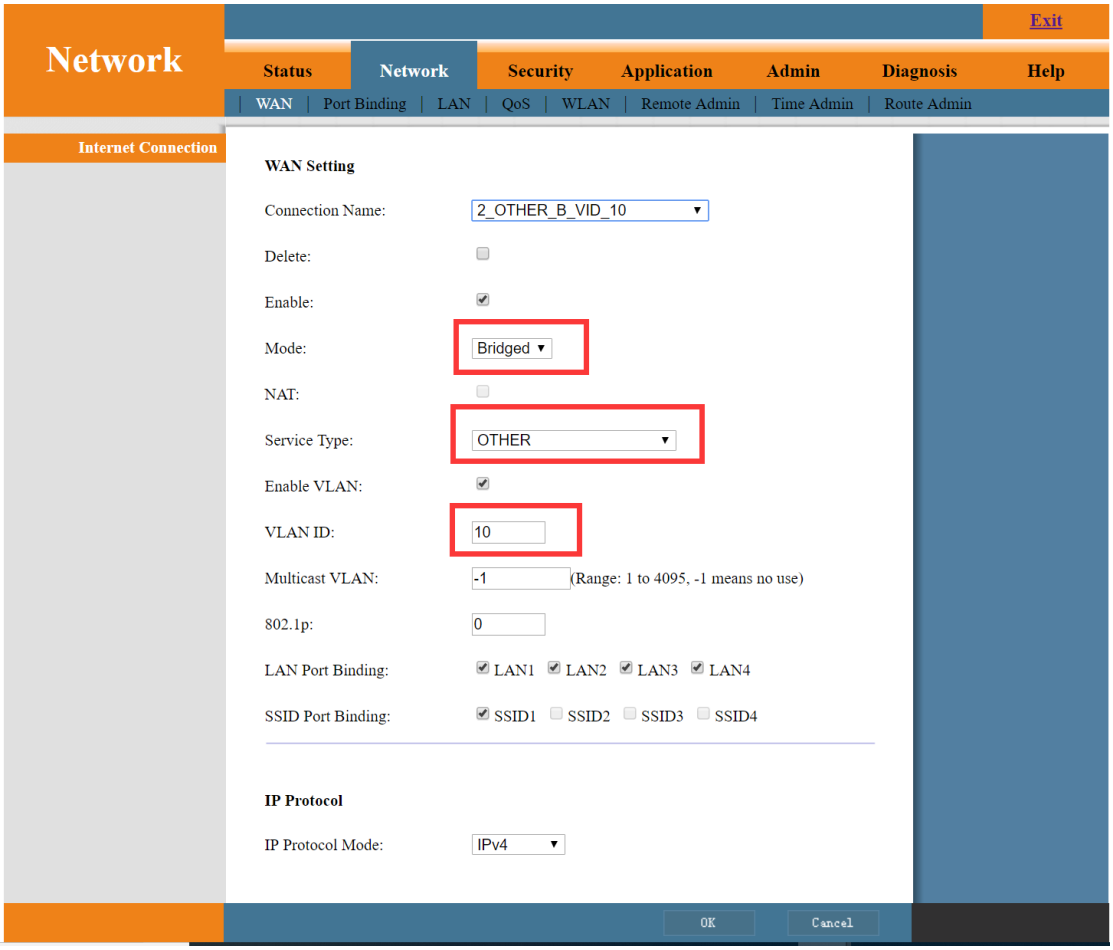


Figure 4-1: Bridge Mode

Attention:

1.If you choose bridge mode, please binds correct LAN interface.

2.Bridge Internet service for client get the IP Address by PPPoE, if client get the IP Address by DHCP, it would get the IP from LAN DHCP Server.

3.Bridge Other service for client get the IP Address by DHCP/PPPoE from ISP

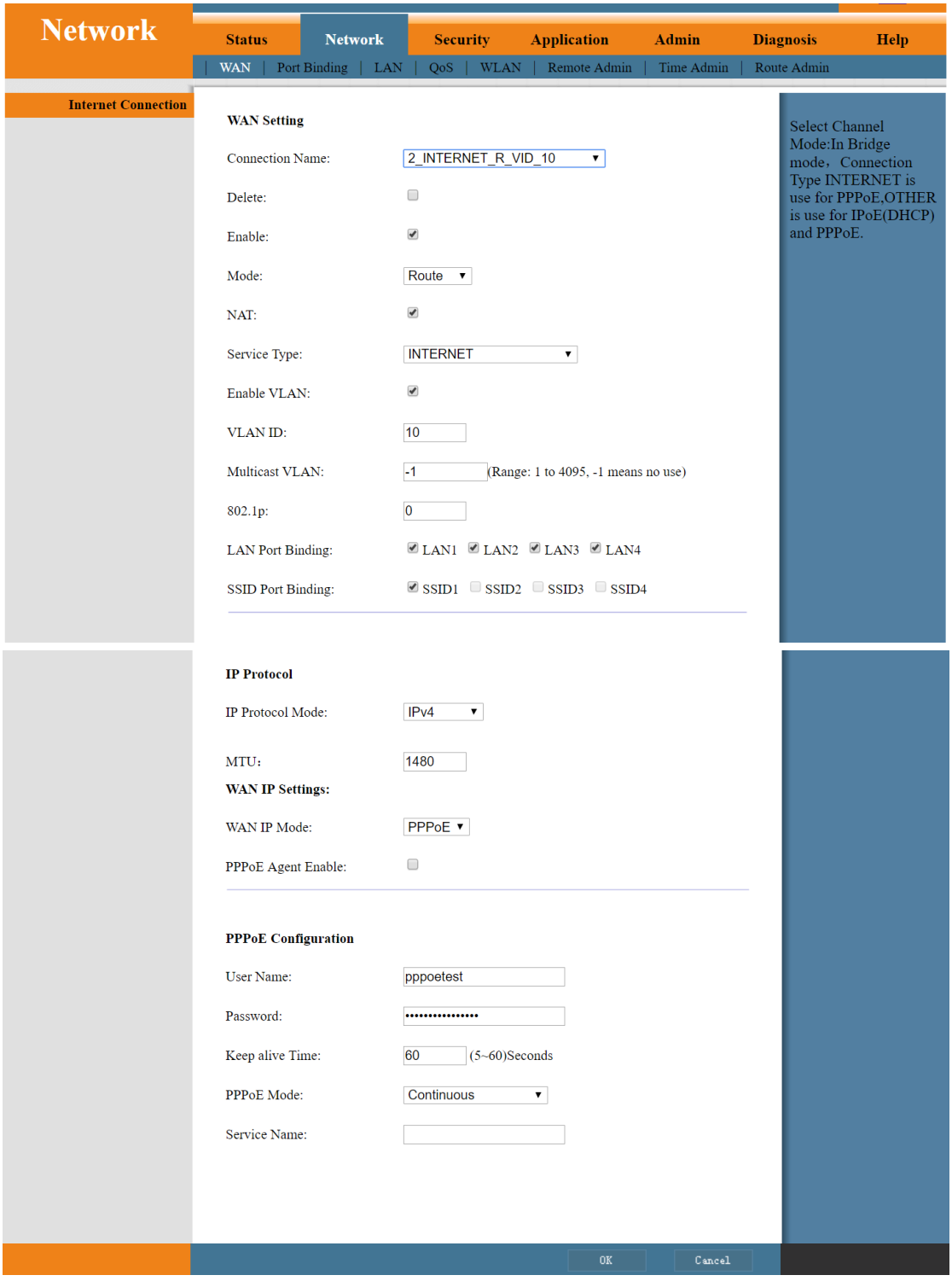


Figure 4-2: Route Mode for PPPoE

Attention:

1.If you choose Route mode, please check the service is Internet, otherwise the WAN Connection get the ip address, the user client could not surf the internet.

2.Please enable LAN DHCP Server, otherwise user client couldn't get the IP address from LAN DHCP Server.

Chapter 5 FAQ

1. After power, why are all the lights lit?

Reasons:

1) Power connection errors;

2) Power is not normal.

Solution:

1) Check that the power cable is connected;

2) The rear panel of the power supply is turned on.

2. Why does LED of LAN not light?

Reasons:

1) Network cable is damaged or loose connection;

2) Cable type errors;

3) Long lines outside the allowable range.

Solution:

1) Replace the network cable, and pay attention to the standard Ethernet cable must be parallel or crossing lines.

3.Why is LED of LOS always blinking?

Reasons:

1) Fiber failure;

2) Center office equipment failure.

Solution:

1) Inspect fiber is connected property, is connected to the correct connector, optical power is normal;

2) Contact your operator.

5. Why does LED of PON flashes instead of always on?

Reasons:

1) Fiber optic connector is loose;

2) Central office equipment failure;

3) Fiber optic connector is dust.

Solution:

1) Inspect fiber is connected property;

2) Cotton ball with alcohol swabbing fiber optic connectors;

3) Contact your operator.

3. Why does ONU stop working after working for a long time?

Reasons:

1) Power supply is not working properly;

2) The equipment from overheating.

Solution:

1) Check if there is contact with abnormal voltage is too high or too low;

2) Check the ambient conditions, vents are nominal ventilation.