1G ONT

Product Manual

Version: A

FiberHome Telecommunication Technologies Co., Ltd.

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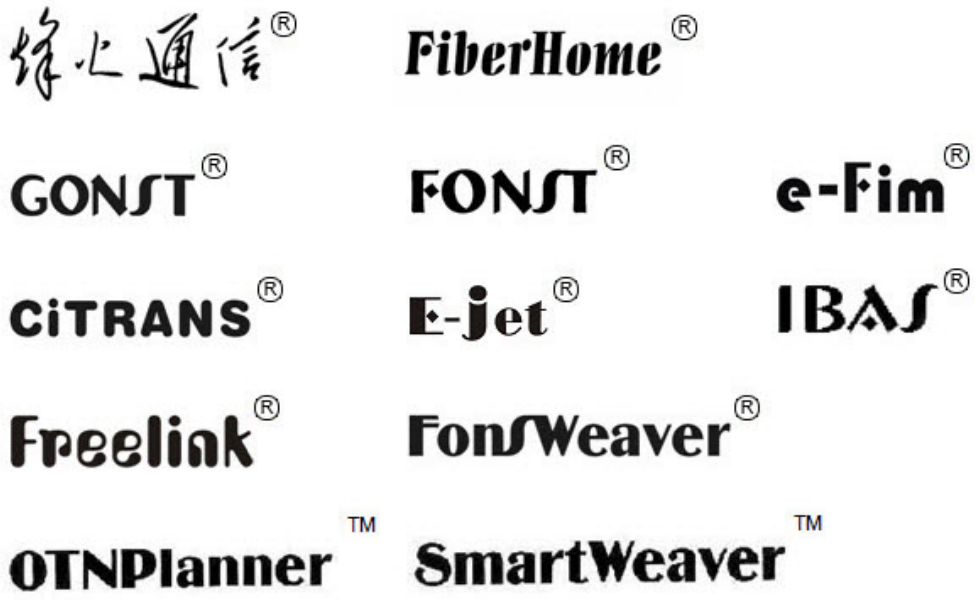

are trademarks of FiberHome Telecommunication Technologies Co., Ltd. (Hereinafter referred to as FiberHome)

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Safety Precautions

For your correct and safe operations on the equipment, please carefully read and strictly observe the following safety instructions:

- High optical power can cause bodily harm, especially to eyes. Never look directly into the end of the optical transmitter fiber jumper or the end of its active connector.
- Exercise care if you must bend fibers. If bends are necessary, the fiber bending radius should never be less than 38 mm.
- Overloaded power sockets or damaged cables and connectors may cause electric shock or fire. Regularly check electrical cables. If any of them is damaged, replace it immediately.
- Use the power supply adapter provided in the package only. Using other adapters may cause equipment damage or operation failures.
- Install the equipment in a well-ventilated environment without high temperature or direct sunlight to protect the equipment and its components from overheating, which may result in damage.
- Cut off the power supply for the equipment in lightning weather and disconnect all the wires and cables (such as the power cable, network cable and phone cable) from the equipment, so as to prevent the equipment from being damaged by lightning.
- Do not place the equipment in a wet or damp environment. Water seepage will lead to abnormal operation of the equipment and short circuit, which may cause dangers and should be prohibited.
- Do not lay this equipment on an unsteady base.

Contents

1 Documentation Guide

Document Orientation

1G ONT Product Manual introduces the positioning, features, functions and technical specifications of the 1G ONTs as well as Web configurations and handling of common problems, so that readers can have an overall idea about the 1G ONTs.

Intended Readers

- Marketing personnel
- Commissioning engineers
- Operation and maintenance engineers

Version Information

Version	Version Information
A	Initial version, corresponding to the 1G ONTs.

Content

Chapter	Summary
Product Introduction	◆ Product Positioning ◆ Product Specification ◆ Interface Specifications ◆ Introduction to each ONT product, including HG6243C and HG6245D
Web Configuration Guide	◆ Local Login to the Web Configuration GUI ◆ Status ◆ Network ◆ Security ◆ Application ◆ Management
Handling Common Problems	Introduces how to handle common problems encountered during product operations and service tests, including abnormal statuses of indicator LEDs, failing to access the Internet, failure of voice service tests, etc.
Standards and Protocols	International standards and communications protocols

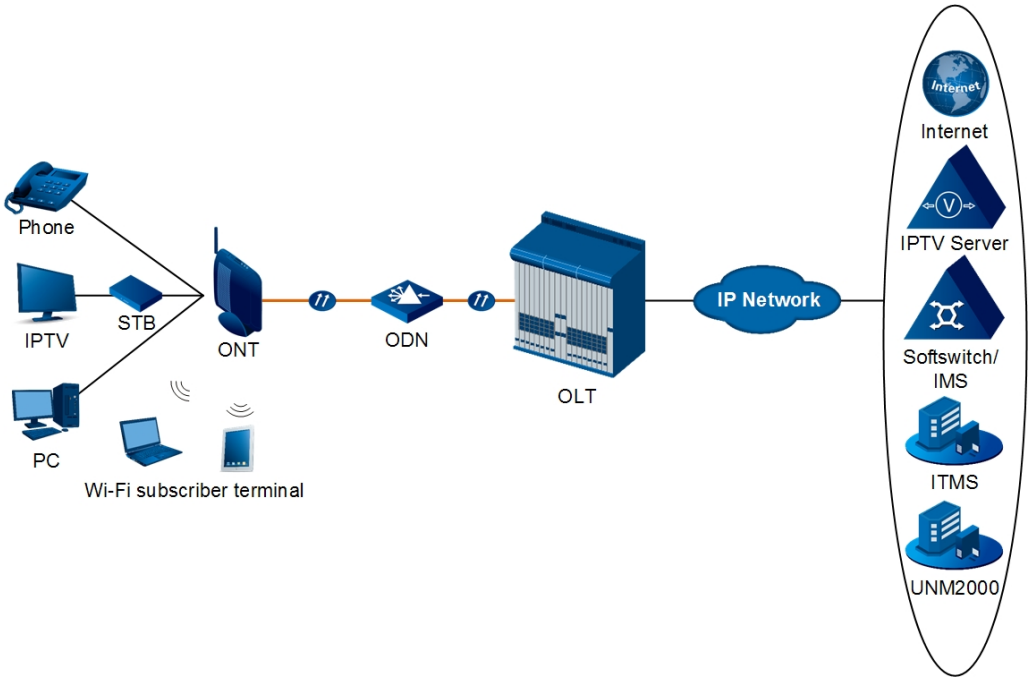
2 Product Introduction

- Product Positioning
- Product Specification
- Interface Specifications
- Introduction to the HG6243C
- Introduction to the HG6245D

2.1 Product Positioning

The 1G ONTs are FTTH-type GPON optical network terminals. They provide users with communication and entertainment services in the form of data, voice, video and so on, to meet the integrated access demand of families and small-scaled enterprises.

The figure below shows the network positioning of the 1G ONTs.



2.2 Product Specification

The tables below describe the interfaces and services supported by the 1G ONTs, which can be referred to for ONT configuration.

Table 2-1 lists the interfaces supported by the 1G ONTs.

Table 2-1 Interfaces Supported by the ONTs

ONT Type	Ethernet Interface Quantity	POTS Interface Quantity	Wi-Fi Interface Quantity	USB Interface Quantity	CATV interface Quantity
HG6243C	4 (GE)	2	√	1	-
HG6245D	4 (GE)	2	√ (2.4 GHz, 5 GHz)	2	-

Table 2-2 lists the service types supported by the 1G ONTs.

Table 2-2 Service Types Supported by the ONTs

ONT Type	Internet Service	Multicast Service	Voice Service	Wi-Fi Service
HG6243C	√	√	√	√
HG6245D	√	√	√	√
"√" indicates "supported"; "×" indicates "not supported".				

Service Reliability

The 1G ONTs support MTBF up to 30 000 hours.

2.3 Interface Specifications

2.3.1 GPON Interface

Item	Specification
Standard compliance	ITU-T G.984, Class B+
Transmission rate	Rx: 2.5 Gbit/s; Tx: 1.25 Gbit/s
Interface mode	Single-mode
Interface type	SC/UPC or SC/APC
Maximum transmission distance	20 km
Central wavelength	Tx: 1310 nm; Rx: 1490 nm
Optical power	Tx.: 0.5 dBm to 5.0 dBm; Rx.: -8 dBm to -29 dBm
Extinction ratio	Higher than 10 dB
Receiving sensitivity	-27 dBm to -29 dBm
Maximum overload optical power	-8 dBm

2.3.2 LAN Interface

Item	Specification
Standard compliance	IEEE 802.3ab
Interface type	RJ-45
Interface rate	10 Mbit/s, 100 Mbit/s or 1000 Mbit/s

Item	Specification
Maximum transmission distance	100 m
Working mode	Supports full-duplex / half-duplex and auto negotiation to rates 10/100/1000 Mbit/s.
Specifications of the cable used	CAT-5 unshielded twisted pair

2.3.3 POTS Interface

Item	Specification
Interface type	RJ-11
Transmission rate	64 Kbit/s
Cable type	Twisted-pair cable
Line code	PCM

2.3.4 Wi-Fi Interface

Item	Specification
Standard compliance	IEEE 802.11 a/b/g/n/ac
Operating band	2.4GHz / 5GHz
Specifications	Four SSIDs and 13 working channels for the 2.4 GHz band; four SSIDs and 20 working channels for the 5 GHz band. Automatic rate adjustment and launched power adjustment for both the 2. 4GHz and the 5 GHz bands.
Authentication mode	OPEN, SHARED, WPA-PSK, WPA2-PSK and WPA-PSK/WPA2-PSK
Encryption mode	WEP, TKIP, AES and TKIP / AES

2.3.5 USB Interface

Item	Specification
Standard compliance	USB2.0 / USB1.1
Transmission rate	20 MB/s

2.4 Introduction to the HG6243C

2.4.1 Appearance

This section describes the appearance of the HG6243C, including the overall look, interfaces, buttons, and indicator LEDs.

Note:

The pictures here are only for reference.

Appearance

The overall look of the HG6243C is shown in Figure 2-1.

Figure 2-1 Overall Look of the HG6243C

Interfaces and Buttons

Interfaces and buttons of the HG6243C are located on the rear, side and bottom panels of the equipment. Figure 2-2, Figure 2-3 and Figure 2-4 show the rear panel, side panel and bottom panel respectively.

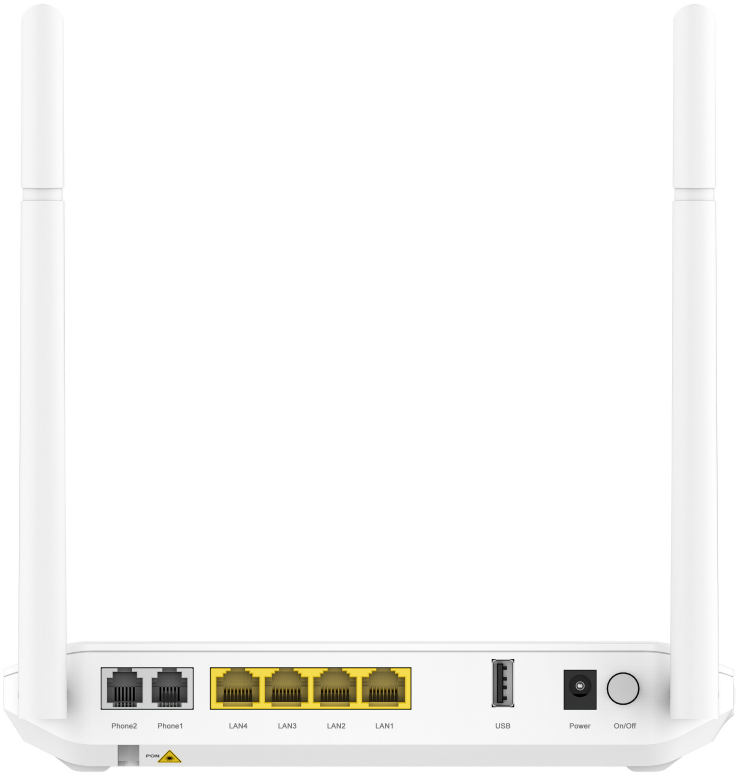


Figure 2-2 Rear Panel of the HG6243C

Figure 2-3 Side Panel of the HG6243C

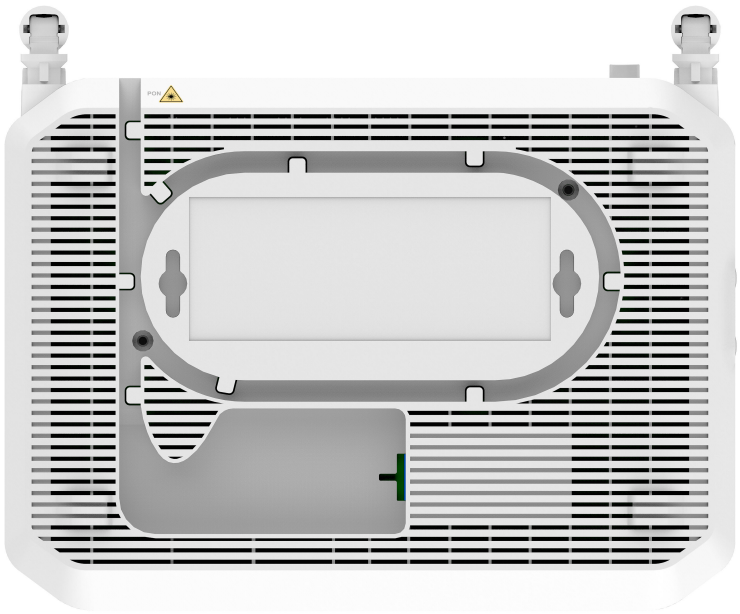


Figure 2-4 Bottom Panel of the HG6243C

Table 2-3 describes the interfaces and buttons on the HG6243C.

Table 2-3 Interfaces and Buttons on the HG6243C

Interface and Button	Description	Function
Phone1, Phone2	Telephone interface	Connects to the subscriber's telephone.
LAN1 to LAN4	Ethernet port	Connects to the computer, IP router or IP set top box.
USB	USB Host interface	Connects to the USB interface storage device.
Power	Power interface	Connects to the power adapter.
On/Off	Power switch	Turns on or off the power for the equipment.
Reset	Reboot button	Press down the button for no more than five seconds to reboot the equipment; press it down for a longer time to restore the factory settings and reboot the equipment.
WLAN	WLAN function button	Enables / disables the WLAN function.
WPS	WPS function button	Enables / disables WLAN data encryption.
PON	Fiber interface	Connects with the optical fiber for uplink access.

Indicator LEDs

Indicator LEDs of the HG6243C are located on the front panel of the equipment. Table 2-4 describes the indicator LEDs.

Table 2-4 Indicator LEDs on the HG6243C

Indicator LED	Meaning	Color	Status	Status Description
Power	Power status indicator LED	Green	ON	The device is powered on.
			OFF	The device is not powered on.
PON	Register status indicator LED	Green	ON	The ONT has been activated.
			Blinking	The ONT is being activated.
			OFF	Activation of the ONT is not yet started.
LOS	Optical signal status indicator LED	Red	Blinking	The device has not received the optical signal.
			OFF	The device has received the optical signal.
Internet	Broadband status indicator LED	Green	ON	Connection to the broadband network is normal.

Table 2-4 Indicator LEDs on the HG6243C (Continued)

Indicator LED	Meaning	Color	Status	Status Description
			Blinking	Connection to the broadband network is normal with data transmission.
			OFF	Not connected to the broadband network.
WLAN	Wireless signal status indicator LED	Green	ON	The wireless interface is enabled.
			Blinking	The wireless interface is transmitting / receiving data.
			OFF	The wireless interface is disabled.
WPS	WPS status indicator LED	Green	ON	WPS is enabled, and the Wi-Fi terminal has been connected to the ONT.
			Blinking	WPS is in use for relevant negotiation.
			OFF	WPS is not enabled, or the Wi-Fi terminal is not connected to the ONT.
USB	USB indicator LED	Green	ON	The USB is connected.
			OFF	The USB is not connected.
LAN1 to LAN4	Ethernet interface status indicator LED	Green	ON	The interface is connected to the user terminal and no data is transmitted.
			Blinking	The interface is transmitting / receiving data.
			OFF	The interface is not connected to the user terminal.
Phone1, Phone2	Phone port status indicator LED	Green	ON	The port is registered in the softswitch system.
			Blinking	Service flow is found at the port.
			OFF	The port is not registered in the softswitch system.

2.4.2 Product Characteristics

The HG6243C can be used together with the OLT equipment to make up a GPON system and provide users with access to multiple services. The HG6243C has the following characteristics:

1. GPON Access Capability

- Conforms to ITU-T G.984 series of standards, with good interoperability.
- Provides large-capacity GPON transmission bandwidth: supports the downlink rate up to 2.5 Gbit/s and the uplink rate up to 1.25 Gbit/s.
- Supports the dynamic bandwidth allocation (DBA) algorithm.
- Supports long-haul transmission. The maximum transmission distance can reach 20 km.

2. Abundant Service Types

Provides abundant physical interfaces on the subscriber side to access multiple services such as Internet access, video, voice and home storage services.

3. Wi-Fi Wireless Access

- Provides Wi-Fi wireless access based on IEEE 802.11 b/g/n to help users set up a safe and reliable wireless network.
- Compatible with IEEE 802.11 b/g/n and authenticated by Wi-Fi Alliance, with good compatibility with other WLAN devices.
- Supports four SSIDs so that users can set different wireless networks as needed.
- Supports multiple authentication and encryption modes to provide users with safe and reliable wireless access approaches.

4. Network Storage and File Sharing

- Provides a USB interface for connection with the USB interface storage device to provide convenient network storage and file sharing service.
- Supports plug-and-play and hot insertion of the USB interface.
- Supports configuration of the USB function based on the Web page to facilitate file sharing in the family network.
- Supports network storage based on FTP to provide the FTP client and server end functions. Users can download files from the FTP server in a public network to the USB interface storage device or access the USB interface storage device on the ONT via the FTP client end on the PC.

5. Gateway Functions

- Serves as home gateway and provides abundant and reliable gateway functions.
- Functions as the DHCP Server to cater for application demands in different scenarios.
- Supports configuring protection against DoS attacks, filtering of MAC addresses, IP addresses and URL addresses, firewall and ACL rules to guarantee safe operation of the equipment.

6. Remote Automatic Service Provisioning, Maintenance and Management

- Supports configuring the user-defined upgrade policies through the network management system so that the equipment can be upgraded automatically after being powered on.
- Supports collecting performance data of the ONT remotely via the network management system to enable real-time monitoring of the network performance.
- Supports remote fault isolation for the ONT via the network management system. Faults can be isolated remotely according to the alarms reported to reduce the maintenance cost.

2.4.3 Functions and Features

Item		Specification
GPON	GPON interface specifications	Compliant with standards ITU-T G.984.1, G.984.2, G.984.3 and G.984.4.
		Supports GEM encapsulation (Ethernet over GEM is supported, but ATM encapsulation is not supported).
		The GPON system adopts the single-fiber bidirectional transmission mechanism, using the TDMA mode with the wavelength 1310 nm in the uplink direction, and the broadcast mode with the wavelength 1490 nm in the downlink direction.
		Supports embedded OAM messages, PLOAM messages and OMCI messages.
		Supports slicing of data messages and OMCI protocol messages in the uplink direction. Message slices with both adaptive length and fixed length are supported.

Item		Specification
	GEM port	Supports bearing the downlink broadcast messages and unknown multicast messages via the broadcast GEM ports.
		Supports mapping from GEM ports to T-CONTs.
		Supports multiple flow mapping modes:
		Supports the GEM port loopback.
	T-CONT	Supports the T-CONTs of Type1 to Type 5.
		A T-CONT supports no less than 64 GEM ports.
		Supports eight T-CONTs.
	DBA	Supports DBA in the SR and NSR modes.
		Supports DBA Piggy-back DBRu Mode 0.
	FEC	Supports bi-directional FEC: downlink FEC decoding and uplink FEC encoding.
		Supports downlink FEC performance statistics.
	Encryption	Supports encryption for the downlink unicast data channel.
		Supports the AES-128 encryption algorithm.
		Supports generation of the key and response to the OLT's request for key.
		Supports OMCI channel encryption.
	Registration authentication	Supports the ONT registration process as specified in ITU-T. G. 984.3.
		Supports four authentication modes: SN, Password, SN + Password and LOID.
		Supports performance statistics for the Ethernet interface.
		Supports performance statistics for the GEM ports.
Ethernet		Complies with the IEEE 802.3 standard.
		Supports configuring the Ethernet interface rate, working mode, and MDI/MDIX auto-negotiation mode.
		Supports manual configuration of the rate 10/100/1000 Mbit/s.
		Supports manual configuration of the half duplex or full duplex mode.
		Supports unlink / downlink rate control based on the Ethernet port, with the granularity of 64 kbit/s.
		Supports the PAUSE flow control.
		Supports the loopback detection at the subscriber side.
		Supports learning up to 1024 MAC addresses.

Item	Specification
	Supports enabling / disabling the MAC address learning function globally.
	Supports remote configuration of the MAC address aging time. The value ranges between 0s and 300s. The default value is 80s.
Multicast	Supports the IGMP Snooping protocol.
	Supports IGMP v1/v2/v3.
	Supports filtering and forwarding of multicast MAC addresses.
	Supports controllable multicast and uncontrollable multicast.
	Supports fast leave.
	Supports translation, transparent transmission and stripping of the multicast VLAN tags.
	Supports VLAN translation for the uplink multicast protocol messages.
	Supports filtering the downlink multicast messages.
	Supports bearing downlink multicast service flows and IGMP signaling messages via different GEM ports.
	Supports configuration of the multicast GEM ports.
	Supports authentication of the GEM ports.
	Supports no less than 256 multicast groups.
	Supports the IPoE/PPPoE mode for multicast services.
	Supports the IPv6 Snooping multicast service; supports the MLDv1 message, MLDv2 query message and MLDv2 report message.
VLAN	Supports the IEEE 802.1Q VLAN standard.
	Supports adding the 802.1Q VLAN ID in the tag / untag mode.
	Supports up to 4095 VLANs.
Wire-speed forwarding	Supports Layer 2 / Layer 3 wire-speed forwarding.
Layer 3 features	Supports the IPv4/v6 dual stack.
	Supports obtaining network parameters such as the user IP address, subnet mask and DNS in the DHCP mode. Supports reporting the physical location of the Ethernet interface based on DHCP Option82.
	Supports obtaining user IP addresses in the PPPoE mode, and supports the PPPoE+ function for precise identification of users.
	Supports static routing and default routing.

Item	Specification
	Supports DDNS, NAT, port forwarding and DMZ.
	Supports ARP, UPnP, ALG, Portal and QoS.
Voice	Supports the protocols H.248 and SIP.
	Supports the speech encoding modes such as G.711, G.729, G.723.1 and G.722.
	Provides a phone number for each connected telephone set.
	Supports simultaneous call and conversation of two POTS subscribers.
	Supports static and dynamic jitter buffer.
	Supports DTMF detection.
	Supports RFC 2833 for transmitting / receiving DTMF.
	Supports RTP/RTCP (RFC 3550).
WLAN	Supports 802.11b, 802.11g, 802.11n, 802.11b/g and hybrid mode for the 2.4 GHz frequency band.
	Supports four SSIDs to differentiate networks.
	Supports 13 working channels in the 2.4GHz frequency band.
	Supports automatic selection and manual configuration of channels.
	Supports Open System, Shared key, WPA, WPA2, WPA-PSK, WPA2-PSK and WPS authentication.
	Supports the WEP, TKIP, AES and AES/TKIP encryption.
	Supports the WPS negotiation encryption algorithm and key.
	Supports adjustment of the transmit power, which is configured in form of percentage. Ten options are provided: 20%, 40%, 60%, 80%, 100%, 120%, 140%, 160%, 180% and 200%. Other values are not supported.
USB	Conforms to the USB 1.1/USB 2.0 standard.
	Supports plug-and-play and hot insertion of the USB storage device.
	Supports storage devices such as the USB HUB and mass storage.
	Supports providing the FTP service on the USB.
Security	Supports the firewall.
	Supports packet filtering.
	Supports filtering MAC addresses.
	Supports filtering URL addresses.

Item	Specification
	Supports protection against illegal message (such as DoS and ARP) attacks; supports suppression of broadcast storms.
	Supports configuring the HTTPS safe channel.
	Supports configuring ACL rules for the ONT.
	Supports remote control.
Management and maintenance	Supports local service configuration, query and software upgrade based on the Web page.
	Supports management of OMCI configurations and queries.
	Supports query of the ONT optical module information.
	Supports Type B protection.
QoS	Provides powerful QoS functions; supports global configuration of queue priorities and flexible mapping of 802.1p values of packets.
	Supports the ACL function to match traffics based on the ACL rules.
	Supports three queue scheduling modes (PQ, WRR and PQ +WRR); supports configuring the weight of scheduled queues to guarantee the quality of high-QoS services such as voice and video in multi-service scenarios.

2.4.4 Technical Specifications

Classification	Item	Specification
Mechanical parameters	Dimensions	36.8 mm × 204 mm × 149 mm (H × W × D)
	Wall mounting hole distance	121 mm
	Weight	About 331 g
Power supply parameters	DC	DC 12 V/1.5 A
Power consumption parameter	Static power consumption	5 W
	Maximum power consumption	12 W
Environment parameters	Working temperature	-5℃ to 45℃
	Storage temperature	-40℃ to 70℃
	Environmental humidity	10% to 90% (no condensation)

2.5 Introduction to the HG6245D

2.5.1 Appearance

This section describes the appearance of the HG6245D, including the overall look, interfaces, buttons, and indicator LEDs.

Note:

The pictures here are only for reference.

Appearance

The overall look of the HG6245D is shown in Figure 2-5.

Figure 2-5 Overall Look of the HG6245D

Interfaces and Buttons

Interfaces and buttons of the HG6245D are located on the rear, side and bottom panels of the equipment. Figure 2-6, Figure 2-7 and Figure 2-8 show the rear panel, side panel and bottom panel respectively.

Figure 2-6 Rear Panel of the HG6245D

Figure 2-7 Side Panel of the HG6245D

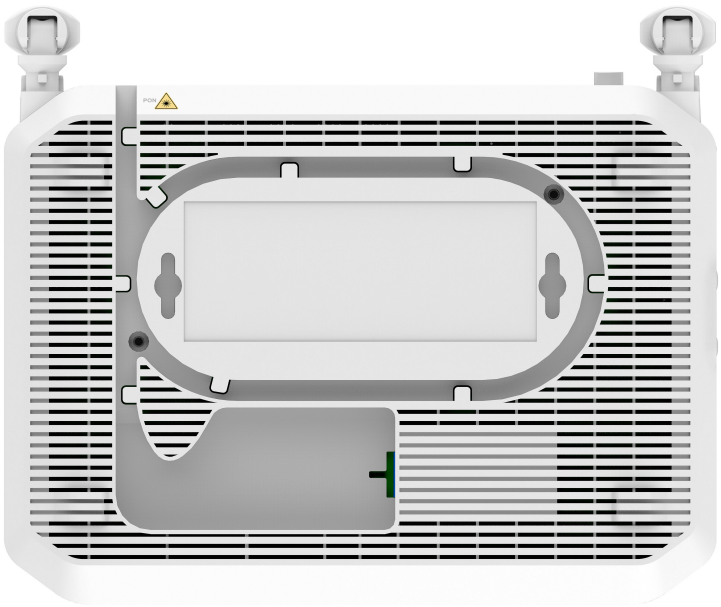


Figure 2-8 Bottom Panel of the HG6245D

Table 2-5 describes the interfaces and buttons on the HG6245D.

Table 2-5 Interfaces and Buttons on the HG6245D

Interface and Button	Description	Function
Phone1, Phone2	Telephone interface	Connects to the subscriber's telephone.
LAN1 to LAN4	Ethernet port	Connects to the computer, IP router or IP set top box.
USB1, USB2	USB Host interface	Connects to the USB interface storage device.
Power	Power interface	Connects to the power adapter.
On/Off	Power switch	Turns on or off the power for the equipment.
Reset	Reboot button	Press down the button for no more than five seconds to reboot the equipment; press it down for a longer time to restore the factory settings and reboot the equipment.
WLAN	WLAN function button	Enables / disables the WLAN function.
WPS	WPS function button	Enables / disables WLAN data encryption.
PON	Fiber interface	Connects with the optical fiber for uplink access.

Indicator LEDs

Indicator LEDs of the HG6245D are located on the front panel of the equipment. Table 2-6 describes the indicator LEDs.

Table 2-6 Indicator LEDs on the HG6245D

Indicator LED	Meaning	Color	Status	Status Description
Power	Power status indicator LED	Green	ON	The device is powered on.
			OFF	The device is not powered on.
PON	Register status indicator LED	Green	ON	The ONT has been activated.
			Blinking	The ONT is being activated.
			OFF	Activation of the ONT is not yet started.
LOS	Optical signal status indicator LED	Red	Blinking	The device has not received the optical signal.
			OFF	The device has received the optical signal.
Internet	Broadband status indicator LED	Green	ON	Connection to the broadband network is normal.

Table 2-6 Indicator LEDs on the HG6245D (Continued)

Indicator LED	Meaning	Color	Status	Status Description
			Blinking	Connection to the broadband network is normal with data transmission.
			OFF	Not connected to the broadband network.
WLAN1, WLAN2	2.4G/5G wireless signal status indicator LED	Green	ON	The 2.4G/5G wireless interface is enabled.
			Blinking	The 2.4G/5G wireless interface is transmitting / receiving data.
			OFF	The 2.4G/5G wireless interface is disabled.
WPS	WPS status indicator LED	Green	ON	WPS is enabled, and the Wi-Fi terminal has been connected to the ONT.
			Blinking	WPS is in use for relevant negotiation.
			OFF	WPS is not enabled, or the Wi-Fi terminal is not connected to the ONT.
USB1, USB2	USB indicator LED	Green	ON	The USB is connected.
			OFF	The USB is not connected.
LAN1 to LAN4	Ethernet interface status indicator LED	Green	ON	The interface is connected to the user terminal and no data is transmitted.
			Blinking	The interface is transmitting / receiving data.
			OFF	The interface is not connected to the user terminal.
Phone1, Phone2	Phone port status indicator LED	Green	ON	The port is registered in the softswitch system.
			Blinking	Service flow is found at the port.
			OFF	The port is not registered in the softswitch system.

2.5.2 Product Characteristics

The HG6245D can be used together with the OLT equipment to make up a GPON system and provide users with access to multiple services. The HG6245D has the following characteristics:

1. GPON Access Capability

- Conforms to ITU-T G.984 series of standards, with good interoperability.
- Provides large-capacity GPON transmission bandwidth: supports the downlink rate up to 2.5 Gbit/s and the uplink rate up to 1.25 Gbit/s.
- Supports the dynamic bandwidth allocation (DBA) algorithm.
- Supports long-haul transmission. The maximum transmission distance can reach 20 km.

2. Abundant Service Types

Provides abundant physical interfaces on the subscriber side to access multiple services such as Internet access, video, voice and home storage services.

3. Wi-Fi Wireless Access

- Provides Wi-Fi wireless access based on IEEE 802.11 a/b/g/n/ac to help you set up a safe and reliable wireless network.
- Compatible with IEEE 802.11 a/b/g/n/ac and authenticated by Wi-Fi Alliance, with good compatibility with other WLAN devices.
- Supports eight SSIDs (four for the 2.4 GHz band and another four for the 5 GHz band) so that users can set different wireless networks as needed.
- Supports multiple authentication and encryption modes to provide users with safe and reliable wireless access approaches.

4. Network Storage and File Sharing

- Provides a USB interface for connection with the USB interface storage device to provide convenient network storage and file sharing service.
- Supports plug-and-play and hot insertion of the USB interface.

- Supports configuration of the USB function based on the Web page to facilitate file sharing in the family network.
- Supports network storage based on FTP to provide the FTP client and server end functions. Users can download files from the FTP server in a public network to the USB interface storage device or access the USB interface storage device on the ONT via the FTP client end on the PC.

5. Gateway Functions

- Serves as home gateway and provides abundant and reliable gateway functions.
- Functions as the DHCP Server to cater for application demands in different scenarios.
- Supports configuring protection against DoS attacks, filtering of MAC addresses, IP addresses and URL addresses, firewall and ACL rules to guarantee safe operation of the equipment.

6. Remote Automatic Service Provisioning, Maintenance and Management

- Supports configuring the user-defined upgrade policies through the network management system so that the equipment can be upgraded automatically after being powered on.
- Supports collecting performance data of the ONT remotely via the network management system to enable real-time monitoring of the network performance.
- Supports remote fault isolation for the ONT via the network management system. Faults can be isolated remotely according to the alarms reported to reduce the maintenance cost.

2.5.3 Functions and Features

Item		Description
GPON	GPON interface specifications	Compliant with standards ITU-T G.984.1, G.984.2, G.984.3 and G.984.4.
		Supports GEM encapsulation (Ethernet over GEM is supported, but ATM encapsulation is not supported).

Item		Description
		The GPON system adopts the single-fiber bidirectional transmission mechanism, using the TDMA mode with the wavelength 1310 nm in the uplink direction, and the broadcast mode with the wavelength 1490 nm in the downlink direction.
		Supports embedded OAM messages, PLOAM messages and OMCI messages.
		Supports slicing of data messages and OMCI protocol messages in the uplink direction. Message slices with both adaptive length and fixed length are supported.
	GEM port	Supports bearing the downlink broadcast messages and unknown multicast messages via the broadcast GEM ports.
		Supports mapping from GEM ports to T-CONTs.
		Supports multiple flow mapping modes:
		Supports the GEM port loopback.
	T-CONT	Supports the T-CONTs of Type1 to Type 5.
		A T-CONT supports no less than 64 GEM ports.
		Supports eight T-CONTs.
	DBA	Supports DBA in the SR and NSR modes.
		Supports DBA Piggy-back DBRu Mode 0.
	FEC	Supports bi-directional FEC: downlink FEC decoding and uplink FEC encoding.
		Supports downlink FEC performance statistics.
	Encryption	Supports encryption for the downlink unicast data channel.
		Supports the AES-128 encryption algorithm.
		Supports generation of the key and response to the OLT's request for key.
		Supports OMCI channel encryption.
	Registration authentication	Supports the ONT registration process as specified in ITU-T. G.984.3.
		Supports four authentication modes: SN, Password, SN + Password and LOID.
		Supports performance statistics for the Ethernet interface.
		Supports performance statistics for the GEM ports.
Ethernet		Complies with the IEEE 802.3 standard.
		Supports configuring the Ethernet interface rate, working mode, and MDI/MDIX auto-negotiation mode.
		Supports manual configuration of the rate 10/100/1000 Mbit/s.

Item	Description
	Supports manual configuration of the half duplex or full duplex mode.
	Supports unlink / downlink rate control based on the Ethernet port, with the granularity of 64 kbit/s.
	Supports the PAUSE flow control.
	Supports the loopback detection at the subscriber side.
	Supports learning up to 1024 MAC addresses.
	Supports enabling / disabling the MAC address learning function globally.
	Supports remote configuration of the MAC address aging time. The value ranges between 0s and 300s. The default value is 80s.
Multicast	Supports the IGMP Snooping protocol.
	Supports IGMP v1/v2/v3.
	Supports filtering and forwarding of multicast MAC addresses.
	Supports controllable multicast and uncontrollable multicast.
	Supports fast leave.
	Supports translation, transparent transmission and stripping of the multicast VLAN tags.
	Supports VLAN translation for the uplink multicast protocol messages.
	Supports filtering the downlink multicast messages.
	Supports bearing downlink multicast service flows and IGMP signaling messages via different GEM ports.
	Supports configuration of the multicast GEM ports.
	Supports authentication of the GEM ports.
	Supports no less than 256 multicast groups.
	Supports the IPoE/PPPoE mode for multicast services.
	Supports the IPv6 Snooping multicast service; supports the MLDv1 message, MLDv2 query message and MLDv2 report message.
VLAN	Supports the IEEE 802.1Q VLAN standard.
	Supports adding the 802.1Q VLAN ID in the tag / untag mode.
	Supports up to 4095 VLANs.
Wire-speed forwarding	Supports Layer 2 / Layer 3 wire-speed forwarding.
Layer 3 features	Supports the IPv4/v6 dual stack.

Item	Description
	Supports obtaining network parameters such as the user IP address, subnet mask and DNS in the DHCP mode. Supports reporting the physical location of the Ethernet interface based on DHCP Option82.
	Supports obtaining user IP addresses in the PPPoE mode, and supports the PPPoE+ function for precise identification of users.
	Supports static routing and default routing.
	Supports DDNS, NAT, port forwarding and DMZ.
	Supports ARP, UPnP, ALG, Portal and QoS.
Voice	Supports the protocols H.248 and SIP.
	Supports the speech encoding modes such as G.711, G.729, G.723.1 and G.722.
	Provides a phone number for each connected telephone set.
	Supports simultaneous call and conversation of two POTS subscribers.
	Supports static and dynamic jitter buffer.
	Supports DTMF detection.
	Supports RFC 2833 for transmitting / receiving DTMF.
	Supports RTP/RTCP (RFC 3550).
WLAN	Supports 802.11b, 802.11g, 802.11n, 802.11b/g and the hybrid mode for the 2.4 GHz frequency band; supports 802.11a, 802.11n, 802.11ac and the hybrid mode for the 5 GHz frequency band.
	Supports the MIMO program for the 2.4 GHz and 5 GHz frequency bands.
	Supports eight SSIDs (four for the 2.4 GHz band and another four for the 5 GHz band) to differentiate networks.
	Supports 13 working channels in the 2.4 GHz frequency band and 20 working channels in the 5 GHz frequency band.
	Supports automatic selection and manual configuration of channels.
	Supports Open System, Shared key, WPA, WPA2, WPA-PSK, WPA2-PSK and WPS authentication.
	Supports the WEP, TKIP, AES and AES/TKIP encryption.
	Supports the WPS negotiation encryption algorithm and key.

Item	Description
	Supports adjustment of the transmit power, which is configured in form of percentage. Ten options are provided: 20%, 40%, 60%, 80%, 100%, 120%, 140%, 160%, 180% and 200%. Other values are not supported.
USB	Conforms to the USB 1.1/USB 2.0 standard.
	Supports plug-and-play and hot insertion of the USB storage device.
	Supports storage devices such as the USB HUB and mass storage.
	Supports providing the FTP service on the USB.
Security	Supports the firewall.
	Supports packet filtering.
	Supports filtering MAC addresses.
	Supports filtering URL addresses.
	Supports protection against illegal message (such as DoS and ARP) attacks; supports suppression of broadcast storms.
	Supports configuring the HTTPS safe channel.
	Supports configuring ACL rules for the ONT.
	Supports remote control.
Management and maintenance	Supports local service configuration, query and software upgrade based on the Web page.
	Supports management of OMCI configurations and queries.
	Supports query of the ONT optical module information.
	Supports Type B protection.
QoS	Provides powerful QoS functions; supports global configuration of queue priorities and flexible mapping of 802.1p values of packets.
	Supports the ACL function to match traffics based on the ACL rules.
	Supports three queue scheduling modes (PQ, WRR and PQ +WRR); supports configuring the weight of scheduled queues to guarantee the quality of high-QoS services such as voice and video in multi-service scenarios.

2.5.4 Technical Specifications

Classification	Item	Specification
Mechanical parameters	Dimensions	36.8 mm × 204 mm × 149 mm (H × W × D)
	Wall mounting hole distance	121 mm
	Weight	About 339 g
Power supply parameters	DC	DC 12 V/1.5 A
Power consumption parameter	Static power consumption	7 W
	Maximum power consumption	17 W
Environment parameters	Working temperature	-5℃ to 45℃
	Storage temperature	-40℃ to 70℃
	Environmental humidity	10% to 90% (no condensation)

3 Web Configuration Guide

This chapter introduces the Web GUI for the 1G ONT administrator, including the parameter meanings and operation methods.

Note:

Configure the ONT on the OLT via the access network management system. For details, please refer to the relevant OLT configuration guide.

- Local Login to the Web Configuration GUI
- Status
- Network
- Security
- Application
- Management

3.1 Local Login to the Web Configuration GUI

This section introduces the local login to the ONT's Web GUI and the layout of the configuration GUI.

Prerequisites

- The ONT has been connected to the computer correctly.
- The user computer is started normally.
- The ONT is started normally.

  Press down the ONT's power button. If the power indicator LED is illuminated, the ONT is powered on normally.

Planning Data

Before setting up the configuration environment, prepare the data as shown in Table 3-1.

Table 3-1 Planning Data for Local Login to the Web GUI

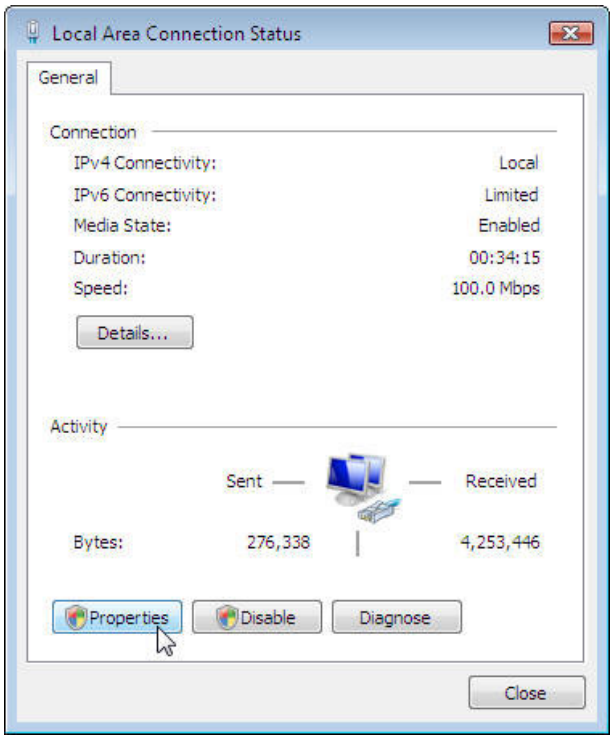
Item	Description
Username and password	Factory default value: ◆ Administrator ▸ Username: admin ▸ Password: admin ◆ Common user ▸ Username: user ▸ Password: user1234 **Note: Some operators require customized username and password, so that the default username and password may be different from the ones mentioned above. In this case, please ask the local operator (if you are an administrator user) or refer to the User Guide attached to the device or the label at the bottom of the device (if you are a common user) for detailed information.** **Note: The password is case sensitive.**
Management IP address and subnet mask of the ONT	Factory default value: ◆ IP address: 192.168.1.1 ◆ Subnet mask: 255.255.255.0 **Note: Some operators require customized management IP address, so that the default management IP address may be different from the one mentioned above. In this case, please refer to the User Guide attached to the device or the label at the bottom of the device.**
IP address and subnet mask of the user computer	◆ Set this item to obtaining IP address automatically based on DHCP (recommended). ◆ Set this item to static IP address, which should be in the same network segment with the management IP address of the ONT. ▸ IP address: 192.168.1.X (X is a decimal integer between 2 and 253) ▸ Subnet mask: 255.255.255.0

Operation Procedure

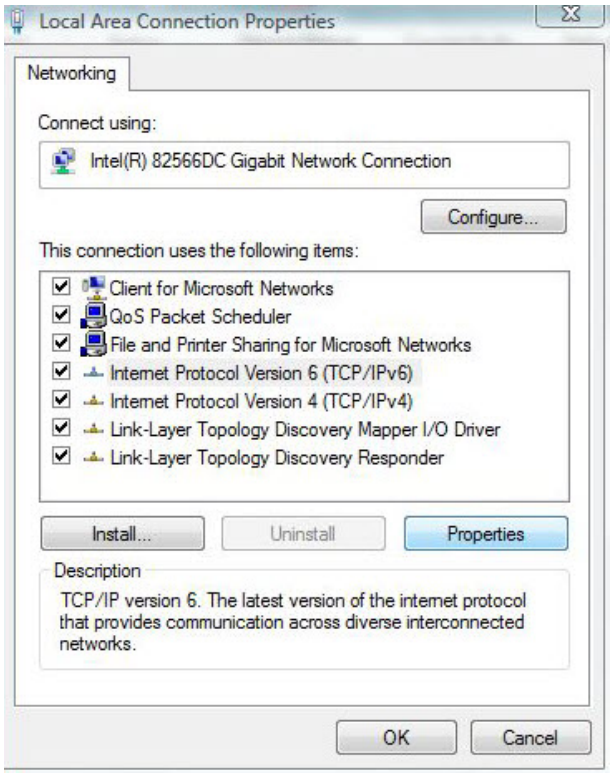
1. Set the IP address and the subnet mask of the computer.
   - ▸ The operations in the Windows 7 operating system are as follows:

a) In the Windows taskbar, select **Start→Control Panel** and click **Network and Sharing Center**.

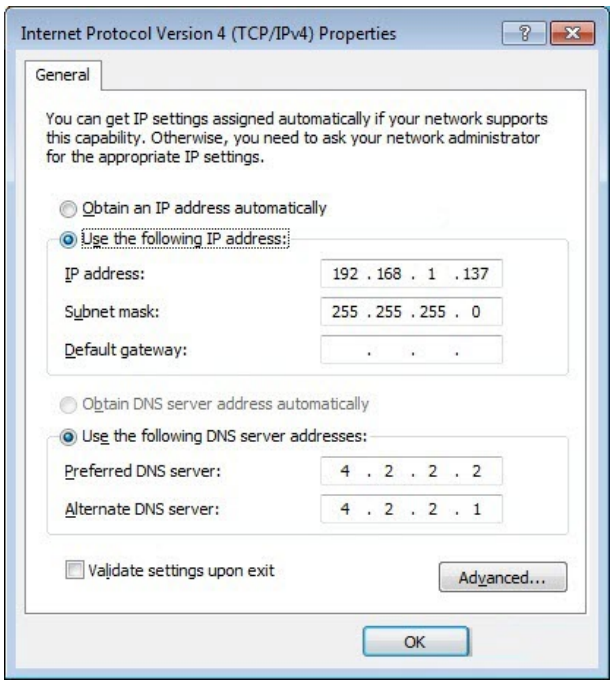
b) Click **Local Area Connection** to bring up the **Local Area Connection Status** dialog box, and click **Properties**.



c) In the **Local Area Connection Properties** dialog box that appears, double-click **Internet Protocol 4 (TCP/IPv4)**.



d) In the **Internet Protocol 4 (TCP/IPv4) Properties** dialog box that appears, set the IP address and subnet mask of the computer. For details of the parameters, see Table 3-1.

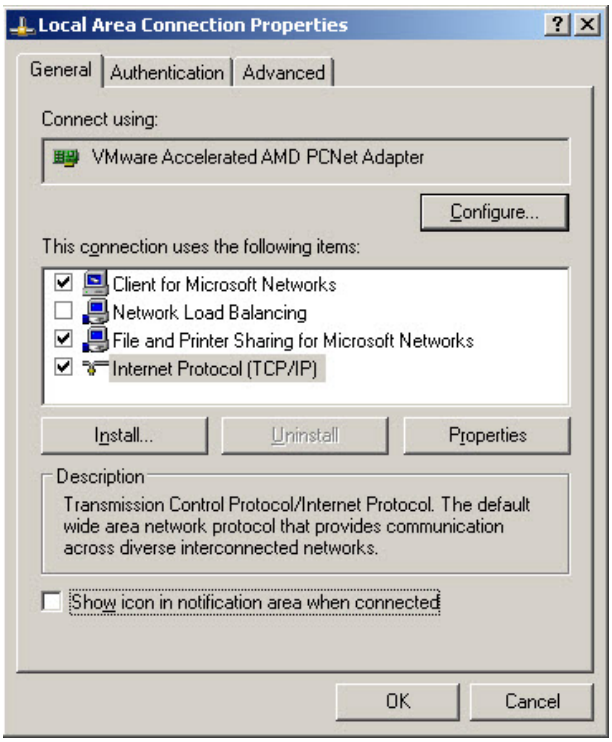


e) Click **OK** to save the configurations.

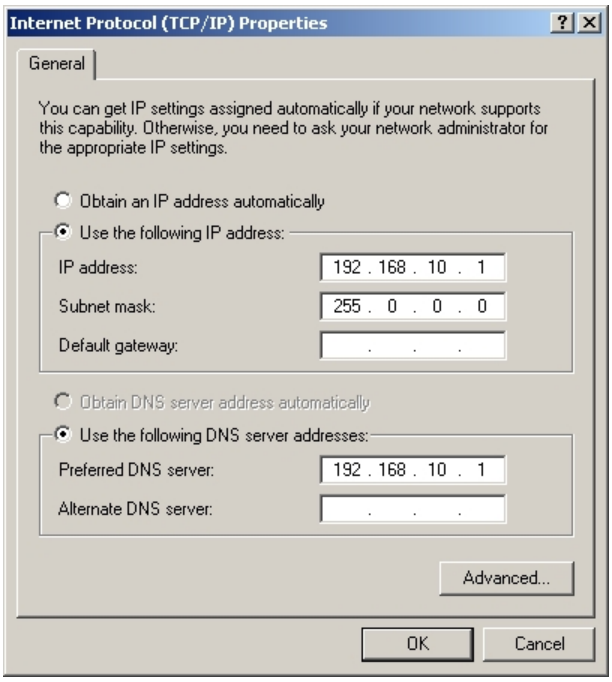
- The operations in the Windows XP operating system are as follows:

a) In the Windows taskbar, select **Start→Control Panel**. Double-click **Network Connection** to access the network connection window.

b) Right-click **Local Connection** and select **Properties** from the shortcut menu to bring up the **Local Connection Properties** dialog box.



c) Double-click **Internet Protocol (TCP/IP)**. In the **Internet Protocol (TCP/IP) Properties** dialog box that appears, set the IP address and subnet mask of the computer. For details of the parameters, see Table 3-1.



d) Click **OK** to save the configurations.

2. Enter **http://192.168.1.1** (default management IP address of the ONT) in the browser address bar of the computer, and press the Enter key to bring up the user login dialog box.
3. Enter the administrator username and password in the login dialog box. Access the Web GUI after the password is authenticated.

Caution:

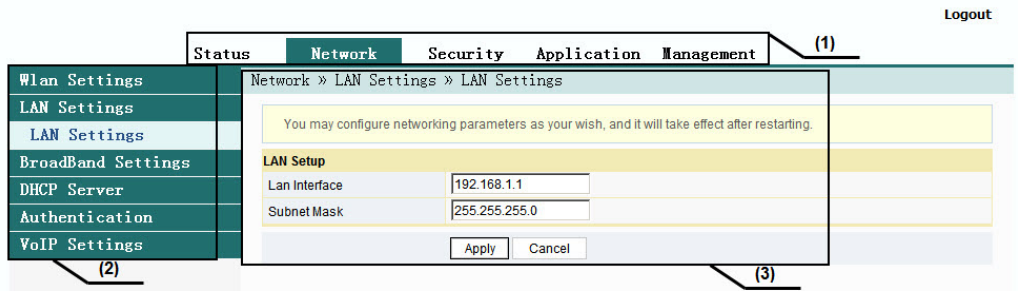
The system will log out automatically if no user operation is detected in five minutes.

Layout of the Web Configuration GUI

The Web configuration GUI comprises three parts, as shown in Figure 3-1.

- Navigation bar. Click the link to access the corresponding configuration management page.
- Link bar. Click the link to access the sub-page for corresponding configuration management.

- Configuration management area. Displays the items selected in the navigation bar and link bar.



(1) Navigation bar (2) Link bar (3) Configuration management area

Figure 3-1 Web Configuration GUI

The Web GUI configuration is basically the same for the 1G ONTs. The configuration GUIs supported by the ONTs vary with the specifications of the ONTs. For example, the ONTs without voice interfaces do not support voice configuration GUIs, and the ONTs without Wi-Fi interfaces do not support wireless network configuration GUIs. The parameters in the **Broadband Settings** GUI vary with the types of Wi-Fi interfaces. Please refer to Product Specification for detailed specifications of the ONTs.

The snapshot pictures provided in this section show the Web GUIs available for an administrator user (admin) of the AN5506-04-FAT for your reference. The GUIs for other devices may be a little different, and the practical GUIs shall prevail.

The configuration GUIs for the administrator are different from those for common users:

- The administrator can view and configure all the node items in the Web GUI.
- The common users can view and configure only part of the node items. The following lists the key nodes available for common users. For details of the configuration items, please refer to the practical GUIs.
  - The **Status** tab.
  - **Wlan Settings** in the **Network** tab.
  - **User Account** and **Device Reboot** in the **Management** tab.

3.2 Status

This section introduces how to view basic information about the ONT, including the device information, WAN side status, LAN side status, optical power status, voice status and wireless network status, etc.

3.2.1 Device Information

Select **Status** in the navigation bar, and then select **Device Information→Device Information** in the left link bar to view the information such as the software version, hardware version, device model and device description, as shown in Figure 3-2.

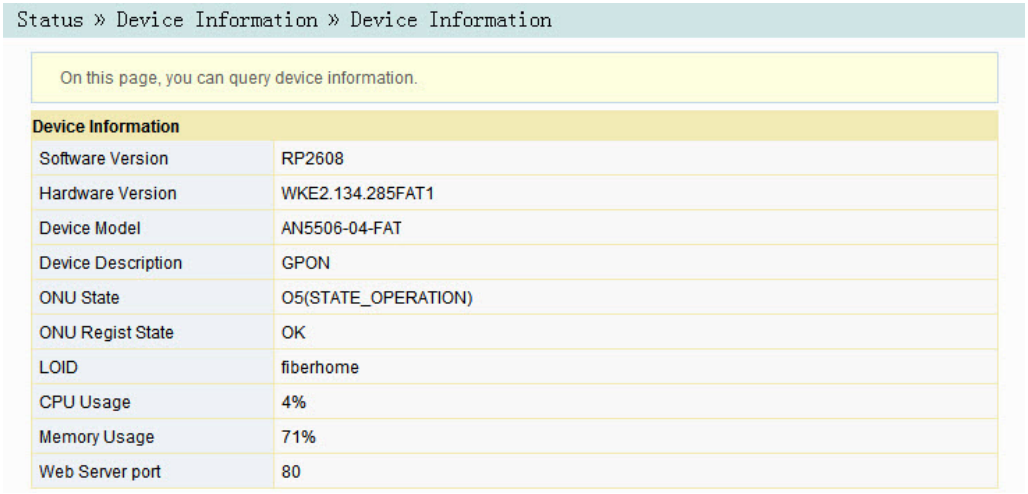


Figure 3-2 Device Information

3.2.2 Wireless Network Status

Note:

Only applicable to Wi-Fi ONTs.

View the information about the wireless network, such as network mode, frequency channel, SSID, count of wireless packets, and list of Wi-Fi clients.

3.2.2.1 Wireless Network Status

Select **Status** in the navigation bar, and then select **Wireless Status→Wireless Status** in the left link bar to view the information of the wireless network, such as network mode, band, SSID and wireless packet statistics, as shown in Figure 3-3.

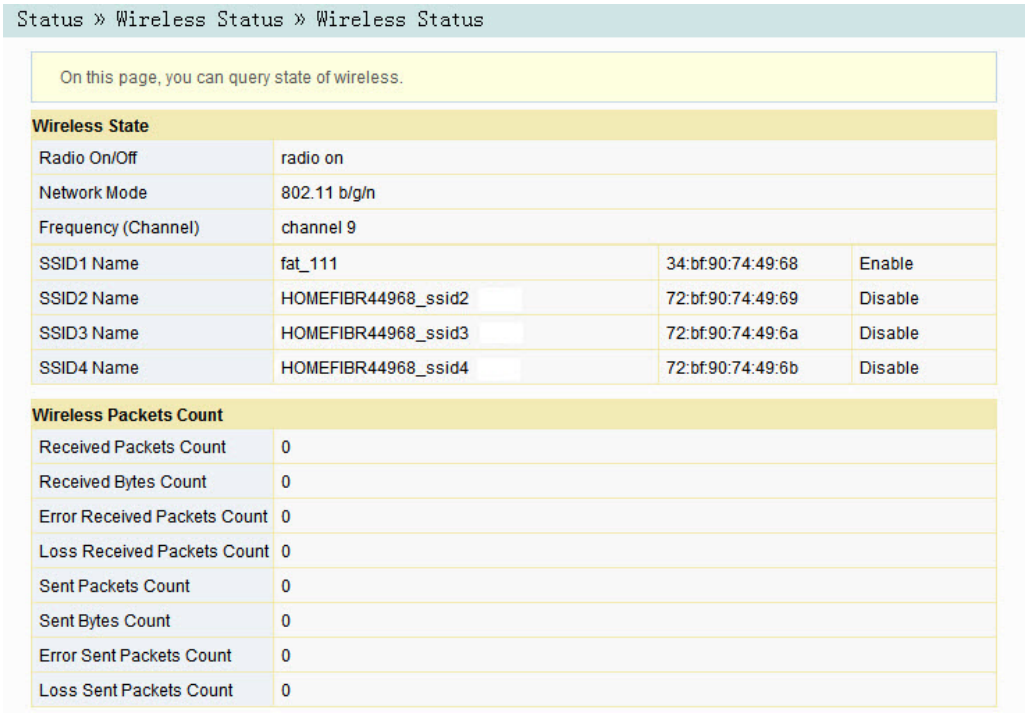


Figure 3-3 Wireless Network Status

3.2.2.2 Status of the 5G Wireless Network

Note:

Only applicable to dual-frequency Wi-Fi ONTs.

Select **Status** in the navigation bar, and then select **Wireless Status→5G Wireless Status** in the left link bar to view the information of the 5G wireless network, such as network mode, band, SSID and wireless packet statistics, as shown in Figure 3-4.

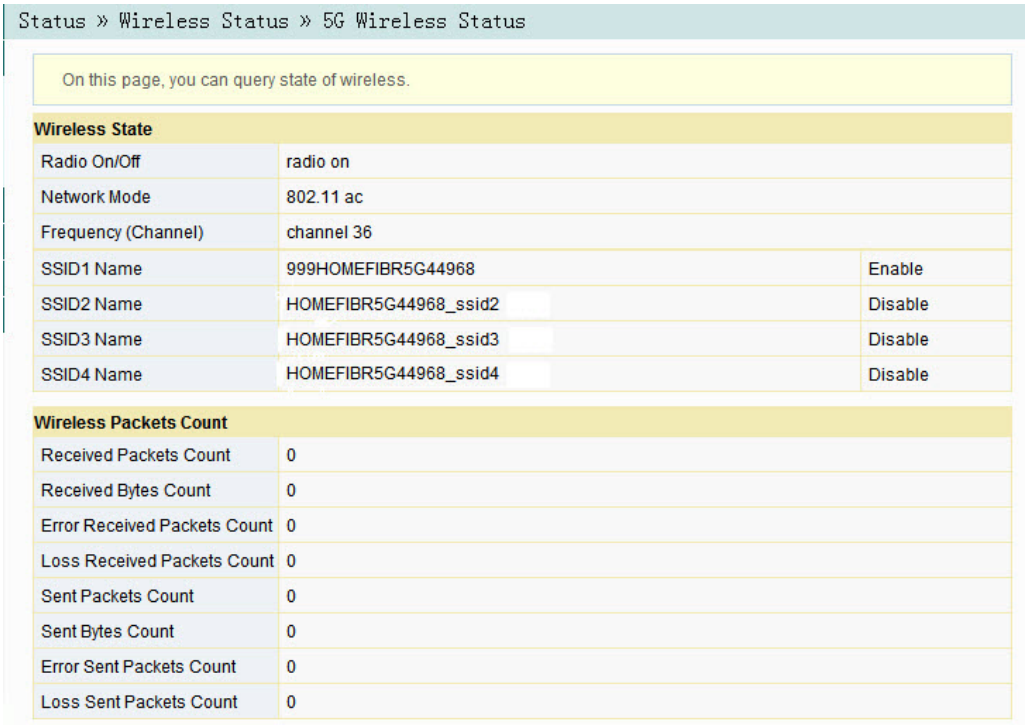


Figure 3-4 Status of the 5G Wireless Network

3.2.2.3 Wi-Fi User List

Select **Status** in the navigation bar, and then select **Wireless Status→WIFI Clients List** in the left link bar to view the list of client ends connected to the ONT wireless network, as shown in Figure 3-5.

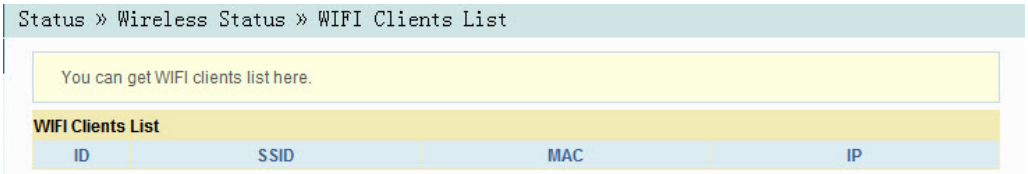


Figure 3-5 WIFI User List

3.2.3 WAN Side Status

Select **Status** in the navigation bar, and then select **Wan Status→Wan Status** in the left link bar to view the information such as the status, IP obtaining mode, IP address and subnet mask of the WAN interface, as shown in Figure 3-6.

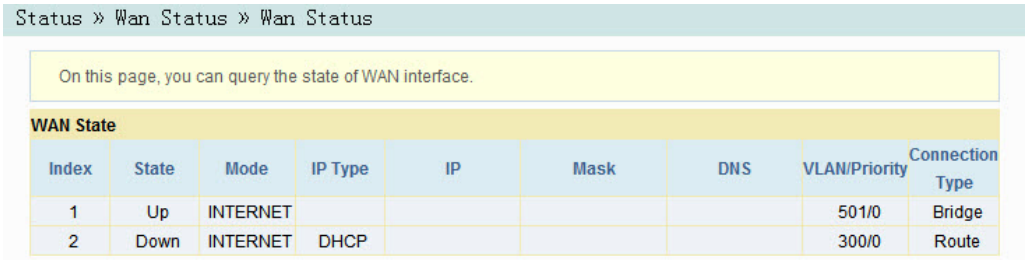


Figure 3-6 WAN Side Status

3.2.4 LAN Side Status

Check the state information about the LAN interface and the DHCP client end.

3.2.4.1 LAN Side Status

Select **Status** in the navigation bar and select **Lan Status→Lan Status** in the left link bar to view the information such as the IP address and subnet mask of the LAN side, as shown in Figure 3-7.

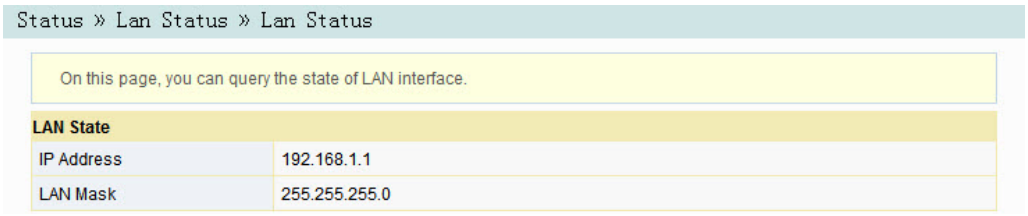


Figure 3-7 LAN Side Status

3.2.4.2 DHCP User List

Select **Status** in the navigation bar and select **Lan Status→DHCP Clients List** in the left link bar to view the information about the DHCP client end such as the IP address, MAC address and lease time, as shown in Figure 3-8.

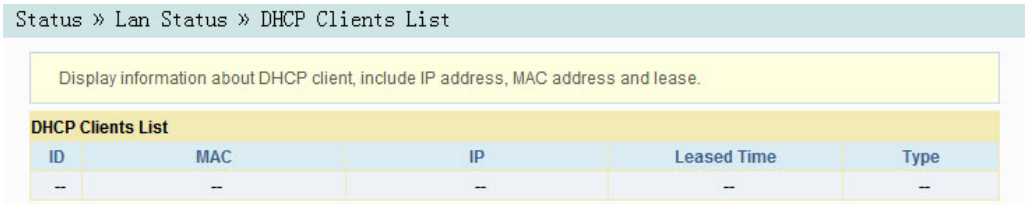


Figure 3-8 DHCP User List

3.2.5 Optical Power Status

Select **Status** in the navigation bar and select **Optical Info→Optical Info** in the left link bar to view the optical module information such as the Tx optical power, Rx optical power and working temperature, as shown in Figure 3-9.

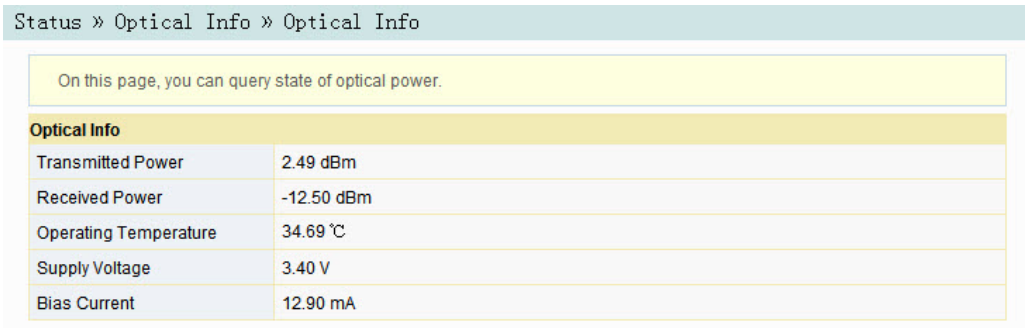


Figure 3-9 Optical Power Status

3.2.6 Voice Status

Note:

Only applicable to ONTs with POTS interfaces.

Select **Status** in the navigation bar and select **VoIP Status→VoIP Status** in the left link bar to view the information such as the port status and telephone number, as shown in Figure 3-10.

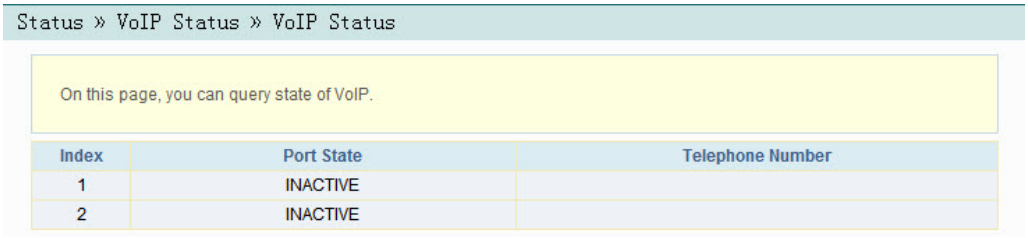


Figure 3-10 Voice Status

3.3 Network

This section introduces how to make the WLAN, LAN, broadband, DHCP server, authentication, IPv6 and voice configurations in the Web GUI.

3.3.1 WLAN Settings

Note:

Only applicable to Wi-Fi ONTs.

This section introduces how to configure Wi-Fi control and WPS as well as basic and advanced parameters of the wireless network on the Web page.

3.3.1.1 Basic Parameters

Configure the parameters of the 2.4G wireless network such as the switch, network mode, domain, frequency bandwidth and frequency channel.

1. Select **Network** in the navigation bar and select **Wlan Settings→Basic** in the left link bar to open the basic setting page for the 2.4G wireless access service, as shown in Figure 3-11.

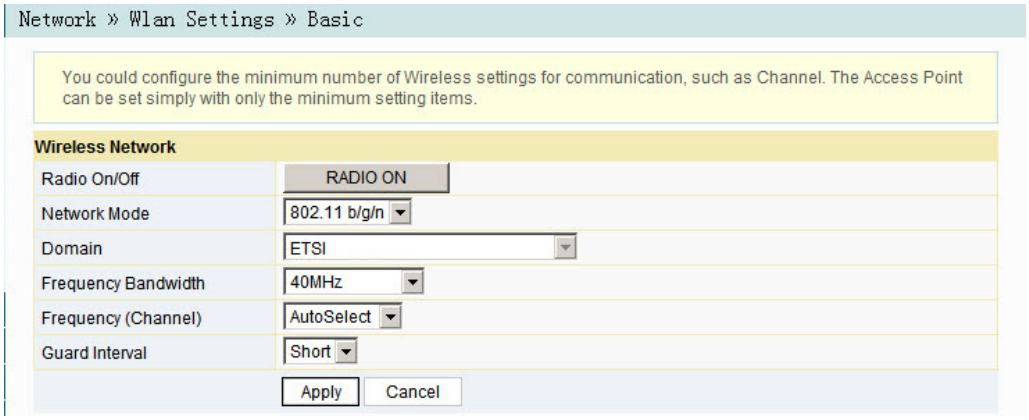


Figure 3-11 Basic Parameters of the Wireless Network

2. Configure the basic parameters of the 2.4G wireless network. For details of the parameters, see Table 3-2.

3. Click **Apply** to save and apply the configuration.

Table 3-2 Basic Parameters of the 2.4G Wireless Network

Item	Description
Radio ON/OFF	Enables or disables the WLAN service. RADIO ON: the wireless network is enabled; RADIO OFF: the wireless network is disabled.
Network Mode	The mode supported by the wireless network. The options include 802.11b, 802.11g, 802.11b/g, 802.11n and 802.11b/g/n. The default setting is 802. 11b/g/n.
Domain	Select your region.
Frequency Bandwidth	The width of wireless band. The options include 20MHz/40MHz, 20MHz and 40MHz.
Frequency (Channel)	The channel used for communication between the wireless access point and the wireless station. The options includes **AutoSelect** and **Channel1** to **Channel13**. The default setting is **AutoSelect**.
Guard Interval	The wireless protection interval. The options include **Short** and **Long**. The default setting is **Short**. **Note:** Applicable to dual-frequency Wi-Fi ONTs.

3.3.1.2 Advanced Configuration

Configure the parameters of the 2.4G wireless network, such as the SSID, password, security mode and algorithm.

1. Select **Network** in the navigation bar, and then select **Wlan Settings**→ **Advanced** in the left link bar to open the advanced setting page for the 2.4G wireless access service, as shown in Figure 3-12.

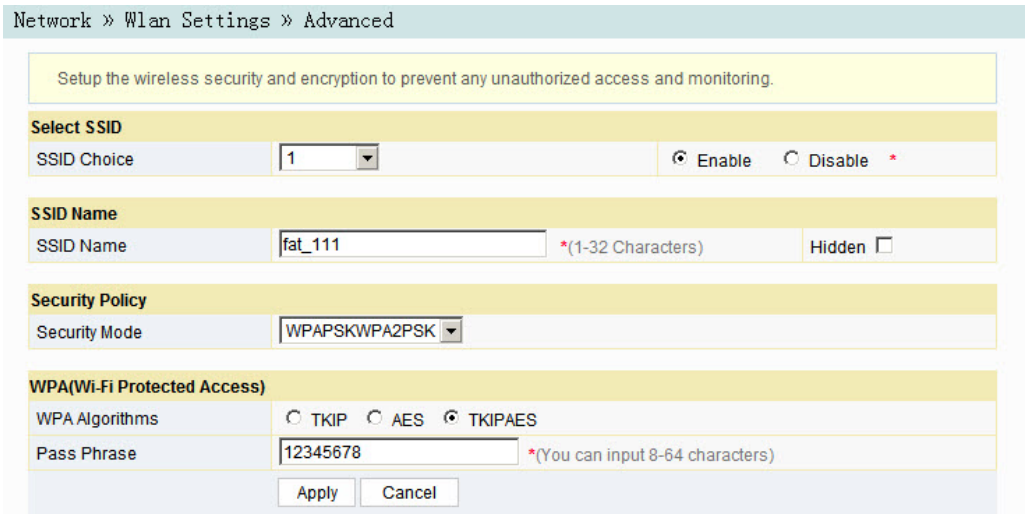


Figure 3-12 Advanced Settings of the Wireless Network

2. Configure the parameters of the 2.4G wireless network, such as the SSID, password, security mode and algorithm. For details of the parameters, see Table 3-3.
3. Click **Apply** to save and apply the configuration.

Table 3-3 Advanced Setting Parameters of Wireless Network

Item	Description
SSID Choice	Select the SSID. The value range is 1 to 4.
Enable / Disable	Enables or disables the corresponding SSID.
SSID Name	The wireless network name, used to identify different wireless networks.
Hidden	Select whether to hide the SSID. When the SSID is hidden, the wireless terminal cannot detect the wireless signals unless the SSID is entered.

Table 3-3 Advanced Setting Parameters of Wireless Network (Continued)

Item	Description	
Security Mode	The authentication mode for the wireless terminal requiring access to the wireless network. The options include OPEN, SHARED, WEPAUTO, WPA-PSK, WPA2-PSK and WPAPSKWPA2PSK. ◆ OPEN: Unencrypted. Any terminal can access the wireless network; therefore, the security cannot be guaranteed. This mode is not advisable. ◆ SHARED: This mode is based on the WEP encryption protocol, where the same key is configured for the wireless access client end and equipment side to provide the same security level as the wired LAN. It is a traditional WLAN security protocol. ◆ WEPAUTO: Both OPEN WEP and SHARED WEP are supported. ◆ WPA-PSK: This mode is based on the WLAN security protocol, where a key is pre-configured for the wireless access client end. The equipment side authenticates the legality of the wireless access client end key by the 4-way handshake key agreement protocol. This provides a safer and more confidential wireless network service than WEP. ◆ WPA2-PSK: WPA2 is the second edition of WPA. ◆ WPAPSKWPA2PSK: the authentication mode combining WPA and WPA2.	
WPA Algorithms	The encryption algorithms include TKIP, AES and TKIPAES.	This item should be configured if the authentication mode is WPA-PSK, WPA2-PSK or WPAPSKW-PA2PSK.
Pass Phrase	Enter the SSID key.	
Encrypt Type	Select to enable or disable the WEP encryption when the network authentication mode is OPEN.	
Default Key	Select Key1 to Key4; that is, select one of the four configured network keys.	This item should be configured when the authentication mode is OPEN and the WEP encryption is enabled or the authentication mode is SHARED or WEPAUTO.
WEP Key 1 to WEP Key 4	Enter the key value and select the key value type. At least enter the item selected in **Default Key**. ◆ If ASCII is selected, you should enter a key value containing 5 to 13 characters. ◆ If Hex is selected, you should enter a hexadecimal figure containing 10 to 26 characters.	

Note:

Pressing the **Apply** button will validate a single **SSID choice** configuration item. If you do not click **Apply** after modifying the SSID 1 setting, the modification will not take effect.

If the SSID1 setting is modified, the factory default wireless network account will be invalid.

If you forget the customized wireless network account, restore the factory default account by pressing down the Reset button for more than 5 seconds.

3.3.1.3 Wi-Fi Control

Configure parameters of the 2.4G wireless network, such as Wi-Fi power and number of WIFI connections.

1. Select **Network** in the navigation bar, and then select **Wlan Settings→WIFI Control** in the left link bar to open the WIFI control setting page for the 2.4G wireless access service, as shown in Figure 3-13.

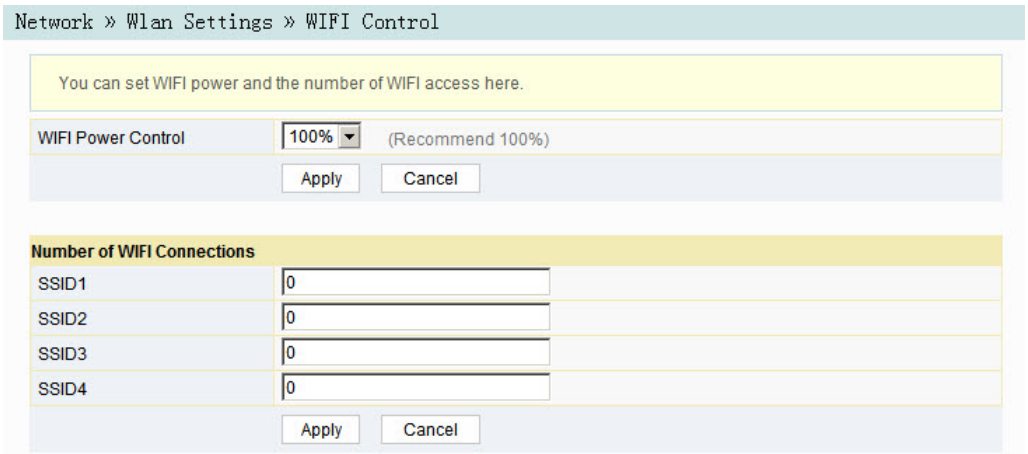


Figure 3-13 WIFI Control

2. Configure parameters of the 2.4G wireless network, such as WIFI power and number of WIFI connections. For details of the parameters, see Table 3-4.
3. Click **Apply** to save and apply the configuration.

Table 3-4 Parameters of WIFI Control

Item	Description
WIFI Power Control	The transmit power of the wireless signal. A larger value indicates a wider signal coverage.
Number of WIFI Connections	The maximum number of client ends supported by the SSIDs.

3.3.1.4 5G Basic Parameters

Note:

Only applicable to dual-frequency Wi-Fi ONTs.

Configure the parameters of the 5G wireless network such as the switch, network mode, domain, frequency bandwidth and frequency channel.

1. Select **Network** in the navigation bar and select **Wlan Settings→5G Basic** in the left link bar to open the basic setting page for the 5G wireless access service, as shown in Figure 3-14.

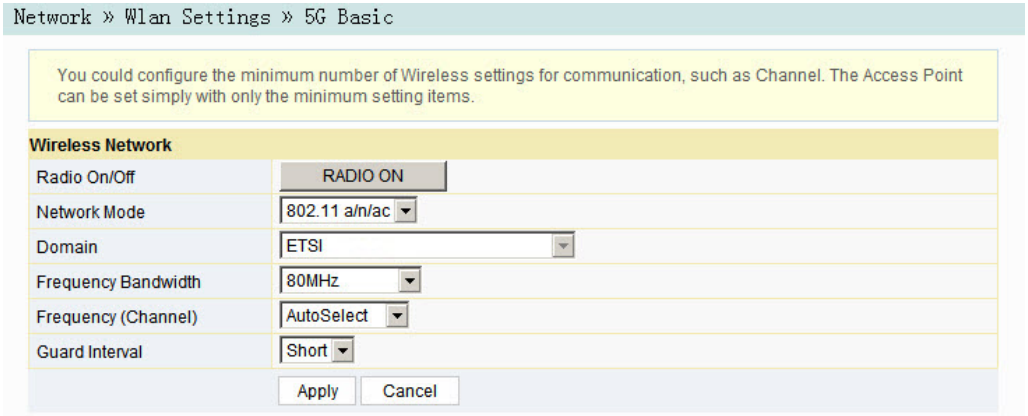


Figure 3-14 Basic Parameters of the 5G Wireless Network

2. Configure the basic parameters of the 5G wireless network. For details of the parameters, see Table 3-5.
3. Click **Apply** to save and apply the configuration.

Table 3-5 Basic Parameters of the 5G Wireless Network

Item	Description
Radio ON/OFF	Enables or disables the WLAN service. RADIO ON: the wireless network is enabled; RADIO OFF: the wireless network is disabled.
Network Mode	The mode supported by the wireless network. The options include 802.11a, 802.11a/n and 802.11a/n/ac. The default setting is 802.11a/n/ac.
Domain	Select your region.
Frequency Bandwidth	The width of wireless band. The options include 20MHz/40MHz, 20MHz, 40MHz and 80MHz. The default setting is 80MHz.
Frequency (Channel)	The channel used for communication between the wireless access point and the wireless station. The default setting is **AutoSelect**.
Guard Interval	The wireless protection interval. The options include **Short** and **Long**. The default setting is **Short**.

3.3.1.5 5G Advanced Configuration

Note:

Only applicable to dual-frequency Wi-Fi ONTs.

Configure the parameters of the 5G wireless network, such as the SSID, password, security mode and algorithm.

1. Select **Network** in the navigation bar and select **Wlan Settings→5G Advanced** in the left link bar to open the advanced setting page for the 5G wireless access service, as shown in Figure 3-15.

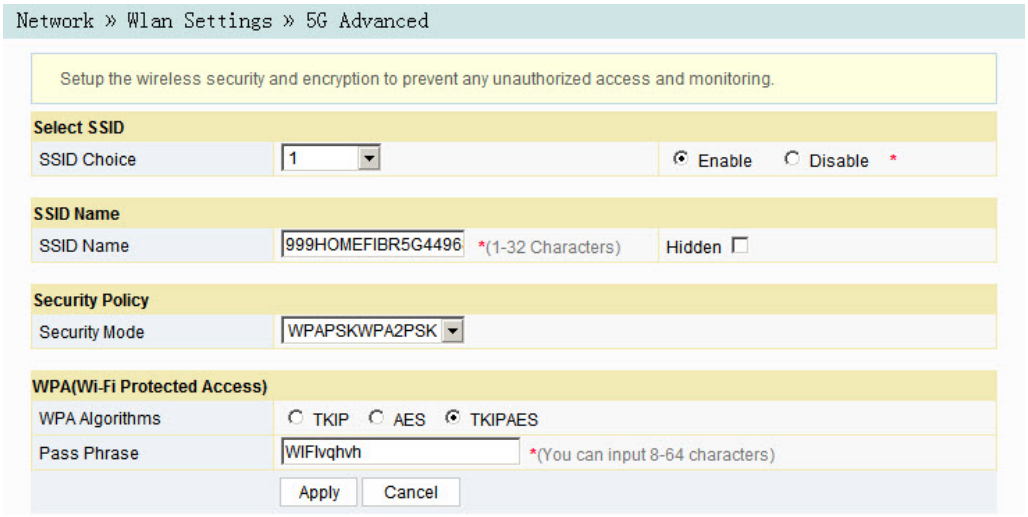


Figure 3-15 Advanced Settings of the 5G Wireless Network

2. Configure the parameters of the 5G wireless network, such as the SSID, password, security mode and algorithm. For details of the parameters, see Table 3-3.
3. Click **Apply** to save and apply the configuration.

Note:

Pressing the **Apply** button will validate a single **SSID choice** configuration item. If you do not click **Apply** after modifying the SSID 1 setting, the modification will not take effect.

If the SSID1 setting is modified, the factory default wireless network account will be invalid.

If you forget the customized wireless network account, restore the factory default account by pressing down the Reset button for more than 5 seconds.

3.3.1.6 5G Wi-Fi Control

Note:

Only applicable to dual-frequency Wi-Fi ONTs.

Configure parameters of the 5G wireless network, such as Wi-Fi power and number of WIFI connections.

1. Select **Network** in the navigation bar and select **Wlan Settings→5G WIFI Control** in the left link bar to open the WIFI control setting page for the 5G wireless access service, as shown in Figure 3-16.

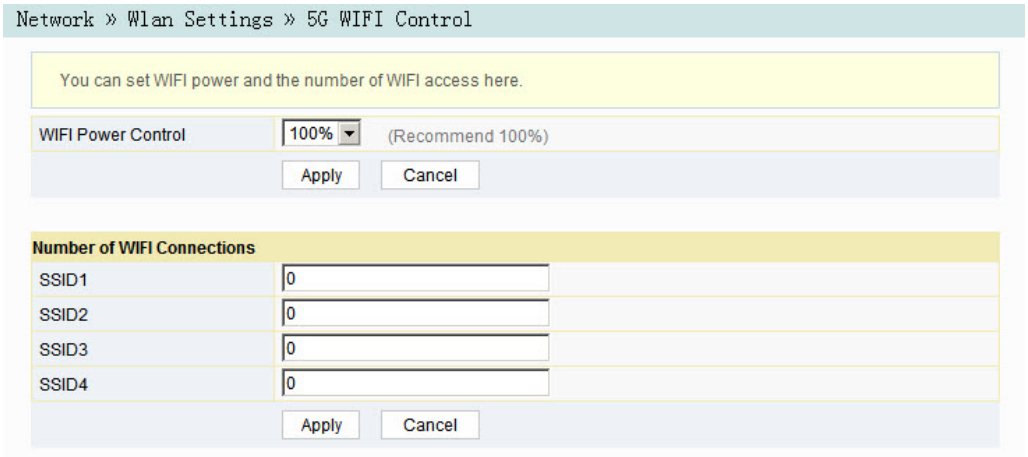


Figure 3-16 5G Wi-Fi Control

2. Configure the parameters of the 5G wireless network, such as WIFI power and quantity of connected client ends. For details of the parameters, see Table 3-4.
3. Click **Apply** to save and apply the configuration.

3.3.1.7 WPS Configuration

WPS can automatically set the wireless network name (SSID) and wireless encryption key for the 1G ONTs and client end supporting the Wi-Fi service. You need only to press down the WPS button or enter the PIN to achieve safe connection. Since you need not remember the long encryption key, you are free of the trouble caused by forgetting the password.

1. Select **Network** in the navigation bar and select **Wlan Settings→WPS** in the left link bar to open the WPS settings page, as shown in Figure 3-17.

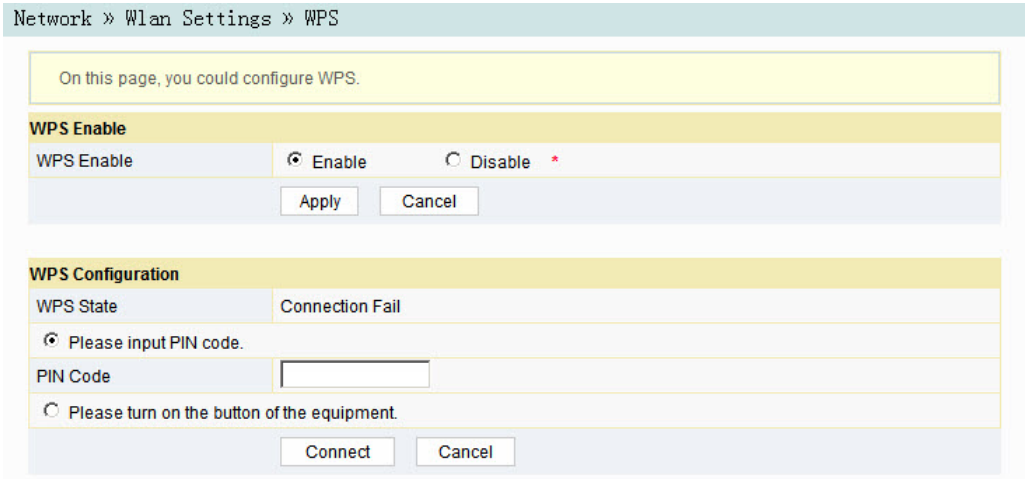


Figure 3-17 WPS Configuration

2. Select whether to enable the WPS function. The options include **Enable** and **Disable**.
3. Select the WPS connection mode as required.
   - Select **Please input PIN code.**, and enter the PIN code of the client end in the **PIN** text box. Then click **Connect**.
   - Select **Please turn on the button of the equipment** and press down the **WPS** button on the ONT. Then press down the WPS button or the WPS software key on the client end.
4. Wait until the connection is completed.

3.3.2 LAN Settings

Configure the management IP address and subnet mask at the LAN side.

1. Select **Network** in the navigation bar and select **LAN Settings→LAN Settings** in the left link bar to open the LAN settings page, as shown in Figure 3-18.

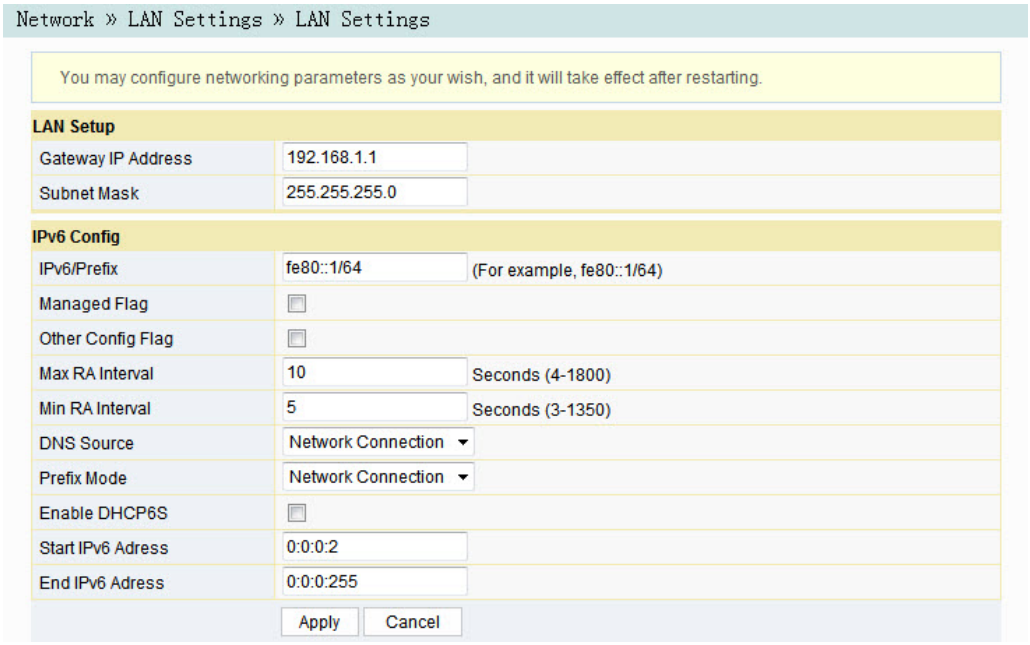


Figure 3-18 LAN Settings

2. Configure the management IP address and subnet mask at the LAN side. For details of the parameters, see Table 3-6.

3. Click **Apply** to save and apply the configuration.

Table 3-6 Parameters of LAN Settings

Item	Description
Gateway IP Address	The management IP address at the LAN side of the ONT. The default setting is 192.168.1.1.
Subnet Mask	The subnet mask of the ONT for the LAN. The default setting is 255. 255.255.0.
IPv6/Prefix	The IPv6 gateway address, including a prefix of 64 bits. The default value is fe80::1/64.
Managed Flag	Select whether to distribute the IPv6 addresses based on DHCP. The default setting is Disable.
Other Config Flag	Select whether to distribute the IPv6 DNS information based on DHCP. The default setting is Enable.
Max RA interval	The maximum interval for announcing the gateway information. The default value is 10.
Min RA interval	The minimum interval for announcing the gateway information. The default value is 5.

Table 3-6 Parameters of LAN Settings (Continued)

Item	Description
DNS Source	The source of the DNS distributed to the PC. The options include WAN connection, ONT proxy and static configuration. The default setting is WAN connection.
Prefix Mode	The source of the prefix information distributed to the PC. The options include WAN connection and static configuration. The default setting is WAN connection.
Enable DHCP6S	Sets whether to enable the DHCPv6 server. This item should be selected if **Managed Flag** or **Other Config Flag** is selected; otherwise the IP address or DNS information cannot be distributed. The server is enabled by default.
Start IPv6 Address	The starting address ID of the address pool for distribution of DHCPv6 IP addresses. The default value is 0:0:0:2.
End IPv6 Address	The ending address ID of the address pool for distribution of DHCPv6 IP addresses. The default value is 0:0:0:255.

3.3.3 Broadband Settings

Select the WAN connection suitable for the network environment, or configure the parameters concerned for the selected WAN connection.

1. Select **Network** in the navigation bar and select **BroadBand Settings**→ **Internet Settings** in the left link bar to open the Internet settings page, as shown in Figure 3-19.

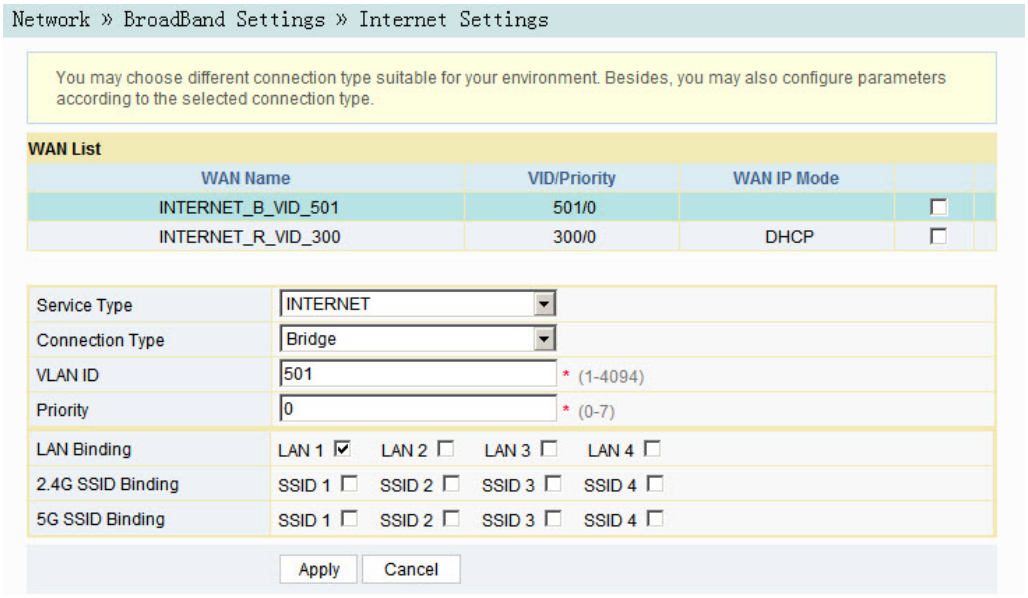


Figure 3-19 Internet Settings

2. Configure parameters relevant to the Internet at the WAN side. For details of the parameters, see Table 3-7.

3. Click **Apply** to save and apply the configuration.

Table 3-7 Parameters for Internet Settings

Item	Description
Service Type	Select the service type at the WAN port. ◆ TR069: this connection is only applicable for TR069. ◆ INTERNET: this connection is only applicable for Internet access. ◆ TR069_INTERNET: this connection is applicable for both TR069 and Internet access. ◆ VOIP: this connection is only applicable for voice application. ◆ VOIP_INTERNET: this connection is applicable for voice and Internet access. ◆ OTHER: other connections.
Connection Type	Select the connection type of the WAN port. ◆ Bridge: the Layer 2 bridge connection mode. This connection mode can be used when the service type is set to **INTERNET** or **OTHER**. ◆ Route: the Layer 3 router connection mode. This connection mode can be used when the service type is set to **INTERNET** or **OTHER**.
VLAN ID	Sets the VLAN ID of the WAN connection. The value range is 1 to 4094. The VLAN ID value here should be consistent with that on the user side of the OLT.

Table 3-7 Parameters for Internet Settings (Continued)

Item	Description	
Priority	Sets the priority of the VLAN. The value range is 0 to 7.	
NAT	Enables or disables the NAT function.	◆ Users need to configure this item when the service type is set to **TR069_INTERNET** or **VOIP_INTERNET**. ◆ Users need to configure this item when the service type is set to **INTERNET** or **OTHER** and the connection type is set to **Route**.
DNS Relay	Enables or disables the DNS relay function.	
MTU	Enter the maximum transmission unit. It is advised to use the default value.	
LAN Binding	Select the LAN port to be bound with the WAN port.	
2.4G SSID Binding	Select the wireless 2.4G SSID to be bound with the WAN port. Note: Only applicable to Wi-Fi ONTs.	
5G SSID Binding	Select the wireless 5G SSID to be bound with the WAN port. Note: Only applicable to dual-frequency Wi-Fi ONTs.	
IP Mode	The options include IPv4&IPv6, IPv4 and IPv6.	◆ Users need to configure this item when the service type is set to **TR069_INTERNET** or **VOIP_INTERNET**. ◆ Users need to configure this item when the service type is set to **INTERNET** or **OTHER** and the connection type is set to **Route**.
WAN IP Mode	Sets the IP address obtaining mode at the WAN side of the ONT. The options include DHCP, static and PPPoE. ◆ DHCP: Obtaining the IP address dynamically. ◆ Static: Setting the IP address in a static mode. ◆ PPPoE: PPPoE dialing mode.	This item should be set if the connection type is **Route**.

Table 3-7 Parameters for Internet Settings (Continued)

Item	Description	
User Name	Enter the username provided by the ISP.	This item should be set if the WAN IP Mode is set to **PPPoE**.
Password	Enter the password provided by the ISP.	
Operation Mode	Sets the PPPoE connection mode. The default setting is **Keep Alive**.	
IP Address	Enter the static IP address at the WAN side provided by the ISP.	This item should be set when the IP Mode is set to **IPv4&IPv6** or **IPv4** and the WAN IP Mode is set to **static**.
Netmask	Enter the subnet mask provided by the ISP.	
Default Gateway	Enter the default gateway provided by the ISP.	
Primary DNS Server	Enter the IP address of the active DNS server provided by the ISP.	
Secondary DNS Server	Enter the IP address of the standby DNS server provided by the ISP.	
IPv6 Address	Enter the static IPv6 address at the WAN side provided by the ISP.	This item should be set when the IP Mode is set to **IPv4&IPv6** or **IPv6** and the WAN IP Mode is set to **static**.
IPv6 Prefix Length	Enter the static IPv6 address prefix length at the WAN side provided by the ISP.	
Default Gateway	Enter the default gateway provided by the ISP.	
Primary DNS Server	Enter the IP address of the active DNS server provided by the ISP.	
Secondary DNS Server	Enter the IP address of the standby DNS server provided by the ISP.	
IPv6 Address Mode / IPv6 Prefix Mode	Select the IPv6 address obtaining mode / prefix obtaining mode.	This item should be set when the IP Mode is set to **IPv4&IPv6** or **IPv6** and the WAN IP Mode is set to **DHCP** or **PPPoE**.

3.3.4 DHCP Server

The DHCP function enables the ONT to distribute network parameters (such as the IP address, gateway and DNS server IP address) to the devices (such as a computer) in the LAN. Users can manage the IP addresses collectively using this function.

1. Select **Network** in the navigation bar, and then select **DHCP Server→DHCP Service** from the left link bar to open the DHCP server configuration page, as shown in Figure 3-20.

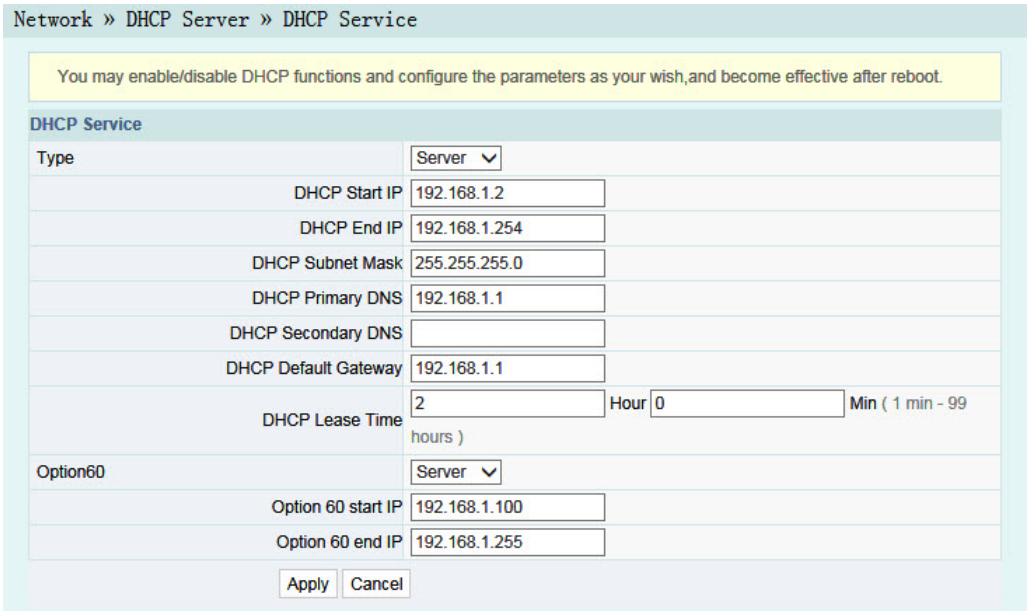


Figure 3-20 DHCP Service

2. Configure the DHCP server parameters as required. For details of the parameters, see Table 3-8.
3. Click **Apply** to save the configuration information. The configuration will take effect after the ONT is rebooted.

Table 3-8 Parameters for the DHCP Server

Item	Description	
Type	Enables or disables the DHCP server. ◆ Server: Enables the DHCP server. The ONT can dynamically distribute IP addresses to user terminals. ◆ Disable: The user terminals connected to the ONT cannot obtain the private network IP address using the DHCP.	
DHCP Start IP	The starting IP address of the IP address pool for the active DHCP server.	**Note: The IP address set here should be in the same network segment with the IP address set in LAN Settings; otherwise, the DHCP server will not operate normally.**
DHCP End IP	The ending IP address of the IP address pool for the active DHCP server.	

Table 3-8 Parameters for the DHCP Server (Continued)

Item	Description	
DHCP Subnet Mask	The mask of the active DHCP server.	
DHCP Primary DNS	The IP address of the active DNS server.	
DHCP Secondary DNS	The IP address of the standby DNS server.	
DHCP Default Gateway	The default gateway of the active DHCP server.	
DHCP Lease Time	The lease time of the IP address pool of the DHCP server.	
Option60	Sets whether to enable the Option 60 property to identify the user terminal.	
Option 60 start IP	The starting IP address of the network segment distributed to the Option 60 property terminal by the DHCP server.	This item should be configured when the Option 60 field of the DHCP server is enabled.
Option 60 end IP	The ending IP address of the network segment distributed to the Option 60 property terminal by the DHCP server.	

3.3.5 Authentication Settings

Configure the parameters relevant to the ONT authentication mode, so that the ONT can pass the OLT authentication.

1. Select **Network** in the navigation bar and select **Authentication→OLT Authentication** in the left link bar to open the OLT authentication configuration page, as shown in Figure 3-21.

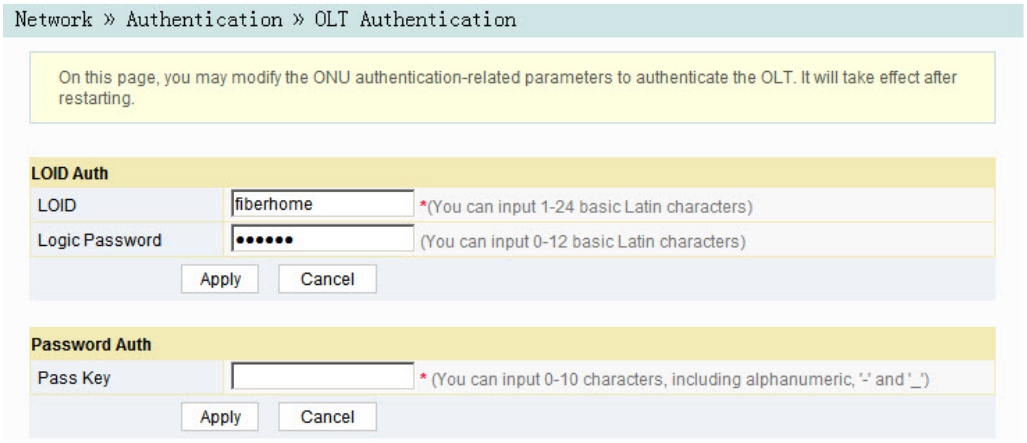


Figure 3-21 OLT Authentication

2. Configure the parameters as required. For details of the parameters, see Table 3-9.
3. Click **Apply** to save the configuration information. The configuration will take effect after the ONT is rebooted.

Table 3-9 Parameters for OLT Authentication

Item	Description	
LOID	Sets the LOID user name.	This item is configurable when the ONT uses the LOID authentication mode.
Logic Password	Sets the LOID password.	
Password Auth	Sets the authentication password when the ONT is authenticated by password.	

3.3.6 IPv6

Configure the IPv6 static routing.

1. Select **Network** in the navigation bar. Select **IPV6→IPV6 Static Route** from the left link bar, and click **Add** in the information bar that appears at the right part to open the page for configuring the IPv6 static routing table, as shown in Figure 3-22.

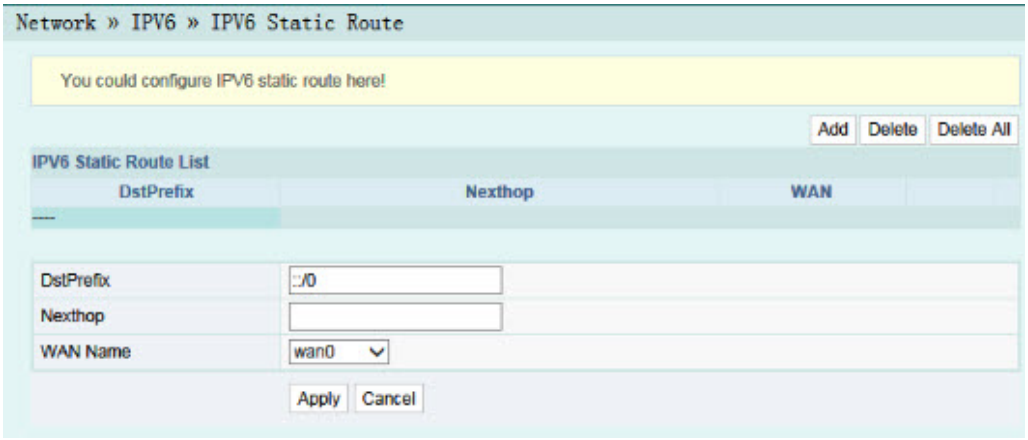


Figure 3-22 IPv6 Static Routing

2. Configure the parameters relevant to static routing as required. For details of the parameters, see Table 3-10.
3. Click **Apply** to save and apply the configuration.

Table 3-10 Parameters for the IPv6 Static Routing

Item	Description
DstPrefix	The destination IP address to be accessed by the host.
Nexthop	The IP address of the next-hop gateway.
WAN Name	The WAN port passed by the static routing. Select a valid WAN port.

3.3.7 Voice Configuration

Note:

Only applicable to ONTs with POTS interfaces.

This section introduces how to configure the key parameters, basic parameters, advanced settings, digitmap and time length, and coding mode for voice services in the Web page.

3.3.7.1 Key Parameters

Configure the parameters such as VoIP protocol type and VoIP port.

1. Select **Network** in the navigation bar and select **VoIP Settings→Key Parameters** from the link bar on the left side to open the VoIP key parameter page, as shown in Figure 3-23.

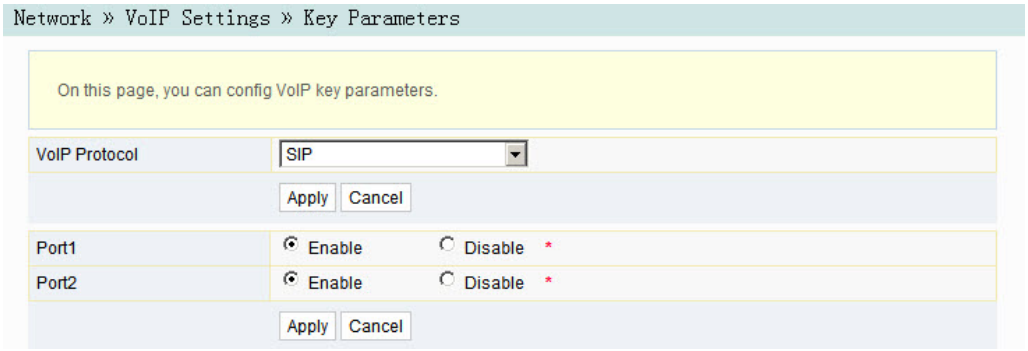


Figure 3-23 Key Parameters for Voice Configuration

2. Configure the key VoIP parameters as required. For details of the parameters, see Table 3-11.
3. Click **Apply** to save and apply the configuration.

Table 3-11 Key Parameters for Voice Service

Item	Description
VoIP Protocol	The voice protocol type. The options include SIP and H.248. The default setting is SIP.
Port	Enable or disable the VoIP port.

3.3.7.2 Basic Parameters

Configure basic voice parameters.

1. Select **Network** in the navigation bar and select **VoIP Settings→Basic** from the link bar on the left side to open the VoIP basic parameter configuration page, as shown in Figure 3-24.

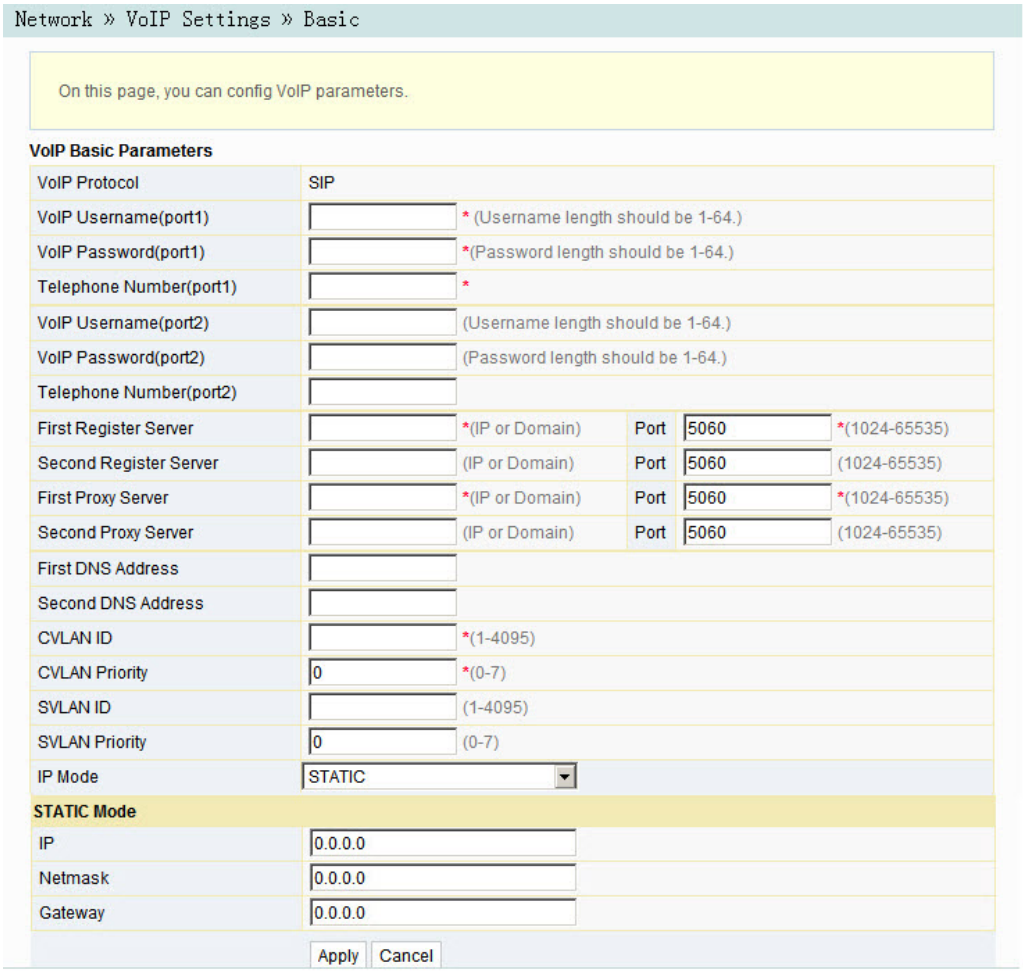


Figure 3-24 Basic Parameters for Voice Configuration

2. Configure the basic VoIP parameters as required. For details of the parameters, see Table 3-12.

3. Click **Apply** to save and apply the configuration.

Table 3-12 Basic Parameters for Voice Service

Item	Description
VoIP Protocol	The VoIP protocol type, configured in **Key Parameters**.
VoIP Username	The VoIP username.
VoIP Password	The VoIP password.
Telephone Number	The telephone number for the voice port.
First Register Server	The IP address or domain name of the active register server. The port number range is 1024 to 65535, and the default setting is 5060.

Table 3-12 Basic Parameters for Voice Service (Continued)

Item	Description	
Second Register Server	The IP address or domain name of the standby register server. The port number range is 1024 to 65535, and the default setting is 5060.	
First Proxy Server	The IP address or domain name of the active proxy server. The port number range is 1024 to 65535, and the default setting is 5060.	
Second Proxy Server	The IP address or domain name of the standby proxy server. The port number range is 1024 to 65535, and the default setting is 5060.	
First DNS Address	The active DNS address.	
Second DNS Address	The standby DNS address.	
CVLAN ID	The CVLAN ID. The value range is 1 to 4095.	
CVLAN Priority	The CVLAN priority. The value range is 0 to 7, and the default setting is 0.	
SVLAN ID	The SVLAN ID. The value range is 1 to 4095.	
SVLAN Priority	The SVLAN priority. The value range is 0 to 7, and the default setting is 0.	
IP Mode	The way to obtain IP address. The options include **STATIC**, **DHCP** and **PPPoE**.	
IP	The IP address.	This item should be configured if the **IP Mode** is set to **STATIC**.
Netmask	The subnet mask.	
Gateway	The gateway.	
PPPoE Username	The PPPoE username.	This item should be configured if the **IP Mode** is set to **PPPoE**.
PPPoE Password	The PPPoE password.	

3.3.7.3 Advanced Configuration

Configure advanced VoIP parameters.

1. Select **Network** in the navigation bar and select **VoIP Settings→Advanced** in the left link bar to open the advanced VoIP setting page, as shown in Figure 3-25.

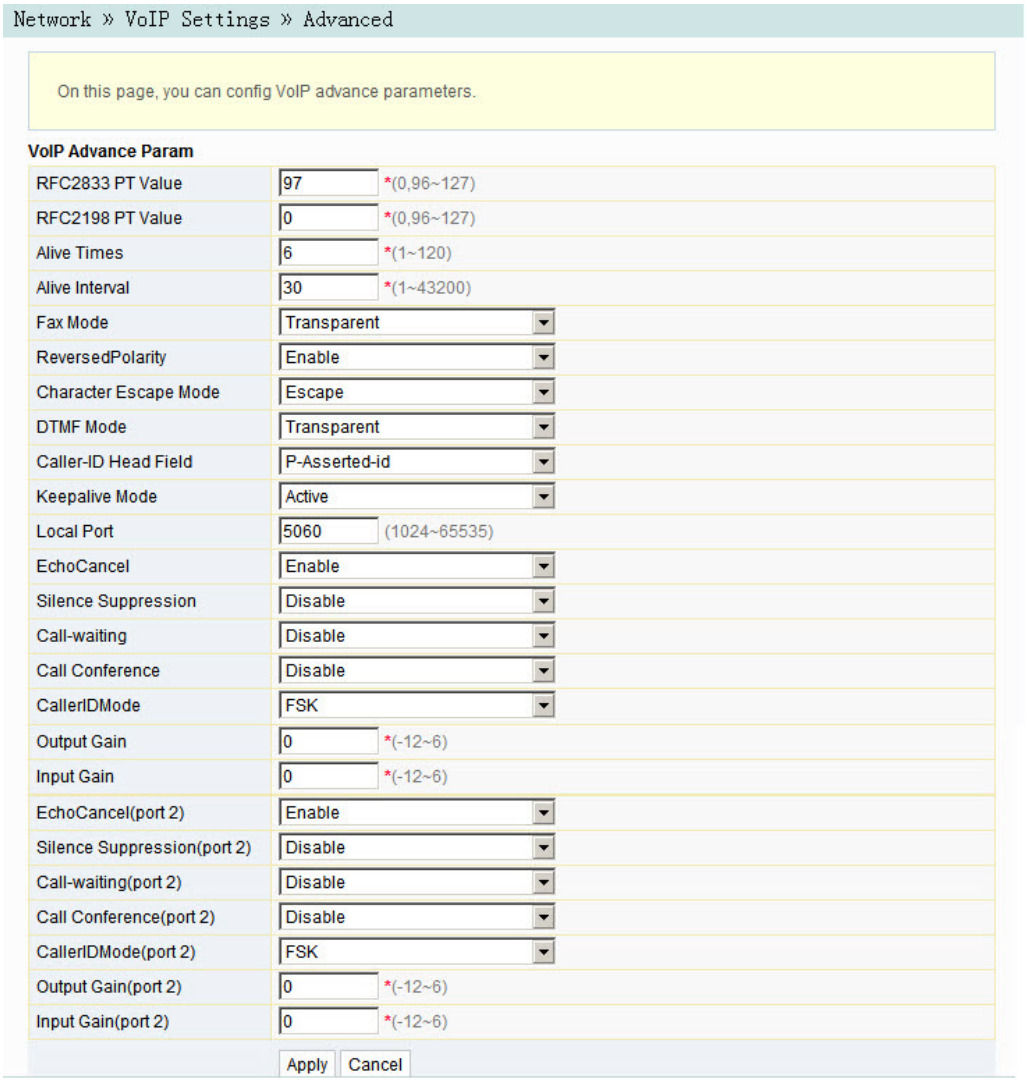


Figure 3-25 Advanced Voice Configuration

2. Configure the advanced VoIP parameters as required. For details of the parameters, see Table 3-13.

3. Click **Apply** to save and apply the configuration.

Table 3-13 Advanced Parameters for Voice Service

Item	Description
RFC2833 PT Value	The default PT value in RFC2833. The value range is 0 and 96 to 127.
RFC2198 PT Value	The PT value in RFC2198. The value range is 0 and 96 to 127.
Alive Times	The heartbeat timeout times. The value range is 1 to 120.

Table 3-13 Advanced Parameters for Voice Service (Continued)

Item	Description
Alive Interval	The heartbeat time length. The value range is 1 to 43200.
Fax Mode	The fax mode. The options include **Transparent** and **T38**. The default setting is **Transparent**.
Reversed Polarity	Enables or disables the reversed polarity signal. The default setting is **Enable**.
Character Escape Mode	The options include **Escape** and **Not Escape**. The default setting is **Escape**.
DTMF Mode	The DTMF mode. The options include **Transparent** and **RFC2833**. The default setting is **Transparent**.
Caller-ID Head Field	The Caller ID display mode. The options include **From domain** and **P-asserted Id**. The default setting is **P-asserted Id**.
Keepalive Mode	Enable or Disable the heartbeat mode. The default setting is **Active**.
Local Port	The number of the local port. The value range is 1024 to 65535, and the default setting is 5060.
Echo Cancel	Enable or disable the echo suppression. The default setting is **Enable**.
Silence Suppression	Enable or disable the silence suppression. The default setting is **Disable**.
Call-waiting	Enable or disable the call-waiting function. The default setting is **Disable**.
Call Conference	Enable or disable the call conference. The default setting is **Disable**.
Caller ID Mode	The options include **FSK** and **Disable**. The default setting is **FSK**.
Output Gain	The output gain. The value range is -12 to 6.
Input Gain	The input gain. The value range is -12 to 6.

3.3.7.4 Digitmap and Time Length

Configure the VoIP time length and digitmap parameters including digitmap matching mode, SIP registration cycle, short timer, long timer, starting timer and long call time, etc.

1. Select **Network** in the navigation bar and select **VoIP Settings→Dial and Timeout** from the link bar on the left side to open the dial and timeout configuration page, as shown in Figure 3-26.

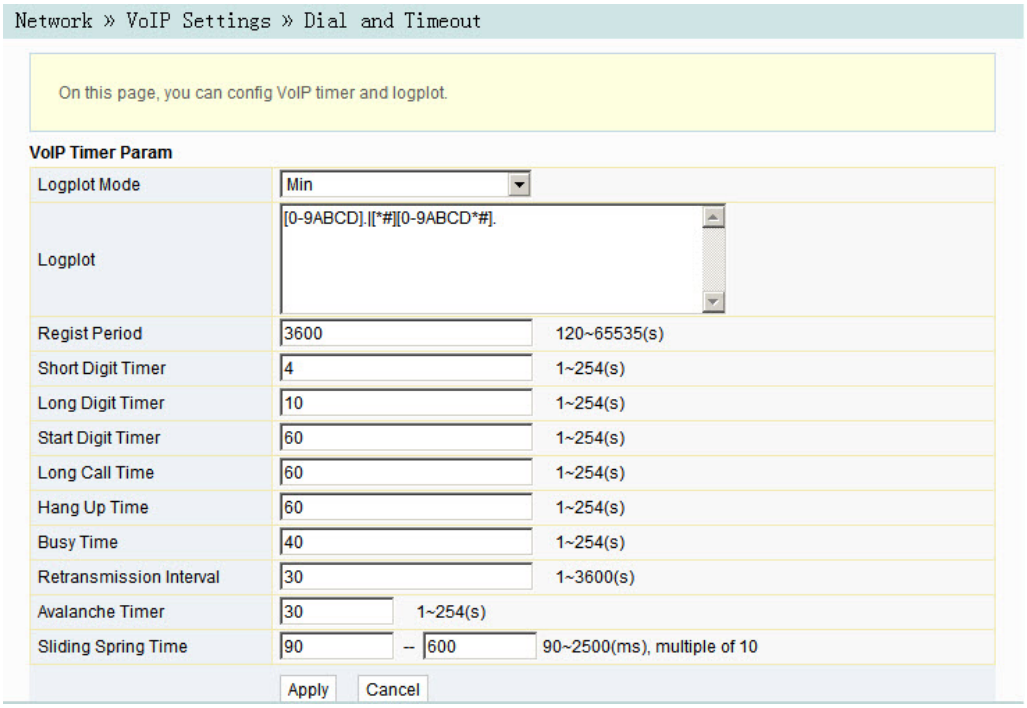


Figure 3-26 Digitmap and Time Length

2. Configure VoIP time length parameters. For details of the parameters, see Table 3-14.

3. Click **Apply** to save and apply the configuration.

Table 3-14 Parameters of Digitmap and Time Length

Item	Description
Logplot Mode	The digitmap matching mode. The options include **Max** and **Min**. The default setting is **Min**.
Regist Period	The SIP registration period. The value range is 120 to 65535 (s), and the default setting is 3600.
Short Digit Timer	The timeout period set for the short timer. The value range is 1 to 254 (s), and the default setting is 4.
Long Digit Timer	The timeout period set for the long timer. The value range is 1 to 254 (s), and the default setting is 10.
Start Digit Timer	The timeout period set for the starting timer. The value range is 1 to 254 (s), and the default setting is 60.
Long Call Time	The time for long call without response. The value range is 1 to 254 (s), and the default setting is 60.

Table 3-14 Parameters of Digitmap and Time Length (Continued)

Item	Description
Hang Up Time	The howler tone time. The value range is 1 to 254 (s), and the default setting is 60.
Busy Time	The busy tone time. The value range is 1 to 254 (s), and the default setting is 40.
Retransmission Interval	The interval for retransmission of registration information. The value range is 1 to 3600 (s), and the default setting is 30.
Avalanche Timer	The timeout period set for the avalanche timer. The value range is 1 to 254 (s), and the default setting is 30.
Sliding Spring Time	The sliding spring time. The value ranges from 90 to 2500 (ms) and should be multiples of 10. The default value range is 90 to 600.

3.3.7.5 Coding

Configure coding priority for voice ports. The parameters include priority, coding mode, RTP packetization period, and so on.

1. Select **Network** in the navigation bar and select **VoIP Settings→Coding** from the link bar on the left side to open the coding configuration page, as shown in Figure 3-27.

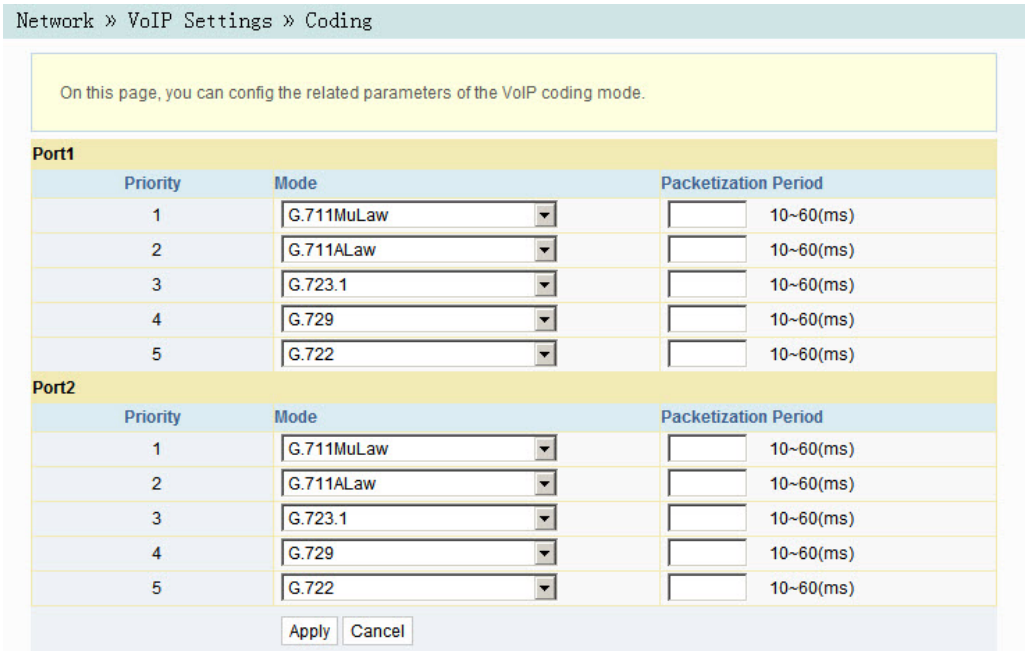


Figure 3-27 Coding

2. Configure parameters of voice ports, including priority, coding mode and RTP packetization period, as shown in Table 3-15.
3. Click **Apply** to save and apply the configuration.

Table 3-15 Coding Parameters

Item	Description
Mode	The coding mode. The options include G.711MuLaw, G.711ALaw, G.723.1, G.729 and G.722.
Packetization Period	The RTP packetization period. The value range is 10 to 60 (ms).

3.4 Security

This section introduces how to configure the firewall, remote control, route QoS, ACL configuration, dynamic DoS and HTTPS in the Web GUI.

3.4.1 Firewall

The firewall configuration includes

- Firewall Control
- IPv4 Filtering
- IPv6 Filtering
- URL Filtering
- DHCP Filtering
- Anti-port Scan
- MAC Filtering
- IPv6 MAC Filtering

3.4.1.1 Firewall Control

Enabling the firewall can prevent malicious access to the WAN port of the ONT.

1. Select **Security** in the navigation bar and select **Firewall→Firewall Control** in the left link bar to open the firewall enabling page, as shown in Figure 3-28.

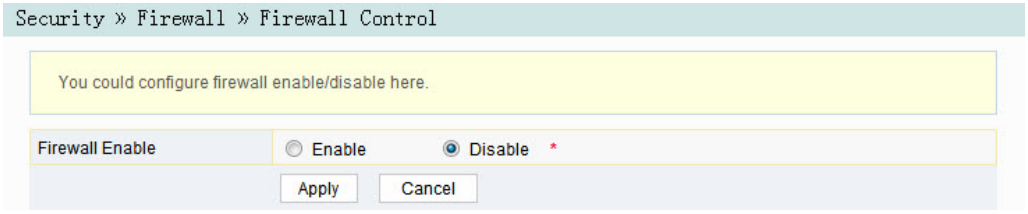


Figure 3-28 Firewall Control

2. Select to **Enable** or **Disable** the firewall as required.
3. Click **Apply** to save and apply the configuration.

3.4.1.2 IPv4 Filtering

Allow or forbid the incoming or outgoing flow of the IP packets meeting the filtering criteria. After the firewall is enabled, the pre-set rules will take effect.

1. Select **Security** in the navigation bar and select **Firewall→IPv4 Filtering** in the left link bar. Then click **Add** to open the filtering rule list configuration page, as shown in Figure 3-29.

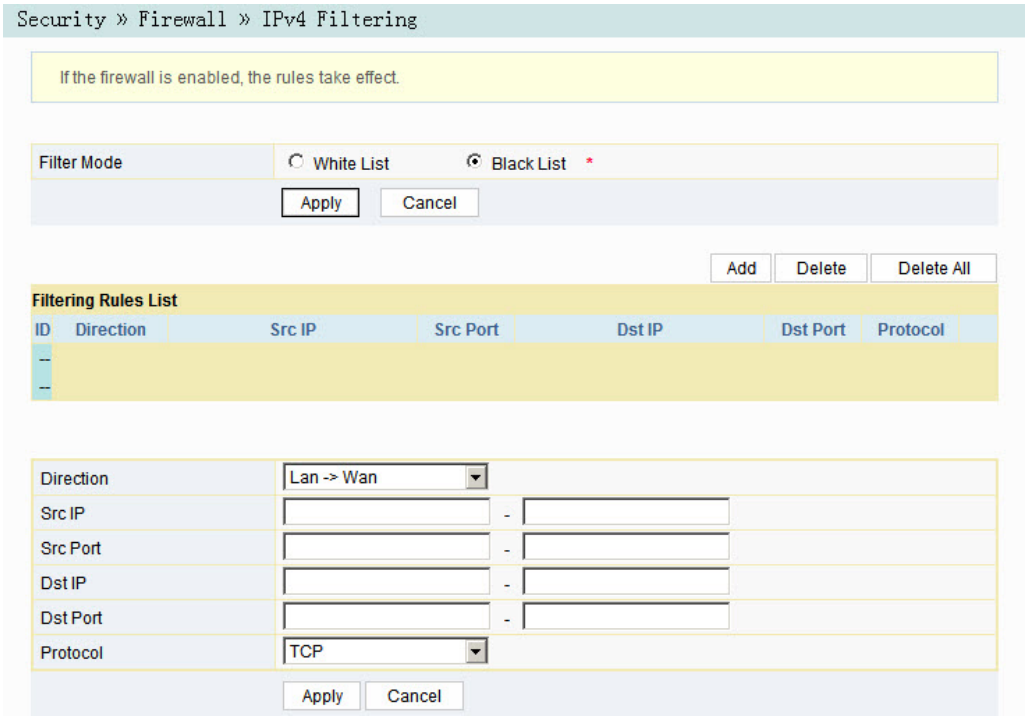


Figure 3-29 IPv4 Filtering

2. Configure the parameters relevant to filtering as required. For details of the parameters, see Table 3-16.

3. Click **Apply** to save and apply the configuration.

Table 3-16 Parameters for IP Address Filtering

Item	Description	
Filter Mode	Select the filtering mode. ◆ **White List** indicates that the data complying with the rules in the filtering rule table will be allowed to pass. ◆ **Black List** indicates that the data complying with the rules in the filtering rule table will not be allowed to pass.	Click the **Apply** button below to apply the settings.
Direction	Sets the direction of the filtering rule. ◆ LAN->WAN: uplink direction. ◆ WAN->LAN: downlink direction.	
Src IP	Enter the IP address at the LAN side if the direction is LAN->WAN. Enter the IP address at the WAN side if the direction is WAN->LAN.	
Src Port	The port range of the source IP address. This item is configurable when the **Protocol** is set to TCP or UDP.	

Table 3-16 Parameters for IP Address Filtering (Continued)

Item	Description
Dst IP	Enter the IP address at the WAN side if the direction is LAN->WAN. Enter the IP address at the LAN side if the direction is WAN->LAN.
Dst Port	The port range of the destination IP address. This item is configurable when the **Protocol** is set to TCP or UDP.
Protocol	The protocol type, including TCP, UDP, ICMP and ALL.

3.4.1.3 IPv6 Filtering

Allow or forbid the IPv6 packets meeting the filtering criteria to be transmitted from the LAN or transmitted into the WAN. After the firewall is enabled, the pre-set rules will take effect.

1. Select **Security** in the navigation bar and select **Firewall→IPv6 Filtering** in the left link bar. Then click **Add** to open the IPv6 filtering rule list configuration page, as shown in Figure 3-30.

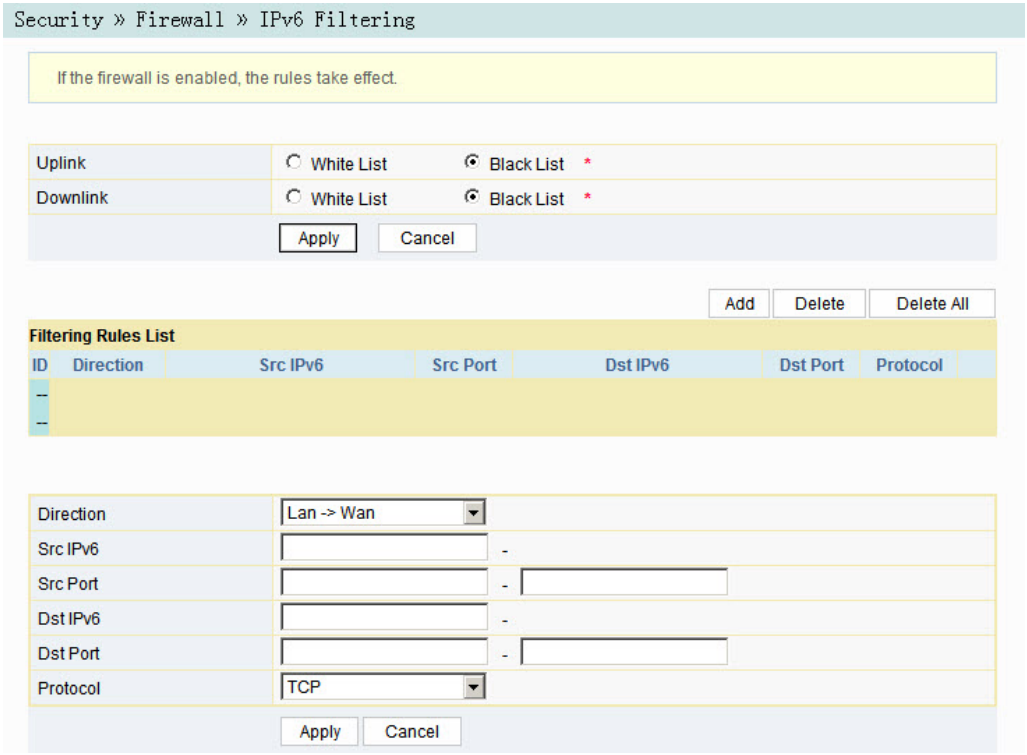


Figure 3-30 IPv6 Filtering

2. Configure the parameters relevant to filtering as required. For details of the parameters, see Table 3-17.

3. Click **Apply** to save and apply the configuration.

Table 3-17 Parameters of IPv6 Filtering

Item	Description	
Uplink	Select the uplink filtering mode. ◆ W**hite List** indicates that the data complying with the rules in the filtering rule table will be allowed to pass. ◆ **Black List** indicates that the data complying with the rules in the filtering rule table will not be allowed to pass.	Click the **Apply** button below to apply the settings.
Downlink	Select the downlink filtering mode. ◆ **White List** indicates that the data complying with the rules in the filtering rule table will be allowed to pass. ◆ **Black List** indicates that the data complying with the rules in the filtering rule table will not be allowed to pass.	
Direction	Sets the direction of the filtering rule. ◆ LAN->WAN: uplink direction. ◆ WAN->LAN: downlink direction.	
Src IPv6	Enter the IPv6 address at the LAN side if the direction is set to LAN->WAN. Enter the IPv6 address at the WAN side if the direction is set to WAN->LAN.	
Src Port	The port range of the source IP address. This item is configurable when the **Protocol** is set to TCP or UDP.	
Dst IPv6	Enter the IPv6 address at the WAN side if the direction is set to LAN->WAN. Enter the IPv6 address at the LAN side if the direction is set to WAN->LAN.	
Dst Port	The port range of the destination IP address. This item is configurable when the **Protocol** is set to TCP or UDP.	
Protocol	The protocol type, including TCP, UDP, ICMP and ALL.	

3.4.1.4 URL Filtering

By setting the URL filtering rules, users can forbid or allow all the data packets sent to or received from a certain IP address. After the fire wall is enabled, the pre-set URL filtering rule will take effect, and the domain names that meet the filtering criteria will be filtered.

1. Select **Security** in the navigation bar and select **Firewall→URL Filtering** in the left link bar, and then click **Add** to open the URL filtering table configuration page, as shown in Figure 3-31.

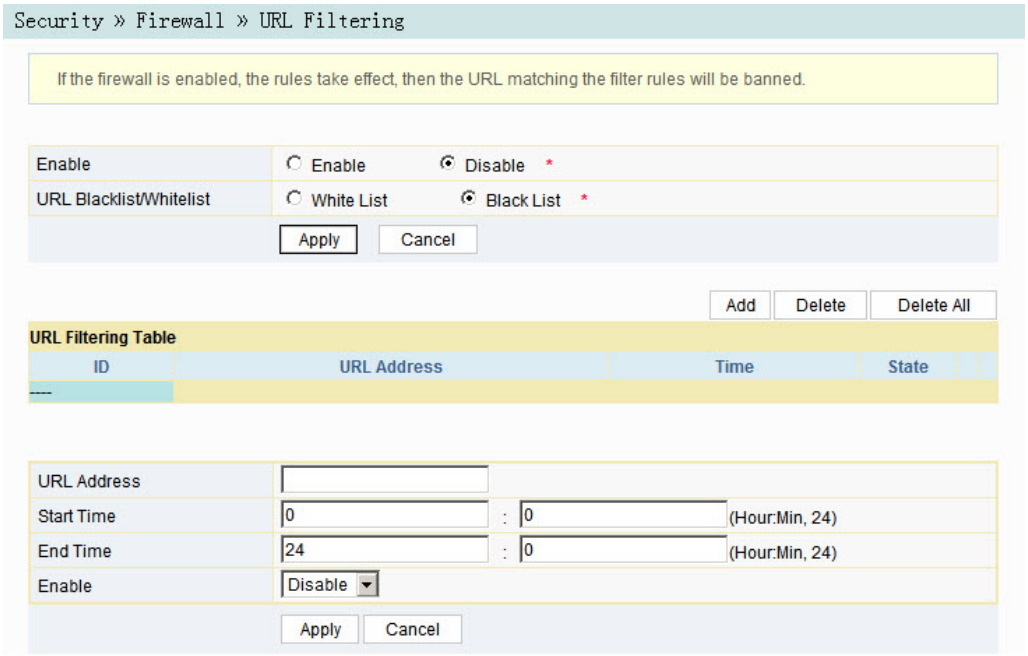


Figure 3-31 URL Filtering

2. Configure the parameters relevant to filtering as required. For details of the parameters, see Table 3-18.

3. Click **Apply** to save and apply the configuration.

Table 3-18 Parameters for URL Filtering Parameters

Item	Description	
Enable	Enables or disables the URL filtering function.	Click the **Apply** button below to apply the settings.
URL Blacklist / Whitelist	Select the filtering mode. The white list and black list modes are configured globally and cannot be enabled simultaneously. ◆ **White List** indicates that the data complying with the rules defined in the filtering table will be allowed to pass. ◆ **Black List** indicates that the data complying with the rules defined in the filtering table will not be allowed to pass.	
URL Address	The URL address accessed by users.	
Start Time	The starting time of the filtering rule.	

Table 3-18 Parameters for URL Filtering Parameters (Continued)

Item	Description
End Time	The ending time of the filtering rule.
Enable	Enables or disables this filtering rule. The options include **Disable** and **Enable**.

3.4.1.5 DHCP Filtering

Forbid or allow the user device configured with the MAC address to obtain an IP address in the DHCP mode to prevent DOS attacks. After the firewall is enabled, the pre-set rules will take effect.

1. Select **Security** in the navigation bar and select **Firewall→DHCP Filtering** in the left link bar. Then click **Add** to open the DHCP Filtering Table configuration page, as shown in Figure 3-32.

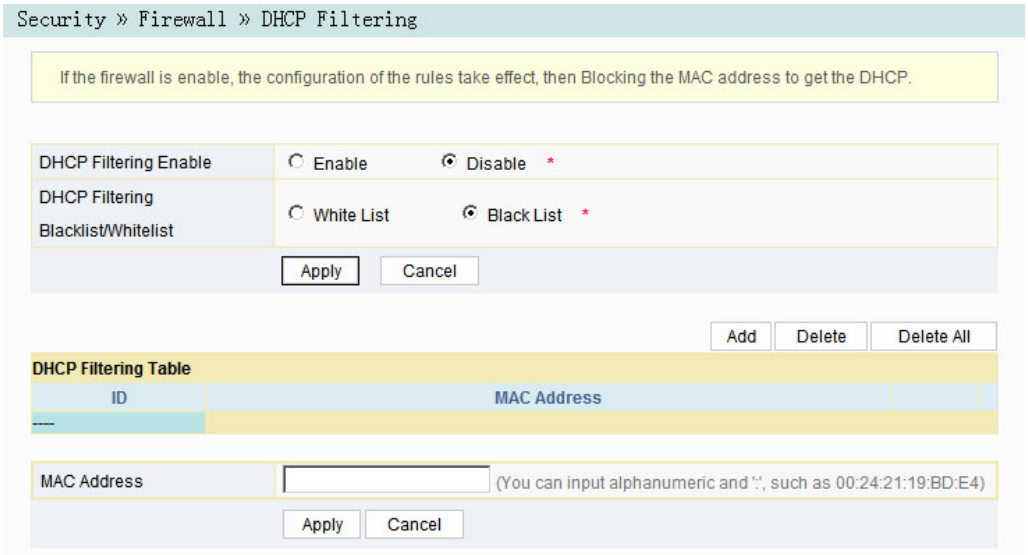


Figure 3-32 DHCP Filtering

2. Configure the parameters relevant to filtering as required. For details of the parameters, see Table 3-19.
3. Click **Apply** to save and apply the configuration.

Table 3-19 Parameters for DHCP Filtering

Item	Description	
DHCP Filtering Enable	Enables or disables the DHCP filtering.	Click the **Apply** button below to apply the settings.
DHCP Filtering Blacklist / Whitelist	Select the filtering mode. The white list and black list modes are configured globally and cannot be enabled simultaneously. ◆ **White List** indicates allowing the device configured with the MAC address to obtain an IP address through the DHCP. ◆ **Black List** indicates forbidding the device configured with the MAC address to obtain an IP address through the DHCP.	
MAC Address	The MAC address of the user device subject to the DHCP filtering rule.	

3.4.1.6 Anti-port Scan

Enable or disable the anti-port scan function.

1. Select **Security** in the navigation bar and select **Firewall→Anti Port Scan** in the left link bar to open the anti-port scan page, as shown in Figure 3-33.

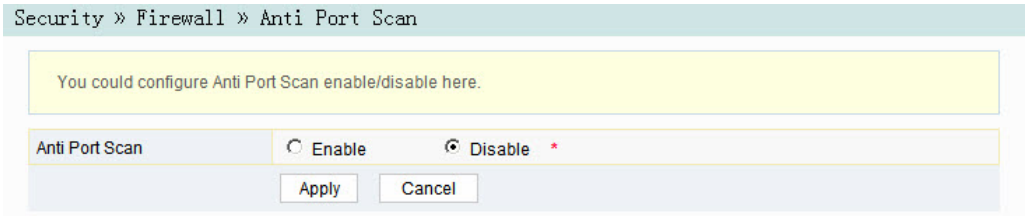


Figure 3-33 Anti-port Scan

2. Select to **Enable** or **Disable** the anti-port scan function as required.
3. Click **Apply** to save and apply the configuration.

3.4.1.7 MAC Address Filtering

One user device may have multiple IP addresses but only one MAC address. The user device access authority in the LAN can be controlled effectively by setting the MAC address filtering. After the fire wall is enabled, the pre-set rules will take effect, and the MAC addresses that meet the filtering criteria will be filtered.

1. Select **Security** in the navigation bar and select **Firewall→MAC Filtering** in the left link bar, and then click **Add** to open the MAC address filtering table configuration page, as shown in Figure 3-34.

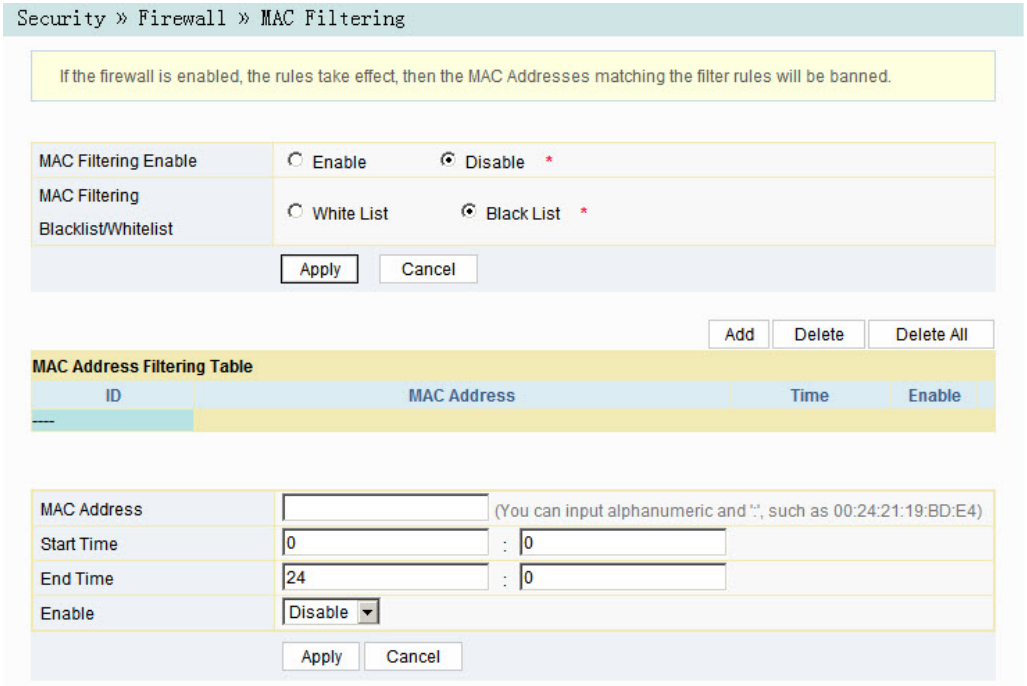


Figure 3-34 MAC Address Filtering

2. Configure parameters relevant to filtering as required. For details of the parameters, see Table 3-20.
3. Click **Apply** to save and apply the configuration.

Table 3-20 Parameters for MAC Address Filtering

Item	Description	
MAC Filtering Enable	Enables or disables the MAC address filtering function.	Click the **Apply** button below to apply the settings.

Table 3-20 Parameters for MAC Address Filtering (Continued)

Item	Description
MAC Filtering Blacklist / Whitelist	Select the filtering mode. The white list and black list modes are configured globally and cannot be enabled simultaneously. ◆ **White List** indicates that the data complying with the rules defined in the filtering table will be allowed to pass. ◆ **Black List** indicates that the data complying with the rules defined in the filtering table will not be allowed to pass.
MAC Address	The MAC address in the MAC address filtering rule.
Start Time	The starting time of the filtering rule.
End Time	The ending time of the filtering rule.
Enable	Enables or disables this filtering rule. The options include **Disable** and **Enable**.

3.4.1.8 IPv6 MAC Filtering

One user device may have multiple IPv6 addresses but only one MAC address. The user device access authority in the LAN can be controlled effectively by setting the MAC address filtering. After the fire wall is enabled, the pre-set rules will take effect, and the MAC addresses that meet the filtering criteria will be filtered.

1. Select **Security** in the navigation bar and select **Firewall→IPv6 MAC Filtering** in the left link bar, and then click **Add** to open the configuration page for the MAC address filtering table, as shown in Figure 3-35.

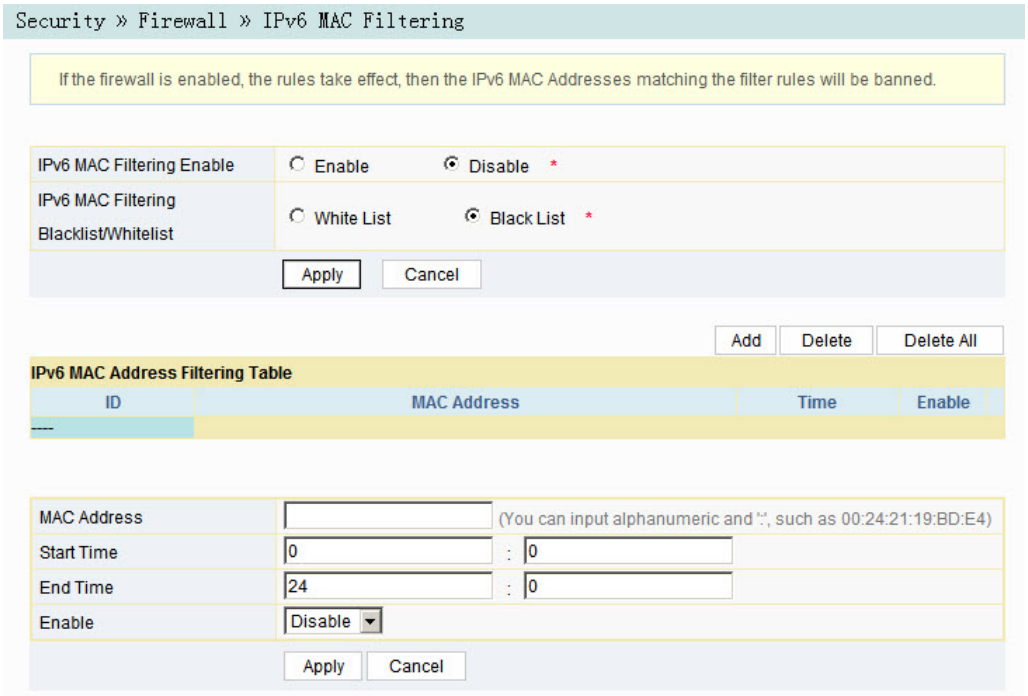


Figure 3-35 IPv6 MAC Filtering

2. Configure the parameters relevant to filtering as required. For details of the parameters, see Table 3-21.

3. Click **Apply** to save and apply the configuration.

Table 3-21 Parameters for IPv6 MAC Address Filtering

Item	Description	
IPv6 MAC Filtering Enable	Enables or disables the IPv6 MAC address filtering function.	Click the **Apply** button below to apply the settings.
IPv6 MAC Filtering Blacklist / Whitelist	Select the filtering mode. The white list and black list modes are configured globally and cannot be enabled simultaneously. ◆ **White List** indicates that the data complying with the rules defined in the filtering table will be allowed to pass. ◆ **Black List** indicates that the data complying with the rules defined in the filtering table will not be allowed to pass.	
MAC Address	The IPv6 MAC address in the IPv6 MAC address filtering rule.	
Start Time	The starting time of the filtering rule.	

Table 3-21 Parameters for IPv6 MAC Address Filtering (Continued)

Item	Description
End Time	The ending time of the filtering rule.
Enable	Enables or disables this filtering rule. The options include **Disable** and **Enable**.

3.4.2 Remote Control

Enable or disable the remote access control. When the remote control is disabled, the PCs in the Internet cannot access the Web GUI of the ONT using the IP addresses at the WAN side; when enabled, the PCs in the Internet can access the Web GUI of the ONT using the aforesaid IP addresses.

1. Select **Security** in the navigation bar and select **Remote Control→Remote Control** in the left link bar to open the remote control configuration page, as shown in Figure 3-36.

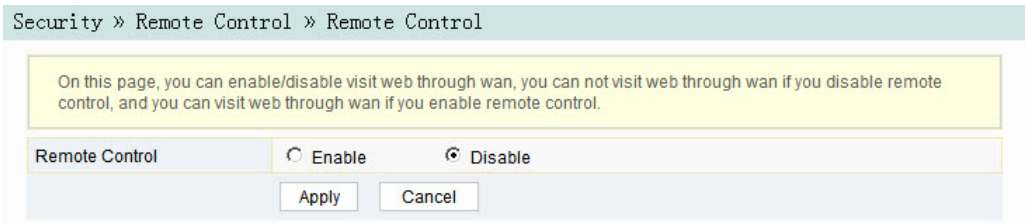


Figure 3-36 Remote Control

2. **Enable** or **Disable** the remote access control as required.
3. Click **Apply** to save and apply the configuration.

3.4.3 Route QoS

The route QoS includes route QoS enabling and route QoS configuration.

3.4.3.1 Enabling Route QoS

Enable / disable the route QoS function.

1. Select **Security** in the navigation bar and select **Route QOS→QOS Enable** in the left link bar to open the route QoS enabling page, as shown in Figure 3-37.

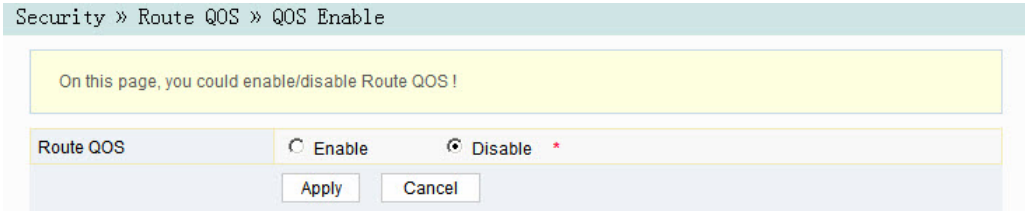


Figure 3-37 Enabling Route QoS

2. Select to **Enable** or **Disable** the route QoS function as required.
3. Click **Apply** to save and apply the configuration.

3.4.3.2 Route QoS Configuration

While configuring the route QoS parameters, you can classify the queues based on priority and process the messages with high priority first when system congestion occurs.

1. Select **Security** in the navigation bar and select **Route QOS→QOS Config** in the left link bar. Then click **Add** to open the route QoS configuration page, as shown in Figure 3-38.

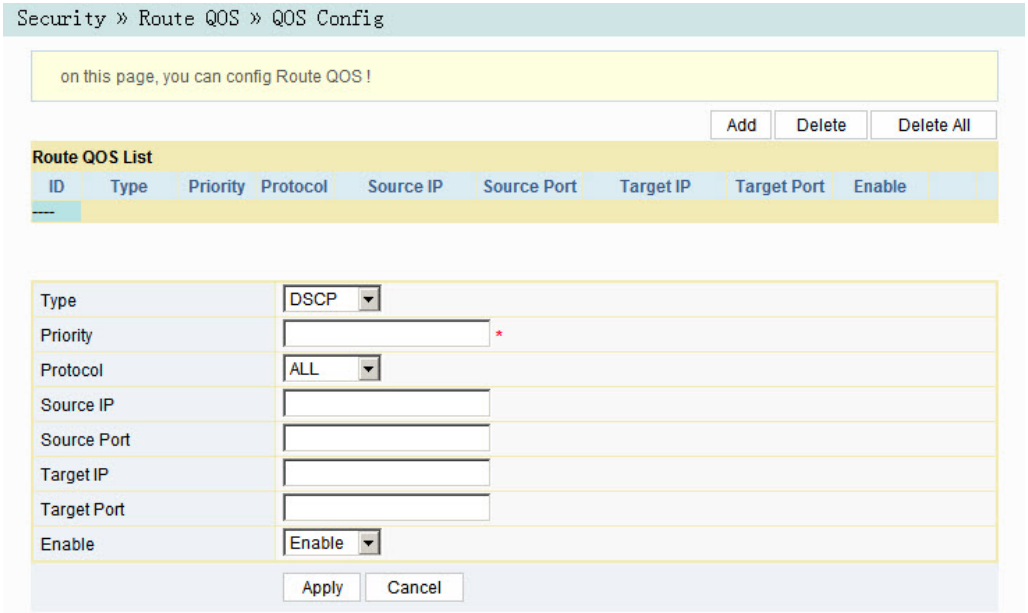


Figure 3-38 Route QoS Configuration

2. Configure the parameters relevant to QoS according to the requirement. For details of the parameters, see Table 3-22.

3. Click **Apply** to save and apply the configuration.

Table 3-22 Parameters of Route QoS Configuration

Item	Description
Type	Select the priority type. The default setting is DSCP.
Priority	Sets the priority value. The value range for the DSCP priority is 0 to 63; and that for the 802.1p priority is 0 to 7.
Protocol	The protocol types include ALL, TCP and UDP.
Source IP	The source IP address.
Source Port	The source port.
Target IP	The destination IP address.
Target Port	The destination port.
Enable	Enables or disables the QoS rule.

3.4.4 ACL Configuration

You can configure the access control list (ACL) to filter designated data packets according to the matching rules. After the ACL rule is enabled, the corresponding port will filter the packets as per the configured ACL rules.

1. Select **Security** in the navigation bar and select **ACL Settings→ACL Settings** in the left link bar to open the ACL configuration page, as shown in Figure 3-39.

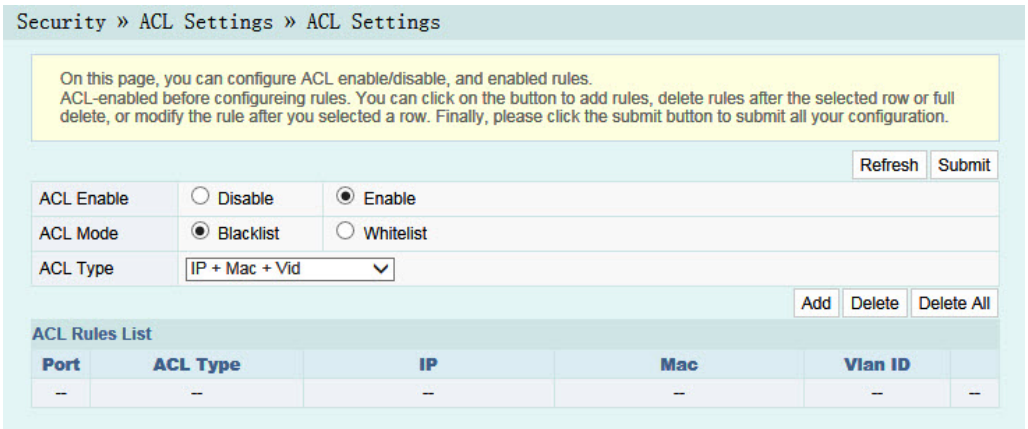


Figure 3-39 ACL Configuration

2. Select **Enable** and set **ACL Mode** and **ACL Type**. Then click **Add** to open the ACL rule list configuration page, as shown in Figure 3-40.

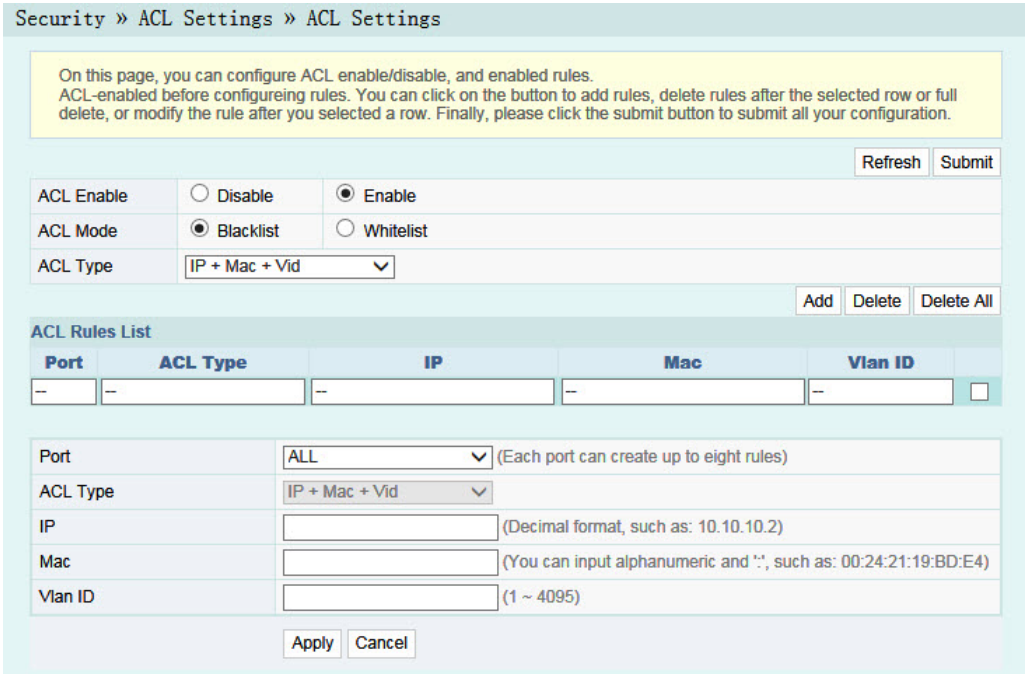


Figure 3-40 ACL Configuration Rule

3. Configure parameters relevant to filtering as required. For details of the parameters, see Table 3-23.
4. Click **Apply** to generate the corresponding ACL rule item.
5. Click **Submit** to save and apply the configuration.

Table 3-23 Parameters for ACL Configuration

Item	Description	
ACL Enable	Select to enable or disable the access control.	After setting, click **Submit** at the upper right part to apply the settings.
ACL Mode	Select the access control mode. ◆ **Whitelist** indicates that the data complying with the rules in the ACL rule table will be allowed to pass. ◆ **Blacklist** indicates that the data complying with the rules in the ACL rule table will not be allowed to pass.	
ACL Type	The options include **IP**, **IP+Mac** and **IP+Mac+Vid**. Modifying the ACL type will delete all the existing ACL rules.	

Table 3-23 Parameters for ACL Configuration (Continued)

Item	Description
Port	The number of the LAN port(s) subject to the ACL rule. The options include ALL and 1 to 4.
IP	The IP address of the accessed user device.
Mac	The MAC address of the accessed user device.
VLAN ID	The VLAN ID of the accessed LAN port; the value range is 1 to 4095.

3.4.5 Dynamic DoS

The DoS attack exhausts the resource of target computer using massive virtual information flow, so that the attacked computer has to handle the virtual information with all strength, which influences the handling of normal information flow. The ONT provides the protection against the DoS attack.

1. Select **Security** in the navigation bar and select **DDOS→DDOS** in the left link bar to open the anti-DoS attack configuration page, as shown in Figure 3-41.

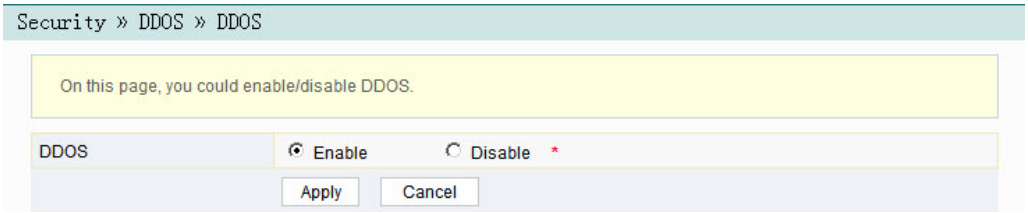


Figure 3-41 Dynamic DoS

2. Select to **Enable** or **Disable** the anti-dos attack function as required.
3. Click **Apply** to save and apply the configuration.

3.4.6 HTTPS

The ONT provides the HTTPS function. HTTPS is the HTTP channel for security purpose. It is built on the SSL+HTTP protocol, and can perform encryption transmission and identity authentication.

1. Select **Security** in the navigation bar and select **HTTPS→HTTPS** in the left link bar to open the HTTPS function configuration page, as shown in Figure 3-42.

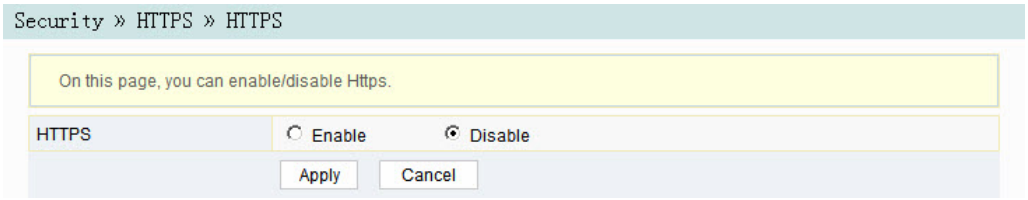


Figure 3-42 HTTPS

2. Select to **Enable** or **Disable** the HTTPS function as required.

Caution:

After enabling the HTTPS function, log into the Web GUI. The protocol type in URL should be https and the management IP address should be added with the port number 4433, e.g. **https://192.168.1.1:4433**.

3. Click **Apply** to save and apply the configuration.

3.5 Application

This section introduces how to configure the VPN, DDNS, port forwarding, NAT, UPnP, DMZ and network diagnosis on the Web GUI.

3.5.1 VPN

Set whether to enable the VPN transparent transmission channel.

1. Select **Application** in the navigation bar and select **VPN→VPN Pass-through** in the left link bar to open the page for configuring the VPN transparent transmission, as shown in Figure 3-43.

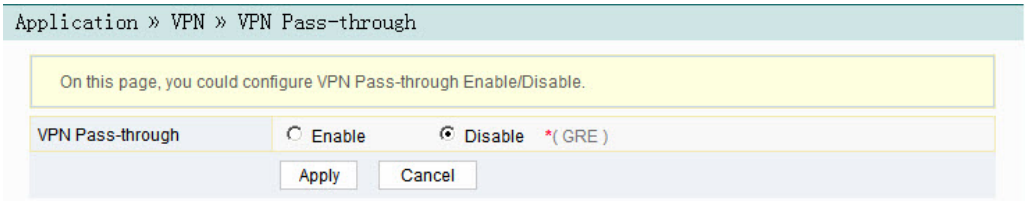


Figure 3-43 VPN Transparent Transmission

2. Select to **Enable** or **Disable** the VPN transparent transmission channel as required.
3. Click **Apply** to save and apply the configuration.

3.5.2 DDNS

The DDNS server transforms the dynamic IP address at the WAN side of the ONT into a static domain name. Users from Internet can easily access the gateway using this domain name.

1. Select **Application** in the navigation bar and select **DDNS→DDNS** in the left link bar to open the DDNS configuration page, as shown in Figure 3-44.

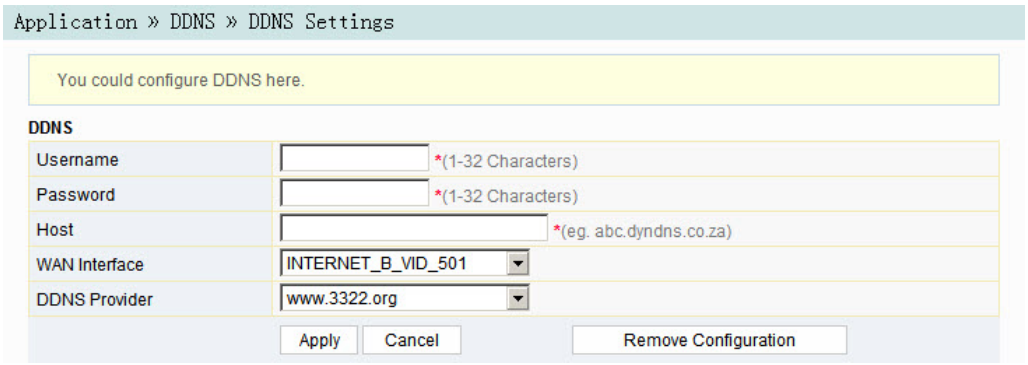


Figure 3-44 DDNS Settings

2. Configure parameters relevant to DDNS according to the requirement. For details of the parameters, see Table 3-24.
3. Click **Apply** to save and apply the configuration.

Table 3-24 Parameters for DDNS Settings

Item	Description
Username	The username allocated by the DDNS provider.
Password	The password allocated by the DDNS provider.
Host	The domain name allocated by the DDNS provider.
WAN Interface	The name of the created WAN connection.
DDNS Provider	The DDNS service provider. Users can select the preset DDNS provider or select **Other** to customize the provider and set the domain name, server IP address, protocol type and URL.

3.5.3 Port Forwarding

Port forwarding can generate the mapping between the WAN port IP address / common port number and the LAN server IP address / private port number. In this way, all the accesses to a certain service port at this WAN port will be re-directed to the corresponding port of the server in the designated LAN.

1. Select **Application** in the navigation bar and select **Port Forwarding→Port Forwarding** in the left link bar. Then click **Add** to open the port forwarding configuration page, as shown in Figure 3-45.

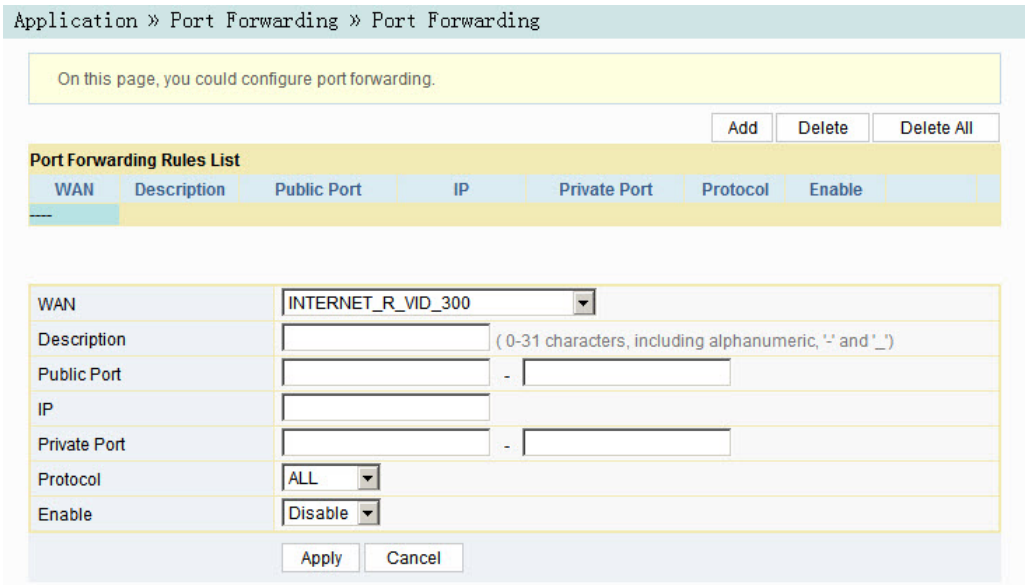


Figure 3-45 Port Forwarding

2. Configure parameters relevant to port forwarding according to the requirement. For details of the parameters, see Table 3-25.
3. Click **Apply** to save and apply the configuration.

Table 3-25 Parameters for Port Forwarding

Item	Description
WAN	The WAN connection bound with the port forwarding rule.
Description	The port forwarding rule name.
Public Port	The range of ports for extranet data packets. If only one port exists, enter the same port number.
IP	The IP address of the LAN virtual server for port forwarding.

Table 3-25 Parameters for Port Forwarding (Continued)

Item	Description
Private Port	The range of the LAN ports for forwarding. If only one port exists, enter the same port number.
Protocol	The protocol used for the port to forward data packets. The options include ALL, TCP and UDP.
Enable	Enables or disables the rule.

3.5.4 NAT

NAT allows the conversion between intranet IP addresses and public network IP addresses. NAT converts a great number of intranet IP addresses into one or a small number of public network IP addresses, so as to save the resource of public network IP addresses.

The NAT configuration below can take effect only when the NAT function is enabled in **Network→BroadBand Settings→Internet Settings**.

1. Select **Application** in the navigation bar and select **NAT→NAT** in the left link bar. Then click **Add** to open the NAT rule list configuration page, as shown in Figure 3-46.

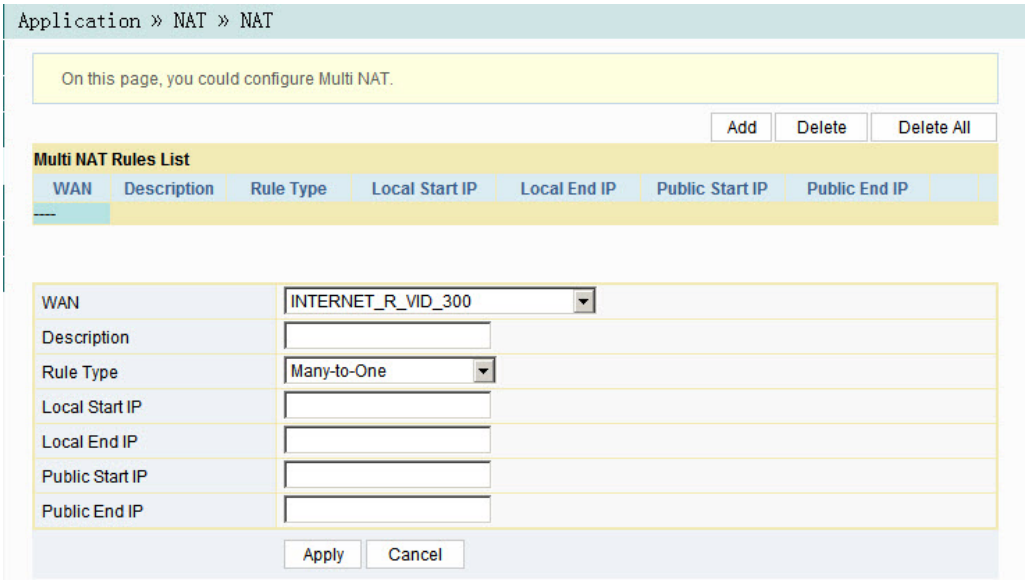


Figure 3-46 NAT

2. Configure relevant parameters according to the requirement. For details of the parameters, see Table 3-26.
3. Click **Apply** to save and apply the configuration.

Table 3-26 Parameters for NAT Configuration

Item	Description
WAN	The WAN connection bound with the NAT rule.
Description	The NAT rule name.
Rule Type	Select the NAT conversion mode. It is advisable to select **One-to-One** or **Many-to-One**.
Local Start IP	The starting IP address of the intranet.
Local End IP	The ending IP address of the intranet.
Public Start IP	The starting IP address of the public network.
Public End IP	The ending IP address of the public network.

3.5.5 UPnP

Universal Plug and Play (UPnP) supports the plug and play function and the automatic discovery function for multiple network devices. When the UPnP is enabled, the devices supporting the UPnP can be added into the network dynamically. In this way, an external computer can access the resource on an internal computer when necessary. For example, when some application software is running on a PC, port mapping table entries will be generated on the ONT automatically based on the UPnP protocol to speed up the operation.

1. Select **Application** in the navigation bar and select **UPNP→UPNP** in the left link bar to open the UPnP configuration page, as shown in Figure 3-47.

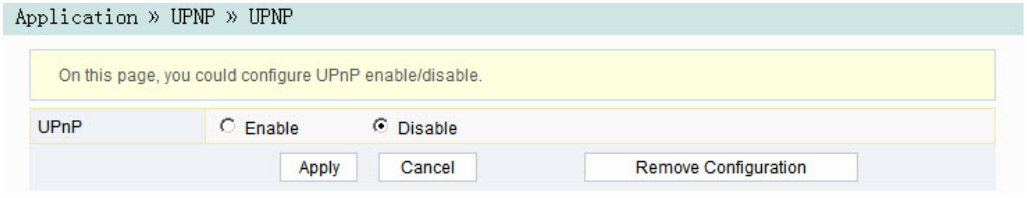


Figure 3-47 UPnP

2. Select to **Enable** or **Disable** the UPnP function as required.
3. Click **Apply** to save and apply the configuration.

3.5.6 DMZ

When the ONT is working in the routing mode, enable the DMZ function if a host at the WAN side needs to access a certain host at the LAN side. The ONT will forward all the IP packets from the WAN to the designated DMZ host.

1. Select **Application** in the navigation bar and select **DMZ→DMZ** in the left link bar to open the DMZ configuration page, as shown in Figure 3-48.

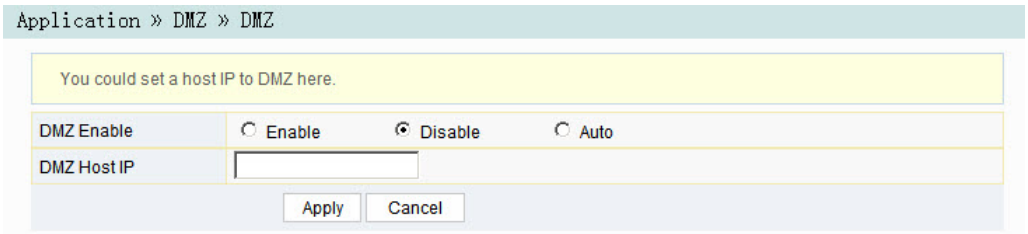


Figure 3-48 DMZ

2. Configure relevant parameters according to the requirement. For details of the parameters, see Table 3-27.
3. Click **Apply** to save and apply the configuration.

Table 3-27 Parameters for DMZ Configuration

Item	Description
DMZ Enable	Enables or disables the DMZ function. The options include **Enable**, **Disable** and **Auto**. If **Enable** is selected, the DMZ host IP address should be set. If **Auto** is selected, the DMZ host uses the first IP address allocated by DHCP.
DMZ Host IP	The host IP address of the DMZ.

3.5.7 Network Diagnosis

Network diagnosis includes network diagnosis and Nat conversation.

3.5.7.1 Network Diagnosis

The ONT provides two network diagnosis tools.

- Ping test: Test whether the router is normally connected with the target host or another device.
- Traceroute test: Check the condition of the route from the router to the target host.

1. Select **Application** in the navigation bar and select **Diagnosis→Diagnosis** in the left link bar to open the network diagnosis page, as shown in Figure 3-49.

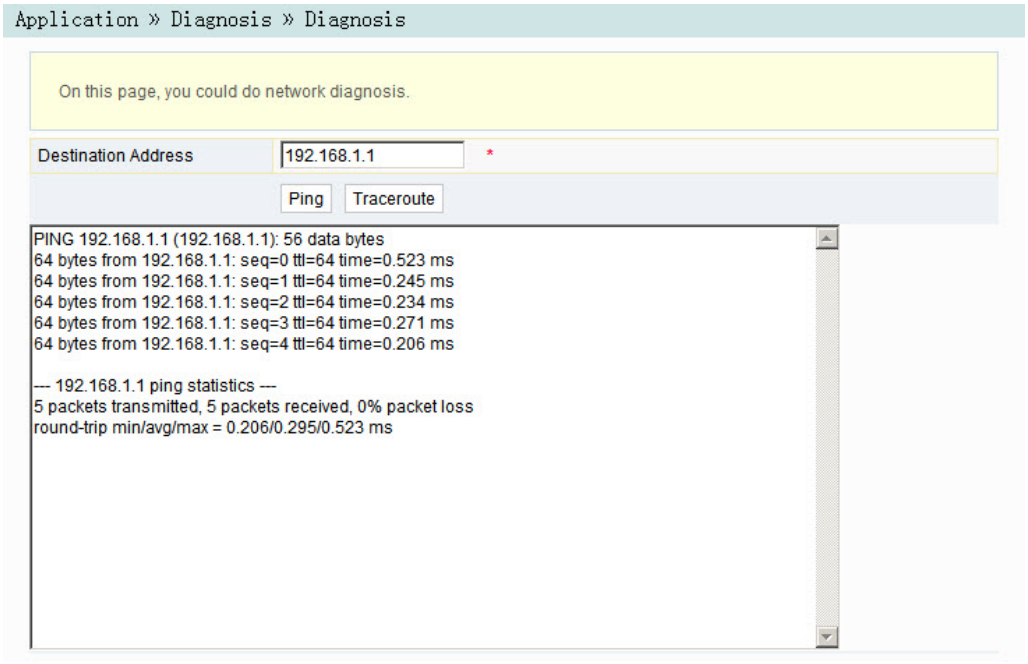


Figure 3-49 Network Diagnosis

2. Enter the destination IP address to be tested in the **Destination Address** box, and click **Ping** or **Traceroute** to test. The test result will be displayed in the lower text box.

3.5.7.2 Nat Session

Click **Application** and select **Diagnosis→Nat Session** at the left side to open the Nat session page and query the mappings between the inner / outer network IP address of NAT and the ports, as shown in Figure 3-50.

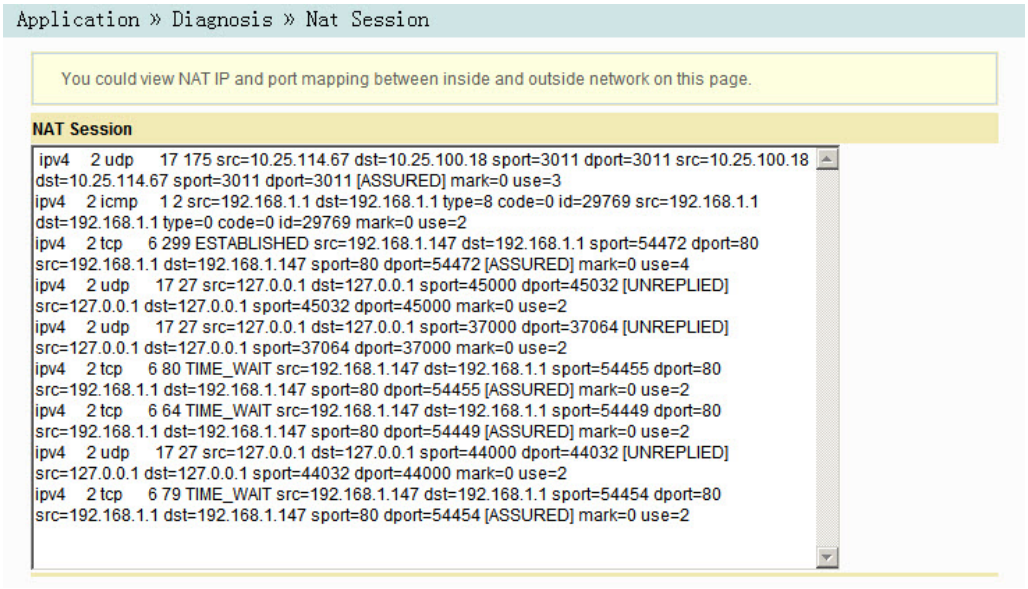


Figure 3-50 Nat Session

3.6 Management

This section introduces how to perform user management, device management and log management in the Web GUI.

3.6.1 User Management

User management includes user account management and maintenance account management.

3.6.1.1 User Account Management

Users can add or delete a common user account or modify the password of a common user account.

1. Select **Management** in the navigation bar. Select **Account Management→ User Account** from the left link bar to open the user account management page, as shown in Figure 3-51.

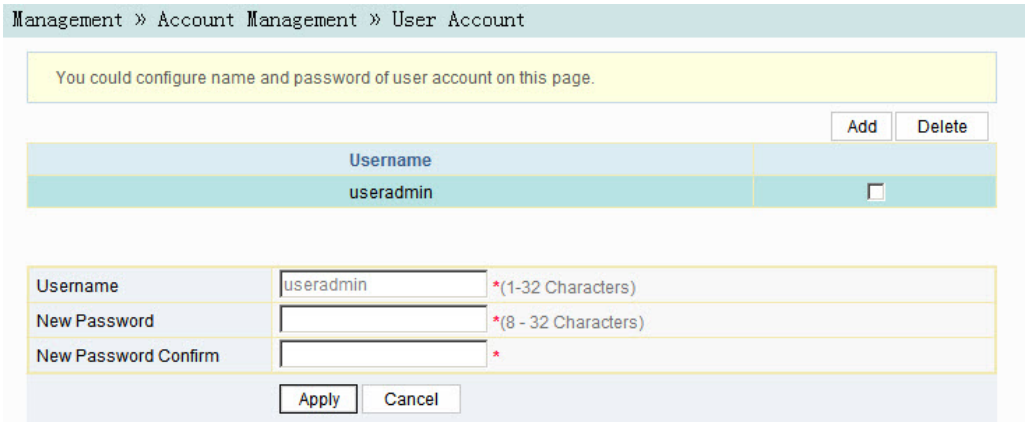


Figure 3-51 User Account Management

2. Add or delete a common user account or modify the password of a common user account as required.
3. Click **Apply** to save and apply the configuration.

3.6.1.2 Maintenance Account Management

Users can modify the username and password of the current account.

1. Select **Management** in the navigation bar. Select **Account Management→ Maintenance Account** from the left link bar to open the maintenance account management page, as shown in Figure 3-52.

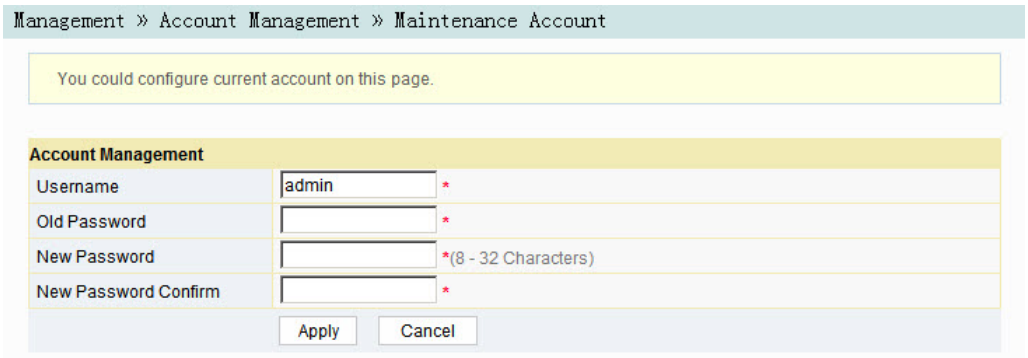


Figure 3-52 Maintenance Account Management

2. Modify the username or password of the current account as required.
3. Click **Apply** to save and apply the configuration.

3.6.2 Device Management

The ONT provides multiple device management functions such as restoring some of the configuration data, restoring all configuration data, local upgrade, configuration backup, FTP server, device reboot, and NTP time calibration.

3.6.2.1 Restoring the Configuration Data

Restore factory settings of the ONT, including user name and password for Web login, SSID and password for wireless network, etc.

1. Select **Management** in the navigation bar. Select **Device Management→ Restore** from the left link bar to open the configuration restoring page, as shown in Figure 3-53.

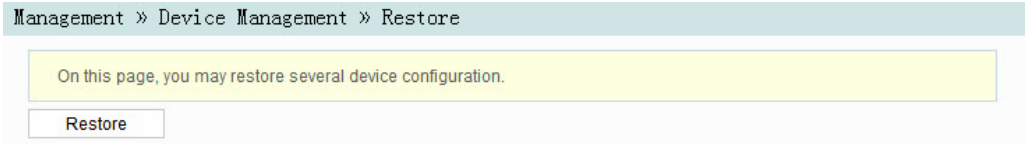


Figure 3-53 Restoring the Configuration Data

2. Click **Restore** and then click **OK** in the alert box that appears. Wait until the configuration data are completely restored.

3.6.2.2 Restoring All the Configuration Data

Restore all the configuration data of the ONT to factory settings.

1. Select **Management** in the link bar and select **Device Management→Restore All** on the left side to open the configuration restoration page, as shown in Figure 3-54.

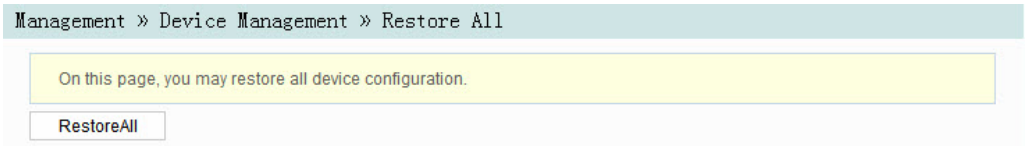


Figure 3-54 Restoring All the Configuration Data

2. Click **Restore All** and then click **OK** in the alert box that appears. Wait until the configuration data are completely restored.

3.6.2.3 Local Upgrade

Select the local file and upgrade the ONT software. During upgrade, do not power off the device or perform other operations to prevent damage to the device.

1. Select **Management** in the navigation bar. Select **Device Management→ Local Upgrade** from the left link bar to open the local upgrade page, as shown in Figure 3-55.

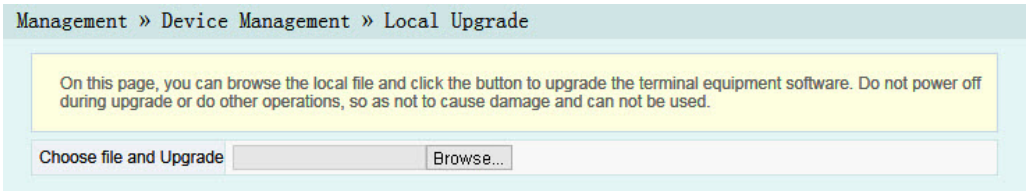


Figure 3-55 Local Upgrade

2. Click **Browse**. In the dialog box that appears, select the device software version to be upgraded and click **Open** to upgrade the ONT software.
3. When the upgrade succeeds, the page will prompt for device rebooting. Click **Reboot**. After rebooting, the device will be upgraded to the new version.

Note:

After the upgrade, you can view the **Software Version** in the device information page to check whether the current version is correct.

3.6.2.4 Configuration Backup

Back up and save the ONT configuration files for restoring configuration data later on. Before backup, enable the FTP tool in the computer.

1. Select **Management** in the navigation bar. Select **Device Management→ Config Backup** from the left link bar to open the configuration backup page, as shown in Figure 3-56.

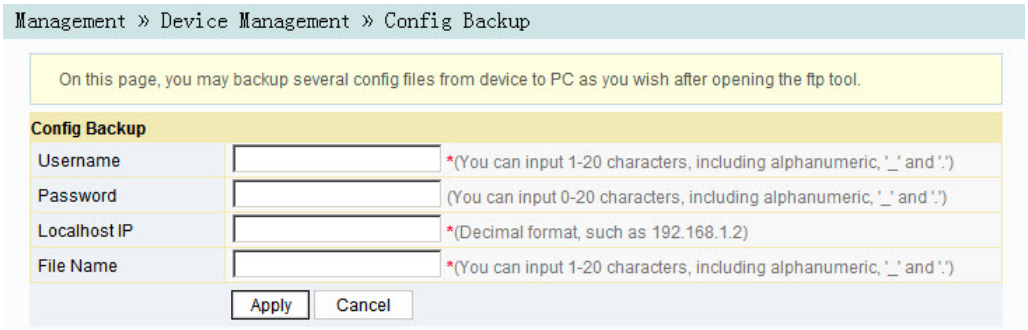


Figure 3-56 Configuration Backup

2. Configure parameters relevant to file backup. For details of the parameters, see Table 3-28.
3. Click **Apply** to save the configuration backup file.

Table 3-28 Parameters for Configuration Backup

Item	Description
Username	The FTP username.
Password	The FTP password.
Localhost IP	The local IP address.
File Name	The existing file name of the ONT.

3.6.2.5 FTP Server

Note:

The FTP server function is only applicable to the ONTs with USB interfaces.

With the FTP server function of the ONT enabled, users can access the ONT resources via the FTP client end on the PC.

1. Select **Management** in the navigation bar. Select **Device Management→FTP Server** from the left link bar to open the FTP server configuration page, as shown in Figure 3-57.

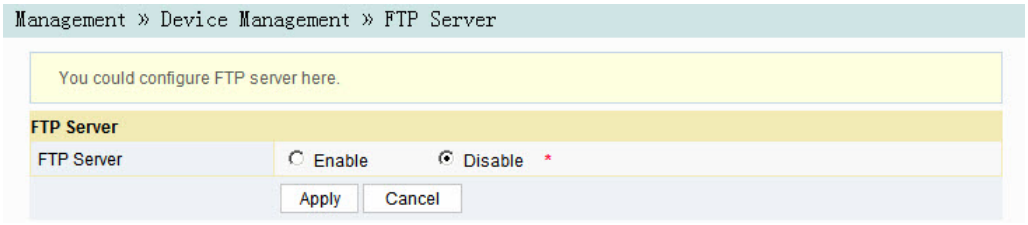


Figure 3-57 FTP Server

2. Enable or disable the FTP server function according to the requirement.Select **Enable** and then enter the **Username** and **Password** for connection with the FTP server.
3. Click **Apply** to save and apply the configuration.

3.6.2.6 Device Reboot

1. Select **Management** in the navigation bar. Select **Device Management→ Device Reboot** from the left link bar to open the device reboot page, as shown in Figure 3-58.

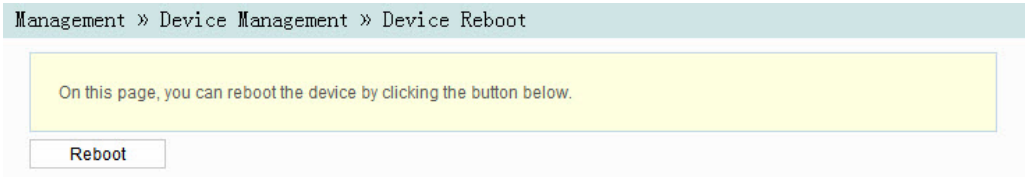


Figure 3-58 Device Reboot

2. Click **Reboot** and click **OK** in the alert box that appears and wait for the device to reboot.

Caution:

Save the configuration data before rebooting the device to prevent loss of the data.

After the device is rebooted, wait for about two minutes before next login to the Web GUI of the device.

3.6.2.7 NTP Time Calibration

Users can obtain the precise time by connecting the ONT to an NTP server.

1. Select **Management** in the navigation bar. Select **Device Management→NTP Check Time** from the left link bar to open the NTP check time page, as shown in Figure 3-59.

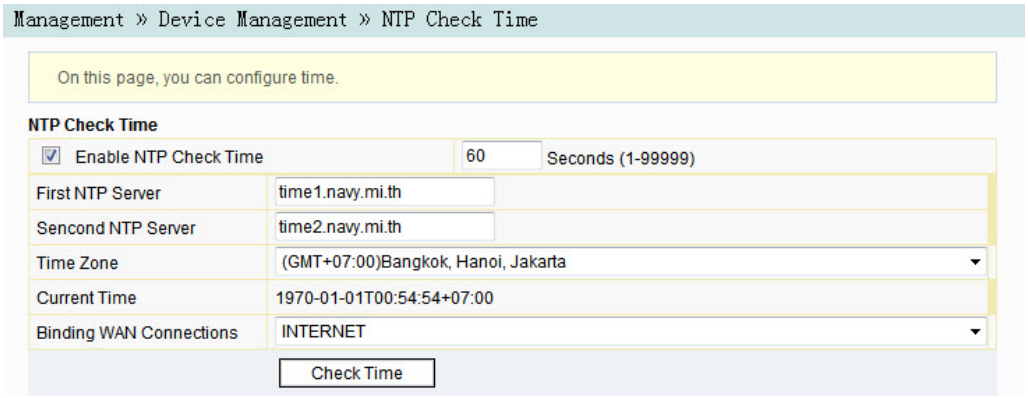


Figure 3-59 NTP Time Calibration

2. Configure parameters relevant to the NTP time calibration. For details of the parameters, see Table 3-29.
3. Click **Check Time** to save and apply the configuration.

Table 3-29 Parameters for NTP Time Calibration

Item	Description
Enable NTP Check Time	Select whether to enable the NTP time calibration function.
Seconds	Sets the time interval for synchronization with the time server.
First NTP Server	Enter the IP address of the active NTP server.
Second NTP Server	Enter the IP address of the standby NTP server.
Time Zone	Select the time zone according to the location of the device.
Current Time	When NTP Check Time is enabled, time will be calibrated according to the location of the device, and the local time will be displayed. When NTP Check Time is disabled, the system initial time (1970-01-01) or the previous calibrated time will be displayed.
Binding WAN Connections	Select the WAN connection type for time calibration.

3.6.3 Log Management

The log files record key operations and actions on the ONT. Users can view the information saved in the log as needed.

Select **Management** in the navigation bar. Select **Log→Log** from the left link bar to open the log information page, as shown in Figure 3-60.

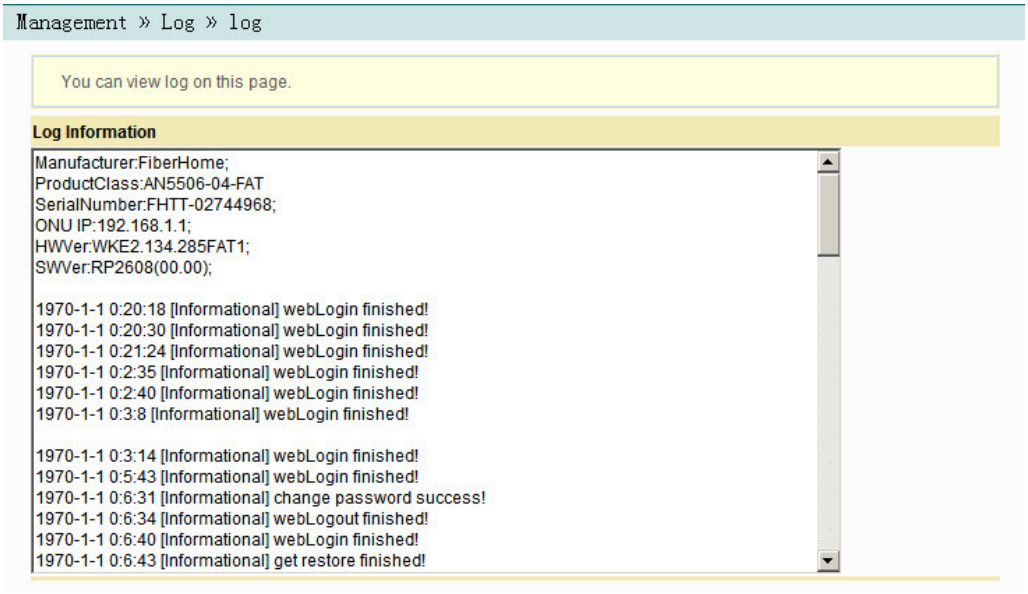


Figure 3-60 Log

4 Handling Common Problems

This chapter introduces how to handle common problems encountered in equipment operation and service test.

- ☑ Power Status Indicator LED Extinguished
- ☑ Register Status Indicator LED Extinguished
- ☑ Optical Signal Status Indicator LED Blinking
- ☑ Ethernet Interface Status Indicator LED Extinguished
- ☑ Failing to Detect the ONT Using Wi-Fi
- ☑ Failing to Access Local Web Login GUI and Failing to Ping 192.168.1.1
- ☑ Failing to Access Internet Using the LAN Port
- ☑ Failing to Access Internet Using Wi-Fi
- ☑ Measured Internet Access Rate Out of Normal Range
- ☑ Connection to IPTV Failed
- ☑ IPTV Picture Suspended
- ☑ Test of Voice Service Failed

4.1 Power Status Indicator LED Extinguished

Handle the problem according to the procedures below.

1. Check whether the mains supply is normal.
2. Check whether the power adapter matches the device.
3. Check whether the power button is pressed down.
4. Check whether the power cable connection is normal.

4.2 Register Status Indicator LED Extinguished

Handle the problem according to the procedures below.

1. Check whether the device power supply is normal.
2. Check whether the optical fiber connection is normal.
3. Check whether the ONT has obtained the ISP authorization.
4. Check whether the optical interface is normal; if not, replace the device.

4.3 Optical Signal Status Indicator LED Blinking

Handle the problem according to the procedures below.

1. Check whether the optical fiber is damaged.
2. Check whether the optical fiber is connected to the correct interface.
3. Check whether the Rx optical power of the ONT (measured with the optical power meter) is below specifications.
4. Check whether the ONT optical module is aged or damaged.
5. Check whether the local device is faulty.

4.4 Ethernet Interface Status Indicator LED Extinguished

Handle the problem according to the procedures below.

1. Check whether the network cable is damaged or connected incorrectly.
2. Check whether the color-coding scheme of the network cable is incorrect; if so, replace it with a standard CAT-5 twisted pair network cable.
3. Check whether the network cable length exceeds the allowed range (100 m).

4.5 Failing to Detect the ONT Using Wi-Fi

Handle the problem according to the procedures below.

1. Check whether the wireless function is disabled for the ONT and whether the SSID is set to **Hidden** so that the network is invisible.
2. Check whether the network card drive of the computer is installed normally and whether the WLAN function of the wireless terminal (such as computer and telephone) is enabled.
3. Adjust the position of the ONT to reduce the barriers on the wireless channel (such as walls) and make sure the distance between the ONT and the wireless terminal is within the required range.

4.6 Failing to Access Local Web Login GUI and Failing to Ping 192.168.1.1

Handle the problem according to the procedures below.

1. Check whether the LAN port indicator LED is solid ON; if not, replace the network cable.
2. Check whether the computer is set with a fixed IP address in the network segment of 192.168.1.x.

4.7 Failing to Access Internet Using the LAN Port

Handle the problem according to the procedures below.

1. Check whether the computer is set with a fixed IP address. If yes, modify the configuration so that the computer can obtain an IP address automatically. Then retry the connection.

2. If the computer obtains an IP address automatically, check whether the computer has obtained an IP address in the network segment of 192.168.x.x.
3. Contact the personnel in the network management center to check whether the WAN is connected correctly and bound with the LAN port.

4.8 Failing to Access Internet Using Wi-Fi

Handle the problem according to the procedures below.

1. Check whether the computer is connected to the ONT's Wi-Fi signal correctly and can obtain an IP address automatically.
2. Contact the personnel in the network management center to check whether the WAN connection is bound with the Wi-Fi port correctly.

4.9 Measured Internet Access Rate Out of Normal Range

Contact the personnel in the network management center to check whether the bandwidth profile is configured correctly and bound to the ONT.

4.10 Connection to IPTV Failed

Handle the problem according to the procedures below.

1. Check whether the STB is connected to the ONT port and configured with the IPTV account number and password correctly.
2. Contact the network management center to check whether the IPTV service work order has been delivered.
3. Check whether the ONT connection port is the service port bound with the IPTV work order.

4.11 IPTV Picture Suspended

Handle the problem according to the procedures below.

1. Check whether the network cable connecting the STB (Set Top Box) is proper.
2. Contact the network management center to check whether the IPTV service is bound with the rate limiting profile correctly.
3. Replace the STB.

4.12 Test of Voice Service Failed

Handle the problem according to the procedures below.

1. Check whether you can hear the current tone when you go off-hook; if no, check whether the phone cable is connected correctly.
2. Check whether you can hear the dial tone when you go off-hook; if no, contact the network management center to check whether the voice service work order has been delivered correctly and whether the uplink device has delivered the configuration data to the voice service port of the ONT.
3. Log into the ONT to check whether it has obtained an IP address for the voice service .
4. Contact the softswitch platform to check whether the voice node data have been configured.

5 Standards and Protocols

Classification	Standard Number	Title
GPON	ITU-T G.984.1	Gigabit-capable passive optical networks (GPON): General characteristics
	ITU-T G.984.2	Gigabit-capable Passive Optical Networks (GPON): Physical Media Dependent (PMD) layer specification
	ITU-T G.984.3	Gigabit-capable Passive Optical Networks (G-PON): Transmission convergence layer specification
	ITU-T G.984.4	Gigabit-capable passive optical networks (G-PON): ONT management and control interface specification
Ethernet	IEEE 802-2001	IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture
	IEEE 802.1D-2004	IEEE Standard for Local and metropolitan area networks: Media Access Control (MAC) Bridges
	IEEE 802.1Q-2005	IEEE Standard for Local and Metropolitan Area Networks - Virtual Bridged Local Area Networks - Amendment 4: Provider Bridges
	IEEE 802.1ad	IEEE Standard for Local and Metropolitan Area Networks - Virtual Bridged Local Area Networks - Amendment 4: Provider Bridges
	IEEE 802.1x-2004	IEEE Standard for Local and Metropolitan Area Networks Port- Based Network Access Control
	IEEE 802.1ag-2007	IEEE Standard for Local and Metropolitan Area Networks Virtual Bridged Local Area Networks Amendment 5: Connectivity Fault Management
	IEEE 802.3-2005	IEEE Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications
	IEEE 802.3z	Gigabit Ethernet Standard
	IEEE 802.1p	Traffic class expediting and dynamic multicast filtering. Describes important methods for providing QoS at MAC level
	TR-101	Migration to Ethernet-Based Broadband Aggregation

Classification	Standard Number	Title
	TR-143	Enabling Network Throughput Performance Tests and Statistical Monitoring
VoIP	ITU-T G.711	Pulse code modulation (PCM) of voice frequencies
	ITU-T G.711.1	Wideband embedded extension for G.711 pulse code modulation
	ITU-T G.722	7 kHz audio-coding within 64 kbit/s
	ITU-T G.723.1	Dual rate speech coder for multimedia communications transmitting at 5.3 and 6.3 kbit/s
	ITU-T G.729	Coding of speech at 8 kbit/s using conjugate-structure algebraic-code-excited linear prediction (CS-ACELP)
	ITU-T G.729.1	G.729 based Embedded Variable bit-rate coder: An 8-32 kbit/s scalable wideband coder bitstream interoperable with G.729
	ITU-T G.165	Echo Cancellers
	ITU-T G.168	Digital network echo cancellers
Multicast	IETF RFC 2236	Internet Group Management Protocol, Version 2
	IETF RFC 3376	Internet Group Management Protocol, Version 3
	IETF RFC 4541	Considerations for Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD) Snooping Switches
Time	IETF RFC 1305	Network Time Protocol (Version 3) Specification, Implementation and Analysis
	IETF RFC 2030	Simple Network Time Protocol (SNTP) Version 4 for IPv4, IPv6 and OSI
EMC	EN 300 386	Electromagnetic compatibility and Radio spectrum Matters (ERM); Telecommunication network equipment; Electromagnetic Compatibility (EMC) requirements
	CISPR 22 (EN55022)	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
	CISPR 24 (EN55024)	Information technology equipment - Immunity characteristics - Limits and methods of measurement
Other	TR-069	CPE WAN Management Protocol

Appendix A Abbreviations

ONT	Optical Network Terminal
FTTH	Fiber To The Home
GPON	Gigabit-capable Passive Optical Network
ODN	Optical Distribution Network
OLT	Optical Line Termination
MTBF	Mean Time Between Failure
DBA	Dynamic Bandwidth Allocation
XML	Extensible Markup Language
GEM	GPON Encapsulation Mode
ATM	Asynchronous Transfer Mode
OAM	Operation, Administration And Maintenance
FEC	Forward Error Correction
TDMA	Time Division Multiple Access
PLOAM	Physical Layer Operations, Administration and Maintenance
OMCI	ONU Management and Control Interface
T-CONT	Transmission Container
NSR	Network Security Recorder
AES	Advanced Encryption Standard
MAC	Medium Access Control
IGMP	Internet Group Management Protocol
VLAN	Virtual Local Area Network
QoS	Quality of Service
ACL	Access Control List
WRR	Weighted Round Robin
DHCP	Dynamic Host Configuration Protocol
PPPoE	Point to Point Protocol over Ethernet
NAT	Network Address Translation

DMZ	Demilitarized Zone
ARP	Address Resolution Protocol
UPnP	Universal Plug and Play
DoS	Denial of Service
URL	Uniform Resource Locator
HTTPS	Hyper Text Transfer Protocol over Secure Socket Layer
CATV	Cable Antenna Television
SIP	Session Initiation Protocol
VoIP	Voice over Internet Protocol
RTP	Real-time Transport Protocol
SSID	Service Set Identifier
WAN	Wide Area Network
LAN	Local Area Network
WLAN	Wireless Local Area Networks
MTU	Maximum Transmission Unit
PPPoE	Point to Point Protocol over Ethernet
DTMF	Dual Tone Multi Frequency
VPN	Virtual Private Network
DDNS	Dynamic Domain Name Server
FTP	File Transfer Protocol
CPE	Customer Premise Equipment
EMC	Electro Magnetic Compatibility
GUI	Graphical User Interface
HG	Home Gateway
ICMP	Internet Control Message Protocol
IP	Internet Protocol
LAN	Local Area Network
MLD	Multicast Listener Discover
PON	Passive Optical Network
POTS	Plain Old Telephone Service
SP	Strict Priority
STB	Set Top Box
TCP	Transmission Control Protocol
UDP	User Datagram Protocol

Product Documentation Customer Satisfaction Survey

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Code and Version	

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☐ in starting up a project ☐ in installing the product ☐ in daily maintenance ☐ in trouble shooting ☐ Other (please specify) _____

3. What is the percentage of the operations on the product for which you can get instruction from the documentation?

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4. Are you satisfied with the promptness with which we update the documentation?

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4. Is the information complete in the documentation?

☐ Yes

☐ No (Please specify) _____

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